

Andreas Luszczak

Using Microsoft Dynamics AX 2009

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With 177 Figures



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Preface

When looking for a business management solution supporting business processes in mid-sized and large companies, Microsoft Dynamics AX is likely to be your favorite. Because of its deep functional and technological integration, it is as well a good choice for universities teaching ERP systems.

Reading This Book

The primary purpose of this book is to provide you with a good knowledge of the standard application concept and functionality, which is required to run business processes in Microsoft Dynamics AX 2009. This book therefore is for you, if you are an end user, student or consultant, interested in learning how to use Dynamics AX.

Going beyond the operations on the user interface, you will also learn how the different parts of the application tie together. As a result, you will as well take advantage learning the end-to-end application concept, if you are a system administrator, developer, IT executive or experienced consultant not knowing the complete application already.

Actually working in an application is the best way to learn it. Therefore, the chapters of this book include exercises that build up on each other in a comprehensive case study. If you need support to solve the exercises, you may access a free download of sample solutions.

This book is the English version of the successful book "Grundkurs Microsoft Dynamics AX", recommended by Microsoft in Germany. Based on the second edition of the German volume, it includes the core improvements of Dynamics AX in version AX 2009.

Since Dynamics AX is a very comprehensive business solution, it is not possible to cover all parts of the application in a single book. In order to provide a profound understanding of the core application, this book addresses the primary functionality in supply chain management (including trade, logistics and production) and finance management. It shows the application, but does not cover tasks in system administration and development.

Applicable Settings

In Dynamics AX, you may individually choose the language that applies to your user interface. Descriptions and illustrations in this book refer to the language "EN-US". Whereas it is obvious, that the Dynamics AX client will display different labels when choosing languages like Spanish or Russian, you will also notice differences when selecting British English. As an example, the label for the field "Sales tax" is "VAT" in British English.

Multisite activation in Dynamics AX 2009 is another setting, which is important throughout the whole application. In this book, we generally apply the multisite functionality, as it is Dynamics AX standard when setting up a new company account. If your company does not activate the multisite functionality, skipping the dimension "Site" in the sentences of the book will apply the explanations to your situation.

Other sources of possible differences from your application to the descriptions in the book are applicable local features as well as specific modifications implemented in your Dynamics AX system.

In order to benefit from the explanations, it is useful to access a Dynamics AX application. A separate test application, where you may do the exercises, minimizes the risk to affect real company data.

The exercises and illustrations in this book are based on the sample company “Anso Technologies Ltd.”. In order to ensure a clear understanding, this company shows a simple setup, limited to the functionality described. You may download the sample company, containing sample exercise solutions, as described below. Nevertheless, the tasks in the exercises are specified in a way, that you may choose a different test environment as well.

Available Support

In order to download the sample company as well as solutions of the exercises in this book, you may access the online service of the publisher or choose the following Web site:

<http://axbook.addyn.com>

In the download links, you may also find additional information and errata, if applicable.

If you have any comments or questions regarding the book or the related exercises, please contact me through the Web site mentioned above or via e-mail to *alu@addyn.com*.

You may also contact me, if you are interested in my training and consulting services, including areas of the Dynamics AX application not covered in the limited number of pages in this book.

Acknowledgements

Many people have been involved in finalizing this book, directly and indirectly, from the first edition in German to the English edition available by now. I want to thank all of them. In particular, I would like to mention Harald Paul, Hubert Grossinger, Peter Sturm, Ingo Maresch, Helga Zopf, Herbert Leberbauer and Keith Dunkinson. Thank you as well to the people of the AxPact World Alliance. An important contribution also comes from the publisher, in the beginning Günter Schulz, and later Sybille Thelen and Christel Anne Roß. Finally, my special thanks go to my family, Sonja, Felix and Caroline.

Andreas Luszczak

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1 What is Microsoft Dynamics AX?

Dynamics AX is Microsoft's core business management solution, designed to meet the requirements of mid-sized companies and multinational organizations. Based on state of the art architecture and deep integration, Dynamics AX shows comprehensive functionality while ensuring high usability at the same time.

With version AX 2009, Dynamics AX shows additional modules and improved functionality in numerous areas. Main innovations include the new user interface with role centers to support a role tailored user experience on the one hand, and the multisite foundation to support company structures with subsidiaries and sites within a legal entity on the other hand.

1.1 Axapta and the History of Dynamics AX

Dynamics AX in its origin has been developed under the name *Axapta* by Damgaard A/S, a Danish software company. The first version released to market has been published in March 1998. At that time, the founders of Damgaard – Erik and Preben Damgaard – have already had more than ten years of experience designing ERP systems. Among others, they have been co-founders of PC&C, where they joined the development of *Navision* (now Dynamics NAV).

Version 1.0 of Axapta has been available in Denmark and the USA only. Version 1.5, published in October 1998, included support for several European countries. Releasing version 2.0 in July 1999 and version 3.0 in October 2002, the development of Axapta continuously increased the application functionality as well as the support of additional countries. Until releasing Axapta under the new brand Dynamics AX in version 4.0, improvements have been deployed in a number of service packs.

After signing a merger agreement in November 2000, Damgaard A/S united with their rival Navision A/S, a successor of PC&C. Finally, Microsoft acquired Navision-Damgaard in May 2002 accepting their main products, Navision and Axapta, as the core business solutions of Microsoft. Whereas Navision focuses on small companies in technological and functional respect, Axapta is the product for mid-sized and large companies.

When releasing version 4.0 in June 2006, Microsoft rebranded Axapta to Dynamics AX. Microsoft Dynamics AX 4.0 differs from previous versions not only by functional enhancements but also by a new user interface, showing a complete redesign with a Microsoft Office-like look and feel.

Axapta

Company history

Dynamics AX

1 What is Microsoft Dynamics AX?

AX 2009 Dynamics AX 2009 has been published in June 2008. Including role centers, workflow functionality and a user interface matching with the current versions of Microsoft Windows and Microsoft Office, Dynamics AX 2009 shows a familiar and intuitive user experience even further improved. Enhanced functionality, including the multisite foundation and additional modules, provides an end-to-end support for the requirements of global organizations.

1.2 Dynamics AX 2009 Product Overview

Microsoft Dynamics AX is an adaptable business management solution, which is easy to adapt and nevertheless applies to installations of multinational companies. Another characteristic is the deep integration to Microsoft technologies and applications like Microsoft SQL Server, SharePoint Services and BizTalk Server.

User interface Most people are familiar to Dynamics AX from the very first start, since the user interface is already known from Microsoft Windows and Microsoft Office products. The intuitive user experience helps to start working in Dynamics AX easily and efficiently, supported by a tight integration to other Microsoft software. Role centers grant an easy and fast overview of information required by the individual employee.

Functionality The end-to-end support of business processes in supply chain management (SCM) and customer relationship management (CRM) allows integrating external business partners like customers and vendors on the one hand as well as internal departments and subsidiaries on the other hand.

Multi-language, multi-country and multi-currency support together with the option to manage several sites within one company make it possible to manage complex global organizations in a common database.



Figure 1.1: Business processes covered by Dynamics AX (Source: Microsoft)

The functionality of Dynamics AX includes following main areas:

- Customer relationship management (CRM)
- Supply chain management (SCM)
- Service management
- Financial and compliance management
- Project management and accounting
- Human resources management
- Collaboration
(Enterprise Portal, Application Integration Framework)
- Business intelligence and reporting

High scalability and adaptability make it easy to implement Dynamics AX initially and to manage later changes in the organization and in business processes. As an example, you may limit deployment to functions like finance at the beginning and simply add new modules like production or warehouse management later, when you need them. Enhancing Dynamics AX with additional users or companies is as well possible any time.

In order to access data for analysis, integrated functionality for reporting and business intelligence grants a fast and reliable presentation of business data. Business intelligence features are not only available for analysis in finance, but also for users in all other areas of Dynamics AX who need to analyze their data.

**Business
Intelligence**

Collaboration functionality to connect external partners is available in two ways: The Enterprise Portal on the one hand and the Application Integration Framework on the other hand.

Collaboration

The Enterprise Portal grants direct access to Dynamics AX through a regular Internet browser like Microsoft Internet Explorer. Limiting access to role-specific data, you may deploy the Enterprise Portal to internal employees as well as external customers and vendors.

The Application Integration Framework (AIF) on the other hand supports automatic data exchange with other business applications inside and outside your company. Receiving and sending documents like invoices, packing slips or price lists works in XML format. Applying an external converter, you may convert the documents to any other format like EDIFACT if necessary.

Industry solutions certified by Microsoft – Microsoft Dynamics Industry Solutions (MDIS) – enhance the core functionality of Dynamics AX to meet the specific requirements of various industries. Industry solutions are designed by selected ISVs and partners in accordance with Microsoft's technical guidelines and quality standards. Worldwide sales and support for these solutions is available directly from Microsoft.

**Industry
solutions**

1 What is Microsoft Dynamics AX?

How to buy	Microsoft does not directly sell Dynamics AX to customers, but provides an indirect sales channel. Customers may purchase licenses from certified partners, which also offer their services to support the implementation of Dynamics AX. This support includes application training and consulting as well as system installation and the development of enhancements to the core functionality.
Implementing	In order to assist the implementation of Dynamics applications, Microsoft provides a standardized implementation methodology for partners – Microsoft Dynamics Sure Step. The Microsoft Dynamics Sure Step Methodology is a comprehensive approach to implement Microsoft Dynamics solutions including project management principles as well as solution-specific guidelines and tools. Within Sure Step, the Dynamics AX Rapid Configuration Tool (RCT) contains the tools and templates to implement Dynamics AX.
Internet resources	Additional resources including product information, customer stories and online demos are available on the Microsoft Dynamics AX web page www.microsoft.com/dynamics/ax/default.mspx in a global version as well as in a local version accessible through the Microsoft homepage of your country. The Microsoft web pages also provide support to find an implementation partner and to access the Microsoft Dynamics Solution Finder available to look for industry solutions.
MorphX	Dynamics AX shows an integrated development environment called MorphX. It allows designing, editing, compiling and debugging code within the Dynamics AX client. In order to provide an efficient way to design the programmable objects like tables and forms, the development environment shows a tree structure – the Application Object Tree (AOT).



Figure 1.2: The Application Object Tree (AOT) to design programmable objects

The programming language in Dynamics AX is X++. X++ is an object-oriented, proprietary language in Dynamics AX, which is similar to C# and Java.

Since application objects in MorphX show an open source code, you may adjust and enhance Dynamics AX functionality in the development environment. You may open the development environment directly within the Dynamics AX client, if an appropriate license is available.

Applying a layer structure, Dynamics AX provides a hierarchy of levels in the application source code separating the standard application from modifications. Different application object layers make sure that your modifications will not interfere with standard objects stored in the system layer. The layering system therefore facilitates release upgrades on the one hand and industry solutions implementations on the other hand.

The lowest object level in Dynamics AX is the SYS layer, which together with the GLS layer contains the core Dynamics AX standard objects. The HFX layer containing applicable standard hot fixes together with higher layers only include objects different to the SYS layer. The layers SL1, SL2 and SL3 are reserved for industry solutions provided by the Microsoft Dynamics Industry Solutions program (MDIS). The highest object level is the USR layer, which contains your specific modifications.

In addition, every layer except for HFX, SL1, SL2 and SL3 refers to a patch layer with a name ending with "P" (e.g. "USP" for the USR layer). The

X++

Layer technology

1 What is Microsoft Dynamics AX?

patch layers are reserved for application updates to the related regular layer.

When accessing the Dynamics AX application, the kernel looks for a version of every object required. This version search starts from the highest layer, the USR layer. If no object version is available in the USR layer, the kernel will go through the lower layers until finding the object – locating it in the SYS layer if no modifications apply.



Figure 1.3: Hierarchy of application object layers in Dynamics AX 2009

If you have modified the item form as an example, Dynamics AX will run the form *InventTable* that you have modified in the USR layer and not the standard object with the same name in the SYS layer.

Three-tier architecture

In order to support large implementations with a high number of users, Dynamics AX consequently shows a three-tier architecture. The three-tier architecture is characterized by separating database, application and client.

Database

Data managed in Dynamics AX are stored in a relational database, which may be either a Microsoft SQL Server or an Oracle database. For large installations, you may use a database cluster.

Application

The application tier contains the business logic of Dynamics AX, executing the code designed in the development environment. It may run on a single AOS server or on a server cluster to support large implementations.

Client

The client tier contains the graphical user interface, which is required to process data input and output. The regular user interface in Dynamics AX is a Windows client.

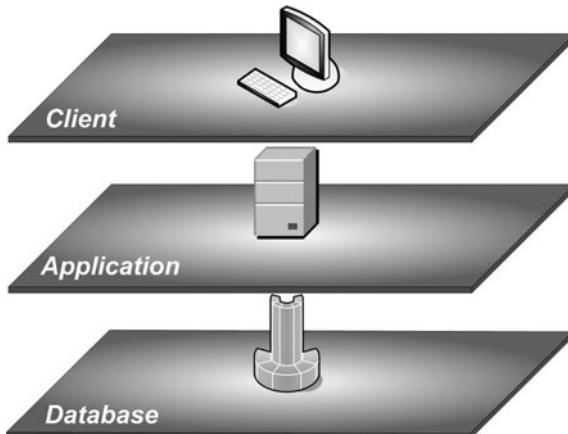


Figure 1.4: The three-tier architecture in Dynamics AX

Database, application (AOS) and client usually run on different computers. In case of small implementations, you may also install database and application together on a single server. For testing purposes, all three tiers may run on a common device.

When working in a module of Dynamics AX (or any other business software), you manage data describing processes (e.g. item transactions). On the other hand, you also need to manage data describing objects (e.g. customers).

In order to group the different kinds of data, you may distinguish three data types:

- Setup data
- Master data
- Transaction data

Setup data determine the way business processes work in Dynamics AX. As an example, you may select in the setup to apply warehouse locations, pallets or serial numbers.

Besides modifying programmable objects, setup therefore is the second way to adapt the application according to the requirements of your company. Usually you will enter setup data when initially setting up the system. Later modifications of core setup data need to be checked carefully.

Master data describe objects like customers, ledger accounts or items. Therefore, master data will change only when the related object changes, as an example when a customer gets a new address.

Installation

Data structure

Setup data

Master data

Master data are entered or imported initially before a company starts working in the application. They do not change regularly, therefore you will need to insert or edit master data only when there are changes.

Transaction data

Transaction data are continuously created when processing business activities. Examples for transaction data are sales orders, invoices or item transactions.

In Dynamics AX, the application generates transaction data for every business activity. Registration and posting of transaction data complies with the voucher principle.

Voucher principle

Vouchers base on master data like ledger accounts, customers or items. If you want to post a transaction, you need to register a voucher containing a header and one or more lines first. It is not possible to post a voucher, as long as it does not comply with the rules defined by settings and Dynamics AX-internal business logic. Once a voucher is posted, it is not possible to change it any more.

Some minor vouchers like quarantine transactions show exceptions regarding the voucher structure, however. They do not contain a separate header and lines part.

Examples for vouchers in Dynamics AX are orders in sales or purchasing as well as journals in finance or inventory management. After posting, the posted documents are available as packing slips, invoices, ledger transactions or inventory transactions.

1.4 Application Components

Role centers

Microsoft Dynamics AX 2009 provides a role-tailored user experience, which aims to show an interface exactly matching the needs of the individual user. The goal is to support efficient standard processes, avoiding to show unnecessary, confusing data on the one hand and ensuring to display all required data immediately on the other hand.

The core feature referring to the role-tailored access is the role center functionality, providing fast and personalized access to required information like alerts, tasks and reports (see Section 2.1.5). Dynamics AX ships with more than 30 role centers designed for standard roles like accountant or marketing manager, which are generally applicable.

In order to comply with individual business requirements, you may easily add new roles or adapt existing roles. User profiles, which represent the different roles, are assigned to users based on their function in the company. Beside the user groups in permission management, user profiles are the second dimension for grouping users, therefore.

The workflow system in Dynamics AX provides configurable workflows to support routine procedures like the approval process for a purchase requisition. The workflow infrastructure in Dynamics AX is based on the Windows Workflow Foundation enabling workflow messages in Microsoft Outlook, the Enterprise Portal or the regular Dynamics AX client.

Functionality in Dynamics AX is packed in modules, including following main functional groups:

- Financial management
- Customer relationship management (CRM)
- Supply chain management (SCM)
- Production and shop floor control
- Project management
- Service management
- Human resources management

Financial management in Dynamics AX supports the business processes in accounting, controlling and budgeting. The deep integration of Dynamics AX ensures that transactions in all other areas of the application like sales, purchasing, production, inventory and project management are immediately available in finance.

Core features in financial management are general ledger, accounts receivable and accounts payable as well as fixed assets and liquidity management (bank management and payments).

Cost accounting provides a comprehensive cost flow analysis of cost centers and purposes. **Balances scorecard** shows a specific analysis of achieving company targets in multiple dimensions like economic efficiency and customer satisfaction. **Expense management** allows web-based registration of travel and entertainment expenses.

CRM (customer relationship management) in Dynamics AX supports the sales and marketing processes. Core feature is the sales force automation managing customers, contact persons, leads and opportunities. Marketing automation includes activity management showing a tight integration with Microsoft Outlook and marketing campaigns.

SCM (supply chain management) supports the complete logistic chain of materials, information and financial transactions from the vendor to the customer including purchasing, inventory management, production and sales. The tight integration of data throughout the whole application grants a common, accurate and immediate access to data for all involved people.

The functionality of supply chain management includes **Inventory management** along with warehouse locations, pallets, RFID support, bills of

Workflow

Modules

Financial management

CRM

SCM

1 What is Microsoft Dynamics AX?

materials and quality management. Sales and purchase order management is available in the **Accounts receivable** and the **Accounts payable** module, including numerous options like direct deliveries, replacement items and comprehensive pricing features.

Product Builder (product configuration) and **Master planning** (operations planning) are additional options to meet the requirements of supply chain management.

The support for **Intercompany** processes enables automatic purchase and sales processes between companies in a Dynamics AX database.

The **Enterprise Portal**, enabling role-based web access, as well as the **Application Integration Framework** (AIF), automatically exchanging business documents like invoices, provide direct access to your Dynamics AX application for customers and vendors.

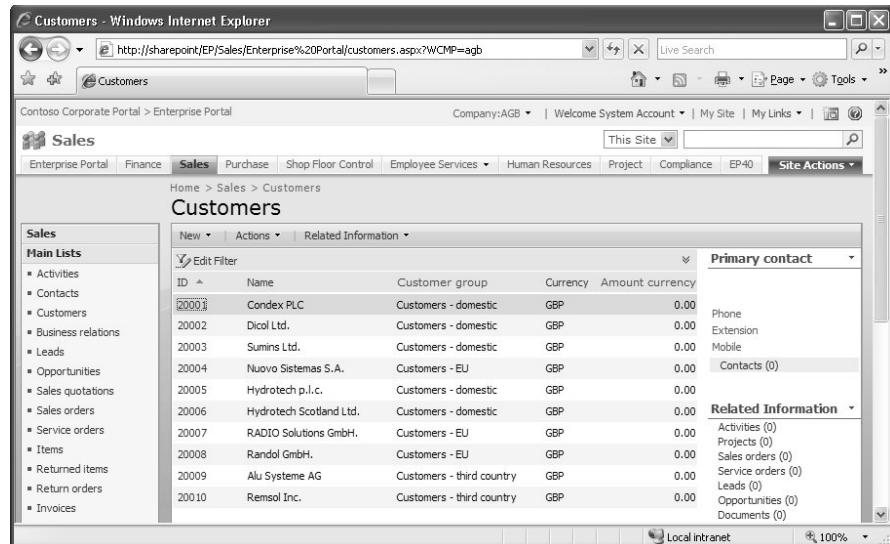


Figure 1.5: Web access to Dynamics AX through the Enterprise Portal

Production

Production in Dynamics AX controls the complete manufacturing process, starting from production scheduling, component and work center management to stocking of finished goods.

In order to support the tasks in manufacturing, numerous features like integrated Gantt diagrams, production order management, options for subcontracting and the module **Shop Floor Control** are available.

Project in Dynamics AX supports financial planning and controlling of projects. Based on the registration of project times, consumed items, expenses and fees, Dynamics AX grants correct invoices and ledger transactions even in highly complex, hierarchical projects.

Apart from external projects like time and material, or fixed-price projects, you may also manage internal activities like investment projects. An interface to the Microsoft Office Project Server provides synchronization with Microsoft Project.

Service in Dynamics AX, designed to manage the service operations of your company, is based on the project module. Service management features include service subscriptions and agreements as well as service orders for periodical activities and repair orders for sudden incidents.

Human resources in Dynamics AX supports employee administration including positions, competencies and payroll data as well as the management of organizational structures. In addition, management of absences, courses and applications is available as well.

Business intelligence in Dynamics AX is based on the Business Intelligence platform of the Microsoft SQL Server. Therefore, you may apply all features provided by the SQL Server like the SQL Report Builder to examine Dynamics AX data, which are continuously updated while analyzing.

In addition, you may access multi-dimensional OLAP queries directly within the Dynamics AX client. Therefore, OLAP queries are easily accessible for every user with appropriate permissions.

In order to comply with country-specific requirements, local features are available. In order to activate local features, you need to apply appropriate parameter settings or configuration keys.

System configuration and license codes control, which modules and features are available in your Dynamics AX implementation. In addition, permission settings will define which Dynamics AX functionality is actually available for you.

Within Dynamics AX, modules group the application by functional aspects. The application logic complies with business processes, nevertheless, ensuring that all steps in a transaction are processed in an end-to-end procedure.

Project

Service

Human resources

Business Intelligence

Local features

Available modules

2 Getting Started: Navigation and Basic Setup

One of the core principles of Microsoft Dynamics AX is to grant a familiar look and feel to people, who are used to Microsoft software. However, business software has to adapt to business processes, which can be quite complex.

2.1 User Interface and Common Tasks

Before we start to go through business processes and case studies, we want to look at the general functionality in this chapter.

2.1.1 Logon and Authentication

Microsoft Dynamics AX logon is Active Directory based, using Windows authentication. You do not need to log on to Dynamics AX with separate credentials as a result. After selecting the Dynamics AX icon on the PC desktop or in the start menu, you automatically connect to the Dynamics application using your Windows account.

The Dynamics AX user-ID, company and language derive from your user options, which you can change inside Dynamics AX.

Logon



Figure 2.1: Icon for Microsoft Dynamics AX on the PC desktop

Sometimes you need to use different user accounts within Dynamics AX – e.g., if you have to check user permissions. In this case, you have to make sure that the users you need are set up in Active Directory administration. In order to start Dynamics AX with a user that is different from your current Windows account, you need to choose the option “Run as” in the pop-up menu (which opens by right-clicking) of the Dynamics AX- icon.

Different user account

If you want to logoff from Dynamics AX shutting your session, you will choose the same way as closing other Windows programs: You may select the shortcut key *Alt+F4*, the menu option *File/Close* or the button in the top right-hand corner of the Dynamics AX workspace. If you have opened several workspace windows, you will log off when you close the last workspace.

Logoff

2.1.2 User Interface

When you start Microsoft Dynamics AX, the Dynamics AX workspace will be the first window you see. The content of the workspace depends on license keys and system configuration on the one hand and your permissions and individual settings on the other hand. If your company applies role centers (see Section 2.1.5), the content pane in the center of the workspace will show your role center; otherwise it contains an area page.

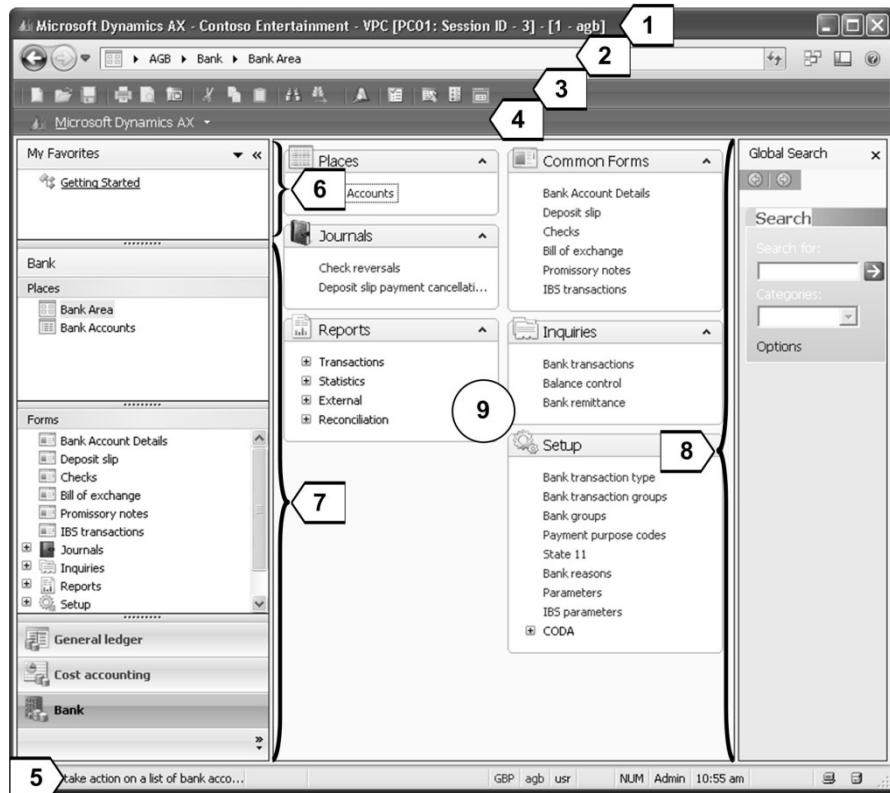


Figure 2.2: Dynamics AX workspace, showing an area page in the content pane

The workspace of Microsoft Dynamics AX 2009 consists of following areas as shown in Figure 2.2:

- Title bar [1]
- Address bar (Breadcrumb bar) [2]
- Toolbar [3]
- Command bar [4]

- Status bar [5]
- Favorites [6]
- Navigation pane [7]
- Task pane [8]
- Content pane [9]

The **title bar** shows the name of the application ("Microsoft Dynamics AX") as well as the name of the licensed company, the server name, the session ID and the current company.

Title bar

The **address bar** (breadcrumb bar) provides navigation possibilities known from Windows Vista and present-day Internet browsers. It shows a "breadcrumb" trail of the pages that you have opened in the content pane, making it possible to go back and forward pushing the travel buttons "Forward" and "Back".

Address bar

The address field shows the path of the current page and allows navigation to other companies, modules and pages.



Figure 2.3: Navigation possibilities in the address bar

In the right part of the address bar, you may find following menu buttons:

- Windows ()
- View ()
- Help ()

Right below the address bar you may find the **toolbar**, which gives the possibility to access frequently required commands by clicking an icon. Depending on the page shown in the content pane, some icons are not visible. You may adjust the settings for the toolbar choosing the command *Tools/Customize*.

Toolbar

The **command bar** contains commands that are globally available within Dynamics AX. This includes common Windows commands like *Copy* and *Paste* as well as specific Dynamics AX commands like *Filter* and *Document handling*. Depending on the content page, some commands are not active. If a certain command is as well accessible by a shortcut key, it will show on the right hand side of the particular command selection.

Command bar



Figure 2.4: The command bar in the Dynamics AX workspace

Status bar

The **status bar** at the bottom of the Dynamics AX workspace consists of two different parts. On the left side of the status bar, you may see a short help text on the active element (field or menu item) of the workspace. On the right side, you may find information on the status of the session.

If you want to change the data shown in the status bar, you need to choose appropriate settings in your user options (command *Tools/Options*). As shown in Figure 2.5, you may select following fields:

- Help text [1]
- Unread notifications / Alert status [2]
- Currency – controls currency of displayed amounts [3]
- Current company account [4]
- Application object layer [5]
- Status of Caps Lock [6]
- Status of Num Lock [7]
- ID of the current user [8]
- Session date [9]
- Session time [10]
- AOS-Name – empty in Figure 2.5 [11]
- Activity: Shows database activity [12]



Figure 2.5: The status bar (all elements displayed)

The status bar not only displays information, it also offers additional functionality. You may start certain functions by double-clicking following fields in the status bar:

- *Alert status* (Opens the alert notifications form)
- *Currency* (Opens the currency converter, which gives you the possibility to show currency amounts in different currencies)
- *Current company* (Switch between company accounts)
- *Session date* (Default for the posting date in the current session)

The **navigation pane** on the left hand side of the Dynamics AX workspace provides access to pages and forms. Pages and forms are the place to work in the different modules of Dynamics AX as described in Section 2.1.3 and 2.1.4 more in detail.

In order to hide the navigation pane completely, you may select the menu button *View*  */Navigation Pane* in the address bar. If you just want to prevent the navigation pane to show completely all the time, you may collapse the navigation pane automatically to a left-side sidebar by pushing the button *View*  */Auto-Hide Navigation*, the shortcut key *Shift+Alt+F1* or the double arrow (<<) in title bar of the navigation pane. If Auto-Hide is enabled, the navigation pane will show completely whenever you move your mouse pointer to the navigation sidebar.

Whereas the pages and forms area in the navigation pane grants access to all menu items in a uniform structure, the **favorites pane** (see Section 2.1.3) allows arranging menu items the way you need them personally. This way you can easily access pages and forms you need frequently. The functionality of favorites in Dynamics AX is similar to the administration of favorites in Microsoft Outlook or Internet Explorer.

The **task pane** also is a known element of Microsoft Office. In Dynamics AX, the task pane contains the global search. The global search gives the possibility to look for information across several tables as described in Section 2.1.6 (appropriate setup required).

In order to adjust the workspace elements according to your needs, you may show and hide the task pane and navigation items (favorites pane, navigation pane and forms area) by selecting the appropriate option in the menu button *View*  of the address bar.

The **content pane** shown in the center of the Dynamics AX workspace contains following types of pages:

- List pages (see description below)
- Area pages (see Section 2.1.3)
- Role centers (see Section 2.1.5)

If you need a second workspace to work in Dynamics AX, you may either open Dynamics AX a second time – which consumes a second session in the Dynamics AX license administration – or open a second workspace within your current session.

Navigation pane

Favorites

Task pane

Content pane

Workspace

2 Getting Started: Navigation and Basic Setup

In order to open a second workspace within your current session, you want to choose the command *Windows/Open new workspace* or the icon . Another way to open a new workspace is to push the button *New Workspace* in the dialog box that displays when you want to change the company account.

List pages

A list page (like the item page shown in Figure 2.6) provides a list of records of a particular table. You may use list pages to view and to select records as well as to complete daily tasks on those records.

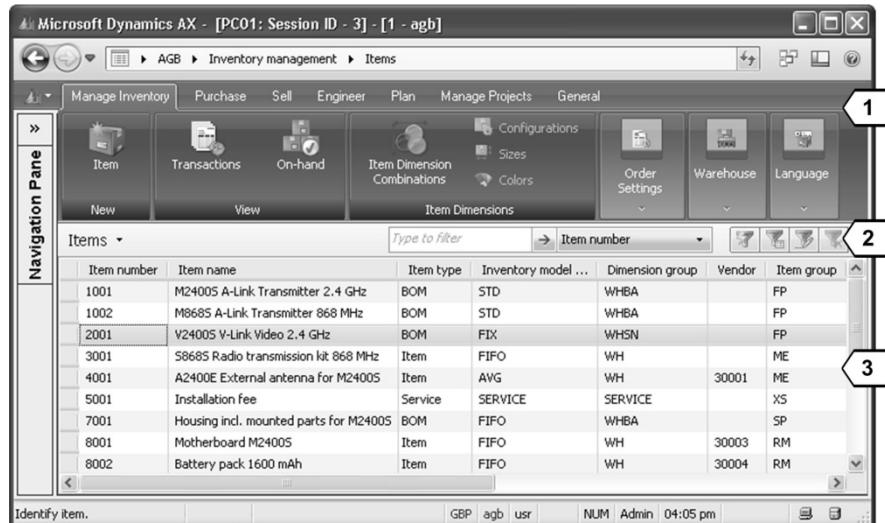


Figure 2.6: Items list page (*Auto-Hide Navigation* enabled)

List pages show a common structure, where some elements and functions depend on the table displayed. The common structure in list pages includes following basic elements:

- The **action pane** [1] consists of action buttons. Action buttons are there to execute activities related to the selected record on the one hand and to open forms, which display more information, on the other hand. Depending on the number of buttons, they show on several tabs.
- The **filter pane** [2] allows entering filter criteria (see Section 2.1.6).
- The **grid** [3] displays the list of records.

In addition to these three basic elements, some list pages contain a preview pane below the grid, which shows information related to the selected record.

Unlike list pages, which are a choice to view records, forms are the choice to insert and modify data. Therefore, if you choose to work on a record in a list page by double-clicking it, Dynamics AX will open the related detail form.

The direct way to open a form is to select the appropriate menu item in the area page or in the forms area of the navigation pane. Unlike list pages, forms do not show in the content pane of the workspace; they open separate windows, which you can move on your PC desktop.

Forms got a common structure. Some elements and functions depend on the particular form, however. Figure 2.7 shows the item form (*Inventory management> Item details*) as an example for the structure of forms.

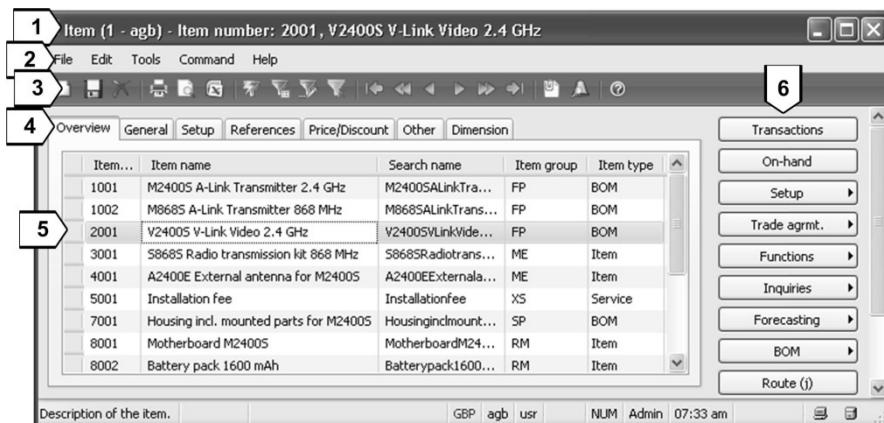


Figure 2.7: Elements in a form (shown on the item form)

The left part of the **title bar** [1] on a form shows the form name and the current company account (if chosen in the users options). Next to it, you may see the identification of the selected line. For illustration, the example in Figure 2.7 shows the number and name of item “2001” in the company account “agb”.

The **command bar** [2] in a form looks different from the command bar in the Dynamics AX workspace. It offers similar options, however.

Like the command bar, the **toolbar** [3] is available in forms and in the workspace. The toolbar in forms contains fewer icons, however, because it only shows icons that are necessary to work in forms.

Forms

Title bar

Command bar

Toolbar

Tabs	<p>Tabs [4] are shown, if it is not possible to display all data of a record in a single line. In this case, a tab <i>Overview</i> contains a grid with columns for the main fields of the particular table.</p> <p>Other tabs available in many forms are the tabs <i>General</i> and <i>Dimension</i>. As shown in Figure 2.7, forms often contain some additional tabs, which depend on the functionality required in the particular form.</p>
Selected record	<p>The line of the record [5] selected for editing shows in blue. Be aware that you still work on the record selected in the <i>Overview</i> tab when you switch to the other tabs. If you change the record selection in one of these other tabs – e.g. by pushing the <i>Page Down</i> key – the selected line in the <i>Overview</i> tab will move in parallel.</p>
Form buttons	<p>Whereas action buttons in list pages show above the grid, form buttons [6] as the equivalent in forms display on the right side of the window. You want to push form buttons in order to start queries, printouts and activities like posting on the one hand and to access enhanced data and settings for the selected record on the other hand.</p> <p>The number and functionality of buttons depends on the particular form.</p>
Connected forms	<p>If you push a button in a form (named “first form” here) that opens another form displaying related information, Dynamics AX will connect the second form to the first form. If you do not close the second form, but click on the first form and select a different record there, the filter in the second form will automatically match the new selected record.</p> <p>You may use this function to scroll through data which are not shown together on a form– e.g. if you want to go through vendor balances.</p>
Two-pane forms	<p>Along with simple forms described above, Dynamics AX also contains two-pane forms. In a two-pane form, the upper pane shows header data and the lower pane shows the lines related to the record selected in the upper pane. You may find two-pane forms particularly in order processing, where the upper pane shows the order header and the lower pane the order lines.</p> <p>Like simple forms, two-pane forms may contain several tabs – the upper pane as well as the lower pane. For illustration purposes, Figure 2.8 shows the currency administration form (<i>General ledger> Setup> Exchange rates</i>), where you can see the exchange rates in the lower pane for the currency “USD” selected in the upper pane.</p>
New in AX 2009	<p>Items new in the user interface of Dynamics AX 2009 include the application window (“Dynamics AX workspace”) with address bar (breadcrumb bar) and content pane. In addition, list pages in Dynamics AX 2009 enhance the possibilities to view records.</p>

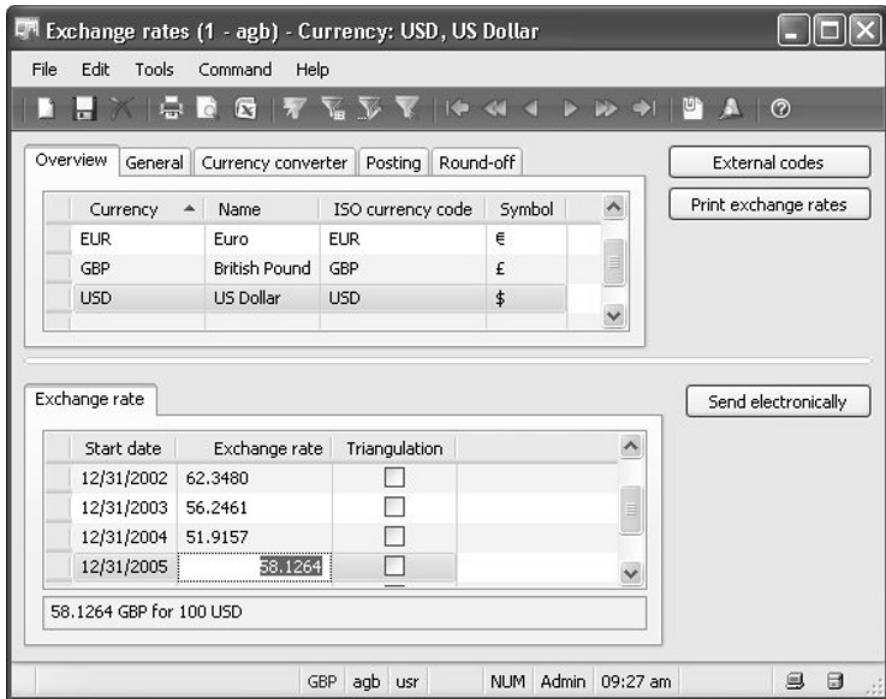


Figure 2.8: Exchange rates form as an example of a two-pane form

2.1.3 Navigation

There are three ways to open pages and forms in Microsoft Dynamics AX:

- The navigation pane (*Places* and *Forms* area)
- The area page in the content pane
- The favorites pane

The navigation pane consists of two different areas, the *Places* and the *Forms* area. Whereas the *Places* area contains menu items to open pages, the *Forms* area will open forms. If you do not want to show the *Forms* area in the navigation pane, you can hide it pushing the menu button *View* / *Forms in Navigation Pane*.

The first selection of the *Places* area in every module is the area page, e.g. the *Inventory management Area* in the inventory management module. The structure of the area page is similar to the navigation pane. You may open forms and menus in the area page the same way as in the *Places* and *Forms* area of the navigation pane, therefore.

Area page

2 Getting Started: Navigation and Basic Setup

Navigation pane

Whereas the favorites pane usually contains a limited number of menu items that you want to use frequently, the area page and the navigation pane show all items, for which you got appropriate permissions.

You may customize the appearance of the navigation pane pushing the menu button *View* . In the *Navigation Pane Options*, which are available in the *View* button and in the module button area, you may hide and move module buttons.



Figure 2.9: Navigation in Dynamics AX 2009 (favorites pane hidden)

If all areas of the workspace are available and shown, the Dynamics AX application window consists of following navigation items as shown in Figure 2.9:

- Module buttons [1]
- *Places* area [2]
- *Forms* area [3]
- Common forms [4]

- Journals [5]
- Inquiries [6]
- Reports [7]
- Periodic activities [8]
- Setup [9]

The structure of the navigation pane complies with functional areas, where menu items required in the different departments determine the related **modules** (e.g. *Inventory management*). You may find the module buttons to open a specific module in the lower part of the navigation pane. If you need to open modules not directly accessible there, may click on the button  below the module buttons to show the remaining modules.

Module buttons

When accessing a module, you will manage data of the selected current company account (or applicable virtual account) only. The sole exception is the module *Administration*, which grants access to date common to all company accounts.

After pushing a module button, the workspace shows the menu items of the selected module in the navigation pane and in the area page. The name of the module displays in the title bar of the navigation pane. Whereas the basic structure for navigation as shown below is common to all modules, the subfolders and menu items are different in every module.

The **Places** area in the navigation pane and in the area page contains the list pages of the particular module.

Places area

In the area page, the other areas/folders open forms.

The items shown in the folder **Common forms** (daily tasks) open forms to execute frequent tasks in the particular module, e.g. sales order management in the *Accounts receivable* module.

Common forms

The folder **Journals** contains forms that are required to enter and post transaction data.

Journals

The folder **Inquiries** contains reporting and analysis forms directly showing results on the screen.

Inquiries

Unlike *Inquiries*, the menu items in the folder **Reports** generate a printout on paper. If you do not need an actual hard copy, you may also display a print preview or save the report to a file.

Reports

The folder **Periodic** contains items, which are not required frequently. In this folder, you may find menu items for tasks like month closing or summary updates, therefore.

Periodic

The folder **Setup** grants access to the configuration data of the particular module. Configuration data are entered when a company is set up initially.

Setup

Later they usually change only if an alteration in business processes causes new functional requirements for Dynamics AX.

Some settings should not be changed without a deep knowledge of the Dynamics AX functionality to ensure data integrity in line with correct data in finance. In general, system administrators will set the permissions for the *Setup* folder in a way that regular users may not edit sensible configuration data.

Favorites management

The favorites pane grants the possibility to all users to set up folders and menu items individually according to the particular needs. If you want to add a form or list page to your favorites, you need to select the particular menu item in the navigation pane or in the area page and to choose the option *Add to favorites* in the pop-up menu, which opens by right-clicking.

If you want to hide the favorites pane, you may push the menu button *View* / *Favorites Pane* in the address bar of the workspace.

You may edit your favorites selecting the command *Favorites/Organize favorites*. As shown in Figure 2.10, favorites management then displays a dialog box known from other Microsoft applications. In order to establish a structure for your favorites, you may create folders and subfolder moving the menu items as needed.

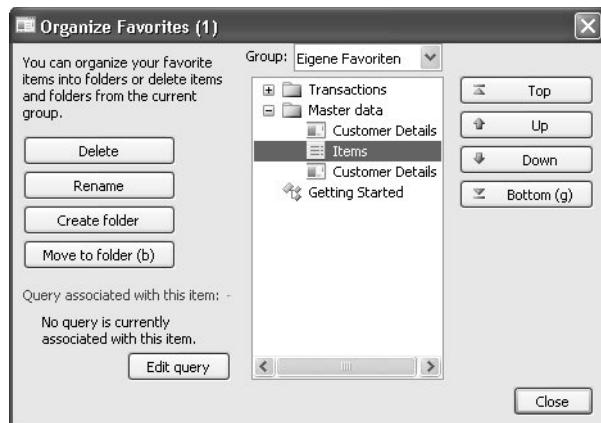


Figure 2.10: The favorites management dialog box

A feature not available for the regular menu items of the navigation pane is accessible pushing the button *Edit query* in the favorites management. This button allows assigning a filter to a form or a list page, which applies whenever you open the form or list page through the particular menu item in the favorites. You may choose the query feature if you want to show

two separate items for sales orders – one for open sales orders and one for invoiced orders – for example. Section 2.1.6 explains how to enter and apply such filters.

Apart from navigation pane, area pages and favorites, the address bar (see Section 2.1.2) also offers a possibility to navigate in Dynamics AX.

Items new in the navigation options of Dynamics AX 2009 include area pages to open list pages and forms as well as the *Places* area in the navigation pane.

Address bar

New in AX 2009

2.1.4 Working with Records

After opening a list page or a form, you may view, edit, delete and insert data according to your permissions. Even though the principles for working in list pages and forms are the same, they show differences in appearance and editing possibilities.

As an example, it is not possible to edit data directly in **list pages**. If you want to modify a record shown in a list page, you need to select the line first. Choosing a double-click, the *Enter* key or the option *Edit* in the pop-up menu, you switch to the related detail form.

List pages

The button *New* in the action pane of list pages will as well take you to the related detail form – in this case to insert a new record.

If you want to insert a record in a **form**, you need to select the shortcut key *Ctrl+N*, the command *File/New* or the icon . In many forms, you may as well insert a new record by simply pushing the *Page Down* or the *Down Arrow* key in the last line of the grid shown on the tab *Overview*.

Inserting a record

In order to switch between the fields of the form, you may choose the mouse as well as the *Enter* or the *Tab* key. Pushing the shortcut key *Ctrl+Tab* or *Ctrl+Shift+Tab* will shift between tabs. When you are finished entering record data, you may close the form selecting the command *File/Close* or the shortcut key *Alt+F4* (or ).

As long as the new record has not been saved in the database, the grid will show an asterisk () on the left side of the line. If you insert a record by mistake and it contains a mandatory field, you need to delete it as described below – even you did not enter anything.

There are options available to save a record manually – the command *File/Save*, the shortcut key *Ctrl+S* and the icon .

Saving a record

Usually you do not apply them, however, since Dynamics AX saves every change of a record automatically when you leave the record. If you close a form pushing the *Esc* key, Dynamics AX will ask if you want to save the changes.

Undo function

When working with records in forms, you have to be aware that it is possible to edit data on the *Overview* tab of forms – different from list pages where you cannot change data. Dynamics AX saves your data input in the *Overview* tab of a form whenever you leave a line.

Deleting a record

The *Undo*-function, available by selecting the command *Edit/Undo* or the shortcut key *Ctrl+Z*, refers to the content of fields. It is only available as long as you do not leave the input field to which the changes apply.

If you have left the field already, but did not select another record or manually save the record yet, you may restore the record from the database choosing the command *Command/Restore* or the shortcut key *Ctrl+F5*. Another possibility not to save changes is to close the form pushing the *Esc*-key or the shortcut key *Ctrl+Q* (assuming you did not leave the record).

Cancelling a transaction

In order to delete the content of an input field, you want to push the *Delete* key. If you need to delete a complete record, you may choose the command *Command/Delete Record* (or the shortcut key *Alt+F9* or the icon  after selecting the appropriate record).

In some cases, Dynamics AX shows an error message preventing you from deleting a record – e.g. if there are open transactions.

Data input

If a transaction – e.g. running a report – is lasting very long and you do not want to wait until it is finished, you may cancel the operation pushing the shortcut key *Ctrl+Break*. After confirming a dialog box – which sometimes displays delayed – Dynamics AX cancels the transaction.

When registering data in a form, you have to distinguish between following elements as shown in Figure 2.11:

- Field group [1]
- Checkbox [2]
- Mandatory field [3]
- Lookup field [4]
- Lookup field with main table [5]

Other field types are textboxes, date or number fields. If a field is locked for data input, it shows in gray.

Field groups

Field groups link different fields to make a joint handling possible (e.g. to easily hide a complete group) and to increase display clearness.

Field types

Mandatory fields show a red underline and require data input before you can save a record.

If you need to select a **checkbox** (e.g. *Mandatory credit limit* in Figure 2.11), you may click it with the left mouse button or push the *Space bar* when the cursor is on the checkbox.

Lookup fields represent another important field type. These fields allow entering of predefined values only. You may know lookup fields from the lookup button  in the right part of the field.

When looking at lookup fields, we may distinguish two different types:

- Lookup fields with a main table, which defines permitted values (e.g. *Statistics group* in Figure 2.11)
- Lookup fields, for which permitted values are given by Dynamics AX (e.g. *Stopped* in Figure 2.11)

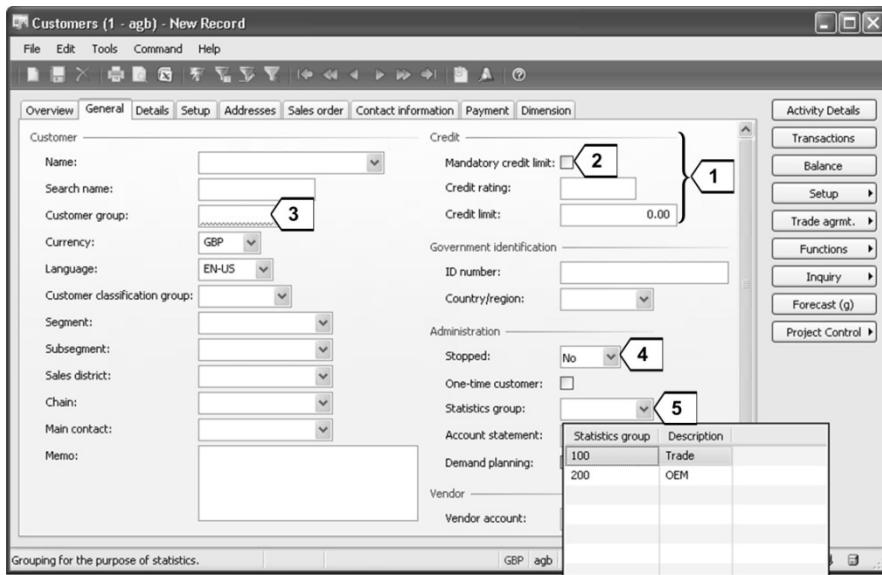


Figure 2.11: Types of fields in a form

To get to know the values available in a lookup field, you may choose the lookup button  or the shortcut key *Alt+Down Arrow* in order to execute a value lookup. The lookup form also shows, if you enter the first characters of the requested field value followed by an asterisk (*). If you enter "E*" in a listbox field as an example, the lookup form will automatically display and show all records starting with "E" in the key field.

In the lookup form, you may select a record to insert into the lookup field by clicking on it. If a value lookup contains numerous lines, you may limit the lines displayed applying the functions *Filter*, *Find* and *Sort* as shown in Section 2.1.6. You should not click the left mouse button to select a column,

Value lookup

2 Getting Started: Navigation and Basic Setup

however (this way you select a record for the lookup field). In order to select a column, choose the right mouse button or the *Tab* (or *Ctrl+Tab*) key.

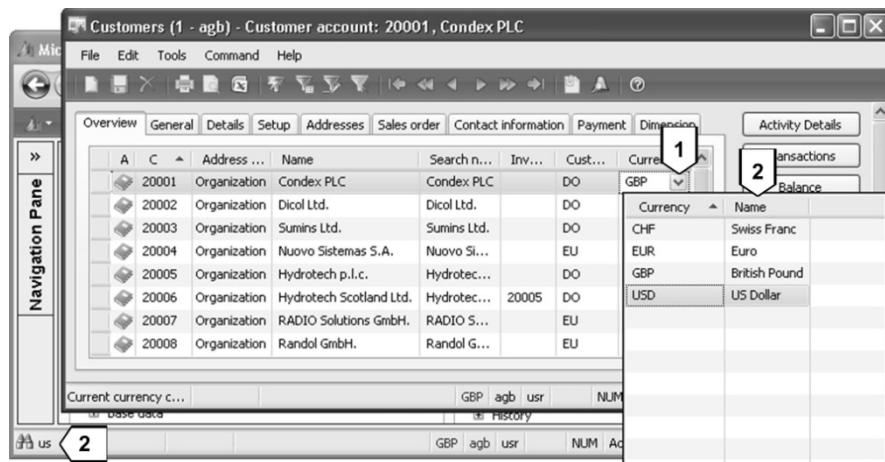


Figure 2.12: Value lookup for the currency field in the customer form

A special feature available in lookup forms is the possibility to go to a line by typing the first characters of the requested value. As shown in Figure 2.12 you may select the first currency starting with "US" by typing "us" in the currency lookup form. You may do this in the *Currency* column as well as in the *Name* column. If you want to select a record in the *Name* column, you have to push the *Tab* key to activate that column. The characters you type appear in the bottom left-hand corner of the workspace for a while.

If required, you may sort in the lookup form by any column (clicking on the column header *Name* as an example).

Go to main table

Apart from value lookup, the table reference also provides the possibility to open the administration form referring to a lookup field. If you want to insert a new currency as an example in Figure 2.12, you may open the currency administration directly from the *Currency* field. The administration form referring to a lookup field is accessible choosing the option *Go to the Main Table Form* in the pop-up menu (which opens by right-clicking) or the command *Command/Go to the Main Table Form* (or *Ctrl+Alt+F4*).

After opening a main table form, you may edit records there the same way as when you access the form out of the navigation pane. You may use the table reference therefore to directly insert and edit related master data. On the other hand, you may also apply it to view related data. As an example you may directly switch from the invoice inquiry (*Accounts payable>Inqui-*

ries> Journals> Invoice) to the related purchase order choosing the *Go to the Main Table Form* feature in the column *Purchase order*.

Settings for date and number fields come from your Windows settings. You know date fields from the calendar icon (📅) that you may push to select a certain date. When entering a date manually, you do not need to type date separators. If the requested date is a day of the current month, you may simply enter the day (e.g. "23"). In order to enter the current date, you may type "t" (and "d" for the session date).

If you want to enter a number in a numeric field, you may apply basic arithmetical operations. As an example, you may enter "55 * 1.1" instead of "60.50" in a numeric field, if the requested value is "GBP 55.00 plus 10 %".

On list pages and on the tab *Overview* of forms, you may find the command *File/Export To Excel* or the icon (EXPORT) (action button in list pages) to export the list shown to an Excel sheet.

Another comfortable way to retrieve data of Dynamics AX is the data export through the clipboard. To do so, you need to select the requested lines leftmost in the grid individually, holding the *Ctrl* key. The *Shift* key selects several consecutive lines, the shortcut key *Ctrl+A* (or a mouse-click in the top left-hand corner) selects all lines of the grid.

After selecting, you want to copy the records to the clipboard pushing the shortcut key *Ctrl+C* or the icon (COPY) before you can insert them into another Windows application (like Microsoft Excel) pushing *Ctrl+V*.

Copying in a Dynamics AX form does not only copy fields of the *Overview* tab, it also contains fields shown on the other tabs of the form.

**Date field,
number field**

**Calculating a
numeric field**

**Export to
Excel**

**Copy and
Paste**

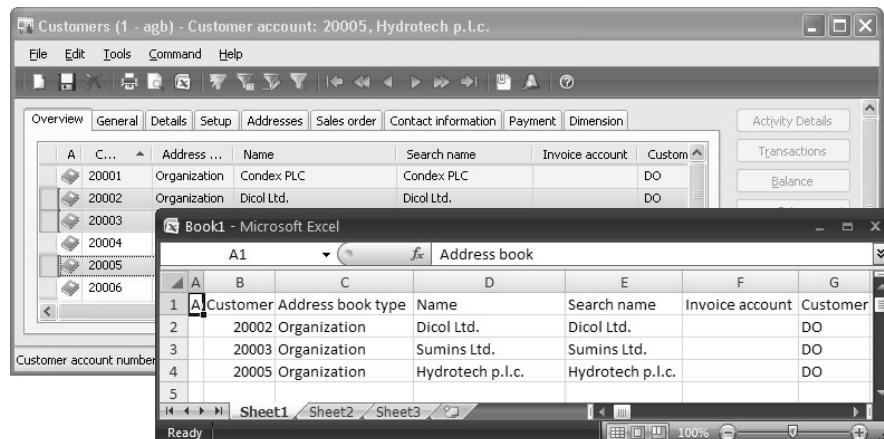


Figure 2.13: Data export through “Copy and Paste”

Infolog

If there is a problem with the operation that you execute in Dynamics AX, a warning or error message shows up in a separate window – the *Infolog*. It is possible to disable warnings and error message in the user options, however.

You may copy or print the message displayed in the *Infolog* through a pop-up menu, which displays by right-clicking on the message text.

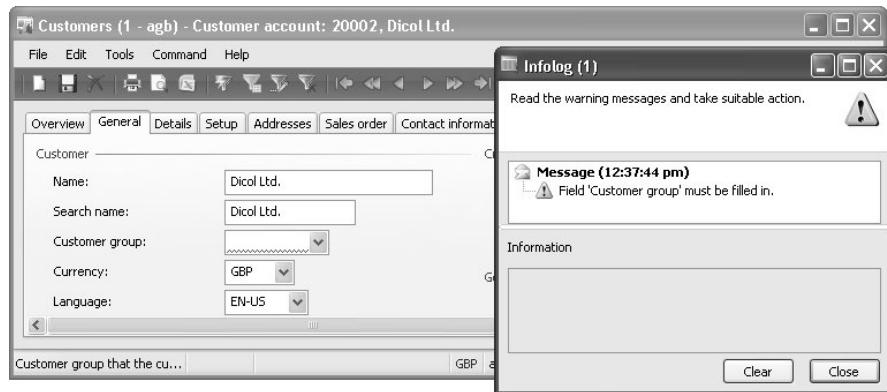


Figure 2.14: Infolog displaying an error message in the customer form

Basic operations

As shown, you may apply four different elements to execute basic operations in a list page or form:

- Command bar (menu options for various commands)
- Shortcut keys
- Toolbar (icons)
- Pop-up menu (opened by right-clicking)

Whereas you may find all available functions in the command bar, the shortcut keys and icons grant access to frequently used operations only. In Appendix C, you may find an overview of icons and shortcut keys to execute basic operations in Dynamics AX.

Pop-up menu

Some features like the filter and sort functionality are as well accessible through the pop-up menu, which shows by right-clicking on a field or column of a form or list page.

New in AX 2009

Items new in Dynamics AX 2009 related to basic handling include the list pages and the direct export to Excel. Forms do not look different from version 4.0 – except for displaying independently from the Dynamics AX workspace.

2.1.5 Role Centers

Role centers are customizable role-based homepages, showing an overview of data you need frequently. Elements available in role centers include task lists, reports, alerts and analysis views. You may display your role center in the Enterprise Portal (web interface) as well as in the regular Dynamics AX client window, where it is the homepage of your workspace.

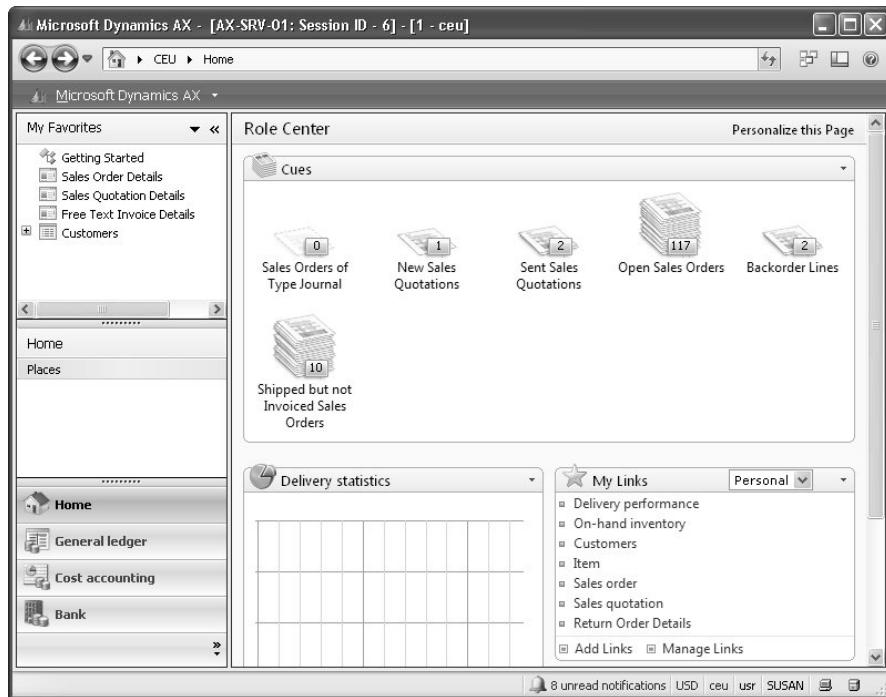


Figure 2.15: Role center in the Dynamics AX workspace

The standard application of Dynamics AX 2009 contains more than 30 role centers, which support different roles like purchasing agent, sales manager or controller. If you can access the development environment, you may set up additional role centers.

Cues are a unique element in role centers. They show remaining work items graphically – e.g. the number of open sales orders in Figure 2.15. In addition to a graphic sign, every cue also displays a selected key figure representing the workload for the responsible person. A mouse-click on a cue opens the related form in Dynamics AX, where you can do your work.

Cues

In order to create a cue, you want to save a filter as a cue (see Section 2.1.6) in a list page or form. If you got appropriate permissions in Microsoft SharePoint, you may then show the new cue in a Web part of your role center page.

Role center assignment
In order to assign a specific role center to a user, you need to allocate a user profile. User profiles represent specific roles in the organization, grouping users with a common role center.

To set up user profiles, you have to choose the menu item *Administration> Setup> User profiles*. If you want to add a user to a user profile, you may push the button *Add user* there. Alternatively, you may assign a user profile on the *Profile* tab of the users form (*Administration> Users*). Assignments are possible for all company accounts or per company.

Prerequisites
As a prerequisite to use role centers, Microsoft SharePoint and the Enterprise Portal Framework need to be available.

New in AX 2009
Role centers permit to realize the role-tailored user experience and are one of the core innovations in Dynamics AX 2009, therefore.

2.1.6 Filter, Find and Sort

In order to work in a table with numerous records efficiently, it is essential to find the records you need quickly. For this purpose, you may apply the functions *Filter*, *Find* and *Sort* in list pages and forms.

In Microsoft Dynamics AX, there is no functional difference between the *Filter* and the *Find* feature – they show different dialog boxes, however.

Distinguish Lookup
When choosing the *Filter* or *Find* function, you should keep in mind that this is something else than the value lookup shown in Section 2.1.4. Whereas the value lookup is available to enter a value into a field, the *Filter* and *Find* feature will select records from the table displayed in the grid.

Filter pane
The easiest way to apply a filter is to choose the filter pane in list pages. After entering the requested characters into the filter field there, you may activate the filter pushing the *Enter* key or the arrow button → on the right next to the filter field. In the lookup field more right, you may select the column to which the filter applies.

In the example shown in Figure 2.16, the grid will display only items containing the characters “24” in the item name after activating the filter.

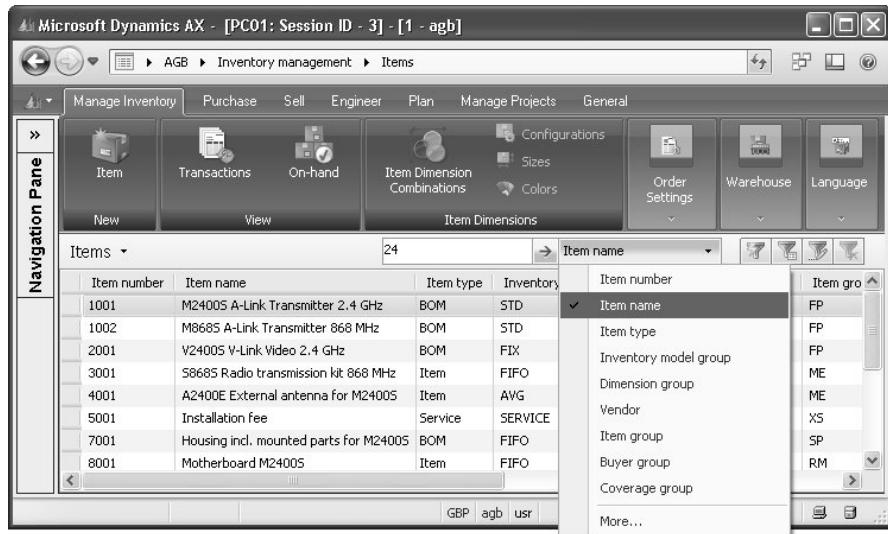


Figure 2.16: Filter pane in a list page, selecting the column for the filter

If you need to enter more complex filter criteria, you may apply advanced filter options as described below. Unlike the filter pane, advanced filter options are available not only in list pages but also in forms.

If you want to display a list of records that show the same value in a certain column, you may apply the *Filter by selection*. In order to activate this filter, you will set the cursor to the field, which contains the requested value for that field on a form or list page.

Filter by selection

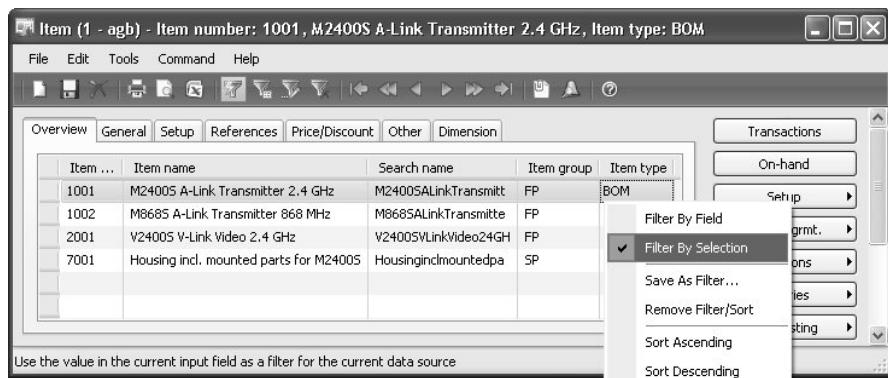


Figure 2.17: Filter by selection (chosen in the pop-up menu)

After selecting the shortcut key *Alt+F3* or the option *Filter by selection* in the pop-up menu, the filter will apply. In forms, you may apply this filter to fields on any tab – not only on the tab *Overview*.

The example shown in Figure 2.17 displays how to apply a filter by selection for the *Item type* “BOM” in the item form (*Inventory management> Item details*).

Filter by grid

Another option to set a filter in list pages and forms is the *Filter by grid*. This filter will show when you push the shortcut key *Ctrl+G* or the icon . In your user options (see Section 2.2.1), you may as well set the filter by grid to display whenever you launch a list page or form.

When selecting the *filter by grid*, it shows a separate line for filter criteria at the top of the grid on a list page or on the tab *Overview* of a form. If you need support to enter a criterion in the filter line, you may push at the arrow at the right side of a specific filter field. If you have entered filter criteria before showing the filter line (e.g. in a filter by selection), the filter by grid will display them.

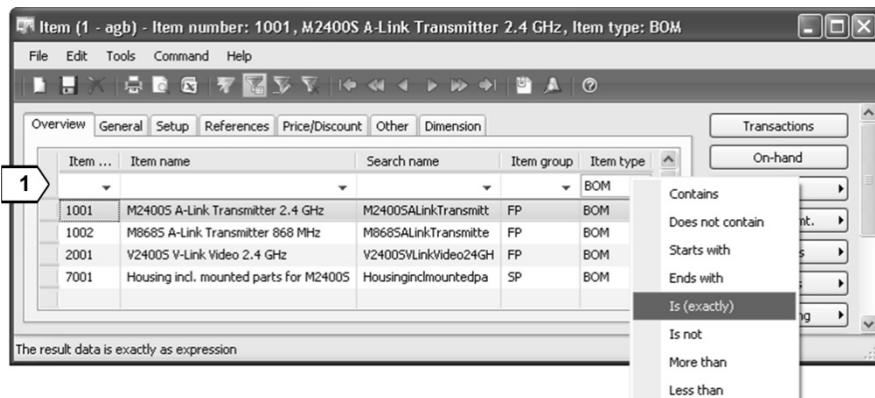


Figure 2.18: Filter by grid in a form

Filter criteria

The online-help in Dynamics AX describes in detail how to enter filter criteria (*Help> Applications and Business Processes> Using Microsoft Dynamics AX> Optimizing productivity> Working with records and record templates> Finding, filtering, and sorting records*). The table below therefore only contains an overview of the most important filter criteria:

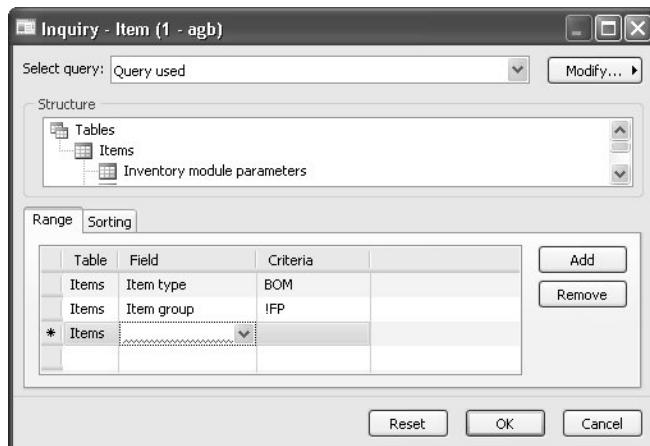
Table 2.1: Important filter criteria

Meaning	Sign	Example	Explanation
Equal	=	EU	Field content to match "EU"
Not equal	!	!GB	Field content not to match "GB"
Interval	..	1..2	Field content from "1" to "2" (incl.)
Greater	>	>1	Field content greater than "1"
Less	<	<2	Field content smaller than "2"
Connection	,	1,2	Field content to match "1" or "2"; criteria "Not equal" (e.g. "1,!2") connect with "And"
Wildcard	*	*E*	Field content containing "E"
	?	?B*	First character unknown, followed by a "B", other characters unknown

If you need to enter complex criteria, you will access the advanced filter in list pages and forms by pushing the shortcut key *Ctrl+F3* or the icon .

The advanced filter opens a separate form, which displays a different view of the criteria entered in the filter by selection and the filter by grid. In addition, the advanced filter makes it possible to set a filter on fields, which do not show on the list page or form.

Advanced filter

**Figure 2.19: Advanced filter form defining filter criteria**

If you need to enter an additional criterion in the advanced filter, you will insert a new record pushing *Ctrl+N* or . In order to define the filter completely, you want to register the fields *Table*, *Field* and *Criteria* in the new filter line. The field in the column *Table* of a new line automatically contains the basic table of the filtered list page or form. In case of simple criteria, you do not need to pay attention to it, therefore.

A lookup () in the column *Field* helps to select the field name of the required table field. Next to the column *Field*, you may find the column *Criteria*, where you want to enter the filter criterion. If the field for the filter is a lookup field, you may open a value lookup.

When you are finished entering the filter criteria, you may close the advanced filter form pushing the button *OK*. This will activate the filter, causing the list page or form to show matching records only.

Related tables

The *Structure* pane in the upper part of the advanced filter form makes it possible to enter filter criteria referring to related tables. In order to apply this option, you need to select the related table choosing the option *1:n* or *n:1* in the pop-up menu for the appropriate basic table in the *Structure* pane.

Since it is possible to select different tables in the filter lines of the advanced filter form then, you need to pay attention on selecting the right table in the column *Table* in this case.

As an example for applying a filter on related tables, you may choose to show only items in the item form, which got transactions in the current year. The appropriate selection for this filter would be a *1:n*-relation from the item table to the inventory transactions, where the advanced filter contains a filter line on the field *Physical date* of the table *Inventory transactions*.

When you apply a filter on related tables, you have to keep in mind that the structure of the filter needs to comply with the database and program structure – especially for filters in reports – to show correct results. To make sure, you should apply a quick check of the result when choosing a new filter combination of related tables, therefore.

Clearing a filter

If you do not need to apply a selected filter any longer, you may clear it pushing the shortcut key *Ctrl+Shift+F3* or the icon . The list page or form then shows all records again.

Active filter

The icon  to clear a filter also gives a hint, if a filter is active in a certain form. If the icon is active and you can push it, a filter is in place. In order to display this filter, you may open the advanced filter form (*Ctrl+F3*).

In list pages, a funnel in the filter button (e.g.  Items (Unsaved filter) ) on the left side of the filter pane additionally indicates an active filter. You may choose this filter button to select and manage filter criteria as well.

If you frequently need certain filter criteria or if you want to apply them in the favorites, you may save them. The button *Modify/Save as* in the advanced filter form allows saving filter criteria. In a dialog box, you have to give a name for the filter then.

Saving a filter

Saved filters are stored in your *Usage data*, which means that only you may access your saved filters. To select a saved filter, you may choose it in the lookup of the field *Select query* in the advanced filter form as shown in Figure 2.20.

In list pages, you may choose the filter button in the filter pane to save and select filters as an alternative to the advanced filter form.

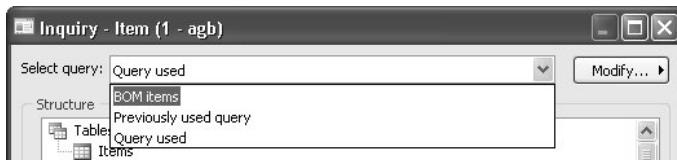


Figure 2.20: Selecting a saved filter in the advanced filter form

If you need a filter for a cue in your role center, you may save the filter as a cue. Similar to the way you save a filter regularly, you may push the button *Modify/Save as Cue* in the advanced filter form (or the filter button in the filter pane of list pages) to save a filter as a cue.

Saving a cue

After saving a filter as a cue, you may show the cue in Web Parts of role centers (see Section 2.1.5).

Sorting

Sorting in list pages or on the *Overview* tab of forms is available by a simple mouse-click on the appropriate column header. If you click a second time on the column header, sorting will switch between ascending and descending order. Alternatively, you may sort in the advanced filter form or choose the option *Sort Ascending* or *Sort Descending* in the pop-up menu (right mouse-button on the requested column in the grid).

If you choose to apply sorting in the advanced filter form, you need to record your sorting criteria on the tab *Sorting*. Like entering a filter criterion, you may enter sorting criteria in several lines choosing table and field name.

Apart from filtering, Dynamics AX offers two additional options to search for a record: The *Find* function and the *Global Search*. Whereas the find function is similar to a filter, the global search orientates on the functionality of search engines.

Searching

Finding

The *Find* dialog box displays when you push the shortcut key *Ctrl+F*, in list pages you may also choose the icon . When applying the find function, you should be aware that finding always works in the selected column or field. Before opening the find dialog, you need to click into the required column/field therefore. The name of the selected field shows in the header of the find dialog box as shown in Figure 2.21.

The rules for entering find criteria are the same as for filter criteria.

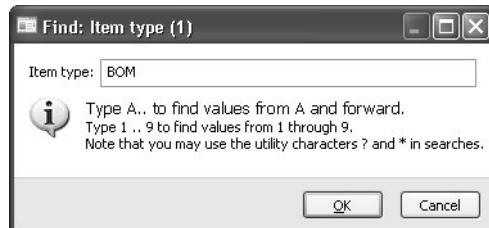


Figure 2.21: The find dialog box (for the column *Item type* as an example)

Filter by field

The *filter by field* is quite the same as the find function, except that it opens with the shortcut key *Ctrl+K* (or the option *Filter By Field* in the pop-up menu) and already shows the content of the selected field as a default in the dialog box.

Global search

Unlike find and filter functions, the global search shows in the task pane of the Dynamics AX workspace and has to be configured.

Before you can use the global search, administration needs to specify which tables and fields are to be included in the global search (*Basic> Setup> Data Crawler> Table setup*). The next step is to start the data crawler accessing the form *Basic> Setup> Data Crawler> Data Crawler*. Setup and start of the data crawler affect all users, which is why Dynamics AX administration needs to be responsible.

Using global search

When setup is finished and the data crawler is running, you may use the global search. Pushing the shortcut key *Ctrl+F1* or the button *View* / *Task Pane* in the address bar of the Dynamics AX workspace, you will open the task pane where you may enter a search criterion. Like in the filter pane of list pages, there is no need to enter wild cards in the *Search for* field.

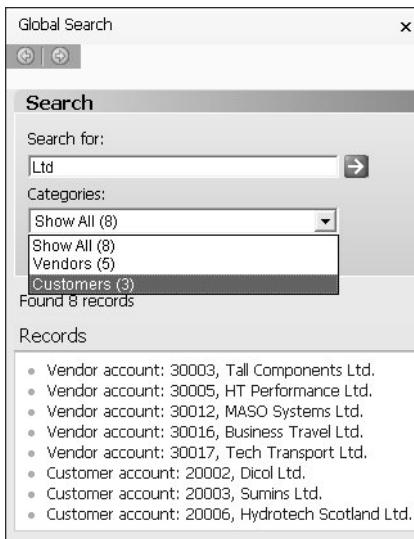


Figure 2.22: Using the global search

Items new in the filter and find functionality of Dynamics AX 2009 include the filter pane in list pages as well as the possibility to save filters as cue.

New in
AX 2009

An important thing to mention for users who upgrade from version 4.0 is that the shortcut key *Ctrl+F* now opens the find function again (as it did in Axapta 3.0). Nevertheless, you may as well apply *Ctrl+K* like in version 4.0.

2.1.7 Printing and Reporting

You may start printouts and reports on several places in Microsoft Dynamics AX:

- Menu path *Reports* (in the navigation pane and area pages)
- Buttons (in list pages and forms)
- Post and print (checkbox *Print* in posting forms)
- Auto-reports (in list pages and forms)

In every module, you may find standard reports in the folder *Reports* containing subfolders as well in most cases. In addition, some forms also allow to run a standard reports by pushing an appropriate button – e.g. a list of exchange rates pushing the button *Print exchange rates* in the currency administration (*General ledger> Setup> Exchange rates*).

Standard
reports

When you post an external document like an invoice or a packing slip, you want to print the document as well in most cases.

Post and print

Posting forms therefore contain a checkbox to print the related document – e.g. the checkbox *Print invoice* when posting an invoice. The buttons *Select* (filter selection) and *Printer setup* (printer selection) in posting forms allow defining filter and printer options as described for standard reports below.

If the printout of a posted document is required at a later date (e.g. if you missed to select the checkbox *Print*), you may select printing by pushing the appropriate button in the inquiry of the particular posted document.

Auto-reports

Auto-reports are available in every list page and form by pushing the shortcut key *Ctrl+P* or the icon . They show a report containing the main fields of the particular table.

Report form

In order to explain how printing works in Dynamics AX, the description below shows how to print a standard report as an example.

After selecting the menu item of the requested standard report, Dynamics AX shows the report form that allows entering filter criteria and printing options. Figure 2.23 shows the report form of the vendor list (*Accounts payable> Reports> Base data> Vendors*) as an example, where a filter on the group “DO” has already been entered.

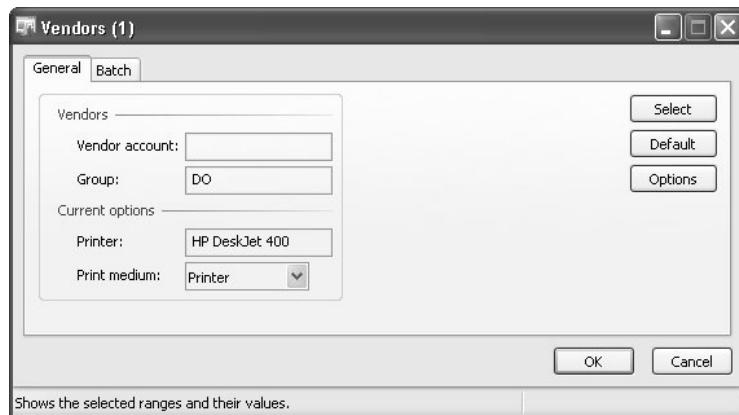


Figure 2.23: Report form for the vendor list

Report filter

The button *Select* in the report form opens an advanced filter form, where you may enter filter criteria. The filter form for reports works the same way as the advanced filter for list pages and forms (see Section 2.1.6). You may enter filter criteria on the tab *Range* as well as sorting criteria on the tab *Sorting*.

In addition to the options of the advanced filter for list pages and forms, the filter form for reports shows a tab *Print options*, which grants the possi-

bility to print the selected filter (checkbox *Print ranges*) and lines for groups and totals.

After closing the filter form, the selected filter shows on the report form.

The button *Options* in the report form opens the printing options, where you may select the destination for the printout. You may choose between following options:

Printing options

Table 2.2: Printing destinations for reports

Destination	Explanation
<i>Screen</i>	Print preview
<i>E-mail recipient</i>	Saves the report content to a file and sends it to an e-mail recipient that needs to be entered
<i>File</i>	Saves the report content to a ASCII-, RTF-, HTML- or PDF-file
<i>Print archive</i>	Saves the report selection to the print archive
<i>Printer</i>	Prints the report to the selected printer

If you need to work on the printout in a spreadsheet application like Microsoft Excel, you might choose an ASCII-file as print destination and select the checkbox *Print everything on a single large page* in the printing options form. After printing, you may open and edit the ASCII-file in the spreadsheet application.

The print archive allows saving a report within Dynamics AX. In the printing options, you may decide to print to the archive either by choosing the print archive as printing destination or – if the printer destination is not the archive – by selecting the checkbox *Save in print archive*.

Print archive

The report selection will be stored in the print archive making it possible to reprint the report later. One point you should consider is that the print archive only stores the report selection, not the printed data. This does not cause a difference in posted documents, since they do not change any more, but an order statistics report will change when orders are modified.

You may access your print archive choosing the command *Tools/Print archive*. In order to access the print archives of all users, you may open the form *Basic> Inquiries> Print archive*.

If you select the screen to be the printout destination, Dynamics AX will show a print preview on the screen. The print preview shows following options (see Figure 2.24):

Print preview

2 Getting Started: Navigation and Basic Setup

- Print the preview to a printer or to a file pushing the shortcut key *Ctrl+P* or the icon [1]
- Scroll between pages pushing *Ctrl+G/* [1], *Page Up/* [1], *Page Down/* [1], *Ctrl+Pos1/* [2] and *Ctrl+End/* [2]
- Zoom pushing the right mouse button in a blank area of the page [3]
- Access the main table form of hyperlink fields; you may disable hyperlinks pushing *Ctrl+L/* [3], however [4]
- Page number [5]

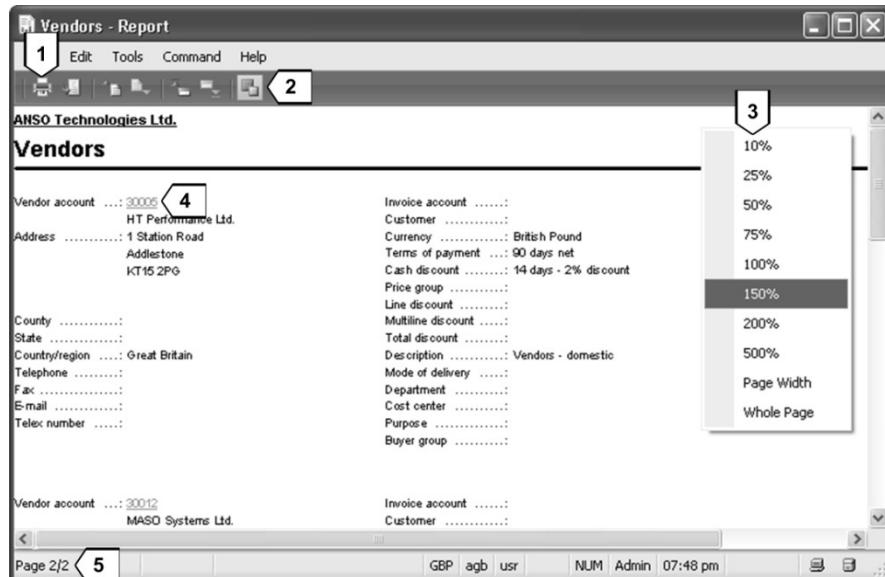


Figure 2.24: Print preview options

Defaults

When you are finished entering the report filter and printing options, you may run the report pushing the button *OK* in the report form. The settings, which you have selected, are automatically stored in your user options.

They will show as a default when you choose to run the report a second time. You may either reset the defaults pushing the button *Standard* in the report form then or change the filter and printing options as required.

Batch processing

If you do not need to run a report immediately, you may switch to the tab *Batch* in the report form to choose batch processing. When selecting the checkbox *Batch processing* and – if required – a *Batch group*, you may define a starting time and repetitions for the batch job after pushing the button *Recurrence*.

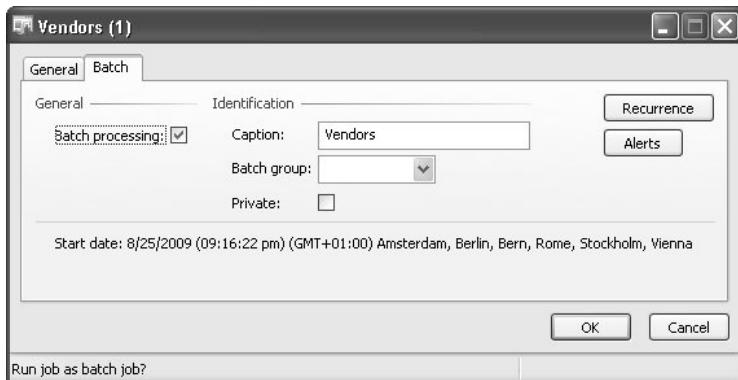


Figure 2.25: Batch processing selection in a report form

As a prerequisite to apply batch processing, a batch server has to be set up and started. You may set up the batch server selecting the menu item *Administration> Setup> Server configuration*.

Batch processing takes places in the background on the batch server except for client and private tasks, which require running the periodic activity *Basic> Periodic> Batch> Processing* on a client.

If you want to check and edit the status of batch jobs, you may access the form *Basic> Inquiries> Batch job*.

Auto-reports are another kind of reports. You may start them in every list page or form selecting the command *File/Print/Print* or the shortcut key *Ctrl+P* (or the icon). Auto-reports show a list containing the main data (field group *Auto-report*) of the particular table shown in the form. The report form of auto-reports looks like a regular report form except that it shows the additional button *Modify*.

Pushing the button *Modify/New* in the auto-report form, you may start a report wizard to create your own report. This report will be stored in your usage data. As soon as you have finished the report wizard, you may select the new auto-report in the field *Select report* of the auto-report form.

Compared to reports in the development environment, the wizard for auto-reports only got limited functionality, however.

Items new in the printing and reporting functionality of Dynamics AX 2009 include the batch framework to run batch-processing independent from an active client session.

**Setup for
batch
processing**

Auto-report

Report wizard

**New in
AX 2009**

2.1.8 Help System

If you need to answer functional questions, you may want to access the Microsoft Dynamics AX help system available in the whole application. You may start the help function in several ways (see Figure 2.26):

- Form help and help collections [1]
(Developer, Enterprise Portal, Applications and Setup help)
- Help text in the status bar [2]
- Tool tips [3]



Figure 2.26: Options to start the Dynamics AX help system

Dynamics AX help

In order to open the form help window, you may choose the command *Help/Help* or the shortcut key *F1* (or the icon in every list page or form). The help window displays the help text for the particular form and contains tabs including a table of contents, search functionality and favorites.

Apart from the form help, which is part of the help collection *Applications and Business Processes*, you may open the help collections *Developer Help*, *Enterprise Portal Administration* and *System and Application Setup*.

Support provided directly within the Dynamics AX workspace includes the help text in the status bar and the tool tips.

2.1.9 Case Study Exercises

Exercise 2.1

Your first task is to log on to Dynamics AX, where you should open the company account “TST” or another company, which has been set up for training purposes. Then open a second workspace, where you choose the *Accounts payable* menu in the navigation pane in order to access the list page *Vendors*. As a comparison, open the form *Accounts payable> Vendor details* afterwards. Finally, log out and close the Dynamics AX session.

Logon

Exercise 2.2

Start a client session in Dynamics AX, select the training company and open the favorites pane. There you should add the list page *Items*, which you may find in the menu *Inventory management*, to your favorites.

Favorites

In order to get a better overview of your favorites, you want to create a new favorites folder “Invoicing”. This folder should contain the list pages *Sales orders* and *Free Text Invoices* of the menu *Accounts receivables* as well as the form *Payment journal* of the menu *Accounts receivables> Journals*.

Exercise 2.3

As an example for forms in Dynamics AX, you want to open the vendor form (*Accounts payable> Vendor Details*). Select the vendor in the third line and switch to the tab *General*. Show an example for a field group and a lookup with and without main table. When you are finished, switch to the tab *Details* and show an example for a checkbox field.

Working in
forms

Which command bar option, shortcut key and icon is available to copy the vendor number (field *Vendor account*) to another application like Microsoft Excel?

Exercise 2.4

Insert a new vendor without applying record templates. For the beginning you only have to register any name starting with ## (## = your user ID) and a vendor group.

Inserting a
record

Notes: If the number sequence for vendor accounts is set to “Manual”, you have to enter the vendor number manually. If the *Accounts payable parameters* require a tax-exempt number (VAT registration number) to be entered, you need to go to the *Setup* tab on the vendor form, where you enter a *Tax exempt number (VAT number)*, which you create through the *Go to main table* feature before.

Exercise 2.5

Lookup fields Looking for a *Buyer group* on the tab *General* of the vendor form, you notice that the group you need is not available. Create a new buyer group ##-P (## = your user ID) applying the *Go to main table* feature. Then you should select that group for your new vendor.

Exercise 2.6

Filtering To get some exercise with filtering, apply following filters in the vendor form one after the other:

- All vendors assigned to the vendor group "Domestic"
- All vendors with a name starting with "T"
- Vendors with a number from 30005 to 30009 or higher than 30012
- Vendors with a number ending with "5" and an "i" in the name
- Vendors with an "e" on the second character of the name
- Vendors with a name not starting with "e"

For the first filter you should choose a *Filter By Selection*, for the other filter exercises you should apply a *Filter By Grid* as well as the *Advanced Filter/Sort*.

When you are finished with the requested filtering tasks above, open the list page *Vendors*. Entering a filter in the filter pane select all vendors, who got the characters "Ltd" in their name. In the next step, you should open the advanced filter window and select vendors, who do not have *Terms of payment* "M15". Export the result of that filter to an Excel sheet.

Exercise 2.7

Printing Print a vendor list (*Accounts payable> Reports> Base data> Vendors*), selecting a print preview for the printout destination. Then you should print the vendor list a second time, filtering on domestic vendors (choosing the appropriate vendor group) and with a PDF-file as printout destination.

2.2 Advanced Options

Before you can access the Microsoft Dynamics AX workspace, system administration needs to create a Dynamics AX user for you, who is assigned to suitable permissions. After opening the Dynamics AX workspace, you may define several individual settings.

2.2.1 User Options and Personalization

User options User options are the main place to manage personal settings in Dynamics AX. You may access your user options selecting the command *Tools/Options*, if you got appropriate permissions. In addition, system ad-

ministration may as well access your user options in the user management (*Administration> Users*), where the button *User options* is available.

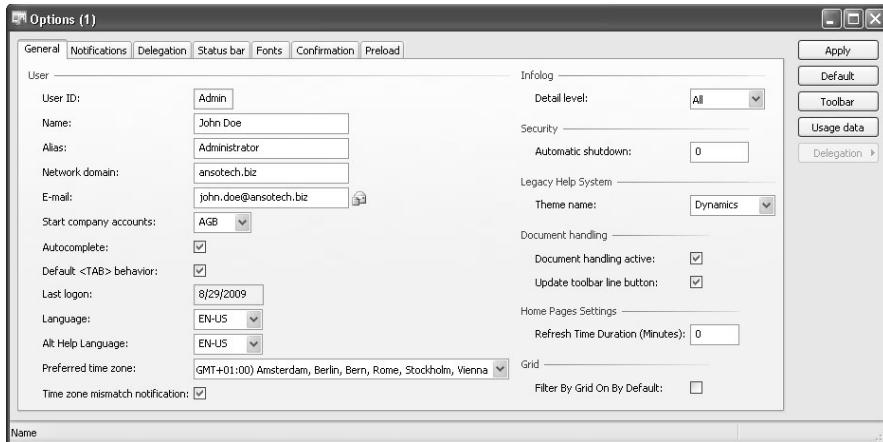


Figure 2.27: The user options form

When accessing the user option form as shown in Figure 2.27, following settings are primarily important to define your workspace:

- *Start company accounts* – Default-company when logging on
- *Autocomplete* – Text you enter in a field will be the default for the next record, when you start to enter the same characters in that field
- *Language* – language of the user interface
- *Detail level* – Show warnings and error messages
- *Automatic shutdown* – Time, after which your session will be closed
- *Document handling* – See Section 2.2.3
- *Filter By Grid On By Default* – Show filter line (see Section 2.1.6)
- Tab *Notifications* – Alerts (see Section 2.2.4) and Workflow-Notifications
- Tab *Status bar* – Fields shown in the status bar
- Tab *Confirmation* – Show confirmation dialog in forms before deleting or saving modified records.

The user options form contains a button *Usage data*, which opens a form showing detailed settings of a user. These settings include filter settings, auto-reports, form settings and record templates (user templates), which have been stored automatically as well as manual

In the usage data, you may switch from the tab *General* to the other tabs that show a list of usage data lines in the particular area. Pushing the button *Data*, you may access detailed data of a usage data record. It is not

Usage data

possible to modify usage data records, but you may delete individual usage data lines pushing the shortcut key *Alt+F9* (or the icon ). Selecting the button *Reset* on the tab *General*, you may delete all your usage data.

If system administration implements modifications or updates in your Dynamics AX application, it may happen that your usage data do not fit to the form settings required by the new application status. In this case, you have to delete the affected usage data records (or reset all usage data) in order to display the new form content correctly.

Form settings

Every user with appropriate permissions in Dynamics AX may individually adjust forms according to his needs. These adjustments are independent from modifications in the development environment, which apply to all users.

User setup

In order to define individual form settings you want to access the *User setup* form, which is available in every list page or form choosing the command *Command/Setup* or the option *Setup* in the pop-up menu. Figure 2.28 as an example shows the user setup form, which has been opened from the vendor list page (*Accounts payable> Vendors*) to personalize the vendor page.

In the *Layout* pane of the user setup, you may select to hide and move tabs, field groups and fields as well as button groups and buttons. You can move elements in and between tabs with the move-buttons *Up*, *Down*, *Left* and *Right* or with your mouse (drag and drop). If an appropriate license is available, you may add additional table fields to the form.

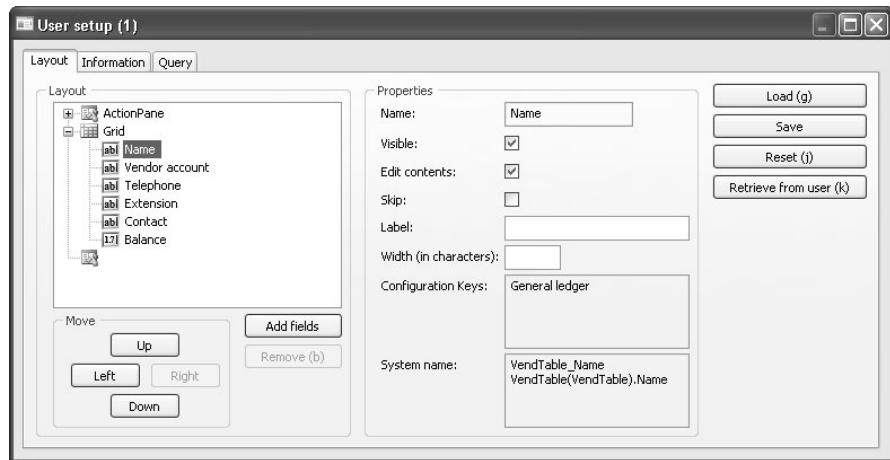


Figure 2.28: Form settings in the user setup form for the vendor page as example

After selecting an element in the *Layout* pane of the user setup form, you may choose if it should be visible and editable in the *Properties* pane.

As soon as you close the user setup form, the modified settings will apply. Pushing the button *Save* in the user setup form you can store different versions to display a certain form. When you save a version, you have to give a name to identify the version for later selection. Selecting a saved version requires to push the button *Load* in the user setup form. If you want to see the standard form again, you will push the button *Reset*.

Apart from settings done in the user setup form, you may do some form adjustments directly in a form. These adjustments include changing the column width and position, which you can do with your mouse in the header column on list pages and on the *Overview* tab of forms (drag and drop). Another option available is to hide and show fields, field groups and buttons selecting the commands *Command/Hide* and *Command>Show all* or the corresponding option in the pop-up menu (which opens by right-clicking).

All individual form settings are stored in the usage data. It is possible to restrict access to form settings by appropriate user permissions, however.

Direct form adjustment

Permissions

2.2.2 Record Information and Templates

After selecting the appropriate record line, you may open the record information dialog in every list page or form choosing the command *Command/Record info* or the option *Record info* in the pop-up menu.

In the *Record information* dialog box, you may choose following options to work on the selected record:

- Rename key field (agree with system administration before)
- Fill utility (Modify multiple records)
- Show/Print all fields of the selected record
- Create insert script
- Create a record template (available in forms only)

Note: Depending on your permissions and Dynamics AX configuration, some options might be not available.

Renaming of key fields is possible by pushing the button *Rename* in the record information dialog. Renaming opens a second dialog box, where you may enter the new field content.

Renaming

Processing a renaming-request may be a time-consuming activity, because Dynamics AX needs to update all references. If you want to modify an item number as an example, the item number also changes in inventory transactions, invoice lines and all other tables where it is used. You also need to take into account, that references will update inside Dynamics AX

2 Getting Started: Navigation and Basic Setup

only. Other applications and external partners like customers or vendors have to receive appropriate information separately.

Therefore, renaming usually is an exceptional activity with restricted access, granted by appropriate permission settings.

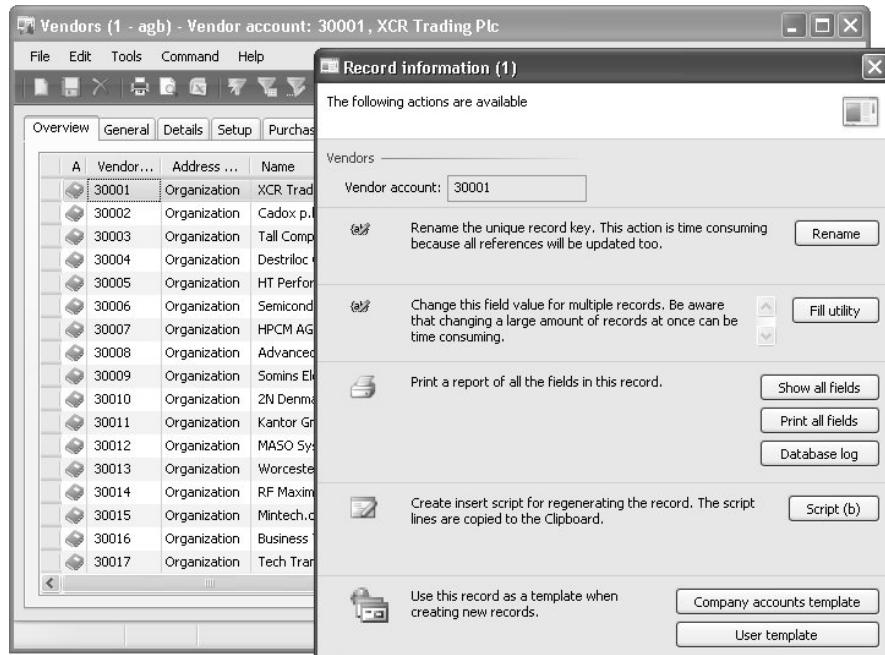


Figure 2.29: The record information dialog for the vendor form

Fill utility

You may apply the fill utility (similar to *Find and Replace* in Microsoft Office) in order to change the content of a field in several records. If you need to change the payment terms for a number of vendors as an example, you will open the vendor form (*Accounts payable> Vendor Details*) and choose the fill utility for the *Terms of payment* after selecting the option *Record info* in the pop-up menu for that field.

The fill utility then opens a form, where you may select a filter to identify the vendors to be modified. When you are finished entering the filter, you may push *OK* in the filter form. Dynamics AX then displays a separate window where you can see the result of your filter. Confirming the selection with *OK*, you may choose the new payment terms in the dialog box shown next.

Unlike *Find and Replace* in Microsoft Office, the fill utility in Dynamics AX is not only there to change the content of a field from one value to another. The selection of records to insert a new content is independent from the previous content in that field.

The fill utility is available for most fields in master data tables and in unposted financial journals. As a prerequisite to apply the fill utility, it has to be activated in the system configuration (*Administration> Setup> System> Configuration*, folder *Administration*). In addition, you need appropriate user permissions to run the fill utility.

The button *Show all fields* displays the content of all fields of the selected record. You need this information primarily if you want to know the content of fields not shown in a list page or form. *Show all fields* also displays field groups – e.g. the field group *Auto-report* containing the fields of the default auto-report.

The button *Database log* shows a log file of all changes to the selected record. As a prerequisite, logging for the particular table needs to be enabled in the form *Administration> Setup> Database log* or in the development environment.

Record templates help to create new records by inserting the content of fields from the template. As an example, it might be useful for a European company to provide templates in the vendor table for domestic vendors, for vendors in the EU and for third-country vendors to make sure that correct posting groups apply when inserting a new vendor.

When working with record templates, you have to distinguish between two types of templates:

- User templates
- Company accounts templates

A user template is available only to the user who has created it. You may create user templates by clicking the button *User template* in the record information dialog, which opens a second dialog box where you can enter a name and description for the template. The template is a copy of the record selected when opening the record information dialog before.

User templates are stored in your usage data, where you cannot modify them later. If a user template is not required any more, you may delete it in the usage data (command *Tools/Options> button Usage data> tab Record templates*). Alternatively, you may as well delete a user template pushing the shortcut key *Alt+F9* in the template selection dialog as shown in Figure 2.30.

**Show/Print
fields**

**Record
templates**

**User
templates**

Company accounts templates

Unlike user templates, company accounts templates are available to all users. You may create company accounts templates by clicking the button *Company accounts template* in the record information dialog.

You may modify company accounts templates in the form *Basic> Setup> Record templates*. Before choosing a particular template on the tab *Templates*, you have to select the table, to which the template belongs, on the tab *Overview*. On the tab *Templates*, you then push the button *Edit* to modify the template.

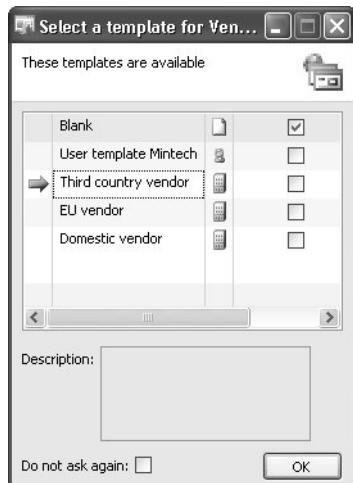


Figure 2.30: The dialog box for template selection

Applying templates

As soon as templates are available for a table, they display in a template dialog box when you create a new record in the particular table. As an example, Figure 2.30 shows the dialog box that appears when creating a new vendor in the form *Accounts payable> Vendor details* supposing some templates are available.

In the dialog box, you may select a template by double-clicking the appropriate line or pushing the button *OK*. You may recognize company account templates by the icon and user templates by the icon . In the far right column, you may select one line to be the default template.

If you select the checkbox *Do not ask again* at the bottom of the template dialog box, Dynamics AX will apply the default template when you insert a record without showing the template dialog box. If you want to show the template dialog box when creating new records again, you need to push

the button *Show template selection*, which displays in the record information dialog box then.

Items new in Dynamics AX 2009 related to record information and templates include the fill utility, which provides the possibility to update multiple records at the same time.

New in
AX 2009

2.2.3 Document Management

In daily business, you frequently need to know data related to one record (e.g. a certain customer), which are available in a structured way in your business application, as well as unstructured data like files or mails.

Document management in Microsoft Dynamics AX is there to deal with this issue by making it possible to assign as many files as required to any table record. The files attached then are accessible directly within Dynamics AX.

If you use document management to attach all files for a certain customer in the customer form as an example, you may access all relevant information for that customer – business data inside Dynamics AX as well as related files – directly out of the customer form.

In order to manage documents in Dynamics AX, you may open document handling in every list page or form selecting the icon or the command *Command/Document handling*. In the document handling form, you may edit existing documents or add new ones.

Document
handling
form

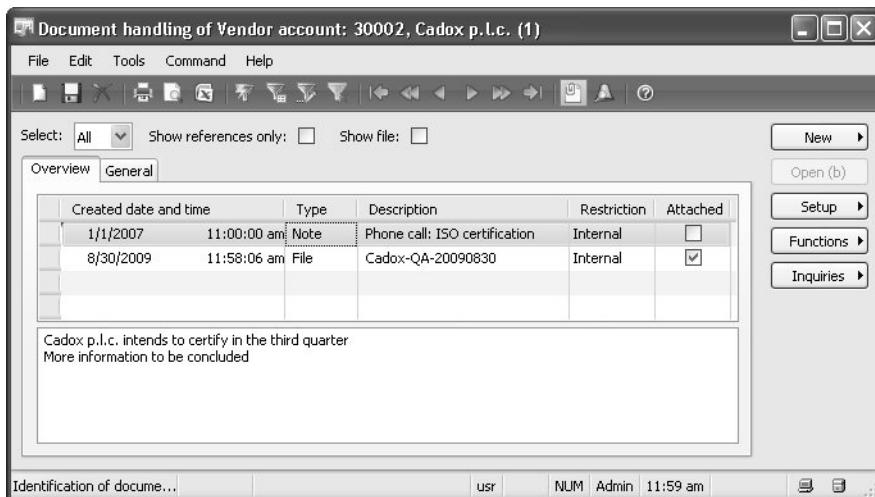


Figure 2.31: The document handling form

As a prerequisite, document management needs to be set up as described below. In addition, the checkbox *Document handling active* in your user options needs to be selected. The second document handling checkbox in the user options controls, if the document-handling icon in the toolbar will highlight when there are attached documents to the active record in a form.

Document types

In document management, you may distinguish three groups of documents:

- *Simple notes* do not include an attached file. In the lower part of the document handling form, you may enter a simple note text as long as required.
- *File attachments* are there to attach any files.
- *Word documents* and *Excel worksheets* are there to create documents directly out of the document handling form.

When creating a new document, you need to select the document type. The document type relates to a document group, which defines the way Dynamics AX controls the document. In order to get a useful structure for document management, you may set up several document types per document group in the document management setup.

Working with documents

If you want to create a new document in the document handling form, you may push the button *New* or as well insert a new line pushing the shortcut key *Ctrl+N*. By selecting the document type, you define if the file is a note, a file attachment or a new Word document.

For existing documents in the document handling form, you may display attachments in a separate form by pushing the button *Open*. As an alternative, you may select the checkbox *Show file* in the document handling form to display the file in the lower pane of the form.

Setup

You may find parameters for document management in the form *Basic> Setup> Document management> Parameters*. Basic parameters include the *Archive directory* (usually a separate directory on the file server) and a number sequence for documents. The archive directory in the parameters is not applicable for document types, which contain the definition of a specific file location as described below. The tab *File types* in the document management parameters controls, which file types are available in document management.

If the checkbox *Use active document tables* in the parameters is active, document handling will be available only for tables included in the active document tables (*Basic> Setup> Document management> Active document tables*).

In order to group documents, you may create several document types in the form *Basic> Setup> Document management> Document types*. Your selec-

tion in the columns *Class description* and *Group* specifies, if assigned documents are simple notes, attachments or new documents. On the tab *General*, you may choose a *File location* and an *Archive directory* different from the document management parameters. If you select “Database” for the file location, Dynamics AX will store files inside the database – a setting that puts load to the database but facilitates administration and access.

2.2.4 Alert Rules and Notifications

Business processes are driven by activities, which start when another activity ends or when a certain event occurs. Dynamics AX supports business processes by providing a workflow system on the one hand and alerts, which enable a notification of subsequent departments, on the other hand.

Depending on your permission settings, you may define alert rules as required. As an example, you may set rules in a way that the responsible person receives a notification when an agreed delivery date passes or when a new vendor is entered.

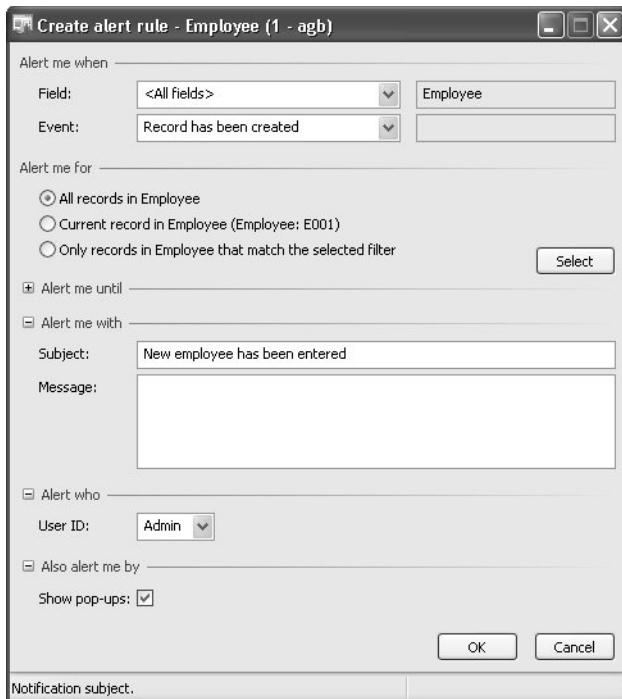


Figure 2.32: The dialog box for creating an alert rule

Alert rules	In order to set up alerts, you may choose the command <i>Command/Create alert rule</i> or the appropriate option in the pop-up menu (which opens by right-clicking) in list pages and forms. Dynamics AX will show a dialog box, where you may enter the required alert rule. The trigger for an alert may be that a record has been created or deleted or that a certain field content has been modified. As an example, Figure 2.32 shows entering an alert rule that applies when a new employee is entered. In order to limit alerts, you may define a filter, for example if you want alerts for employees of a certain department only. If you want to edit existing alert rules, you may choose the menu item <i>Basic> Setup> Alerts> Manage alert rules</i> or the command <i>Tools/Manage alert rules</i> to open the alert rule administration form. You may choose this form as well to create new alert rules based on alert templates, which you have saved as record templates there before.
Alert processing	Alert notifications will show only after the periodic activities <i>Basic> Periodic> Alerts> Change based alerts</i> and/or <i>Basic> Periodic> Alerts> Due date alerts</i> have been executed. Usually system administration will submit these activities as a periodic batch job, but you may run them online manually for testing purposes as well. The alert parameters (<i>Basic> Setup> Alerts> Alert parameters</i>) set the period which Dynamics AX should process for due date alerts like exceeding an agreed delivery date. Other important settings are available in the user options, where you may set the update period and the display options for alert notifications.
Alert notification	When an alert triggering event occurs, alert notifications will show within the selected period depending on these settings. Alerts are available within Dynamics AX as pop-up and in the status bar and outside Dynamics AX as an e-mail message. When you receive an alert notification, you may display the alert in the notification list form by double-clicking on the alert field in the status bar, or by selecting the command <i>View/Notifications</i> or the icon  in the toolbar. In the notification line, you may push the button <i>Go to origin</i> in order to open the alert origin. By pushing the shortcut key <i>Alt+F9</i> or the icon  , you may delete alert notifications not required any more. Usually you simply set the alert notification status to "Read" by switching to the tab <i>General</i> or pushing the button <i>Change status</i> , however.

2.2.5 Case Study Exercises

Exercise 2.8

You want to access your user options in order to make sure your name and e-mail address is correct. In addition, select the training company to be the *Start company accounts* to avoid opening a different company when you log on the next time. Your settings for the status bar should include the user ID to show.

User options

Exercise 2.9

Create a new user template based on the vendor that you have entered in exercise 2.4. Afterwards insert a new vendor applying this template to get to know how to use templates.

Record templates

2.3 Security and Information Access

Business applications like Microsoft Dynamics AX contain confidential information. Therefore, access to the application has to be limited to an extent, which each company needs to set according to the specific situation in order to protect sensitive data.

Access control in Dynamics AX is based on two elements:

- User authentication
- User permissions

As a prerequisite for you to authenticate in Dynamics AX, system administration needs to create and enable a Dynamics AX user ID linked to your Windows user ID.

Authenticate user

As shown at the beginning of this chapter, usually you do not notice the authentication and logon procedure, since it happens automatically in the background applying your Windows user ID. If you do not have a valid Dynamics AX user ID, Dynamics AX will reject to grant access to you, however.

Information access inside Dynamics AX depends on the permission settings of the user groups attached to your Dynamics AX user ID. Security privileges will limit access to read or write permission.

User permissions

For that purpose, user group permissions do not only control access based on menu items, forms, tables and fields. Record level security is there to restrict the records you can see in a table depending on record data. As an example, this is necessary to limit users in sales to see their customers only.

User authentication is not only required to control permissions. It is as well the basis to log transactions and to track the modification of records

Other settings

in tables, which are set up for logging. Other settings linked to the Dynamics AX user ID are favorites, user options and usage data, which enable a personalized workspace in Dynamics AX.

2.3.1 User Groups and Permissions

After installing a new Microsoft Dynamics AX instance, Dynamics AX will create the Administrator user “Admin” and the user group “Admin” for the first user who connects to the application. Members of the Administrators user group got access to all parts of the application.

In the next step, administration needs to set up additional user groups and users in order to maintain a reasonable level of security.

User groups

The way to group user permissions depends on aspects like company size and data confidentiality. Usually you want to create user groups according to the different responsibilities in your company.



Figure 2.33: The user groups form

You may access user groups in the form *Administration> Setup> User groups*. In order to add a new user group, you may insert a new record entering a code and a name in the grid. Switching to the tab *Users* you may assign users to the user group. The button *Permissions* opens the form *User group permissions*, which grants access to permissions management for the user group.

User group permissions

The tab *Overview* in the user group permissions shows the selected user group in the left part of the form. The right part shows all available Dynamics AX domains.

As shown in Section 2.3.3, Dynamics AX domains are required to set permissions on company account level. If you do not distinguish permissions for different companies or if there is only one company account in your

application, you do not need other domains than the default domain “Admin”, which includes all company accounts.

After selecting a particular domain in the right part of the tab *Overview* in the user group permissions, you need to switch to the tab *Permissions* as shown in Figure 2.34 in order to set the permissions for the companies of the selected domain. You cannot modify permissions of the default user group “Admin”, however. Permission settings are only available for the specific user groups that you have set up additionally.

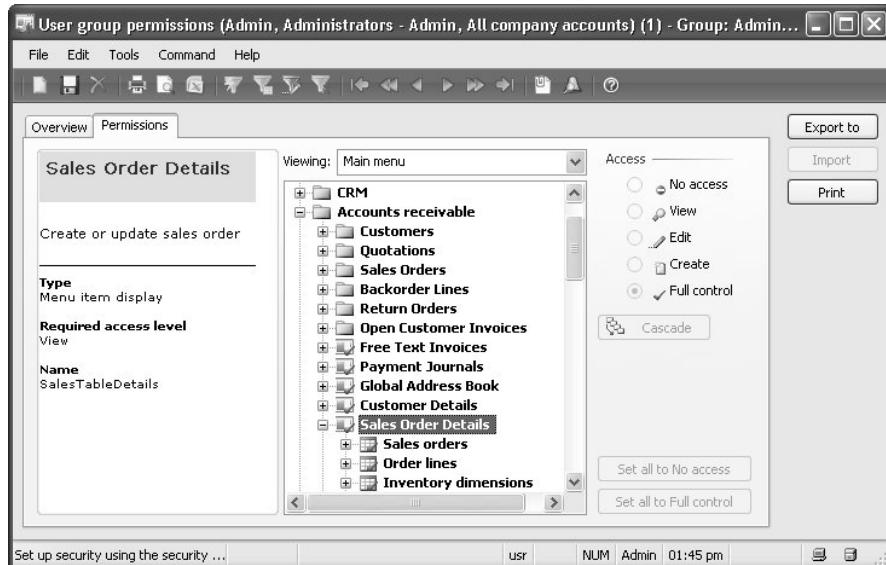


Figure 2.34: Setting user group permissions

If you select “Main menu” instead of the default “Security” for the lookup field *Viewing*, the permission list will show a structure according to the menu structure in the navigation pane. Clicking on the “+” sign of a tree node, you may expand the permission items to display child elements like forms, fields and buttons.

When selecting a permission item, you may specify the access level choosing the appropriate radio button in the pane *Access*. To make setup easier, you may push the button *Cascade* that inherits the permission settings of a node to all child elements.

2.3.2 Users and Employees

User accounts

As mentioned, everybody accessing Dynamics AX has to be set up as a Dynamics AX user. You may add a user manually in the form *Administration> Users* by inserting a new record. After choosing the Windows user ID in the column *Alias* and the Active Directory domain in the column *Network domain*, you may register the *User ID* for the user in Dynamics AX.

Alternatively, you may import Dynamics AX users from Active Directory applying the import wizard, which is accessible pushing the button *Import* in the user form.

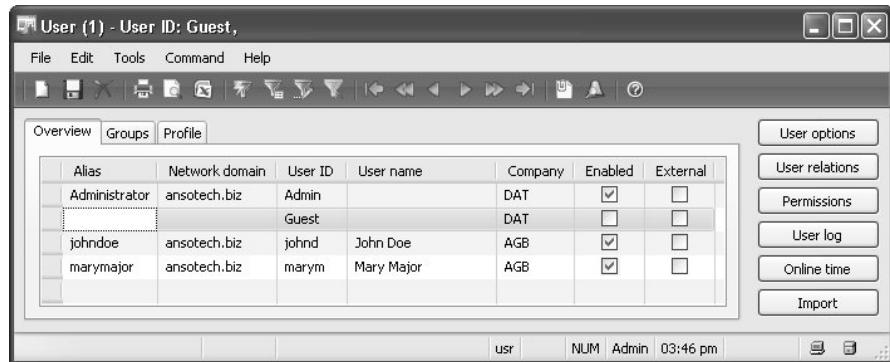


Figure 2.35: Managing users in the user form

In order to specify permissions for a user in the user form, you need to switch to the tab *Groups*, where you may assign appropriate user groups. On the tab *Profile*, you may link the user to a role center as described in Section 2.1.5.

User group assignment

It does not matter, if you link users to user groups in the user form (*Administration> Users*, tab *Groups*) or in the user group form (*Administration> Setup> User groups*, tab *Users*). Both are different ways to manage the same relation.

If you assign a user to several user groups, the permissions of all selected groups apply. In case permission settings for an object overlap, the higher access level applies.

The button *User options* in the user form allows to open the user options, which the user may as well access himself selecting the command *Tools/Options*. As an example, the administrator may want to choose certain options like the language or start company to provide appropriate settings for a new user to start with.

The user form contains general user settings for all company accounts. In addition, employee data in the employee form are available on company level.

Employees include Dynamics AX users as well as personnel not accessing Dynamics AX. Dynamics AX requires employee records in numerous areas throughout the whole application – as an example in purchase requisitions, pallet transports, sales commissions, project accounting, human resources and customer relationship management.

You may access employee records choosing the form *Basic> Employee Details* or the list page *Employees*. If and which data apart from employee code and name you need to enter primarily depends on the Dynamics AX modules used in your company. If applicable, detailed data are necessary for project accounting, human resources and Outlook synchronization.

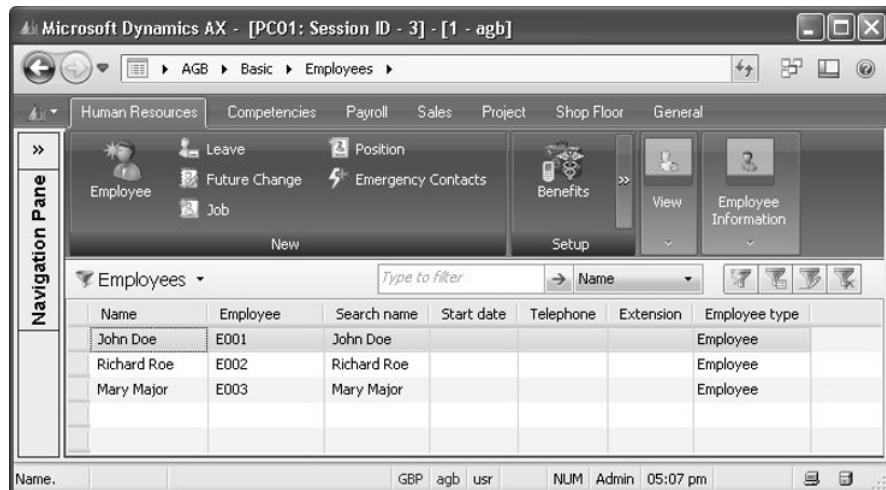


Figure 2.36: The employee list page

In order to assign a Dynamics AX user to his employee record in a company account, Dynamics AX requires a link. The form *Administration> Setup> User relations*, which you may as well open pushing the button *User relations* after selecting the appropriate user in the user form, is there to establish this link.

After entering the *User ID* in a new user relations record, you switch to the tab *General* where you choose the option *Internal user* for an employee. Then you want to insert the employee code in the lookup field *Employee*.

Employees

User relations

Current client sessions	If you need to know which users currently log on to Dynamics AX, you may open the form <i>Administration> Online users</i> . The inquiry shows all client sessions connected to your Dynamics AX application. Assuming you got appropriate permissions, you may use this form to log off a user by pushing the button <i>End sessions</i> if required.
New in AX 2009	Items new in Dynamics AX 2009 related to the user management include the user profile assignment, which is required for role centers.

2.3.3 Security Domains

Domain setup	If you need to assign permissions that are different per user depending on the company account, you need to apply domains. As an example, you might grant comprehensive permissions to a test company, but limited access to real company accounts.
	A domain in Dynamics AX is a group of company accounts used for permission assignment. In the domain management, you may assign one company account to one or several domains.

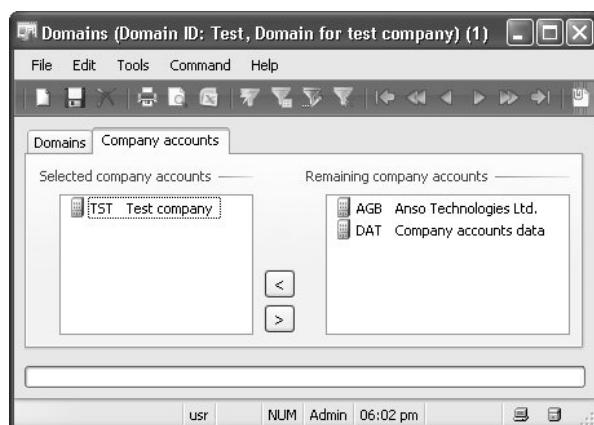


Figure 2.37: Assigning company accounts in the domains form

A special domain is the default domain “Admin” – it includes all company accounts and cannot be modified or deleted.

In order to set up a new domain, you want to open the form *Administration> Setup> Domains* and to insert a new record with an appropriate name. Making sure the required domain is selected on the tab *Domains*, you switch to the tab *Company accounts* where you may assign companies. In order to add companies to the selected domain, you move them from the

right pane to the left pane by drag and drop with your mouse or by pushing the arrow button as shown in Figure 2.37.

In order to apply domains in the permission settings, you need to access the user group permissions choosing the form *Administration> Setup> User groups*, where you push the button *Permissions* after selecting the appropriate user group.

If you have entered a new domain, you may see it in the pane *Domains* of the user group permissions. Setup of permissions on domain level requires selecting domains separately in the pane *Domains* before switching to the tab *Permissions*, where you set the permissions for the selected domain. If you do not want a certain user group to have common permission settings for all company accounts as an example, you should set the permissions for that group to “No access” in the domain “Admin”.

Domains in user groups

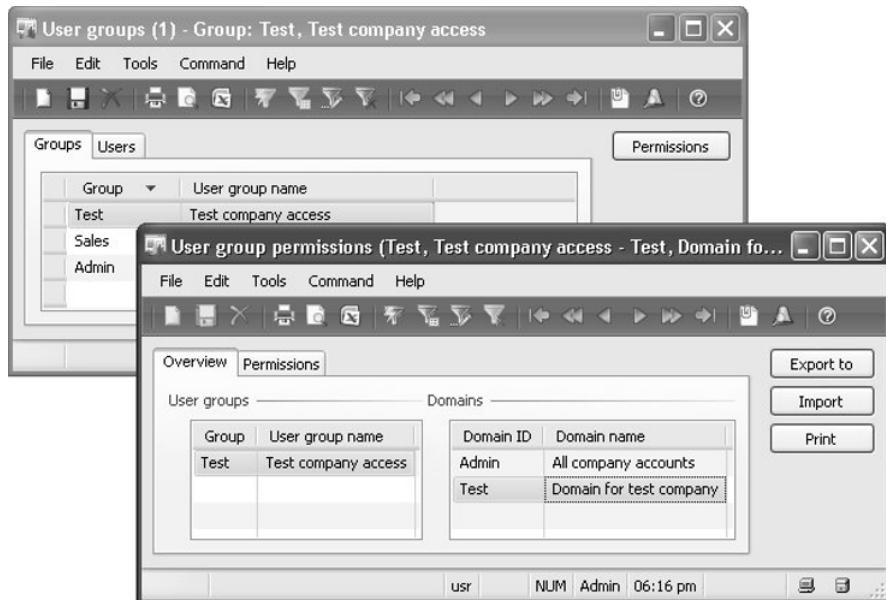


Figure 2.38: Selecting a domain for the permission setup of a user group

2.3.4 Case Study Exercise

Exercise 2.10

Create a new employee E-## (## = your user ID) with your name in the employee form. Then you should open the user relations and assign that employee to your Dynamics AX user ID.

Employees

2.4 Organizational Structures

The core task of business applications is to support business processes. Therefore, the ERP system in a company has to contain a model for the operational and organizational structure of that specific company.

The form of organization may be very different for individual companies, which you have to take into account when implementing an ERP system. In Dynamics AX, you will choose a setup according to your company for that reason.

When you do the setup of a Dynamics AX installation, you should also consider possible major future changes of the organization. This way it might be much easier to integrate the detailed setup necessary to comply with new requirements later.

2.4.1 Organizational Units

On top level, a Dynamics AX installation technically and organizational is grouped by the elements system, company account and site.

System

A system is an independent instance of Dynamics AX, which contains its own database and application. Therefore, modifications of configuration settings and programmable objects in one system do not affect other systems. You may physically install a Dynamics AX system on one or more database and application servers. On the other hand, it is also possible to install several systems on one server.

In a business environment, usually you will find at least one separate system for testing and development. It runs independent from the operational system to be able to do testing and development without affecting daily business.

Company account

Within one Dynamics AX system, you may have multiple company accounts. Company accounts are independent legal entities, which got their own separate set of data within one common Dynamics AX database.

Within the database, company data of all companies are stored in common tables. To identify data of an individual company account, all tables contain a three-digit key field *DataAreaId*. The only exceptions are a few system tables like the user administration, which are common to all companies.

DAT company

A special company account included in all Dynamics AX databases is the company "DAT". Dynamics AX generates this company, which holds system data, when you install the system. You cannot delete it, and you should not use it for a test or operational company in order to distinguish company data from non-company specific data clearly.

Sites are included in Dynamics AX 2009 as an additional inventory dimension, which makes it possible to manage subsidiaries within one company account. In order to separate different subsidiaries in finance and cost accounting, you may link the inventory dimension "Site" to a financial dimension. More details on sites are available in Section 2.4.4.

Financial dimensions like department, cost center, purpose and possible other dimensions are a separate layer in finance below system and company account. You may apply them to group ledger transactions, getting the possibility to do analysis and reports like balance sheet and income statement on a dimension level.

If you link the inventory dimension "Site" representing your subsidiaries to the financial dimension "Department" as an example, you may print an income statement per subsidiary applying a filter on the department dimension.

In order to take advantage of a common Dynamics AX database for several companies, you may link company accounts in different areas:

- Virtual company accounts to manage common master data (e.g. common items or customers)
- Domains to manage permissions
- Consolidated company accounts in finance to manage consolidation of an affiliated group

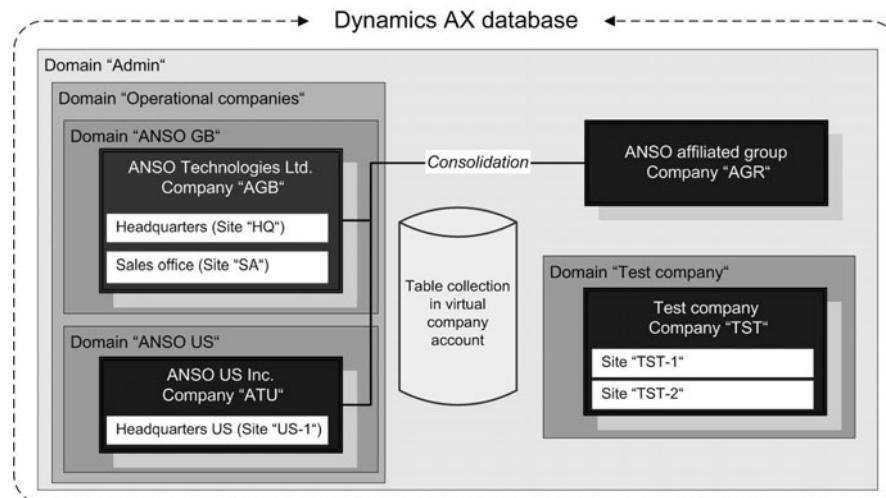


Figure 2.39: Example of a company structure in Dynamics AX

Sites

Financial dimensions

Consolidation

Intercompany In addition, the intercompany functionality enables you to automate business processes between company accounts in an intercompany organization.

2.4.2 Company Accounts

When you log on to Dynamics AX, you always work in a company account. You may set your default company, which opens when you start a Dynamics AX client, in your user options or in the client configuration. Depending on your user options, the current company shows in the status bar and in the title bar of forms.

Switching the company If you want to switch from one company account to another, you need to access the dialog box for switching companies. Opening that dialog box is possible choosing the command *File/Open/Company* or *Tools>Select company accounts*, or by double-clicking on the company field of the status bar.

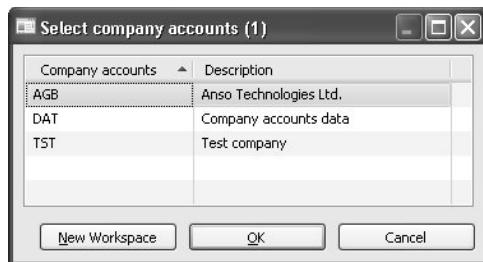


Figure 2.40: Dialog box to select a company

When selecting a company account in the dialog box, you may open it by double-clicking or by pushing the button *OK*. If you choose the button *New workspace*, the selected company will open in a second Dynamics AX workspace.

Alternatively, you may select another company in the address field (breadcrumb bar) of the workspace as well.

Managing company accounts The company account management in Dynamics AX is accessible in the form *Administration> Company accounts*. In order to create a new company, you simply need to insert a record (*Ctrl+N*) entering code and name of the company.

Before you can start to enter and post transactions in that new company, it needs to be set up. In the appendix of this book, you may find a checklist of essential basic settings in Dynamics AX for a new company.

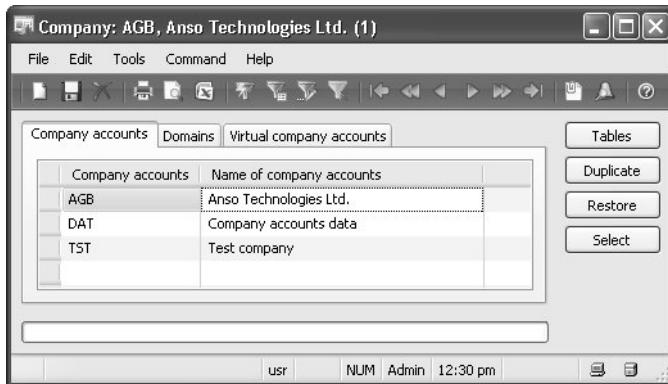


Figure 2.41: The company account form

The button *Select* in the company accounts form allows switching to a selected company, which does the same as the dialog box for switching companies described above.

If you want to create a copy of an existing company, you may select the original company and push the button *Duplicate* in the company account form. This might be useful if you need a company copy for testing purposes as an example. However, be careful with common data in virtual company accounts and with external links like file directory settings in the document management. In order to avoid confusion with printouts, you should also consider changing the company name in the form *Company information*.

Another possibility to insert data into a new company account is to import a company. You may import data choosing the import features in the folder *Administration> Periodic> Data export/import*.

The company accounts form is there to support basic administration tasks for company accounts including:

- Company identification (company code and internal name)
- Domain assignment (for permission settings)
- Virtual company accounts assignment (for shared tables)

In order to enter more details of a company like address or contact data, you need to access the form *Basic> Setup> Company information* after selecting the particular company account.

Apart from company name (which prints on all documents and reports), address and basic contact information, the company information form also includes essential setup data.

Copying a company

Company information

2 Getting Started: Navigation and Basic Setup

One of the core settings is the *Currency* on the tab *Other*, where you enter the local currency. All financial transactions post in this currency, which may not be modified as soon as transactions are entered in the particular company account, therefore. If you need to change the local currency – converting to Euro as an example – later, you will require specific conversion tools.

The default language code on the tab *Other* of the company information form specifies the default for all reports. For customers and vendors, you may choose a different language individually to print the appropriate language on external documents like invoices. The default language code in the company information is the default when setting up a new customer or vendor.

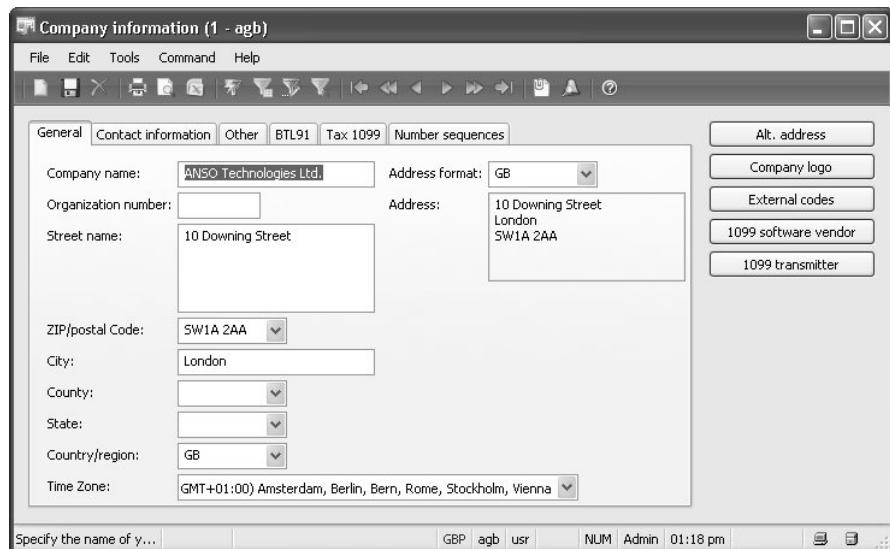


Figure 2.42: The company information form

Important settings also include registration numbers like the *Routing number* for tax reporting on the tab *Contact information*. Companies located in the European Union will enter their tax-exempt number (VAT registration number) in the lookup fields *Export* and *Import* on the tab *Other*.

If you need to enter alternative addresses for your company like invoice or delivery addresses, you may push the button *Alt. address*. Alternative addresses may be useful to set a separate delivery address in purchase orders as an example.

When working in the company information form, you will notice that many fields like the ZIP/postal code, the country or the default currency require a value lookup. If you have to enter a code not available in the lookup, you have to insert an appropriate record in the related main table.

2.4.3 Virtual Company Accounts

Virtual company accounts allow joint management data, which are common to several company accounts. Depending on the requirements, you may define areas of common data by selecting shared tables for ZIP/postal codes, items, customers or any other table required.

In order to set up a virtual company, you need to access the form *Administration> Setup> Virtual company accounts*. There you may insert a new record on the tab *Virtual company accounts*, entering a three-digit *Company accounts* code and a name. Dynamics AX internally applies the virtual company account code instead of the regular company account in the key field *DataAreaId* for all tables of the table collections assigned to the virtual company. It is not possible therefore to choose a code, which already exists for a regular company in Dynamics AX.

As soon as the new virtual company account record is saved, you may switch to the tab *Company accounts* where you can assign companies to the virtual company moving them from the right pane to the left pane by drag and drop with your mouse or by pushing the arrow buttons < and >.

In order to set the common tables of these companies, you need to switch to the tab *Table collections*. You cannot specify individual tables on this tab, however. You need to select table collections, which represent a group of tables and which you may set up or modify in the development environment if you got an appropriate permission and license.

Virtual company accounts are a basic setup of a system, which you need to set up at the beginning if you want to apply them. If you add virtual companies or shared tables when there are already data in the tables concerned, you have to manage data consolidation directly in the database. Without doing this, data in the tables concerned will not be visible any more for the affected companies.

Unlike working in regular company accounts, you cannot directly switch to a virtual company. In order to access virtual company data, you log on to a regular company and insert, modify and delete records of shared tables like you do in tables with company-specific data.

Modifications of data in tables of a shared table collection are immediately available in all companies of the virtual company account, however.

**Setup of
virtual
companies**

**Working in
virtual
companies**

2.4.4 Sites

Unlike company accounts, which comply with legal entities, sites apply to manage subsidiaries within a company account. Being an inventory dimension, sites are available in all areas of supply chain management within Dynamics AX. If you link sites to a financial dimension, you may apply them in finance as well.

The multisite functionality in Dynamics AX to run subsidiaries includes following options:

- Operations planning (master scheduling): per site or for the whole company
- Bills of materials and routes: per site or for the whole company
- Item data for order management and planning: per site or for the whole company
- Including sites in all inventory transactions, sales orders, purchase orders and production orders
- Financial reports (balance sheet, income statement) for sites

Setup of sites

When setting up a company you need to decide if to use sites. You may activate the multisite functionality selecting the menu item *Administration> Setup> System> Multisite activation*. As a default, the multisite functionality is active when you create a new company account in Dynamics AX 2009. If required, you may deactivate the multisite functionality, however. To maintain organizational flexibility within Dynamics AX, you do not deactivate the multisite functionality usually, even if there are no subsidiaries at the beginning. In this case, you will set up Dynamics AX to default the same main site to all transactions.

In order to specify the link between the inventory dimension “Site” and a financial dimension, you need to access the form *Inventory management> Setup> Posting> Dimension link*.

Sites themselves are available in the form *Inventory management> Setup> Inventory breakdown> Sites*. Apart from a code and name for the site, you may enter an appropriate value of the linked financial dimension in the right column of the tab *Overview* or on the tab *Dimension*. This setting is mandatory, if you have activated the dimension link.

Figure 2.43 shows the site form in a company, where the financial dimension “Department” refers to sites.

Applying sites

If the multisite functionality is activate in a company account, the inventory dimensions *Site* and *Warehouse* will be active in all inventory dimensions. Appropriate dimension values need to be entered in every inventory transaction, therefore. In addition, every warehouse needs to be linked to a site.

More information on inventory dimensions is available in Section 7.2.2.

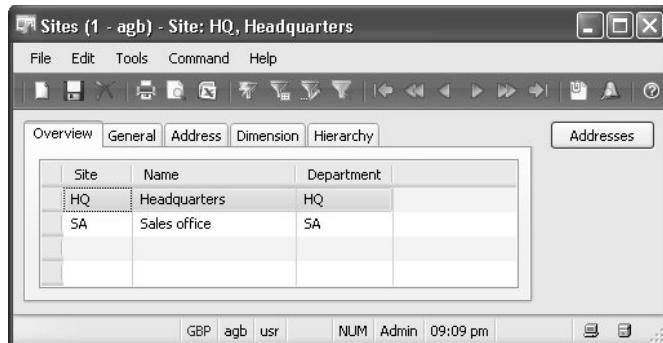


Figure 2.43: Sites form for a company with sites linked to the financial dimension “Department”

Whereas material management applies the dimension *Site*, capacity management applies the *Production unit* to represent plants in operations planning.

More information on production units is available in Section 5.3.1.

The multisite functionality to support subsidiaries within a company account is one of the core functional changes in Dynamics AX 2009 and affects the whole application.

Production units

New in AX 2009

Test company

2.4.5 Case Study Exercise

Exercise 2.11

Take a look at the basic data of the sample company “Anso Technologies Ltd.” in the appendix or of another company you choose. Which settings are required to make this company work in Dynamics AX? Compare your proposals to the actual setup of the company.

2.5 General Settings

Apart from security management including users and permissions as well as organization management including companies and sites there is a number of other settings, which are required before a company can start to work in the Dynamics AX application operationally.

In the appendix, you may find an overview of basic settings for a Dynamics AX installation. Explanations regarding the setup of individual modules are available in the chapter concerning the particular module.

The description below therefore only covers basic settings, which are important for all areas of the application.

2.5.1 Number Sequences

Number sequences drive the automatic allocation of numbers throughout the whole application. You will find them in following areas in particular:

- Master data, assigning vendor numbers as an example
- Journals (including orders), assigning purchase order numbers as an example
- Posted transactions, assigning invoice numbers as an example

The setup of a number sequences requires two steps: In the first step, you have to define the number sequence itself. In the second step, you need to assign the number sequence to its purpose in the number sequence references.

Managing number sequences

Number sequences are set up in the form *Basic> Setup> Number sequences> Number sequences* as shown in Figure 2.44. You may insert a number sequence as a new record (*Ctrl+N*) with a unique code and name there. In order to specify a number sequence completely, you have to include the numeric first and last number (columns *Smallest* and *Largest*) as well as the number format.

The column *Next* contains the number, which the number sequence will apply next. You may change the next number, but you have to make sure to avoid duplicate keys and gaps in continuous numbers – Dynamics AX will show an error message to the user who tries to apply that number.

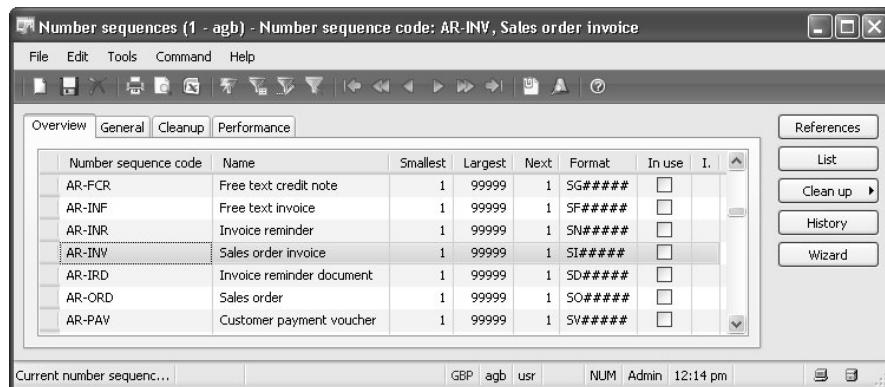


Figure 2.44: The number sequences form

The number format may contain prefixes (e.g. in the format "INV#####" or "12#####") as well as suffixes (e.g. in the format "#####-INV"). In general, you will prefer prefixes since they are easier to apply for filtering as an example.

When applying a number, the number sequence will replace the number signs "#" in the format with the next number. If you enter a format for the number sequence, it needs to be able to hold the last number. Therefore, the minimum number of number signs depends on the column *Largest*.

On the tab *General* in the number sequences form, you may specify if users can change the number automatically inserted from the number sequence. Marking the checkbox *Manual*, you may also specify a purely manual entry of numbers.

The checkbox *Continuous* prevents gaps in a number sequence. To ensure a better system performance, you should select it only for number sequences where you actually need continuous numbers, however.

Number sequence references specify the assignment of number sequences to master data and transactions. You may access them pushing the button *References* in the number sequences form or selecting the menu item *Basic> Setup> Number sequences> References*. Alternatively, you may specify number sequence references on the tab *Number sequences* of the parameters form in every module. Figure 2.45 shows assigning the number sequences for purchasing in the accounts payable parameters (*Accounts payable> Setup> Parameters*) as an example.

Number sequence reference

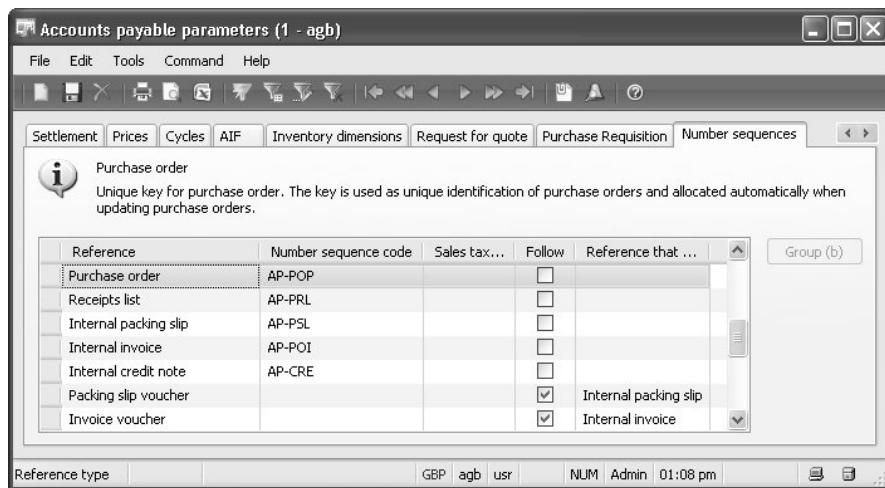


Figure 2.45: Referencing number sequences in the accounts payable parameters

In order to ensure easy tracking of transaction through the whole Dynamics AX application, you should assign unique document and transaction numbers paying attention to avoid overlapping.

You may assign a single number sequence to several number sequence references, as an example if you want to apply a common number sequence for invoices and credit notes. There will not be any duplicate number in this case. Depending on the chronological order of transaction posting, Dynamics AX will alternately assign numbers to invoices and credit notes.

2.5.2 Currencies

Every value-based transaction refers to currencies – financial transactions as well as inventory transactions. This always includes the local currency and sometimes a foreign currency additionally. Currencies are a main requirement before you can do any posting in Dynamics AX, therefore.

Currency setup

In order to set up currencies and exchange rates, you will access the form *General ledger> Setup> Exchange rates*. Major settings apart from currency code and name are the ledger accounts for posting exchange rate gains and losses on the tab *Posting* as well as the definition of the rounding precision on the tab *Round-off*.

The setting in the field *General round-off* specifies the precision in finance. If financial transactions are posted with two decimal places, you should set it to “0.01”, even if a higher number of decimal places is required in other areas like sales prices.

Exchange rates

For the currency selected in the upper part, the lower part of the exchange rate form shows the exchange rates in a chronological order. In daily business, you need to enter new exchange rates continuously to ensure correct currency conversion.

Often you will find a line without a start date for an exchange rate. This ensures currency conversion for transactions before the first start date.

Your local currency requires entering an exchange rate as well. Usually this is a record with an exchange rate “100.00” and no start date.

Currency converter

On the tab *Currency converter*, you may specify if to include the selected currency into the online currency conversion.

In Dynamics AX, amounts without a referring currency field – like the sales price in a foreign currency – are amounts in local currency. The currency converter enables to show these amounts in a foreign currency, applying the exchange rate for a date of your choice.

You may open the currency converter dialog by double-clicking on the currency field in the status bar. In the dialog box, you select the requested

currency with a second double-click. As an example, Figure 2.46 shows the customer credit limit displayed in US-dollars after selecting “USD” in the currency converter.

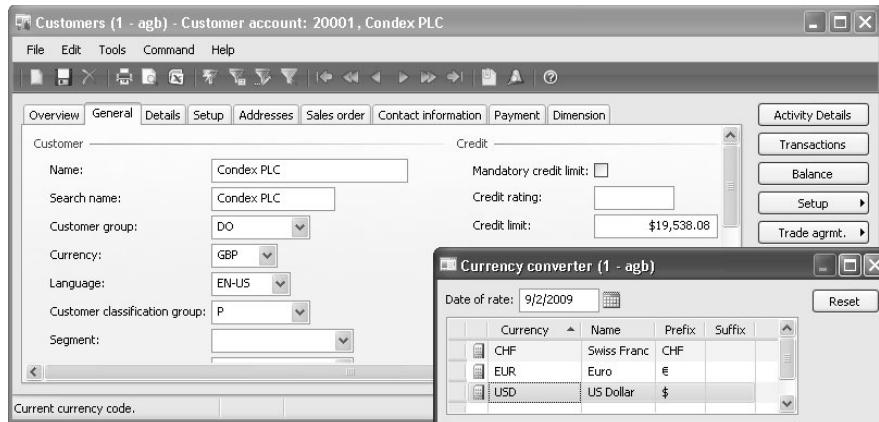


Figure 2.46: Applying the online currency conversion feature

The currency field in the status bar shows, which currency presently applies to display amounts. The currency converter only applies for displaying amounts, however. If you select a certain field with a mouse-click, the amount in this field will show in your local currency. Anything you enter also needs to be in local currency, therefore.

In order to reset currency conversion, you may open the currency converter dialog again and push the button *Reset* there.

2.5.3 Periods

As a prerequisite to post any transaction in Dynamics AX, the accounting period for the posting date has to be available and opened.

To set up accounting periods, you have to access the form *General ledger> Setup> Periods> Periods*. Periods got a start date and an end date. When setting up a period, you are free to choose the period length according to the specific requirements.

The status of a period controls if postings are possible on a certain date. The period status “Open” allows to post transactions in the period, whereas the period status “Stopped” blocks postings. The status “Closed” also blocks postings; unlike stopped periods, you cannot reopen closed periods, however. Therefore, the status “Closed” should only apply if a period is closed finally in accounting.

Period status

2 Getting Started: Navigation and Basic Setup

The tab *Module status* gives the possibility to specify blocking per module and to except user groups from blocking.

Special periods

Apart from regular periods, there are two special period types: Opening periods and closing periods. Opening and closing periods specify a fiscal year and do not contain regular postings.

Closing periods contain year-end transactions, which you may enter in the closing sheet (*General ledger> Periodic> Fiscal year close> Closing sheet*). Opening periods contain the opening transactions for a fiscal year, which are transferred in the form *General ledger> Periodic> Fiscal year close> Opening transactions* after closing a year.

Setup of periods

In order to set up a series of accounting periods, you may choose the button *Create new fiscal year*. In a dialog box, you are to enter start date, end date, period length and unit – be sure to select the unit “Months” if you want monthly periods. Pushing the button *OK* in the dialog box then, you will create the requested periods.

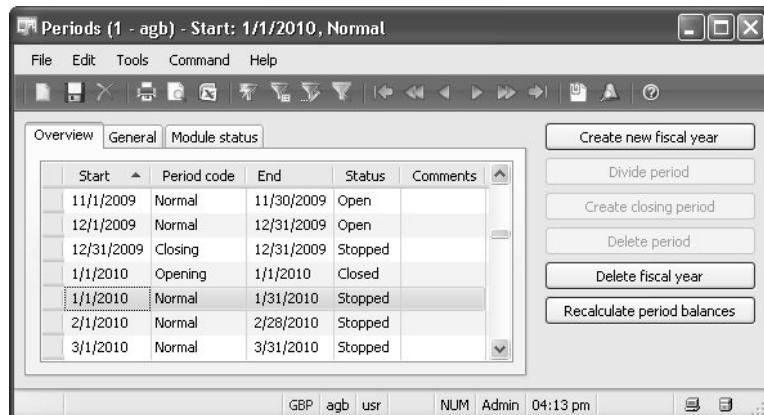


Figure 2.47: Managing accounting periods

Other calendars

Apart from periods in accounting, other areas of the Dynamics AX application got additional period and calendar definitions.

In the form *Basic> Setup> Calendar> Working time templates* you may define working times, which are the basis for setting up calendars in the form *Basic> Calendar*. This calendar applies for supply chain management including operations planning, production, purchasing, sales and inventory management.

The project module got a separate calendar linked to estimates, invoice subscriptions and employees, which you may access in the form *Basic> Setup> Calendar> Periods*. This calendar is required for project invoicing.

Another calendar (*General ledger> Setup> Periods> Fixed assets calendars*) is available for fixed assets to specify alternative periods.

2.5.4 Global Address Book

Dynamics AX stores every address in a common address table, no matter to which module or area the address belongs.

Therefore, you may find the addresses of all customers, sales leads, vendors, sites, warehouses, employees and other contacts in the global address book. In order to access the global address book, you may choose the list page *Global Address Book* or the form *Global Address Book Details* in the module *Basic* as well as in other modules like *CRM*, *Accounts receivable* and *Accounts payable*.

Data structure

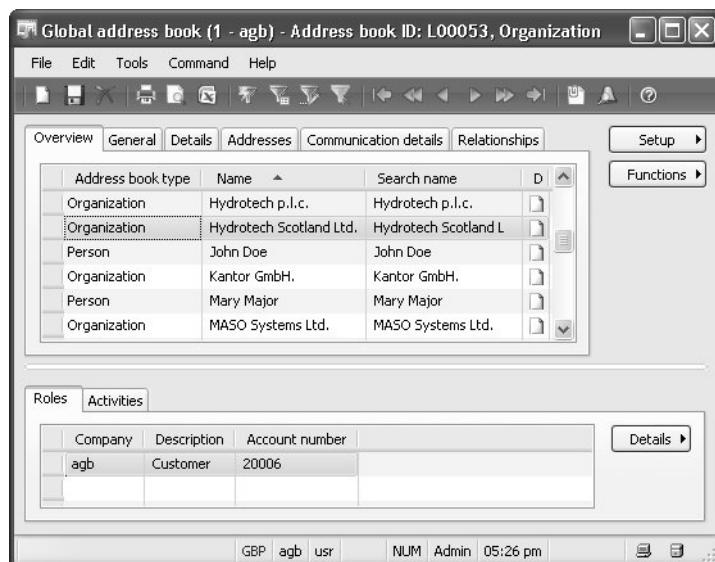


Figure 2.48: The global address book form

If several companies of an affiliated group want to share a common global address book, they may apply a virtual company account as mentioned in Section 2.4.3.

**Shared
addresses**

New in AX 2009

The global address book is a new feature in Dynamics AX 2009.

Address format

2.5.5 Other Settings

Address formats are a prerequisite to enter and print addresses correctly. The address format specifies the lines and the order of street, ZIP/postal code, city and country in the address field of addresses. To comply with the regulations in different countries, you may specify a separate format per country.

When setting up address formats, you have to take into account that Dynamics AX stores the formatted address in addition to the individual fields of the address. If you change the format after entering some addresses, the new format will only apply to addresses entered or modified later.

In order to define an address format, you want to access the form *Basic> Setup> Addresses> Address format*. You may set up new formats choosing the button *Wizard* or manually entering a new line. The assistant creates a separate format per country, but it is not required to apply that large number of formats. In order to specify the address format for a country, you need to access the form *Basic> Setup> Addresses> Country/region* and select the appropriate format in the column *Address format*.

Parameters

A setup form available in every module of Dynamics AX is the parameters form. You may access the parameters of an individual module through the menu item *Setup> Parameters* – as an example the purchasing parameters in *Accounts payable> Setup> Parameters*.

Parameters include basic settings for a module and make it possible to select those business process settings from the options in Dynamics AX, which fit to the way your company works.

Setting parameters is a core task when implementing Dynamics AX. Depending on the individual parameter, later changes are possible in a working environment or not. Before you do any changes on basic settings in an operational environment, be sure you know the consequences. Depending on the circumstances, you might read the online help or ask an expert to avoid data inconsistency or other problems.

3 Purchasing

The primary responsibility of purchasing is to provide your company with goods and services from your suppliers. To fulfill this task, purchasing needs to carry out following activities:

- Determine material requirements in operations planning
- Process requests for quote, purchase requisitions and orders
- Process item arrivals and purchase invoices

3.1 Business Processes in Purchasing

Before we start to go through the details, the lines below should give an overall picture of business processes in purchasing.

3.1.1 Basic Approach

Starting point for procurement are correct master data, in particular vendor and item data. As for all master data, vendor and item records are usually entered once and do not change frequently later on.

In the course of purchase processing, master data copy to transaction data. Planning records and purchase orders therefore retrieve item and vendor data as a default. You may modify these default data in transactions, as an example if you agree on different payment terms in a specific purchase order.

Changing data in a transaction will not change master data. If you generally agree to a change of payment terms with a vendor as an example, you have to update the payment terms in the vendor record therefore.

Starting from correct master data, we may split the purchasing business process into six steps as shown in Figure 3.1.

Master data

Transaction data

Purchasing process

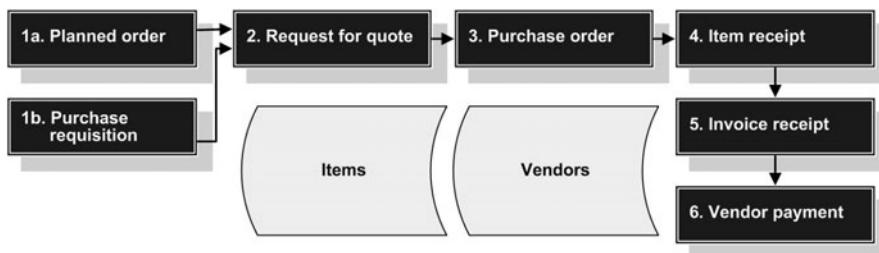


Figure 3.1: Purchase order processing in Dynamics AX

Material requirement	The identification of material requirements is the first step in the purchasing process and may take place in two different ways: <ul style="list-style-type: none">- Automatically, generating planned orders- Manually, entering purchase requisitions
Planned orders	The basis for generating planned orders within operations planning (master scheduling, see Section 6.3) are accurate figures in inventory, sales orders, purchase orders and forecasts as well as appropriate item coverage settings.
Purchase requisition	Unlike planned orders, which are created automatically by master scheduling, purchase requisitions are internal documents entered manually in order to require the purchasing department to buy requested items.
	A purchase requisition runs through an approval process workflow, before you may release it as a purchase order.
Request for quote	Requests for quote are sent to vendors in order to receive information on prices and delivery times. The purchasing department may either enter requests for quote manually or generate them out of planned purchase orders and purchase requisitions.
Purchase order	You may create purchase orders either manually or by transferring planned orders, purchase requisitions and requests for quote. A purchase order consists of a header, which contains data like vendor data common for the whole order, and one or more lines, which contain the required items. If you want to send an order to your vendor electronically or in a printed document, you need to post the purchase order. Posting an order in Dynamics AX means to save it. The posted order therefore is available with its original content no matter if there is a modification on the current order afterwards.
	To get to know the status of a purchase order, you may look at the order status and the document status in the header as well as at the posted quantities in the lines. Apart from periodic reports and inquiries, you may also apply alerts to get to know problems in order processing like late shipments.
Item receipt	When goods or services actually arrive, you need to record an item receipt related to the purchase order in Dynamics AX. Posting the packing slip receipt increases the physical quantity in inventory and reduces the open quantity in the purchase order.
Invoice receipt	Together with the item or some time later, the vendor sends an invoice. When registering the invoice, Dynamics AX supports invoice control by comparing it with the purchase order and the packing slip. If you receive a vendor invoice not related to a purchase order, you will post it in an in-

voice journal as shown in Section 8.3.3 referring to appropriate ledger accounts.

Based on posted invoices you may register payments to vendors either manually or by running a payment proposal, taking into account due dates and cash discount periods.

Payment processing is independent from purchase orders and usually a responsibility of the finance department. You may find an appropriate description in Section 8.3.4 later in this book.

Because of the deep integration of Dynamics AX, all inventory and vendor transactions in purchasing post to ledger accounts in parallel as described in Section 8.4.

In order to keep record of the whole business process, Dynamics AX comprehensively applies the voucher principle to transactions: You have to register a document (voucher), before you can post it. After posting, it is not possible to modify the document any more. Figure 3.2 shows an overview of the documents in purchase order processing.

Vendor payment
Ledger integration
Voucher principle

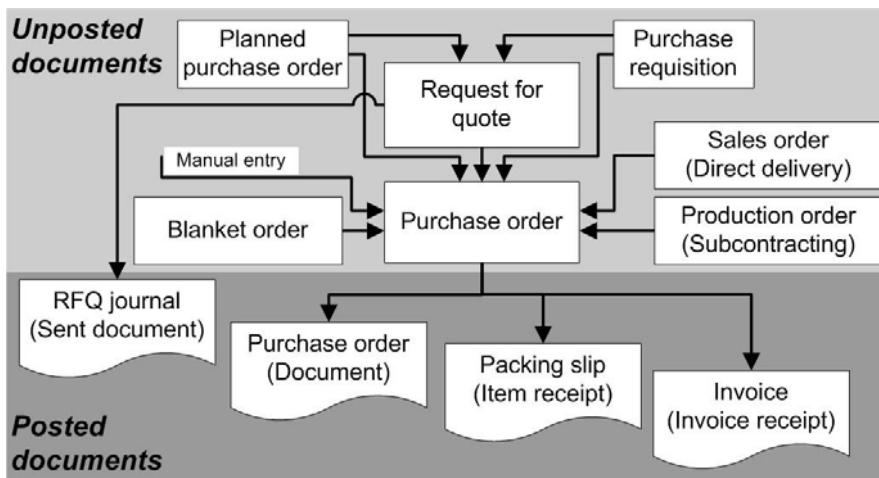


Figure 3.2: Posted and unposted documents in purchasing

3.1.2 At a Glance: Purchase Order Processing in Dynamics AX

In order to give an overview of the main steps in purchase order processing, this page is here to show the basics. For your convenience, you may post all transactions directly in the purchase order form. Of course, you may choose the *Purchase Orders* list page instead of the form as well.

Order header

In order to create a new purchase order, you want to insert a record in the upper part of the form *Accounts payable> Purchase Order Details* by pushing *Ctrl+N* or the icon . Dynamics AX shows the *Create purchase order* form then, where you may select a vendor number in the field *Vendor account*. Data from the vendor like language or currency will transfer to the order header, where you may modify them.

Order lines

In order to register a purchase order line, you need to insert a record containing item number, quantity and price into the lower part of the order form. When selecting the item, Dynamics AX will insert appropriate defaults for quantity and price as well as for other fields like site or warehouse. Pushing the button *Advanced* (or *Simple*) top right, you may switch between the simple order form shown in Figure 3.3 and an advanced form.

The screenshot shows the 'Purchase order' form in simple mode. The title bar reads 'Purchase order P000001 , Name XCR Trading Plc , Item name (1 - agb)'. The menu bar includes File, Edit, Tools, Command, and Help. The toolbar contains standard icons for file operations. The main area has several input fields and dropdowns:

- Purchase order: P000001
- Vendor account: 30001
- Invoice account: 30001
- Delivery name: ANSO Technologies Ltd.
- Contact: (dropdown)
- Contact ID: (dropdown)
- Delivery address: 10 Downing Street London
- Buyer group: (dropdown)
- Pool: (dropdown)
- Currency: GBP
- Language: EN-US
- One-time supplier: (checkbox)
- Status: Open order
- Document status: None

To the right of the form is a vertical toolbar with buttons for Advanced, Posting, Pro forma, Inquiries, Create lines, and Intercompany. Below the form is a table showing one purchase order line:

Item number	Site	Warehouse	Batch...	Quantity	Unit	Unit price	Discount	Disc. pct.	Net amount	Item name
* 4001	HQ	10		100.00	Pcs.	2.93			293.00	A2400E ...

At the bottom, there are fields for Delivery date (9/7/2009), Confirmed (checkbox), and Quantity ordered in... (dropdown). The status bar at the bottom right shows GBP, agb, usr, NUM, Admin, 03:50 pm, and system icons.

Figure 3.3: The purchase order form (simple mode)

Printing

If you want to print the purchase order sending it to the vendor, you need to post it pushing the button *Posting/Purchase order*. In the posting form, you should make sure to choose "All" in the *Quantity* field and to select

the checkboxes *Posting* and *Print purchase order*. The button *Printer setup* is available to select a printer for the printout as described in Section 2.1.7. When pushing the button *OK*, Dynamics AX will post and print the order.

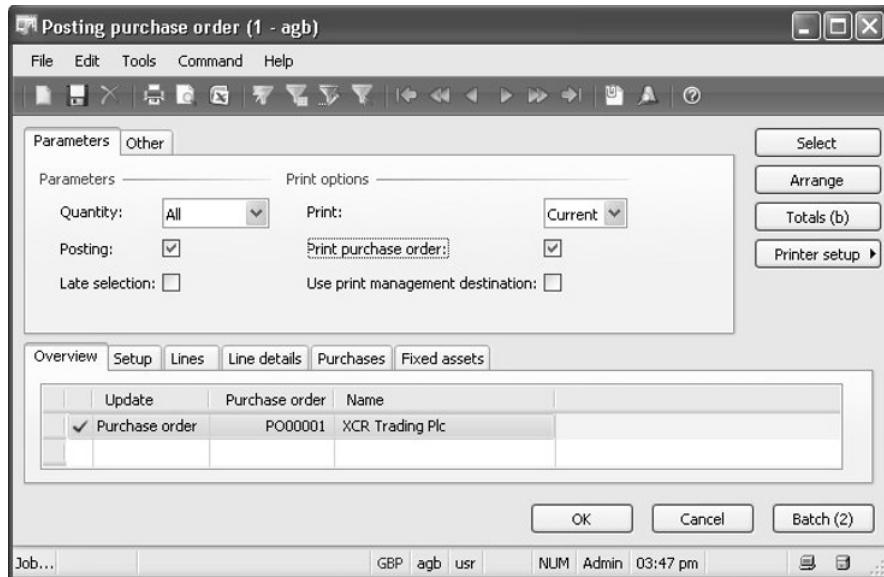


Figure 3.4: Posting and printing the purchase order

Like printing the purchase order, you may post the item receipt by pushing the button *Posting* in the order form. The right choice for the item receipt is the option *Posting/Packing slip*. The posting form for packing slip receipts works like the posting form for order posting, described above. Packing slip posting requires entering the packing slip number of the vendor into the column *Packing slip*, however. Packing slip posting increases the physical quantity in inventory and sets the order status to “Received”.

Posting the invoice receipt is possible by pushing the button *Posting/Invoice* similar to item receipt posting. When you register a purchase invoice, it is often useful to show the invoice total by pushing the button *Totals*. After entering the vendor invoice number in the column *Invoice*, you may post the invoice. Invoice posting generates an open vendor transaction to be paid and sets the order status to “Invoiced”.

If applicable, you may skip transactions in the process described above. As a minimum, you may post the invoice receipt directly after registering the purchase order (Select “All” in the *Quantity* field of the posting form then).

Item receipt

Invoice receipt

Skipping transactions

3.2 Vendor Management

Vender records are required in purchasing as well as in finance. According to the deep integration of Dynamics AX, there is only one place to manage vendor records, which then applies to all areas of the application. Setting appropriate permissions, you can limit access to fields and field groups of vendor records. The Dynamics AX application does not provide different vendor forms for purchasing and finance, however.

3.2.1 Vendor Records

Overview

In order to check existing or create new vendors, you need to access the form *Accounts payable> Vendor Details*. According to the general structure of forms, the tab *Overview* containing the list of available vendors shows first.

As an alternative to the overview in the vendor form, you may open the list page *Accounts payable> Vendors*. If you need to see details of a vendor shown in the list page, you will double-click on the line of the particular vendor to open the related vendor form.

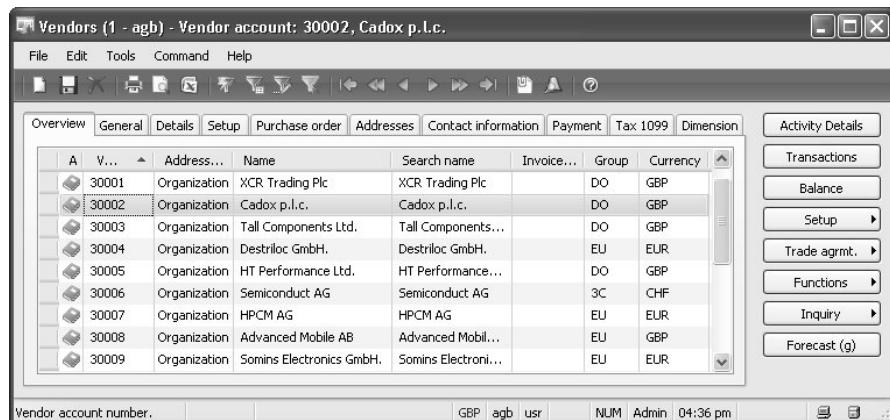


Figure 3.5: The vendor form

The vendor form contains numerous fields, which are a default for purchase orders. Below you may find a description of core settings. Additional information is available in the online help.

Creating a vendor

In order to register a new vendor, you have to insert a record in the vendor form pushing the shortcut key *Ctrl+N* or the icon . If templates are set up for vendors in your company (see Section 2.2.2), you may populate fields of the new record by choosing a template.

Depending on the setting of the number sequence, a unique vendor number in the column *Vendor account* shows automatically or needs to be entered manually. The search name copies from the vendor name, but you may modify it. Mandatory fields in the vendor form are the vendor group in the column *Group*, which usually controls ledger integration (see Section 3.2.3), and the currency, which holds the local currency as a default.

The *Address book type* shows if a vendor is a person or a company (organization). Depending on the address book type, the tab *Details* will show different fields. If you choose "Person" for the address book type, it is not possible to enter contact persons referring to the vendor.

In addition to fields already included in the tab *Overview*, the tab *General* contains two other fields generally important – the field *Language* to set the document language and the field *Stopped* to block a vendor. If you choose the option "All" in the field *Stopped*, it will not be possible to post a transaction or to enter an order for the vendor concerned.

Tax settings are available on the tab *Setup*, where you enter a *Sales tax group (VAT group)* for the vendor to specify the tax duty depending on his location. A correct sales tax group is necessary to distinguish between domestic vendors, who charge sales tax or VAT, and foreign vendors, who do not.

The setup of sales tax groups and tax calculation depends on your company and its location. Section 8.2.5 of this book contains more information on the tax setup.

If your company is located within the European Union and you need to record the VAT registration number of your vendors for tax purposes, you will enter it in the *Tax exempt number (VAT number)* field below the sales tax group. Since it is a lookup field, you have to insert a new tax-exempt number in the main table (*Go to the Main Table Form* in the pop-up menu or *General ledger> Setup> Sales tax> Tax exempt numbers*) before you may select it for a vendor.

The field to enter the usual delivery terms of the vendor is available on the tab *Setup* as well. You may access the setup of required delivery terms including text in foreign languages in the form *Accounts payable> Setup> Distribution> Terms of delivery*.

Vendor address data are available on the tab *Addresses*, where you may enter several addresses for a vendor. The addresses are stored in the global address book (see Section 2.5.4), which you may open in the vendor form clicking with your mouse on the icon  in the left-most column of the tab *Overview*.

General data

Address book type

General tab

Input tax

Delivery terms

Address

In order to record an address of the selected vendor, you want to insert a line in the *Addresses* tab pushing the shortcut key *Ctrl+N* or the icon . For the main address of a vendor, you need to select the checkboxes *Public* and *Primary*. If the address name of the primary address is not different from the vendor name, you may leave it empty as well as the *Address type*. If you enter a second address for a vendor, choose an appropriate address type – as an example “Payment” to identify an alternative payee.

An important setting of an address is the *Country/region* as it is the basis for the address format as well as for reports to the authorities like sales tax and Intrastat reports. If you enter the country code before selecting a *ZIP/postal Code*, only postal codes of that country will show in the lookup.

If you enter the *ZIP/postal Code* before the country on the other hand, your selection for the postal code will set the *Country/region* of the address as well. ZIP/postal codes are a separate main table, which is why you have to insert a code you miss there before you can enter it in an address. You may access postal codes in the form *Basic> Setup> Addresses> ZIP/postal Codes* or through the *Go to the Main Table Form* option in the ZIP/postal code field.

If you want to see how a selected address looks like when printed, you may push the plus sign (+) in the *Address* section at the bottom of the *Addresses* tab.

Contact information

On the tab *Contact information* in the vendor form, you may register general contact data like the vendor telephone number or e-mail address. If you want to select a new main contact person in the field *Contact*, you have to enter that person pushing the button *Setup/Contact details* first.

Pushing the button *Setup/Advanced contact info*, you may switch between a simple and an advanced layout of the tab *Contact information*.

Payment

The tab *Payment* contains settings for payment terms and cash discount. You may find more details on these settings in Section 3.2.2.

Vendor form features

Pushing the form buttons in the vendor form, you may access following inquiries and activities for the selected vendor:

- *Transactions* (showing vendor invoices and payments)
- *Balance* (showing the total of open liabilities)
- *Setup* (administration of further vendor data like contact persons and vendor bank accounts)
- *Trade agrmt.* (purchase prices and discounts – see Section 3.3.2)
- *Functions* (settlement of open transactions – see Section 8.2.2)
- *Inquiry* (showing documents, vouchers and activities)

Depending on your system configuration, you may find the buttons *Forecast* for purchase forecasts as described in Section 6.2.1 and *Activity details* for CRM activities.

The accounts payable parameters (*Accounts payable> Setup> Parameters*) may contain the vendor number of a vendor used as template for one-time vendors on the tab *General*. In addition, you may specify a separate number sequence for one-time vendors on the tab *Number sequences* of the parameters.

If the parameters are set up this way, you may select the checkbox *One-time supplier* as shown in Figure 3.6 instead of choosing an existing vendor when creating a new purchase order. Dynamics AX will create a new vendor for every such order automatically. In the vendor record of these vendors, the vendor account number derives from the number-sequence for one-time vendors and the checkbox *One-time supplier* (*Details* tab on the vendor form) is marked.

One-time vendor

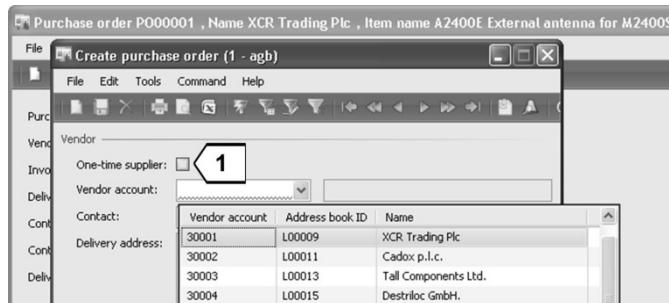


Figure 3.6: Creating a one-time vendor in a new purchase order

Items new in Dynamics AX 2009 related to vendor records include the integration of the global address book (tab *Addresses*) as well as an advanced mode to show contact information.

New in AX 2009

3.2.2 Payment Terms and Cash Discount

Unlike many other business applications, which include cash discount settings in the payment terms, Dynamics AX clearly distinguishes payment terms and cash discount. Therefore, you need to register two different fields in order to manage vendor payment settings.

Payment terms and cash discounts in Dynamics AX are in common for vendors and customers. You may access the appropriate administration forms in the accounts payable as well as in the accounts receivable menu.

The calculation of due date and cash discount date starts from the document date, which you may enter when registering an invoice. If you leave the document date empty, Dynamics AX will apply the posting date as the

start date for due date calculation. Especially in purchase invoices, the document date may deviate from the posting date, however.

You may change due date and cash discount date when posting the invoice or later, modifying the open transaction.

Terms of payment

In order to specify payment terms, you may access the form *Accounts payable> Setup> Terms of payment* in the accounts payable menu or *Accounts receivable> Setup> Terms of payment* in the accounts receivable menu. On the tab *Overview* of the form, you will find a code and a description for the terms of payment. Settings for due date calculation are available on the tab *Setup*.

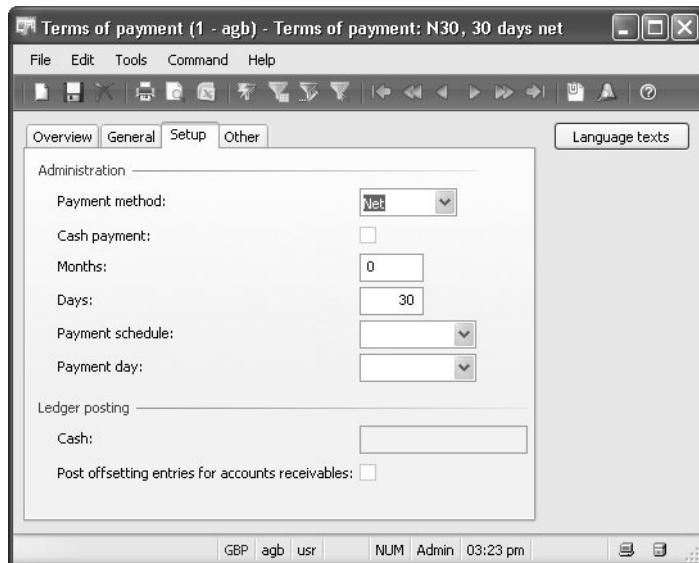


Figure 3.7: Setting due date calculation in the payment form

The field *Payment method* on the tab *Setup* specifies the start date for due date calculation. The payment method "Net" means starting from the document date, "Curr.Mth." means starting from month end. In order to specify the period length for the due date, you may enter the number of days and months. If required, you may as well select a payment schedule.

The button *Language texts* is available to enter a longer description in own and foreign languages. This description will be printed on external documents like the printed purchase order instead of the payment terms name.

As with payment terms, you may access the cash discount setup in the accounts payable menu as well as in the accounts receivable menu (*Accounts payable> Setup> Cash discounts* and *Accounts receivable> Setup> Cash discounts*).

Setting up new cash discounts works like setting up payment terms, except that you have to add a cash discount percentage and ledger accounts for posting. Since cash discounts apply not only for vendors, but also for customers, you need to enter ledger accounts for two different kinds of transactions:

- Cash discount allowed for customer payments
- Cash discount received for vendor payments

Cash discount

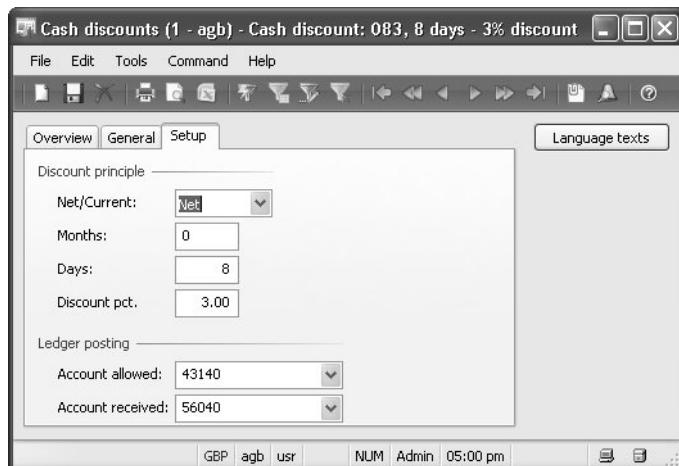


Figure 3.8: Setting up a cash discount

In many companies, it is required to post cash discount to ledger accounts, which depend on the vendor location. As an example, you may want to distinguish between cash discounts received from domestic and from foreign vendors. You may do this by registering ledger accounts for cash discount in the ledger posting group, which is included in sales tax setup (*General ledger> Setup> Sales tax> Ledger posting groups*, tab *General*). Section 8.2.5 contains more information on sales tax/VAT setup.

3.2.3 Ledger Integration

Whenever you post an invoice in purchasing, you will automatically post in finance in parallel. The postings in finance apply to two different areas: The general ledger on the one hand and sub-ledgers for accounts payable, accounts receivable, inventory and others on the other hand.

Sub-ledgers

As mentioned, there is no separate form for vendors in purchasing and the accounts payable ledger in finance administration. Data of both areas are available in a common vendor form. Whenever posting vendor invoices, credit notes and payments, Dynamics AX posts vendor transactions for accounts payable.

General ledger

In parallel to sub-ledger posting, Dynamics AX posts transactions in the general ledger as described in Section 8.4.

The link between transactions in purchasing and the general ledger consists of two different assignments:

- Assignment of inventory items to general ledger accounts:
Settings for inventory transactions, which are posted when receiving or invoicing items, are available in the inventory posting setup (*Inventory management> Setup> Posting> Posting*) depending on the item and vendor selection – see Section 8.4.2.
- Assignment of vendors to summary accounts in the general ledger:
Settings are available in the posting profiles.

Vendor group

The assignment for both – item and vendor transactions – can be done on record level for particular items and/or vendors as well as on group level.

For vendors, you may set up the vendor groups in the form *Accounts payable> Setup> Vendor groups*. You may additionally enter a default tax group for the input tax in the vendor group, which applies when you select the vendor group in a vendor record.

Posting profile

The posting profiles for vendors to assign summary accounts is available in the form *Accounts payable> Setup> Posting profiles*. In order to be able to post purchase transactions, your company needs to set up at least one posting profile. In addition, the default posting profile to post regular purchase transactions needs to be entered in the accounts payable parameters (*Accounts payable> Setup> Parameters*, tab *Ledger and sales tax*).

In order to assign summary accounts – which specify the ledger accounts for vendor liabilities – to vendors you want to access the posting profile form. On the tab *Setup* of the posting profiles, you may find the column *Summary account*.

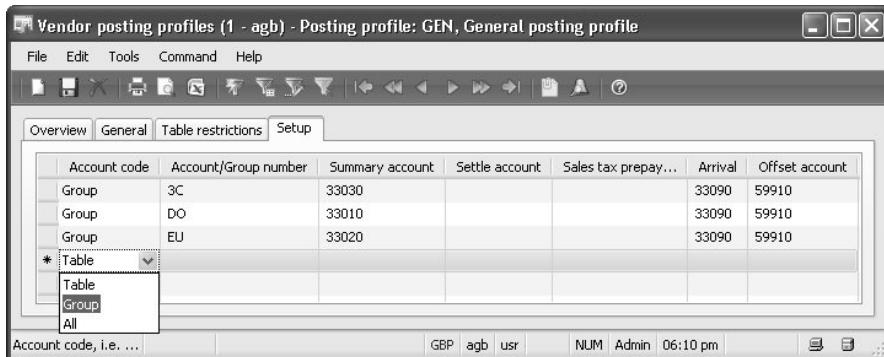


Figure 3.9: The vendor posting profiles form

As shown in Figure 3.9, you may assign summary accounts on three different levels. The column *Account code* contains the specification level for a line:

- “Table” to assign a summary account to a particular vendor (enter vendor number in the column *Account/Group number*)
- “Group” to assign a summary account to a vendor group (enter vendor group in the column *Account/Group number*)
- “All” to assign a general summary account (*Account/Group number* remains empty)

If settings are available on several specification levels, Dynamics AX will apply the most appropriate setting searching first with the vendor number and then with the vendor group. The specification level “All” got the lowest priority.

If you need to apply different profile settings for business cases like prepayment, you may set up additional posting profiles with account assignments different to the general posting profile. If you need to apply such an additional posting profile in a transaction, you may choose it on the *Setup* tab of purchase orders as an example. For prepayment, the posting profile is included in the accounts payable parameters.

3.2.4 Case Study Exercises

Exercise 3.1

Your vendor agrees on new terms of payment “60 days net”, which you want to enter in Dynamics AX choosing a code P-## (## = your user ID). In addition, a new cash discount D-## for “14 day with 3 percent discount” is required.

Assignment level

Payment terms

Be sure to enter the values for due date and cash discount date calculation correctly. When recording the cash discount in Dynamics AX, choose ledger accounts similar to the accounts in existing cash discounts.

Exercise 3.2

Vendor record

The responsible department accepts a new domestic vendor, who wants to ship items to your company. Insert a new record for this vendor without applying a template. Register a name (starting with your user ID) and a primary address, select an appropriate vendor group and sales tax group. For this vendor, the terms of payment and the cash discount entered in exercise 3.1 apply.

Exercise 3.3

Ledger integration

You want to find out about ledger integration. To which summary account in the general ledger will an invoice from your new vendor post?

3.3 Item Management

Item records contain numerous fields to describe products and services. They are a main data source for every department involved in the core business process of providing goods and services. Apart from regular inventory items, which exist as a physical item, item records in Dynamics AX also include intangible items like services, fees and licenses.

Along with a short introduction to the basics of item management, this section primarily contains an explanation of item data necessary for purchasing. A more general description of item management is available in Section 7.2.

3.3.1 Item Records in Purchasing

Overview

In order to check existing or create new items, you need to access the form *Inventory management> Item details*, which shows a list of available items on the tab *Overview*. Alternatively, you may open the list page *Inventory management> Items*.

Creating an item

If you want to enter a new item, you need to insert a record in the item form pushing the shortcut key *Ctrl+N* or the icon . If templates are set up for items in your company (see Section 2.2.2), you may populate fields of the new record by choosing a template. The item number inserts automatically if the number sequence for item numbers does not require manual assignment.

The search name copies from the item name column, but you may edit it. In order to continue registering the new item, you need to enter following mandatory fields on the tab *General* then:

- *Item group*
(specifies ledger accounts for ledger integration)
- *Inventory model group*
(specifies item handling and inventory valuation)
- *Dimension group*
(specifies which inventory dimensions to apply – colors, batch numbers or pallets as an example)
- *Item type*
(Item, BOM or Service)

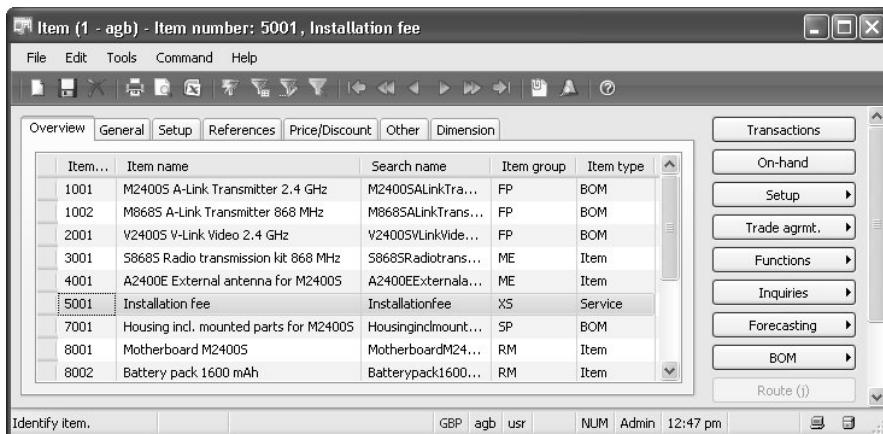


Figure 3.10: The item form

In addition, you will need to enter the inventory unit of measure on the tab *Setup* as well as purchase and sales tax groups and units of measure on the tab *References*. The default for the units of measure is available in the inventory parameters.

In order to register a general cost price for the item, you will open the tab *Price/Discount*, where you may find the *Base cost price* column. The button *Price* is available to enter a cost price per site as described in Section 7.2.4.

The buyer group on the tab *General* is there to specify purchasing responsibility for the item. Additional data in the item record required for purchasing include coverage and order quantity settings as well as purchase prices.

The primary setting for item coverage is the item type: Production is only possible for items of the type “BOM”. Items of the type “Item” and “Service” are to be purchased from vendors. In order to support procurement

Purchasing related data

Item coverage

processing, you may register a main vendor on the tab *References* of the item form.

Coverage groups contain parameters for requirements planning. The general coverage group is available in the master planning parameters (*Master planning> Setup> Parameters*). On the tab *General* of the item form, you may assign a different coverage group to individual items.

When pushing the button *Setup/Item coverage* in the item form, further settings are available for an item. In the item coverage form, you may specify settings like the minimum and the maximum quantity on inventory. In addition, you may enter a specific vendor overriding the main vendor of the item form. Depending on the inventory dimension group, you may enter coverage settings on dimension level (e.g. for a site or warehouse) as described in Section 6.3.3.

Default order settings

Pushing the button *Setup/Default order settings* in the item form, you may enter order settings for the item on company account level. In the default order settings form, the tab *Purchase order* shows the fields for purchasing, containing defaults for settings like lot size (field *Multiple*), order quantity (field *Standard order quantity*) and site. Marking the checkbox *Stopped*, you may block an item to transactions.

When recording a purchase order then, you may override the default order settings except for item blocking.

If there are different sites in your company account, you may override the default order settings on site level pushing the button *Setup/Site specific order settings* in the item form. In order to override standard order settings, you need to select the checkbox *Override* in the site-specific order settings. In addition, you may record a default warehouse for particular sites there.

New in AX 2009

Items new in Dynamics AX 2009 related to item data for purchasing include the site-specific order settings, which are the reason for replacing the *Quantity* tab in the item form with the buttons *Setup/Default order settings* and *Setup/Site specific order settings*. In addition, you may register cost prices pushing the button *Price*.

3.3.2 Purchase Price and Discount

In Dynamics AX, pricing works the same way for purchasing and for sales. The pricing functionality includes a multi-stage calculation for prices and discounts, which starts with the base price in the item form and continues in trade agreements for vendor groups and individual vendors.

As discount calculation in many companies is widely used in sales, following section focuses on price calculation. Details on discount calculation are available in Section 4.3.2.

The purchase base price shows on the tab *Price/Discount* of the item form. Companies with sites might choose the button *Prices* to register and activate a base price per site as shown in Section 7.2.4. Purchase order lines will apply the base price, if no trade agreement is applicable for the vendor and item concerned.

The price unit specifies the quantity, which is the basis for the price. As an example, the price unit “100” will give a price for hundred units.

In order to record miscellaneous charges like fees and freight on base prices, you may register a *Price misc. charges* in the item form. If the checkbox *Incl. in unit price* is not selected, the value in the *Price misc. charges* will add to an order line independent from the quantity. As an example, 10 units for a price of three pounds will add to a line amount of 31 pounds if the price misc. charges is one pound in a purchase order. The price misc. charges will not show separately on documents, however.

If the checkbox *Incl. in unit price* is marked, Dynamics AX will add the price misc. charges to the price. In this case, the field *Price quantity* is the quantity basis for the price misc. charges. As an example, 10 units for a price of three pounds will add to a line amount of 40 pounds if the price misc. charges is one pound in a purchase order.

When working with miscellaneous charges, do not confuse the price misc. charges specified in the base price section of the item form with miscellaneous charges, which are managed separately selecting a miscellaneous charges code in orders. Details on miscellaneous charges management in orders are available in Section 4.4.4.

Item base price

Price misc. charges

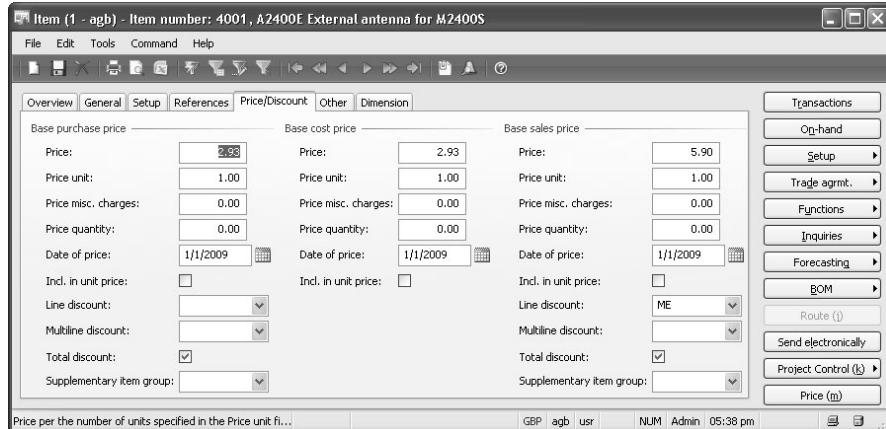


Figure 3.11: Base price in the item form

3 Purchasing

Currency	Prices in the item record are in local currency. If a foreign currency applies to an order, Dynamics AX converts prices derived from item records to the currency of the order.
Trade agreements	You may access trade agreements for purchase prices pushing the button <i>Trade agrmt./Purchase prices</i> in the item form. Trade agreements are available to record detailed settings for prices and discounts showing following specification levels: <ul style="list-style-type: none">- Period of validity (from/to date)- Quantity (minimum quantity)- Unit of measure- Currency- Level (<i>Account code</i>: individual vendor, vendor group or all vendors) In addition to the options listed above, you may also enter prices on inventory dimension level like site or color. You will need this option, if prices depend on the site or warehouse or on item dimensions like size or color. In order to show columns with the required dimensions, you may push the button <i>Inventory/Dimensions display</i> . As a prerequisite to apply dimensions in pricing, the dimension group of the particular item has to include the selected dimensions in the price search (see Section 7.2.2).
Inventory dimensions	

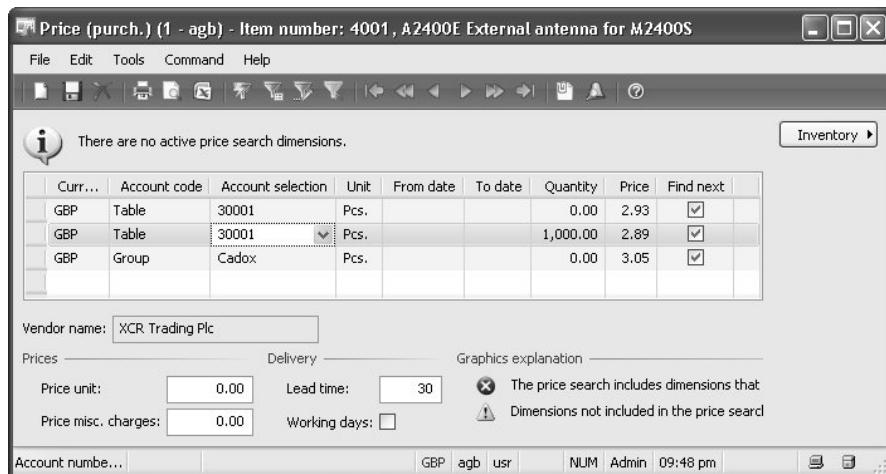


Figure 3.12: Trade agreements for purchase prices

In order to support price registration, an information text in the header part of the trade agreement shows inventory dimensions available for pricing. In Figure 3.12 this header information tells, that there are no inventory dimensions available for price agreements of the selected item.

The price search in Dynamics AX will go from the most specific to the general agreement, in other words from vendor prices to vendor group prices and finally to general prices. As a default, Dynamics AX always looks for the lowest price in trade agreements, however. A lower group price will override a vendor price, therefore. You may stop this search by clearing the checkbox *Find next* in the right-most column of the trade agreement.

In order to set up a new purchase price, you may insert a record in the trade agreement form for purchase prices. The *Account code* specifies if the price is for a vendor ("Table"), for a vendor price group ("Group") or for all vendors. Apart from the columns in the grid, you need to pay attention to the bottom fields where you may enter a price unit and a lead-time. Price, price unit and lead-time of the applicable trade agreement for an order line override the defaults from the base data in the item record.

As a prerequisite for applying trade agreements, your company needs to activate the appropriate pricing options in the price/discount setup (*Accounts payable> Setup> Price/Discount> Activate price/discount*).

If you want to enter group prices, you need to set up the required vendor price groups (*Accounts payable> Setup> Price/Discount> Vendor price/discount groups, Show "Price group"*). In the vendor form (*Accounts payable> Vendor Details*), you may select the appropriate price group on the tab *Purchase order* then. When selecting a vendor in a purchase order, the vendor price group will default the order. You may change the price group in the order, nevertheless (*Accounts payable> Purchase Order Details, tab Price/Discount*).

3.3.3 Case Study Exercises

Exercise 3.4

In order to accomplish purchase order processing in the following exercises, you need to set up a new item. This first item is a trade item, later on we will continue with the more complex structures of BOM items.

Enter a new item with the item number I-## and the item name "# #-merchandise" (## = your user ID). Select an appropriate item group for merchandise and a dimension group only containing site and warehouse as active dimensions. Then select an inventory model group with FIFO valuation.

On the tab *References*, you should select a sales tax group with the standard tax rate for sales and for purchasing. The unit of measure for the item is "Pieces" in all areas. The main vendor is the vendor of exercise 3.2. The base purchase price and the base cost price are 50 pounds, the base sales price is 100 pounds.

Search priority

Setup for pricing

Item record

In the *Default order settings* (button *Setup*), you should enter the main site as well as default quantities for purchasing and sales (*Multiple 20, Min. order quantity 40, Standard order quantity 100*). In the *Site specific order settings*, you should enter the main warehouse of the main site.

Which item type do you select for merchandise?

Note: If the number sequence for item numbers is set up for automatic numbering, you do not need to enter an item number.

Exercise 3.5

Trade agreement

You agree upon a lower price for the new item with your main vendor. Set up a trade agreement for the vendor of exercise 3.2, which specifies a purchase price of 45 pounds for the item of exercise 3.4. There is no minimum quantity and no end date for this price.

3.4 Purchase Orders

An order is a definite promise to deliver goods or services on agreed terms. Orders therefore have to include following details to be complete:

- Vendor with name and address
- Ordered item
- Quantity and unit of measure
- Delivery date, delivery address and terms of delivery
- Price, currency and terms of payment

When you register a purchase order, Dynamics AX will check these requirements before you may post and print the purchase order.

3.4.1 Basics of Purchase Order Processing

Starting point

In order to receive a purchase order, you may either insert it manually or generate it as follows:

- Create a purchase order automatically as a result of a purchase requisition workflow or master scheduling
- Transfer a request for quote, planned order or purchase requisition to a purchase order
- Transfer a purchase journal to a purchase order
- Create a purchase release order based on a blanket order (see Section 3.4.6)
- Create a purchase order based on a sales order (direct delivery, see Section 4.7.1)
- Create a purchase order based on a production order (Subcontracting)

Other ways to create purchase orders in Dynamics AX are automatic transfers – from external applications through the AIF-framework as well as from other company accounts through the Intercompany functionality.

Purchase order processing related to projects is part of the project module, described in the relevant online help and training documentation.

Within procurement, there are three different documents, which you may process before creating a purchase order:

- Planned orders
- Purchase requisitions
- Requests for quote

A request for quote is required, if you want to obtain and compare quotes from several vendors in Dynamics AX. You may either create them automatically out of a planned order or a purchase requisition or enter them manually.

If your company applies master scheduling or purchase requisitions, you usually skip requests for quote for known items in daily business, however. In most cases, you create a purchase order directly out of a planned order or purchase requisitions then.

Planned purchase orders are a result of master scheduling. Depending on master planning setup, master scheduling may skip planned orders and directly create purchase orders, however. You may find details on the appropriate setup in Section 6.3.3.

After creating a purchase order, you want to process it as shown in Figure 3.13 from the start to the end, which is invoice posting.

Prior documents

Order processing

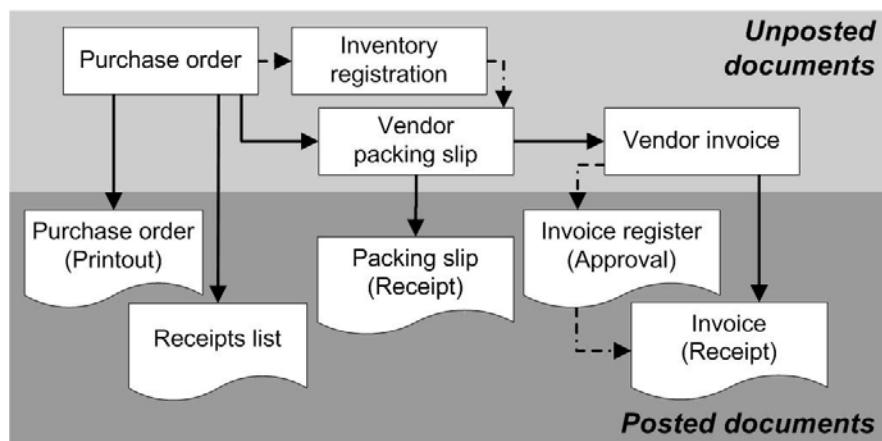


Figure 3.13: Purchase order processing in Dynamics AX

	The first step in order processing often is printing the purchase order to send it to the vendor.
Receipts list	If your warehouse requires a list of items for information purposes to prepare item arrival, you may print a receipts list.
Registration	Before posting the packing slip receipt, you may register the items including all required inventory dimensions like warehouse, serial number and batch number. You may do this registration either in the registration form, which is accessible pushing the button <i>Inventory/Registration</i> in the purchase order line, or in the separate item arrival journal. If the checkbox <i>Registration requirements</i> in the inventory model group of the purchased item is selected, you need to do inventory registration before you may post the packing slip receipt.
Packing slip	Posting the vendor packing slip is possible directly in the related purchase order or in a summary update. When you post a packing slip, Dynamics AX posts inventory transactions as well as general ledger transaction depending on the setup.
Invoice	When the vendor invoice arrives, you may post it in the purchase order. Alternatively, you may record the invoice in the invoice register to go through an approval process. Depending on the setup, you may skip all steps of order processing except the invoice. If the checkbox <i>Receiving requirements</i> on the inventory model group of an item is selected, you need to post the packing slip before you can post the invoice receipt, however.
Physical and financial transactions	In the following sections, you may find detailed explanations on purchase order processing. When posting inventory transactions you should be aware that there are two different kinds of transactions: Physical and financial transactions. Generally speaking, physical transactions mean packing slips and financial transactions mean invoices. You need to distinguish between these transactions, in particular regarding inventory valuation and general ledger posting. Details on these topics are available in Section 7.2.5 and 7.2.6.

3.4.2 Planned Orders

Planned purchase orders are based on the demand for a purchased item. The settings, if item requirements calculation in master scheduling should include forecasts as well as available inventory on hand, sales quotes, sales orders, production orders and purchase orders are available in the operations planning (master planning) setup.

The description below shows a simple procedure to generate planned orders in master scheduling. The item requirement in the example is caused

by a minimum inventory quantity entered in the item coverage form, which exceeds the quantity on hand.

In order to enter a minimum inventory quantity for an item, you may open the item coverage form pushing the button *Setup/Item coverage* in the item form (*Inventory management> Item details*) after selecting the appropriate item.

If you want to enter a minimum quantity in the item coverage, you need to insert a new record there. Depending on the dimension group of the item (see Section 6.3.3), you may specify a minimum inventory quantity on dimension level, as an example per site or per warehouse.

Minimum quantity

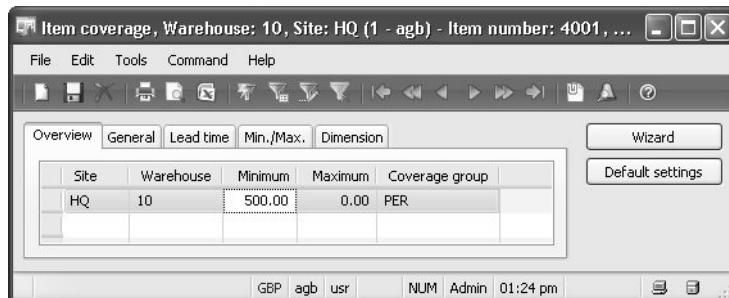


Figure 3.14: Inserting a minimum inventory quantity in the item coverage form

Item coverage settings and the availability of the item show in the net requirements form, which you may access pushing the button *Inquiries/Net requirements* after selecting the particular item in the item form. In the net requirements form, you may update master scheduling as shown in Figure 3.15 then.

Net requirements

When updating the master schedule by pushing the button *Update/Master scheduling*, Dynamics AX generates planned orders. As an alternative, you may as well run general master scheduling by choosing the periodic activity *Master planning> Periodic> Master scheduling*, which usually is a batch job in the night.

Master scheduling

Dynamics AX may apply multiple master plans, including a static master plan for current master scheduling and a separate dynamic master plan for simulation purposes. When updating a master schedule, planned orders will affect the selected plan only – either a dynamic or the static.

If your company settings specify a two master plan strategy as shown in Section 6.3, the dynamic plan will be the default for updating the master schedule in the net requirements form.

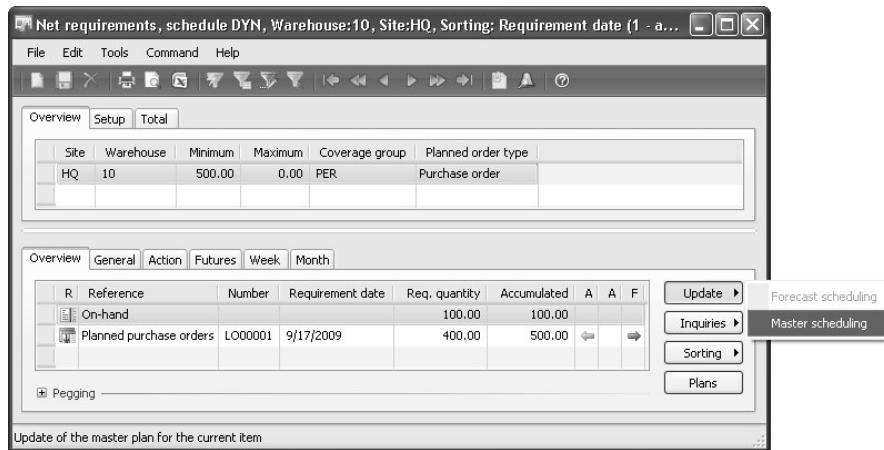


Figure 3.15: Local master scheduling in the net requirements form

Planned order

In order to access planned purchase orders generated in master scheduling, you may open the form *Accounts payable> Planned Purchase Order Details* or the list page *Accounts payable> Planned Purchase Orders*. If setup specifies a separate dynamic plan (two master plan strategy), you need to push the button *Plans* in the planned order form to switch to the dynamic plan.

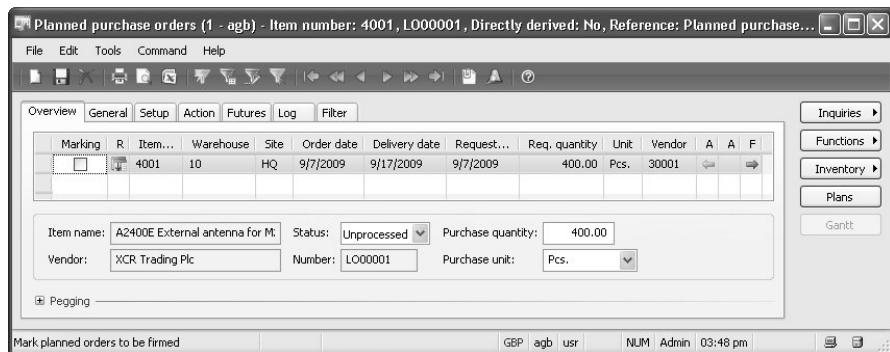


Figure 3.16: Processing a planned purchase order

You may modify the planned purchase orders as necessary. If you want to know the origin of a requirement, you may push the plus sign (+) in the line *Pegging*.

The column *Vendor* shows the suggested vendor for the item, which derives from the main vendor in the item record, from a trade agreement or from item coverage. If there is no default for the vendor, you need to assign a vendor manually before you can transfer the planned order to an actual purchase order.

When you have finished your updates on planned orders, you may put a checkmark into the column *Marking* of the lines that you want to transfer to the purchase order.

After pushing the button *Functions/Firm*, Dynamics AX will generate appropriate orders. As an alternative to purchase orders, you may create requests for quote pushing the button *Functions/Change to request for quote* as shown in Section 3.4.4.

If you want to know later on, which planned orders have been transferred to orders, you may switch to the tab *Log* of the planned purchase order form.

Creating a purchase order

3.4.3 Purchase Requisitions

A purchase requisition is an internal document, which requires the purchasing department to buy requested goods or services. Unlike a planned order, which is created automatically because of an item requirement, a purchase requisition has to be entered manually by the person, who needs the item.

Purchase requisitions may include two different kinds of items:

- *Catalog items* (regular items, available in the item form)
- *Category items* (non-catalog items, which work as placeholder for regular items)

A detailed description of purchase requisitions and the workflow system is beyond the scope of this book. The following overview should give you a basic knowledge of the way to process purchase requisitions, nevertheless.

Before a purchase requisition transfers to a purchase order, it runs through an approval process. This approval process is based on the workflow system, which needs to be installed and activated therefore.

Prerequisites

In order to configure the purchase requisition workflow, you need to access the form *Accounts payable> Setup> Workflow configurations*. When setting up a new purchase requisition workflow, you want to choose the template "Purchase requisition approval".

The accounts payable parameters (*Accounts payable> Setup> Parameters*) contain the tab *Purchase Requisition*, specifying if users may choose all reg-

ular items in purchase requisitions (*Purchase requisition catalog = "All"*) or if you want to apply a product catalog.

In order to manage a product catalog you may access the form *Accounts payable> Setup> Purchase catalog> Product groups*. The product catalog contains category items (placeholder for inventory items) and additionally needs to include a catalog of inventory items, if you choose to run a product catalog for them.

Entering a requisition

You may enter purchase requisitions in the regular Dynamics AX client as well as in the Enterprise Portal, which is the web access for occasional users.

If you choose the regular client, you will access the form *Accounts payable> Purchase Requisition Details* or the appropriate list page. When inserting a new record pushing the shortcut key *Ctrl+N*, Dynamics AX shows the form *Create purchase requisition*, where you may enter the *Purchase requisition name*.

The way you enter purchase requisitions lines depends on the item kind:

- *Catalog items* (regular items, shown in the item form) are available in the item number column when entering a requisition line. Alternatively, you may push the button *Add item* in the requisition lines to open the *Create lines* form, where you select an item number.
- *Category items* need to be selected in the *Create lines* form, where the tab *Non-catalog items* is available to enter a *Text* and a *Category* for these items.

When working in the *Create lines* form, you need to push the button *Add item* in the upper pane to choose catalog and category items. When you are finished with selecting items in this form, you may push the button *Create* at the bottom of the form to transfer the items to the requisition lines.

Workflow

As soon as the purchase requisition is complete, you may start the requisition workflow pushing the button *Submit*. The further proceeding depends on the workflow configuration – the lines below show the standard proceeding for a manual approval.

When the workflow system has processed a requisition, which is not complete, the responsible for completing – usually a purchasing agent – will receive a notification. He may then open the purchase requisition choosing “Assigned to me” in the filter field *Show requisitions* at the top of the requisitions form (*Accounts payable> Purchase Requisition Details*). In order to complete the requisition, he may enter missing data like the vendor number. If a request for quote is required, he may push the button *Functions/Request for quotes* in the purchase requisitions form.

On condition that a requisition exceeds the spending limit of the requisitioner, the approver receives a notification as soon as the requisition is submitted correctly and completely. The approver may then authorize the requisition ("Assigned to me" in the filter) pushing the button *Actions/Approve* in the purchase requisitions form.

Purchase requisitions below the spending limit automatically approve.

After approval, you need to release the purchase requisition manually to generate a purchase order, if the accounts payable parameter *Auto create purchase order* on the tab *Purchase Requisition* is set to "No". Otherwise, the purchase order will create automatically when approval is finished.

If manual releasing is necessary, you may push the button *Create purchase order* in the form *Accounts payable> Periodic> Purchase requisition> Release Approved Purchase Requisitions Details*.

Purchasing requisitions and the approval workflow are new features in Dynamics AX 2009.

**Purchase
order**

**New in
AX 2009**

3.4.4 Requests for Quote

A request for quote (RFQ) is an external document, which asks vendors to supply a quote. In Dynamics AX, you may send a single request for quote to multiple vendors. As soon as the quotes from your vendors arrive, you will enter them as "request for quote replies" to be able to compare the quotes. If you accept a quote, you may transfer it to an order.

If you want to enter a new request for quotes, you may manually enter a new record in the form *Accounts payable> Request for Quote Details* or in the appropriate list page. Alternatively, you may create requests for quote out of planned purchase orders and purchase requisitions.

A request for quote consists of a header part, which contains general data like a delivery date and a quote deadline (*Expiry date*), and a lines part, which contains items and quantities. Unlike purchase orders lines, which may contain only items, request for quote lines may contain simple text lines when selecting "None" in the column *Line type* available there.

In the header as well as in the lines you may find the columns *Lowest status* and *Highest status*, which show the status of the request – "Created", "Sent", "Accepted" or "Rejected". The filter line at the top of the form is available to enter a filter easily.

The screenshot shows the 'Request for quote' form in Dynamics AX. The header displays the case ID 'PQ00001' and the item name '(1 - agb)'. The interface is a standard Windows-style application with a menu bar (File, Edit, Tools, Command, Help) and a toolbar with various icons. A 'Filter' section at the top allows searching by Employee, Buyer group, Vendor account, and RFQ vendors. The main area features a grid with tabs for Overview, General, Vendor, Address, Price/Discount, and Dimension. The Overview tab is selected, showing a single row of data: Case ID 'PQ00001', Orderer 'E001', Lowest status 'Created', Highest status 'Created', Expiry date '9/7/2009', Currency 'GBP', Purchase type 'Purchase order', and RFQ vendors 'None'. To the right of the grid are buttons for 'Update', 'Setup', 'Functions', and 'Inquiries'. Below the grid is another table with tabs for Lines, General, Address, Price, Other, Project, and Dimension. The Lines tab is selected, showing one item line: Line type 'Item...', Name 'A2400E External antenna...', Site 'HQ', Weight '10', Delivery date '9/7/2009', Expiry date '9/7/2009', Low... 'Created', High... 'Created', and Quantity '1.00'. To the right of this table are buttons for 'Setup (b)', 'Functions (d)', 'Inquiries', and 'Inventory'. At the bottom of the form are status indicators: 'Quantity ordered in purchase unit', currency 'GBP', user 'agb', system 'NUM Admin', and time '08:24 pm'.

Figure 3.17: The request for quote form

Creating a request for quote

When inserting a request for quote manually by pushing the shortcut key *Ctrl+N*, Dynamics AX will show the *Create request for quote* form. In this form, you want to choose “Purchase order” for the *Purchase type* to start a request for a regular order. After selecting a delivery and an expiry date, you may close the form pushing the button *OK* to create the request.

Sending the request

In the request for quote, you want to select the lines part then to insert records for item and text lines pushing the shortcut key *Ctrl+N*. Data like delivery date and address in the lines will retrieve appropriate defaults from the header. Applying document management as shown in Section 2.2.3, you may add details like data sheets or drawings to header and lines.

In order to specify vendors that receive the request for quote, you want to switch to the tab *Vendor* in the request header. On the tab *Vendor*, you may insert a new line for every vendor concerned.

After inserting vendors, you may push the button *Update/Send* to open the posting form for printing the request. In the posting form, you need to select the checkbox *Print request for quote*. Pushing *OK*, you will post and print the request then. You may find more information on posting forms in Section 3.4.8, which describes purchase order printing.

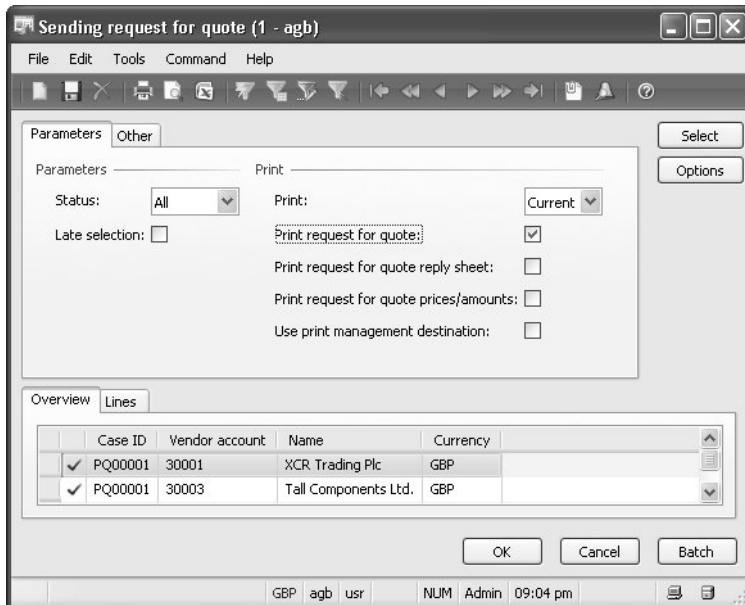


Figure 3.18: Printing the request for quote

If you want to know later, to which vendor you have sent the request for quote, you may push the button *Inquiries/Request for quote journal* to see the posted requests.

In the request header, you may choose the button *Setup/Configure request for quote reply* in order to specify the fields to be included in a reply. These fields print on the request for quote reply sheet, which you may select to print in parallel in the posting form when sending the request.

The default for the reply field settings derives from the accounts payables parameters (button *Default request for quote reply fields* on the tab *Request for quote*).

As soon as a vendor replies to a request by sending a quote, you may register the quote (reply) in the form *Accounts payable> Periodic> Request for quote> Request for Quote Reply Details* or the appropriate list page. Alternatively, you may enter a reply pushing the button *Inquiries/Request for Quote Reply Details* in the request for quote form as well.

In the reply form, you may enter details of the vendor quote on the tab *Reply fields* in the header part as well as in the lines. In order to support data input, you may push the button *Functions/Copy data to reply* copying data from the request into the reply fields.

RFQ reply setup

Request for quote reply

Approval/ Rejection

When you are finished entering the reply, the highest/lowest status of the request and the replay will be set to “Received” automatically.

If you want to compare the replies (quotes) from your vendors, you may push the button *Inquiries/Compare* in the request for quote form to open the compare request replies form.

In order to accept a quote, you need to put a checkmark into the column *Mark* for the selected reply and to push the button *Update/Accept* in the compare request replies form or the request reply form. Dynamics AX will show a posting form, where you may decide to print a confirmation.

When posting the acceptance, Dynamics AX will automatically create a purchase order. If you want to accept a request reply line showing the *Line type* “None”, you need change the line type to “Item” entering an item number then. If necessary, you have to set up a new item that you may enter in the line then.

When accepting all lines of a request in a reply, Dynamics AX suggests rejecting the other replies for that request. Rejecting a request is also possible pushing the button *Update/Reject* in the reply, however.

New in AX 2009

Requests for quote are a new feature in Dynamics AX 2009, which replaces the purchase type “Quotation” in purchase orders.

Order structure

Like all documents, purchase orders consist of a header and one or several lines. The header contains data, which are common for the whole order like order number, purchase type, vendor, currency, language and payment terms.

Other fields in the order header like the delivery date are a default for the order lines, where you may change them on line-level. If you change header data after inserting order lines, settings in the accounts payable parameters (button *Update order lines* on the tab *Updates*) control whether to update existing order lines automatically.

The default for the *Purchase type* derives from the accounts payable parameters, which usually show the type “Purchase order” to set regular purchase orders as default. You may choose any of the following options for the purchase type in the purchase order, however:

- *Purchase order* (regular purchase order)
- *Journal* (draft or template, not affecting inventory or finance)
- *Subscription* (periodic order, remains open after invoicing)
- *Returned order* (credit note, see Section 3.7.1)
- *Blanket order* (see Section 3.4.6)

Order lines contain data like item numbers, description, quantities, prices and discounts as well as delivery dates. In Dynamics AX, you also need to apply an item number if you want to order services. The item type for those items is “Service”.

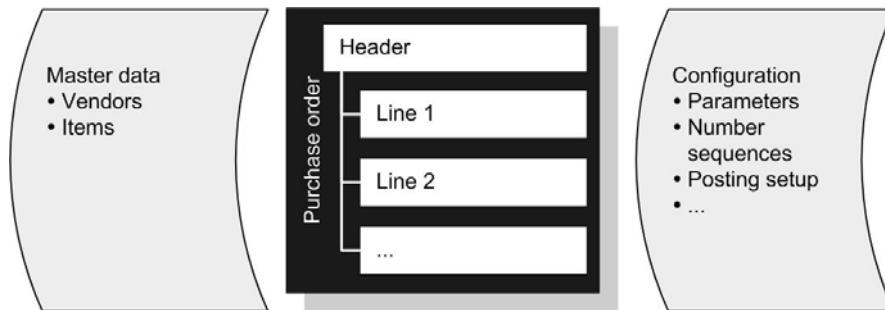


Figure 3.19: Structure of purchase orders

When inserting a new purchase order header or line, Dynamics AX will retrieve defaults for numerous fields after selecting the vendor or the item. Depending on your permissions, you may change the content of the fields in the order, however.

If you agree on different payment terms for a certain order with your vendor as an example, you may change the terms of payment in the order header. If the new payment terms apply to all future orders, however, you need to change the terms of payment in the vendor record to get the right default when entering an order for that vendor the next time.

The purchase order form has two different modes – the simple and the advanced mode. You may switch between these modes pushing the top right button *Advanced* (or *Simple*). Unlike the simple order form, which only shows a single purchase order, the advanced form displays a list of purchase orders in the header part as shown in Figure 3.21 below. In addition, the advanced form shows tabs in the header and line part containing numerous detail data. As an example, changing the item description is only possible in the advanced form, where you may find the field *Text* on the line tab *General*.

When working in the advanced form, you need to make sure to select the right purchase order in the header area in order to avoid working on lines of a wrong order.

If you want to enter a purchase order manually, you need to insert a new record in the form *Accounts payable> Purchase Order Details* or to push the

Defaults

Advanced order form

Selected header

Creating an order

appropriate action button in the list page *Purchase orders*. In the purchase order form, you need to be sure to select the header part of the form when inserting a new record for a new order. If the lines part is active, a new record will create a new line.

When inserting the new header, Dynamics AX will show the *Create purchase order* form where you want to choose a vendor in the vendor lookup. If you need details on how to find a record in a lookup field easily, please refer to Section 2.1.4 of this book.

After selecting a vendor number, the order form retrieves various defaults from the vendor record. By clicking the plus sign (+) in the *Delivery address* or *Administration* line of the create order form, you may show additional fields of the new order header. If you want to change data like the vendor number, purchase type or currency, you may do it directly in the *Create purchase order* form or – after closing that form – in the purchase order header form.

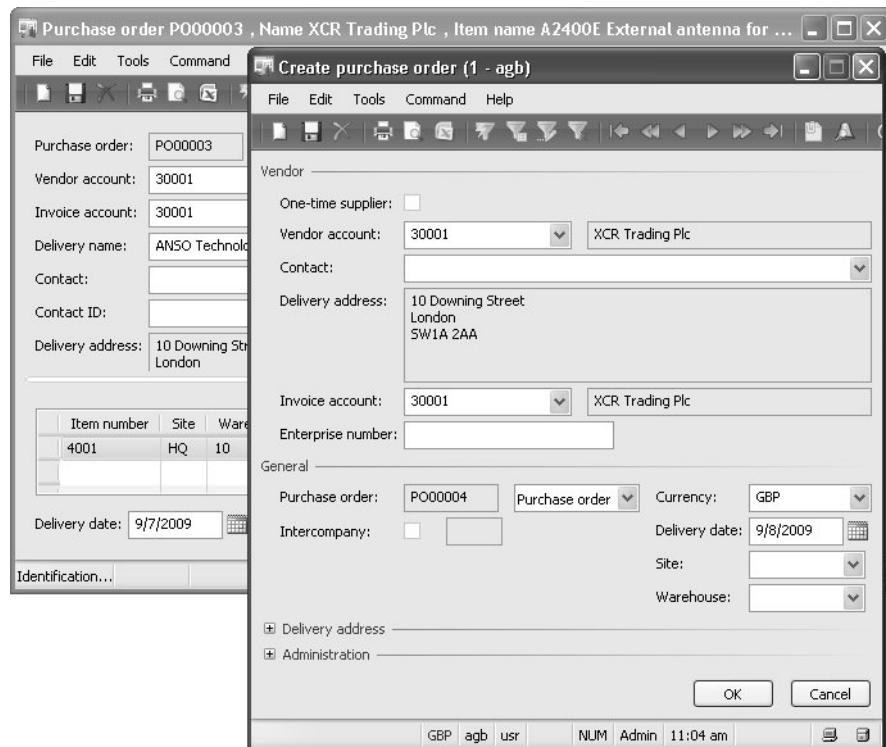


Figure 3.20: Creating a purchase order

When pushing the button *OK* in the *Create purchase order* form, Dynamics AX inserts the order header and switches to the order lines, where you may start to register items. If you want to go through the header of the new order before starting to enter a line, you need to select the lines part of the form later by clicking into the lines or pushing the shortcut key *Ctrl+Page Down* before you may start to insert a line.

In order to register a purchase order line, you need to insert a new record selecting an item number. The item provides various defaults for fields like quantity, purchase unit, unit price, site or warehouse. If entered in the order header, site and warehouse will default from the header, however. Trade agreements may set the unit price and discount.

The delivery date defaults from the header, if that date is after the lead-time of the item. Otherwise, the default for the delivery date of the line is the lead-time added to the session date. You may specify the lead-time for an item in the default or site-specific order setting form of the item record, in the purchase price trade agreement and in the item coverage form.

You may enter *Miscellaneous charges* on order header level as well as on line level to register charges like freight and insurance. The functionality of miscellaneous charges in purchasing corresponds to miscellaneous charges in sales (see Section 4.4.4). In order to access miscellaneous charges, you may push the button *Setup/Misc. charges* in the header or line part of the advanced purchase order form.

Order lines

Charges

Figure 3.21: The purchase order form in advanced mode

Inventory transaction

When entering a line of a regular purchase order, Dynamics AX will create a related inventory transaction. Pushing the button *Inventory/Transactions* in the order line, you may see that inventory transaction showing the receipt status “Ordered” but no posting date. In the course of purchase order processing, packing slip and invoice posting will update the inventory transaction as shown in Section 7.2.5.

Delivery address

The default for the delivery address on the tab *Address* of a purchase order is your company address in the company information form. If a delivery address is available for a site or warehouse, the purchase order will insert the site or warehouse address.

You may change the address in the purchase order manually or by pushing the button *Setup/Alt. address*, which opens a form where you may choose to copy an address from various areas of the Dynamics AX application.

If you want to apply different delivery addresses on line level, you may access the tab *Address* or the button *Setup/Alt. address* in the lines area of the order form as well. In order to apply alternative line addresses when printing a purchase order, you may decide to split printouts of purchase orders to several documents (accounts payable parameters, tab *Summary update*).

Input tax

Input tax (Sales tax/VAT) calculation is based on the combination of vendor and item. The vendor record contains the sales tax group (VAT group), which distinguishes between domestic and foreign vendors. For companies in the European Union, EU vendors will be a third category.

The item record contains the item sales tax group (item VAT group) distinguishing between items with a regular tax rate and other items, for which a reduced rate applies (food as an example in many countries).

Purchase order header and lines retrieve the vendor and item tax group to calculate tax automatically. In order to display the calculated sales tax for a purchase order, you may push the button *Setup/Sales tax* in the header or lines area.

Copying an order

As an alternative to enter a purchase order manually, you may copy an existing order. This existing order may refer to a different purchase type, providing the possibility to copy a journal into an order as an example.

Before you may copy an order, you need to insert a new order header that should receive the copied records. Selecting that new header you may push the button *Functions/Copy from all*. The *Copy from all* form displays a list of available orders, where you may select the checkbox in the left-most column to choose records for copying as shown in Figure 3.22 – entire orders in the upper part or single lines in the lower part of the form.

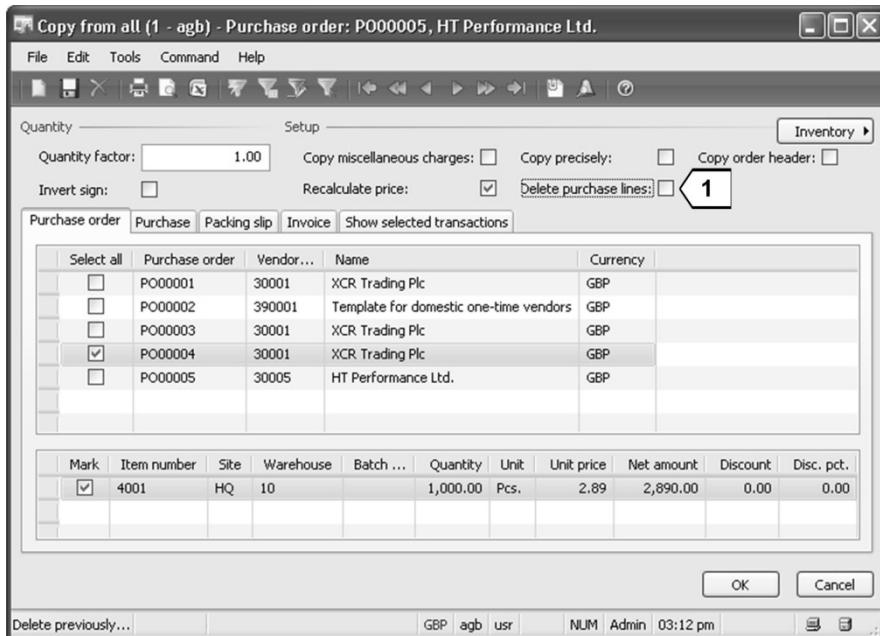


Figure 3.22: Copy from all form to copy a purchase order

When copying an order, check the checkbox *Delete purchases lines* [1]: If that checkbox is marked, Dynamics AX will delete all existing lines of the new order before inserting the lines selected. Whereas this does not matter for a new order, it may be undesirable if you just want to copy additional lines to an existing order.

When you are finished with marking required orders and lines, you may close the copy form pushing the button *OK*. Dynamics AX will copy the selected lines then. Header data like the delivery address will copy, if you select the checkbox *Copy order header*.

You might notice another button in the purchase order form available to copy into a purchase order – the button *Functions/Copy from journal*. This button is applicable if you got an existing purchase order and want to transfer related posted documents like the invoice into that order.

As an alternative to selecting a copy button in the header area, you may find the copy functionality in the lines button *Functions* as well.

It is not possible to post purchase orders of the purchase type „Journal“, which serve as draft or template. If you want to access purchase journals, you may choose the form *Accounts payable> Journals> Purchase orders> Pur-*

Deleting without intention

Journals

chase journals, which shows purchase journals only, as an alternative to the regular purchase order form.

Apart from copying a purchase journal, you may transfer a journal into a purchase order by changing the purchase type or by running the periodic activity *Accounts payable> Periodic> Post the purchase journal*.

New in AX 2009

Items new in Dynamics AX 2009 related to purchase orders include the implementation of the multisite functionality and the list pages as well as numerous minor improvements on the purchase order form.

3.4.6 Blanket Purchase Orders

Blanket orders

Entering a blanket order in Dynamics AX works the same way as entering a regular order, except that you choose the purchase type “Blanket order”. As with purchase journals, a separate form (*Accounts payable> Journals> Purchase orders> Blanket order*) for blanket orders in parallel to the regular purchase order form is available to access blanket purchase orders.

Printing a blanket purchase order works the same way as printing a regular order (see Section 3.4.8). It is not possible, however, to post packing slips and invoices for blanket orders. In order to post deliveries and invoices referring to blanket orders you will apply release orders, which are regular purchase orders in Dynamics AX.

Release orders

If you want to create a release order, you may push the button *Functions/Create release order* after selecting the appropriate blanket order. Dynamics AX then shows the *Create release order* form, where you will select the required items in the lookup of the column *Lot ID*. Before you close the form pushing the button *OK*, you may enter the purchased quantity and the delivery date for the release order.

Dynamics AX creates the new release order as a regular purchase order of the type “Purchase order”. In the column *Blanket order*, the release order shows a link to its originating blanket order.

As soon as the quantities in assigned release orders equal the line quantities in a blanket order, the blanket order is complete and shows the status “Received”.

Blanket order inquiries

If you want to know all release orders assigned to a certain blanket purchase order, you may push the button *Inquiries/Attached purchase orders* after selecting the blanket order header. In the blanket order lines, you may choose the button *Inquiries/Attached order lines*.

3.4.7 Order Cancellation

You should cancel a purchase order line, if you want to keep the original order quantity while not expecting any further deliveries for that line. You also need to cancel lines if you want to stop an order of the type "Subscription".

Canceling

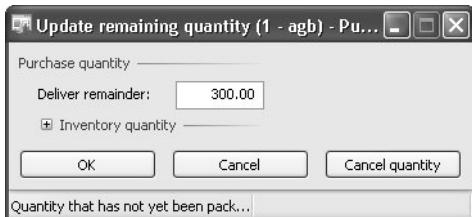


Figure 3.23: The dialog box to change or cancel a remaining line quantity

In order to cancel a purchase order line or to change the open quantity, you need to push the button *Functions/Deliver remainder* after selecting the line in the purchase order form. Dynamics AX then shows the dialog box *Update remaining quantity*, where you may change or cancel the remaining quantity for deliveries. In order to cancel the deliver remainder, you may push the button *Cancel quantity* in the dialog box to set the deliver remainder to zero.

Pushing the button *OK* in the dialog box adjusts the deliver remainder quantity in the order line. Canceling an order line is possible no matter if there have been partial deliveries before.

Unlike canceling, which reduces the open line quantity, deleting a purchase order line or a complete order removes it from Dynamics AX. Deleting is not possible, if there is a quantity received not yet invoiced.

Deleting

Regarding purchase order deleting, you should keep in mind following accounts payable parameters:

- *Mark purchase as voided* (tab *General*)
If this checkbox is marked, you may display deleted orders in the form *Accounts payable> Inquiries> History> Voided purchase orders*.
- *Delete purchase order line invoiced in total* and
Delete purchase order after invoicing (tab *Updates*)
If these checkboxes are marked, orders or order lines will delete automatically when the invoice is posted

In order to delete a purchase order or order line, you may select the record and push the shortcut key *Alt+F9* or the icon

Posted documents

Deleting a purchase order only removes the order registration (unposted document). It is not possible to delete posted documents like posted purchase orders, packing slips and invoices. If you delete the purchase order concerned, you may still access the posted documents choosing the appropriate form in the menu *Accounts payable> Inquiries> Journals*.

3.4.8 Purchase Order Printing

When you are finished entering a purchase order, you may send it to the vendor. In Dynamics AX, you do that by posting the order.

Posting a purchase order means to save it unchanging and separate from the current purchase order you work on. It is available to keep record of the document sent to the vendor and does not create physical or financial transactions.

Quantity received now

As a preparation for posting, you may enter the posting quantity in the column *Receive now* on the tab *Quantity* of the purchase order lines as shown in Figure 3.24.

Whereas you may apply this column more frequently when posting partial receipts or invoices, for purchase order printing you will rarely face the situation to post and print a partial quantity. Nevertheless, it is important to know this column if you want to understand the posting functionality.

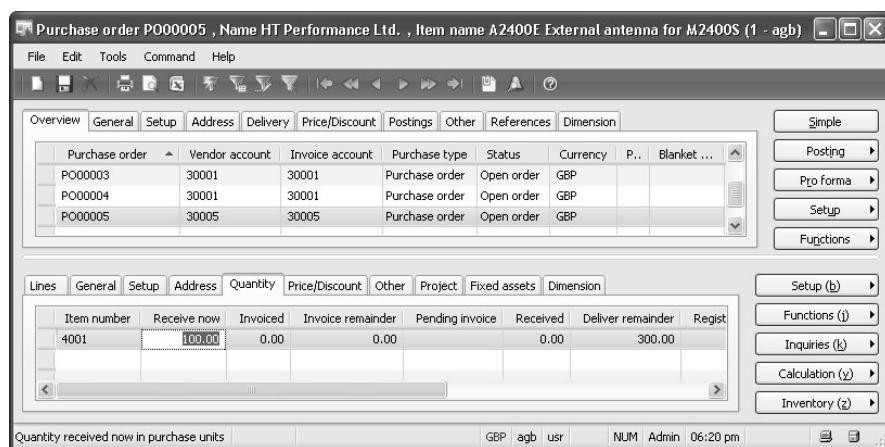


Figure 3.24: Receive now quantity in the purchase order form

Posting form

In order to post the purchase order, you may push the button *Posting/Purchase order* in the purchase order form or in the appropriate list

page after selecting the appropriate purchase order. Dynamics AX opens the posting form, where you may choose following options:

- *Parameters/Quantity*
„All“ posts the total quantity of all lines; “Receive now” posts the quantity entered in the order line column *Receive now*
- *Parameters/Posting*
If selected, a purchase order document will be printed; if cleared, the printout will be a pro forma document
- *Print options/Print*
When selecting several orders for summary update, “Current” will print documents individually while posting, whereas “After” will print after the last document has been posted
- *Print options/Print purchase order*
If selected, the order will be posted and printed; otherwise posting is without printing (reprinting is possible nevertheless)
- *Print options/Use print management destination*
If selected, print settings specified in the setup form *Accounts payable> Setup> Forms> Form setup* (Button *Print management*) or in the vendor form apply; otherwise, print settings chosen by pushing the button *Printer setup* in the posting form apply

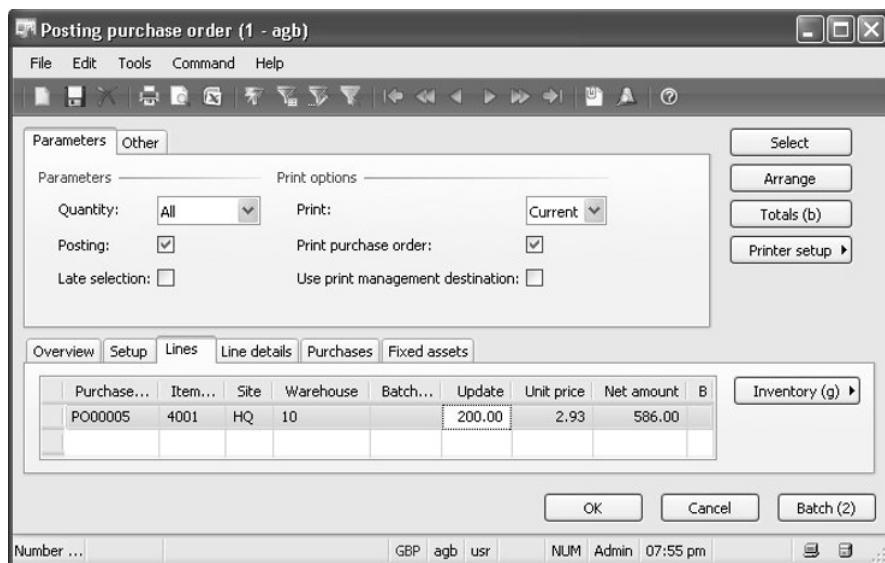


Figure 3.25: Updating the quantity in the posting form (purchase order printing)

On the tabs *Lines* and *Line details* in the lower part of the posting form, you may change the quantities and amounts before posting. As an example in Figure 3.25, the printed purchase order will show a quantity of only 200 units instead of the total quantity, because the quantity in column *Update* of the posting form has been changed to 200 units. Dynamics AX calculates the *Net amount* according to the quantity entered.

Total amount	If you want to check the total amount before posting, you may push the button <i>Totals</i> in the posting form.
Warnings	If you see a yellow exclamation mark () on the tab <i>Overview</i> , Dynamics AX indicates a problem for posting. The reason frequently is that the selected quantity in the posting form is “Receive now”, but the appropriate column in the order lines is empty. Selecting the quantity “All” in the posting form will solve this problem.
Posting	In order to complete posting you need to push the button <i>OK</i> in the posting form. If the checkmark for printing in the posting form is marked, Dynamics AX will print to a printer or file depending on the printer selection.
Pro forma document	If the checkbox <i>Posting</i> in the posting form is cleared, Dynamics AX prints pro forma documents. A pro forma document is not a posted document, which is why reprinting or displaying is not possible when printing is finished.
	You may as well print a pro forma document by selecting the appropriate option in the button <i>Pro forma</i> of the purchase order form. In the posting form for pro forma documents, the checkbox <i>Posting</i> is not available for marking.
Summary update	Apart from posting by pushing the appropriate button in the order form, you may as well choose the periodic activity for summary updates to post and print purchase orders.
	You may access the summary order update by selecting the menu path <i>Accounts payable> Periodic> Purchase order update> Purchase order</i> , which opens the same posting form as the button in the purchase order. Whereas Dynamics AX sets a filter selecting the current order automatically when accessing the posting form from a purchase order, the summary update requires setting a filter manually. You may do this pushing the button <i>Select</i> in the posting form, which opens the advanced filter form to select the requested purchase orders.
	When closing the filter form, you may check the selected orders in the <i>Overview</i> tab of the posting form. If you decide not to post an order listed there, you simply need to delete the line concerned before posting by pushing the button <i>OK</i> .

More information on general tasks for filtering and printing is available in Section 2.1.6 and 2.1.7. Section 3.6.2 contains a description of how to collect purchase orders into one collective document pushing the button *Arrange*.

After posting a purchase order, you may display the posted document independent from modifications to the current order. In order to access posted purchase orders, you may choose the form *Accounts payable> Inquiries> Journals> Purchase order* or push the button *Inquiries/Purchase order* in the purchase order form.

Purchase order inquiry

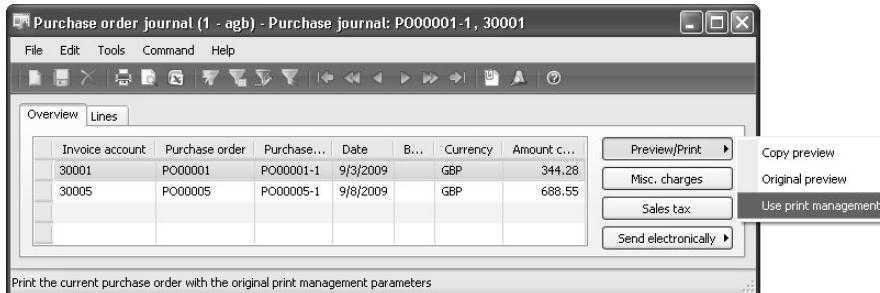


Figure 3.26: Selecting to reprint in the purchase order inquiry form

The order inquiry form shows all posted purchase orders on the tab *Overview*. The tab *Lines* displays the order lines of the posted order selected on the tab *Overview*.

You may apply the inquiry form to display a print preview of a posted order choosing the option *Copy preview* or *Original preview* in the button *Preview/Print*. In the preview form, you may reprint the document.

In order to print one or more posted orders after selecting, you may also choose the button *Preview/Print/Use print management*, which prints to the printer specified in print management.

Items new in Dynamics AX 2009 related to purchase order printing include the separate button for pro forma documents and the possibility to reprint in the order inquiry form without going through the print preview.

Reprinting a document

New in AX 2009

3.4.9 Case Study Exercises

Exercise 3.6

A minimum inventory quantity of 200 units is required for the item entered in exercise 3.4. After registering this minimum quantity, you want to open the net requirements form for the item updating the master schedule. What is result of that master scheduling?

Planned order

Open the planned purchase order form in the accounts payable menu. If required, switch to the dynamic master plan that has been applied when updating the net requirements. Select the planned order referring to your item and transfer it to a purchase order.

Exercise 3.7

Request for quote (RFQ)

You want to receive vendor quotes for your item. Choose the request for quotes form in the accounts payable menu in order to insert a new request. This request contains a line with your item from exercise 3.4. The RFQ reply configuration for the request should include the header field *Reply valid to* and the line fields *Quantity* and *Unit price*.

You want to send the request to your vendor from exercise 3.2 and another vendor of your choice. When you are finished entering the request, choose the option *Send* to post and print the RFQ for these vendors.

After a while, you may receive quotes from both vendors containing quantities and prices of your choice. In order to track the quotes, you enter them as request for quote replies assigned to the original request. Your vendor has submitted the better quote, which you accept transferring the RFQ reply to a purchase order. Then send a quote rejection to the other vendor.

Exercise 3.8

Purchase order

You want to order your item (entered in exercise 3.4) from your vendor (entered in exercise 3.2). Open the *Purchase Order Details* form in the accounts payable menu, leaving it in simple mode to enter the purchase order including header and line. Which quantity and which price display as default, where do they come from?

Switch to the advanced mode for displaying the purchase order form and select all orders referring to your vendor. How many appropriate orders are available?

Exercise 3.9

Printed order

Post and print both purchase orders that you have created in previous exercises. One time you should print to a PDF file, the other time you should display a print preview.

Then change the quantity in the order of exercise 3.8 to 120 units. Are the original data of the printed order still available to reprint it?

3.5 Item Receipt

As soon as an ordered item arrives in your warehouse, you want to post an item receipt to make the item available in inventory.

In order to make sure that required items arrive in time, you may choose following inquiries in Dynamics AX to display open purchase order lines:

- *Accounts payable> Inquiries> Order status> Open purchase order lines:*
Form showing open order lines containing quantity and delivery date (apply a filter to select relevant records)
- *Accounts payable> Backorder Purchase Lines:*
List page showing open order lines which contain a confirmed delivery date before the date you select in the filter area of the list page

Monitoring orders

In addition, you may apply reports to monitor purchasing orders – as an example the report *Accounts payable> Reports> Delivery date exceeded*.

In order to prepare for an expected item receipt, you may print a receipts list to inform the vendor and/or the responsible in your warehouse.

Receipts list

Item receipt includes two different steps of posting:

- *Inventory registration*
You may record inventory registration, which increases the quantity on hand in inventory, directly in the order line or through an item arrival journal. When posting an arrival journal, posting of pallet transactions in warehouse may be required depending on the setup.
- *Packing slip receipt*
The packing slip posts the physical inventory transaction and general ledger transactions for the item receipt finally. Inventory registration is a possible preliminary step.

Posting item receipts

You may as well skip posting the item receipt (registration and packing slip) for a purchase order. In this case, Dynamics AX posts the item receipt together with the invoice receipt.

3.5.1 Receipts List

The functionality of the receipts list is similar to posting and printing the purchase order: You need to access a posting form to post and print a receipts list, but that posting does not create inventory or financial transactions. Printing of a receipts list is not very common, but you may choose it for information purposes regarding an expected item receipt.

In order to post and print a receipts list, you may push the button *Posting/Receipts list* after selecting the required order in the purchase order form.

Posting a receipts list

As an alternative, you may access the posting form for summary update selecting the menu path *Accounts payable> Periodic> Purchase order update> Receipts list*. In the posting form for summary update, you need to set a filter pushing the button *Select*.

3.5.2 Inventory Registration

Inventory registration is a preliminary step before posting the packing slip receipt. In order to execute inventory registration, you may choose two different ways:

- Posting an item arrival journal
- Registration in a purchase order line

Arrival overview

If you want to get an overview of expected item arrivals, you may open the form *Inventory management> Periodic> Arrival overview*. After selecting an expected receipt, you may create an item arrival journal out of the arrival overview. For more details on the arrival overview form, please refer to the online help.

Item arrival journal

Your company will probably apply item arrival journals, if it is required to register item receipts in the warehouse separately from posting packing slip receipts in the office.

Item arrival journals are available in the form *Inventory management> Journals> Item arrival> Item arrival*. As described in Section 7.4.2 later in more detail, you may register and post an item arrival journal like any other inventory journal.

After posting the item arrival journal, the inventory transaction shows the status “Registered” and the tab *Quantity* of the purchase order line shows the posted quantity in the column *Registered*.

As an exception, the status will not be “Registered” but “Arrived” after posting the journal, if the item arrival journal contains settings to post pallet transports for goods on the inbound dock. In this case, the transaction will not show the status “Registered” until you post the pallet transport.

Registration in order lines

Apart from item arrival journals, you may as well record an inventory registration in the purchase order form. As an example, you might want to enter inventory registration, if you need to split the receipt for a single order line to different locations, batch or serial numbers.

In order to open the item registration form, you may push the button *Inventory/Registration* after selecting the appropriate order line in the purchase order form.

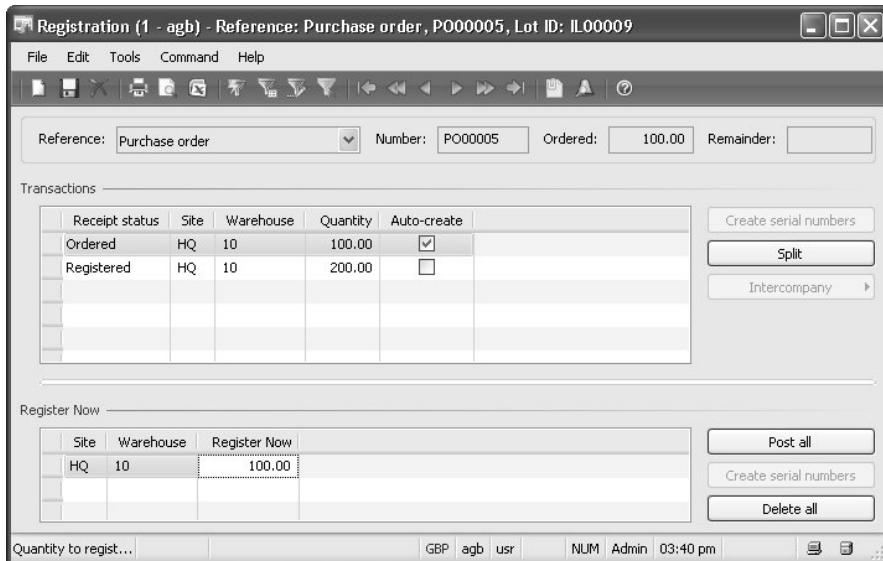


Figure 3.27: Registering a receipt in the inventory registration form

The inventory registration form contains two parts: The upper part (*Transactions* pane) shows the status of the inventory transaction(s) linked to the order line. The lower part (*Register now* pane) is available to post the registration.

Initially the upper pane shows a single inventory transaction, which Dynamics AX creates when you enter the order line. This transaction splits into several lines if you post partial deliveries or if you split the line manually. You may do that splitting by pushing the button *Split* or *Create serial numbers* in the registration form in order to register inventory dimensions like different batch or serial numbers.

In order to record and post an inventory registration, you need to insert appropriate lines in the *Register now* pane of the registration form. Apart from manually inserting a record there (*Ctrl+N*), you may put a checkmark in the column *Auto-create* of the *Transactions* pane as shown in Figure 3.27.

Before posting the registration by pushing the button *Post all*, you may change warehouse, quantity and applicable inventory dimensions. If you record a partial registration by inserting a lower than the original quantity in the *Register now* pane before posting, the inventory transaction will split into two lines – one for the registered and one for the remaining quantity.

Registration form

Posting a registration

Cancelling a registration	If you have started a registration in the <i>Register now</i> pane, but want to cancel it before posting, you may push the button <i>Delete all</i> . Dynamics AX will not post the registration and leave the transaction as it has been before.
Registration status	When an inventory registration is posted, the recorded quantity shows the status “Registered” and is available in inventory. You may post subsequent transfer and consumption of that quantity, therefore.
	Unlike packing slip and invoice posting, which generate voucher documents that contain unchanging transactions, inventory registration is a preliminary transaction. If you reset an inventory registration, there is no posted transaction of the original registration any more. The only transaction you may see after resetting a registration is the posted item arrival journal, if registration has been posted through an item arrival journal.
Reversing a registration	In order to reverse a registration, which has been posted in an item arrival journal or in the registration form, you may open the registration form in the purchase order form after selecting the appropriate order line. In <i>Transactions</i> pane of the registration form, you may select the registered transaction in the column <i>Auto-create</i> and post the transaction like a regular registration, but with a negative quantity. As an alternative, you may as well post an item arrival journal with a negative quantity to reverse a registration.
Settings for registration	The inventory model group of the purchased item controls, if you have to post a registration before posting the packing slip. You need to record a registration, if there is a checkmark in the checkbox <i>Registration requirements</i> on the <i>Setup</i> tab of inventory model group (<i>Inventory management> Setup> Inventory> Inventory model groups</i>).
New in AX 2009	Items new in Dynamics AX 2009 related to inventory registration include the arrival overview form to process item arrivals.

3.5.3 Packing Slip Receipt

Posting the receipt of a packing slip (delivery note) is the physical inventory transaction, which finally receives the item in an unchanging voucher document.

Ledger integration	If ledger integration is activated for the packing slip receipt, Dynamics AX will post transactions in the general ledger in parallel to the inventory transactions. These ledger transactions will reverse when you post the related invoice. There are two relevant settings in order to activate packing slip receipt posting to the general ledger:
--------------------	--

- The checkbox *Post packing slip in ledger* in the accounts payable parameters (tab *Updates*) needs to be marked.
- In addition, the checkbox *Post physical inventory* in the inventory model group (tab *Setup*) of the purchased item needs to be marked.

Posting the packing slip receipt works similar to posting and printing the purchase order. You may open the posting form by pushing the button *Posting/Packing slip* in the purchase order form after selecting the particular order.

The posting form shows the familiar format. Which option to select in the lookup field *Quantity*, depends on the previous procedure:

- You should select “Registered” in the *Quantity* field, if warehouse posts an inventory registration before you post the packing slip. Dynamics AX then inserts the quantity registered not yet received (packing slip posted) into the *Update* column on the *Lines* tab.
- If you select “All” in the *Quantity* field, Dynamics AX will insert the total remaining quantity in the *Update* column on the *Lines* tab.
- If you select “Receive now” in the *Quantity* field, Dynamics AX will insert the quantity of the order line column *Receive now*.

The other parameters in the posting form work the same way as described in Section 3.4.8 for printing the purchase order, except for following options:

- The checkbox *Print packing slip* usually is cleared, because you do not want to print a packing slip when posting a packing slip receipt.
- The column *Packing slip* on the *Overview* tab requires entering the packing slip number of your vendor.

If you want to post a packing slip receipt for an item with an inventory model group, which got the checkbox *Registration requirements* on the *Setup* tab marked, you need to post inventory registration before you can post the packing slip for the particular quantity.

If the checkbox *Receiving requirement* on the *Setup* tab of the inventory model group is marked, you need to post the packing slip before you can post an invoice.

As for purchase order printing and for receipt lists, a posting form for summary packing slip update is available, which you may access selecting the menu path *Accounts payable> Periodic> Purchase order update> Packing slip*. In the posting form for summary update, you need to specify a filter pushing the button *Select*.

You may push the button *Arrange* to collect multiple purchase orders into one collective packing slip. More information on arranging purchase orders for collective documents is available in Section 3.6.2 of this book.

Posting form

Setup for posting

Summary update

Partial delivery

3.5.4 Partial Delivery, Over and Under Delivery

You need to post a partial delivery, if you do not receive the whole quantity of a purchase order line in one shipment, but divided into several shipments. It is not possible to post partial deliveries, if the checkbox *Complete* on the tab *General* of the order line is marked, however.

In order to prepare packing slip posting of a partial delivery, you may enter the received quantity into the column *Receive now* on the *Quantity* tab of the purchase order line. In the posting form for packing slip receipt, you may choose “Receive now” in the quantity lookup field then.

As an alternative, you may skip entering quantities into the *Receive now* column and choose “All” in the quantity lookup field of the posting form. In this case, you need to record received quantities in the column *Update* on the tab *Lines* of the posting form.

After posting a partial delivery, you may see the open quantity for packing slip posting in the column *Deliver remainder* on the *Quantity* tab of the purchase order form. The total quantity received shows in the column *Received*.

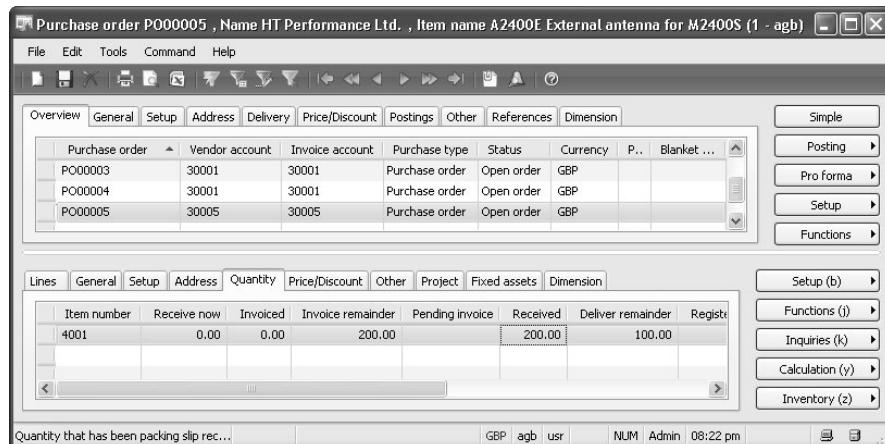


Figure 3.28: Purchase order after posting the packing slip for a partial delivery

When you receive further partial deliveries, you may post the packing slip receipts the same way as described for the first delivery until the total of the received quantities is the same as the ordered quantity.

If you are posting inventory registration (see Section 3.5.2), you may record partial deliveries in the registration similar to packing slip posting for partial deliveries. For inventory registration, you enter the partial

quantity received into the registration form or into the item arrival journal before posting.

You may post under or over deliveries only if the checkbox *Accept underdelivery* or *Accept overdelivery* on the tab *Updates* of the accounts payable parameters is selected.

Other settings for over and under deliveries are available on the tab *References* of the item form, where you may enter the maximum percentage for over delivery and under delivery in purchase and sales orders.

The percentages in the item record are a default for order lines, where you may adjust them on the tab *Setup* as needed in the particular order.

A transaction is an over delivery, if the total quantity received exceeds the ordered quantity when posting a receipt (registration or packing slip). Dynamics AX will accept the over delivery, if the exceeding quantity is below the over delivery percentage of the order line.

If you post the receipt of a quantity smaller than the ordered quantity, Dynamics AX will post a partial delivery unless you mark the receipt to be the last one for the particular order line. As shown in Figure 3.29, you may apply under delivery by selecting the checkbox in the column *Close* on the tab *Lines* of the posting form after entering the received quantity in the *Update* column.

Settings for Over/Under delivery

Over delivery

Under delivery

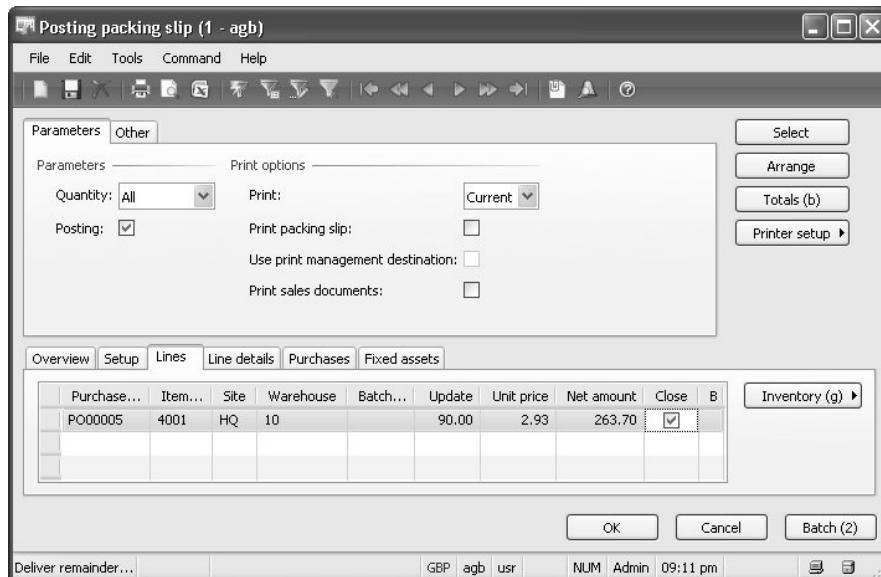


Figure 3.29: Selecting an under delivery in the posting form for the packing slip

As an alternative, you may set the open quantity to zero by cancelling the deliver remainder quantity as described in Section 3.4.7. Unlike when posting an under delivery in the posting form, Dynamics AX does not control if the missing quantity is below the under delivery percentage of the order line in this case, however.

3.5.5 Order Status and Inquiries

Purchase order status

When posting the item receipt, Dynamics AX will change the inventory quantity and the order status. In the header part of the purchase order form, the order status shows on the tab *Overview* as well as on the tab *General*. On the tab *General*, you may see the document status additionally. Whereas the order status indicates the order progress showing the lowest status of any line in the purchase order, the document status shows the highest status of a posted document. Therefore, the order status may still be "Open order" while the document status is "Invoice" in case of partial deliveries.

Table 3.1 below shows an overview of receipt transactions and the related order status.

Table 3.1: Order status and document status for receipt transactions

Transaction	Order status	Document status
(None)	<i>Open order</i>	<i>None</i>
Purchase order posting (Printing)	<i>Open order</i>	<i>Purchase order</i>
Receipts list	<i>Open order</i>	<i>Receipts list</i>
Inventory registration	<i>Open order</i>	As above, no change (<i>None</i> , <i>Purchase order</i> or <i>Receipts list</i>)
Partial packing slip	<i>Open order</i>	<i>Packing slip</i>
Complete packing slip	<i>Received</i>	<i>Packing slip</i>

In addition, the tab *Postings* in the order header shows the last document number for the document types involved.

On line level, you may get to know the status from the field *Line status* on the tab *General* and from different quantity columns on the tab *Quantity*.

Inventory registrations as well as packing slips change the quantity on hand in inventory through inventory transactions.

When you enter a new purchase order line, Dynamics AX inserts an inventory transaction showing the *Receipt* status “Ordered”. You may see this transaction pushing the button *Inventory/Transactions* in the purchase order form after selecting the appropriate order line.

When posting an inventory registration, the receipt status of the inventory transaction will change to “Registered”. The registration date is stored in the field *Inventory date* on the tab *General* of the inventory transaction (if you reverse the registration, Dynamics AX clears the inventory date).

When posting a packing slip – with or without a previous inventory registration – the receipt status of the inventory transaction will change to “Received”. The posting date of the packing slip shows in the column *Physical date* of the inventory transaction. Since reversing a packing slip is only possible by posting an offsetting transaction, the physical date will never change.

In case of partial deliveries, the inventory transaction splits into two transactions with different status according to the posted quantities.

As an example, Figure 3.30 shows the inventory transactions linked to a purchase order line after posting the packing slip receipts for two partial deliveries at a different time.

Inventory transaction status

Transaction inquiry

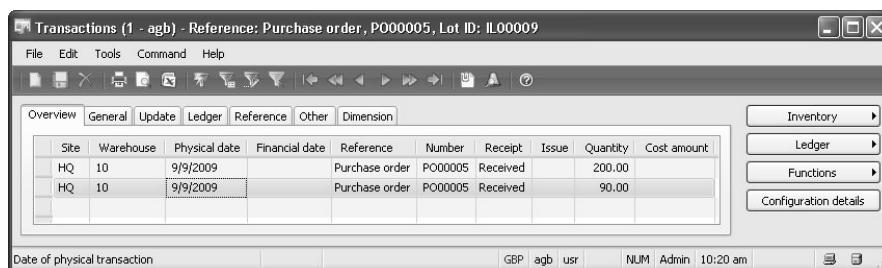


Figure 3.30: Inventory transactions after packing slip receipt

As long as you do not post the invoice receipt for an inventory transaction, the receipt status remains “Received” and the column *Financial date* will remain empty. If you want to know the packing slip number, you may switch to the tab *Update* of the inventory transaction.

In order to access posted packing slips, you may choose the form *Accounts payable> Inquiries> Journals> Packing slip* or push the button *Inquiries/Packing slip* in the purchase order form. After selecting a packing slip on the tab

Packing slip inquiry

Overview of the inquiry form, you may switch to the tab *Lines* displaying the packing slip lines. The button *Inventory/Lot transactions* on the *Lines* tab then opens the inventory transactions shown above again.

Ledger transactions

If ledger integration is activated for the packing slip receipt, you may push the button *Ledger/Physical voucher* in the inventory transaction to see related general ledger transactions. In the packing slip inquiry, you may push the button *Voucher* on the *Overview* tab to see the general ledger transactions for the complete packing slip.

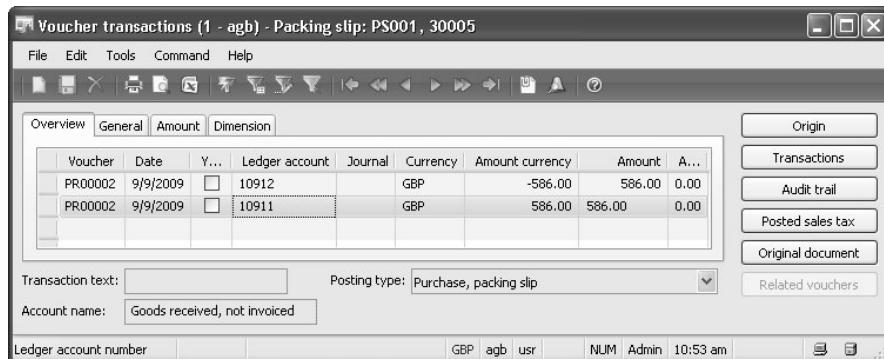


Figure 3.31: General ledger transactions related to a packing slip

The general ledger accounts in the ledger transactions depend on the inventory posting setup. You may access the inventory posting setup form selecting the menu path *Inventory management> Setup> Posting> Posting*. On the tab *Purchase order* of this form, you may find the options “Packing slip” and “Packing slip offset”, which set the ledger accounts dependent on the item and vendor (“Account”) of the transaction. Section 8.4.2 contains more details on inventory posting setup.

Transaction origin

If you push the button *Origin* in the voucher transactions form as shown in Figure 3.31, the transaction origin form displays, showing the transactions in all modules related to the selected document voucher.

Depending on integration settings, a packing slip posts inventory and ledger transactions as shown in Figure 3.32.

Based on the deep integration of all modules in Dynamics AX, the transaction origin form provides the possibility to see the consequences of a document in all parts of the application.

Module	Voucher	Date	Number	Text	Currency	Amount currency	Amount	Dimension	Number
Ledger	PR00002	9/9/2009	10911		GBP	586.00	586.00		
Ledger	PR00002	9/9/2009	10912		GBP	-586.00	-586.00		
Inventory	PR00002	9/9/2009	4001	Physical	GBP	586.00	586.00		

Name: A2400E External antenna for M240
Table: Inventory transaction posting

Application ... | GBP agb usr | NUM Admin 11:19 am |

Figure 3.32: Transaction origin form, showing all transactions for a packing slip

3.5.6 Case Study Exercises

Exercise 3.10

Your vendor ships the goods ordered in exercise 3.8 with packing slip PS01. Before posting the receipt, check following items in the purchase order:

- Order status and document status
- Inventory quantity of the ordered item (button *Inventory/On-hand*)
- Inventory transaction related to the order line (button *Inventory/Transactions*)

Post a packing slip for the complete quantity ordered (120 units after exercise 3.9) referring to the vendor packing slip number mentioned above. You may do the posting directly out of the purchase order form.

Now review the status of the items on the checklist above again. What is different after packing slip posting?

Exercise 3.11

You want to order your item from your vendor another time. Enter a purchase order for 80 units. Printing the purchase order is not required this time. You may immediately post the packing slip PS02 for a partial delivery of 50 units. Then post the packing slip of a second partial delivery containing 10 units.

Do you know how to show the remaining quantity? Check the order status, inventory quantity and inventory transactions like in exercise 3.10. What is different in comparison to exercise 3.10?

Packing slip receipt

Partial delivery

Exercise 3.12

Packing slip inquiry

You want to see the packing slip of exercise 3.10. Therefore, open the packing slip inquiry out of the purchase order concerned. In a second step, open the packing slip inquiry choosing the appropriate form in the accounts payable menu. Check packing slip header and lines and try to find out, if there are related ledger transactions.

3.6 Invoice Receipt

Together with the shipment or some time later, the vendor will send an invoice. You need to check the invoice, comparing it to order prices and received quantities, before posting the invoice receipt, which closes the purchase order.

Whereas the packing slip receipt posts a preliminary inventory value, the invoice receipt posts the final value. Posting an invoice receipt therefore not only increases the open vendor balance, it also increases the financial inventory value.

As soon as all lines of a purchase order are invoiced, the purchase order processing in Dynamics AX is completed. Payment of vendor invoices then runs through a separate process shown in Section 8.3.4.

Ways of invoicing

You may post the invoice receipt for a purchase order in two different ways:

- *Purchase invoice:*
Final posting of an invoice with or without payment approval
- *Invoice register:*
Recording and posting of an invoice to interim accounts in the invoice register; later approval and final posting in the invoice approval journal

If you want to post a purchase invoice, which does not refer to a purchase order, you may choose the invoice register as well as the invoice journal or other applicable journals to record the invoice. Such an invoice does not refer to items and therefore shows no impact on inventory and supply chain management.

Below you may find the basic procedure to post an invoice in purchasing either pushing the button *Posting/Invoice* in the purchase order form or selecting the summary update *Accounts payable> Periodic> Purchase order update> Invoice*.

Information on how to post purchase invoices through the invoice register or journal form is available in Section 8.3.3 of this book.

Invoice and item receipt

You may post an invoice related to a purchase order with or without previous item receipt posting. Selecting the option “All” or “Receive now” in the lookup field *Quantity* of the posting form, you do not compare invoiced with received quantities in the posting form. If the invoiced quantity exceeds the total of previously received quantities, invoice posting will include receipt posting for the exceeding quantity.

Invoice posting without a previous receipt posting is useful, if you receive goods or services together with the invoice and do not post a separate item receipt in the warehouse. As a prerequisite, the checkbox *Receiving requirement* on the *Setup* tab of the inventory model group for the particular item may not be marked (see Section 7.2.3).

Usually you record invoice receipts assigning them to posted packing slips, however. In the posting form, you will choose the option “Packing slip” in the lookup field *Quantity* therefore. As shown below, you may assign individual packing slips to an invoice receipt.

3.6.1 Invoice Receipt Posting

Posting form

Posting the invoice receipt is similar to posting the purchase order and the packing slip. You may open the posting form by pushing the button *Posting/Invoice* in the purchase order form after selecting the appropriate order.

The posting form shows the familiar format. Which option to select in the lookup field *Quantity*, depends on the previous procedure:

- Usually you post a packing slip receipt before invoice receipt, which is why you select “Packing Slip” in most cases.
- If you select “All” or “Receive now” in the posting form, Dynamics AX does not default the quantity received to the update quantity. A receipt will post for the quantity not yet received.

Selecting packing slips

If you select “Packing slip” in the invoice posting form, Dynamics AX inserts the quantity received not yet invoiced in the *Update* column of the *Lines* tab. You may select individual packing slips for invoicing by pushing the button *Select packing slip* in the posting form then.

When selecting individual packing slips, the select form shows packing slips available for invoicing. You may include or exclude packing slips marking the checkbox in the column *Include*. After closing the select form, you may see the selected packing slips in the column *Packing slip* on the tab *Lines* of the posting form.

Other parameters

The other parameters in the posting form work the same way as described for packing slip posting. An exception is available on the tab *Setup*, where you may enter data concerning payment and due date calculation. You

may as well clear the checkbox *Approved* on the *Setup* tab, if you want to exclude an invoice from payment proposals.

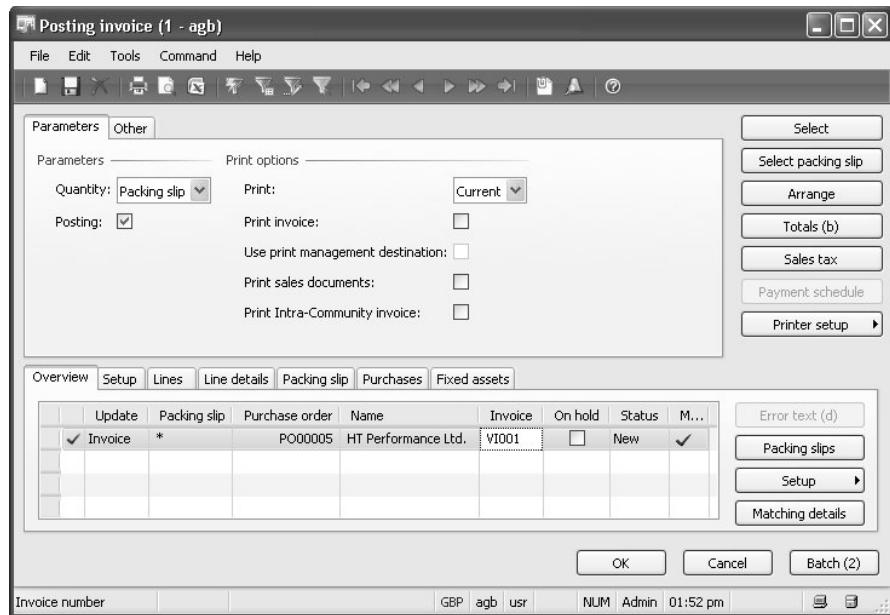


Figure 3.33: Posting form for the purchase invoice receipt

Price variance

Before you post the invoice pushing the button *OK* in the posting form, you might push the button *Totals* to compare the totals on the vendor invoice with the totals you are going to post. If necessary, you may adjust quantities, prices, discounts and line amounts on the tab *Lines* or *Line details* in the posting form.

In order to keep record of a price variance, you should not modify prices and amounts in the purchase order line, but enter invoiced prices on the tab *Lines* or *Line details* in the posting form. This way, Dynamics AX may discover price variances automatically in the posting form, showing an exclamation mark (!) in the column *Match variance* on the tab *Overview* and in the column *Price match* on the tab *Lines*.

The form *Accounts payable> Setup> Price/Discount> Price tolerance setup* contains settings, which price difference to accept. Further invoice matching setup is available in the accounts payable parameters, where you may find settings regarding price and quantity variance control in the *Invoice matching* parameters on the tab *Updates*.

After inserting the invoice number of your vendor into the column *Invoice* on the *Overview* tab, you may post the invoice receipt pushing the button *OK* in the posting form.

If you do not want to post an invoice (e.g. because of price differences), you may select the checkbox *On hold* on the tab *General* of the posting form. When you push the *OK* button in the posting form then, Dynamics AX saves the invoice data you have entered, but does not post the invoice. The next time you open the invoice posing form, the invoice will show again and you may either post the invoice after clearing the *On hold* checkmark or delete it.

Posting the invoice receipt will post general ledger transactions, inventory transactions, vendor transactions and transactions in other sub-ledgers like sales tax if applicable.

As shown in Section 3.2.3, the posting profile specifies to which summary account in the general ledger the vendor transaction will post. Settings for inventory transactions are available in the inventory posting setup, depending on the item and vendor selection as shown in Section 8.4.2.

Items new in Dynamics AX 2009 related to invoice receipt include the enhanced functionality for packing slip selection, the invoice variance control and the possibility to set an invoice on hold.

3.6.2 Collective Invoice

If you receive an invoice from a vendor, which refers to several purchase orders, you need to post a collective invoice in a summary update. Collective documents are available for all document types. Therefore, apart from collective invoices you may as well post collective packing slips for example.

The way to post collective documents is not different from posting an individual document. Settings on company and vendor level control, whether to generate a collective document.

Basic settings for collective documents in purchasing are available on the tab *Summary update* in the accounts payable parameters. After pushing the button *Summary update parameters* there, Dynamics AX shows the summary update parameters form. This form displays a tab per document type, where you may select the fields that must be equal in purchase orders to join a collective document.

In the accounts payable parameters form, you may find the lookup field *Default values for summary update* where you choose if settings for collective document posting are available on order level. Usually the choice is “Automatic summary” to be able to deselect a certain order from collective

**Posting the
invoice**

**Invoices on
hold**

**Ledger
integration**

**New in
AX 2009**

**Setup for
summary
updates**

documents in the order form. If you select “Invoice account”, you may exclude individual orders only by deleting them in the posting form.

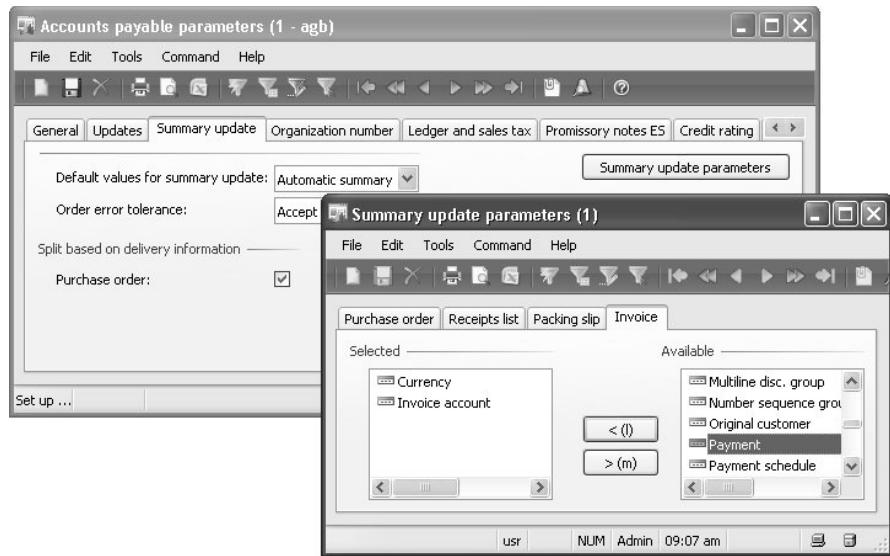


Figure 3.34: Summary update parameters

If the *Default values for summary update* is “Automatic summary”, you may push the button *Setup/Summary update* in the vendor form as well as in the purchase order form to decide for which document types to post collective documents. The settings on the vendor will be the default for the purchase orders.

Posting collective invoices

In order to post a collective invoice, you may access the summary update form *Accounts payable> Periodic> Purchase order update> Invoice*. In the posting form, you usually select “Packing slip” in the lookup field *Quantity* to make sure invoice posting will be for received quantities only.

As shown in Figure 3.35, you may push the button *Select [1]* in order to select appropriate purchase orders in the advanced filter form next. After closing the filter form, you may see the selected orders on the tab *Overview*.

If you notice some orders that you do not want to post, you may delete the appropriate lines. Deleting a line in the posting form only removes the selection. It does not delete the order or the packing slip, which is why the orders concerned will show again, whenever you choose to post an appropriate invoice the next time.

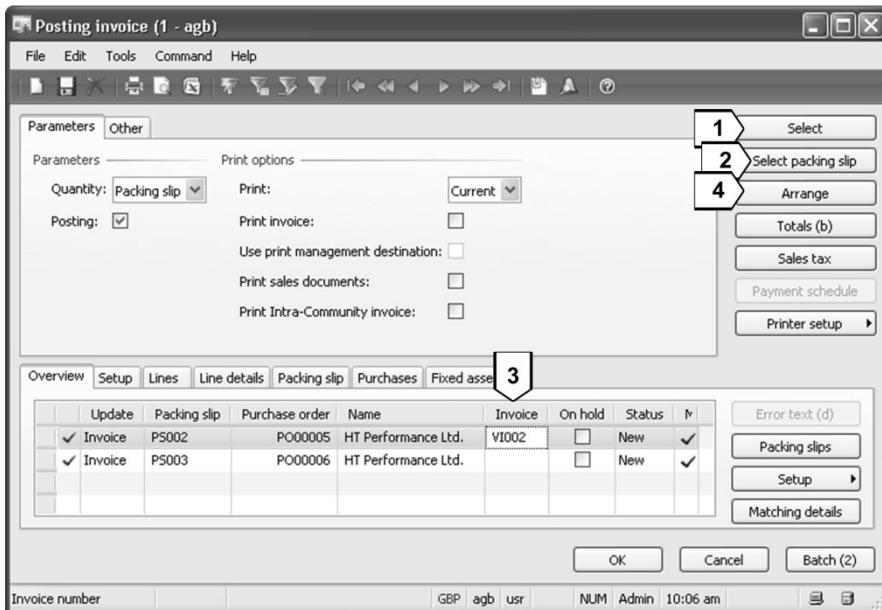


Figure 3.35: Posting a collective invoice receipt

If you want to exclude particular packing slips from invoice posting, you may choose the button *Select packing slip* [2] as shown in Section 3.6.1.

When you are finished selecting purchase orders and packing slips, you need to enter the collective invoice number of your vendor in the column *Invoice* [3] and push the button *Arrange* [4].

The *Arrange* feature combines the orders into a common invoice according to the summary update parameters. If the setting in the accounts payable parameters is not suitable in a certain situation, you may choose a different option on the tab *Other* of the posting form before pushing the *Arrange* button.

In the example of Figure 3.35, Dynamics AX will merge the two orders into a common line. Before finally posting the invoice by pushing the button *OK* in the posting form, you should check the totals selecting the button *Totals* as usual.

3.6.3 Order Status and Inquiries

Purchase order status

Like item receipt posting, invoice receipt posting updates the purchase order status. Depending on partial or complete invoicing of an order, the purchase order shows following status after posting an invoice:

- Partial invoice:
Order status “Received” or “Open order”, document status “Invoice”
- Complete invoice or last partial invoice:
Order status “Invoiced”, document status “Invoice”

Posting the invoice affects inventory transactions, vendor transactions and general ledger transactions.

Inventory transactions

If you want to see the changes in inventory transactions caused by a purchase invoice, you may push the button *Inventory/Transactions* in the purchase order form after selecting the appropriate order line.

After posting an invoice, the inventory transactions show the *Receipt* status “Purchased” and display the posting date of the invoice in the column *Financial date*. If you want to know the invoice number, you may switch to the tab *Update* of the inventory transaction.

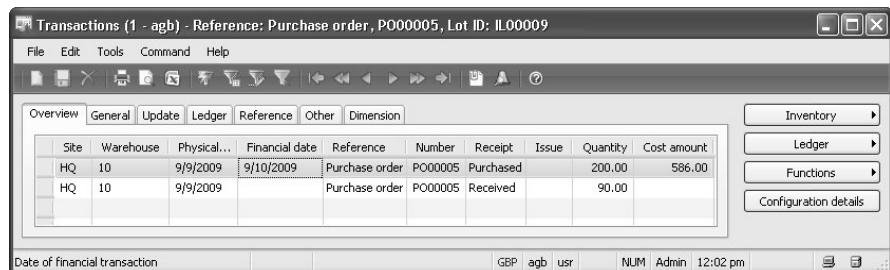


Figure 3.36: Inventory transactions after a partial invoice (first line invoiced)

The example in Figure 3.36 shows two inventory transactions referring to a purchase order line, where a partial invoice covering the first line has been posted.

Invoice inquiry

In order to access a posted invoice, you may choose the form *Accounts payable> Inquiries> Journals> Invoice* or push the button *Inquiries/Invoice* in the purchase order form. After selecting the appropriate invoice on the tab *Overview* of the inquiry form, you may switch to the tab *Lines* that displays the invoice lines. The button *Inventory/Lot transactions* on the *Lines* tab then opens the inventory transactions shown above again.

If you want to see the general ledger transactions related to the invoice, you may push the button *Ledger/Financial voucher* in the inventory transaction.

In the invoice inquiry, you may push the button *Voucher* on the *Overview* tab to see the general ledger transactions for the complete invoice.

Ledger transactions

The screenshot shows the SAP Voucher transactions interface. The title bar reads "Voucher transactions (1 - agb) - Reference: Purchase order, PO00005, Lot ID: IL00009". The menu bar includes File, Edit, Tools, Command, and Help. Below the menu is a toolbar with various icons. The main area has tabs: Overview (selected), General, Amount, and Dimension. A large grid table displays transaction details. To the right of the table is a vertical panel titled "Origin" containing buttons for Transactions, Audit trail, Posted sales tax, Original document, and Related vouchers. At the bottom, there are input fields for Transaction text (Vendor invoice VI001), Posting type (Vendor balance), Account name (Accounts payable domestic trad), and Transaction voucher number. The status bar at the bottom shows GBP, agb, usr, NUM, Admin, and the time 12:19 pm.

Voucher	Date	Y..	Ledger account	Journal	Currency	Amount curr...	Amount	A...
PI00002	9/10/2009		33010		GBP	-688.55	688.55	0.00
PI00002	9/10/2009		25520		GBP	102.55	102.55	0.00
PI00002	9/10/2009		10912		GBP	586.00	586.00	0.00
PI00002	9/10/2009		10911		GBP	-586.00	586.00	0.00
PI00002	9/10/2009		10310		GBP	586.00	586.00	0.00

Figure 3.37: General ledger transactions related to a posted invoice receipt

The voucher transactions form shows all general ledger transactions referring to the posted invoice. As example, Figure 3.37 shows following transactions:

- Reversing the packing slip transactions
(Account 10911, 10912)
- Summary account posting for vendor balance
(Account 33010, derived from posting profile)
- Stock account posting for inventory items
(Account 10310, derived from inventory posting setup)
- Input tax posting
(Account 25520, derived from the ledger posting group of the sales tax code)

More information concerning posting profile setup is available in Section 3.2.3 and concerning inventory posting setup in Section 8.4.2.

If you push the button *Origin* in the voucher transactions form, the transaction origin form displays, showing the transactions in all modules related to the selected invoice.

Transaction origin

Apart from ledger transactions, the transaction origin includes vendor transactions, inventory transactions and tax transactions as shown in Figure 3.38.

The screenshot shows a software application window titled "Transaction origin (1 - agb) - Module: Vendor, 30005". The menu bar includes File, Edit, Tools, Command, and Help. Below the menu is a toolbar with various icons. The main area has tabs: Overview (selected), General, and Dimension. A large table displays transaction details:

Module	Voucher	Date	Number	Text	Currency	Amount currency	Amount	Dim...	N...
Ledger	PI00002	9/10/2009	10310	Vendor invoice VI001	GBP	586.00	586.00		
Ledger	PI00002	9/10/2009	10911	Vendor invoice VI001	GBP	-586.00	-586.00		
Ledger	PI00002	9/10/2009	10912	Vendor invoice VI001	GBP	586.00	586.00		
Ledger	PI00002	9/10/2009	25520	Vendor invoice VI001	GBP	102.55	102.55		
Ledger	PI00002	9/10/2009	33010	Vendor invoice VI001	GBP	-688.55	-688.55		
Vendor	PI00002	9/10/2009	30005	Vendor invoice VI001	GBP	-688.55	-688.55		
Inventory	PI00002	9/10/2009	4001	Financial	GBP	586.00	586.00		
Sales tax	PI00002	9/10/2009	25520	Sales tax	GBP	102.55	102.55		

Below the table, there are two input fields: "Name: HT Performance Ltd." and "Table: Vendor transactions". At the bottom, there are buttons for "Application mod...", "GBP agb usr", "NUM Admin 12:42 pm", and standard window controls.

Figure 3.38: Transaction origin form, showing all transactions for an invoice

3.6.4 Case Study Exercises

Exercise 3.13

Invoice receipt

Your vendor sends the invoice VI01 to you, which concerns the goods received in exercise 3.10. Before posting the invoice, check following items:

- Order status and document status of the purchase order
- Inventory transaction related to the order line
(button *Inventory/Transactions*)

Post the invoice for the quantity received. You may do the posting directly out of the purchase order form, checking the invoice total in the posting form before posting.

Now review the status of the items on the checklist above again. What is different after invoice posting?

Exercise 3.14

Partial invoice

Now your vendor sends the invoice VI02 to you, which applies to the goods received with packing slip PS02 in exercise 3.11. Post the invoice

directly out of the purchase order form, making sure that the invoice posting only contains the items received with packing slip PS02.

Exercise 3.15

You want to see the invoice of exercise 3.13. Therefore, open the invoice inquiry for the order concerned in the purchase order form. As an alternative, choose the appropriate menu path as well. Check the invoice header and lines as well as the related ledger transactions.

In exercise 3.3, you were looking for the summary account for your vendor. Can you find the ledger transaction for this account? Finally, open the transaction origin form and check, to which modules your invoice has been posting.

Invoice inquiry

3.7 Credit Notes and Item Returns

If you receive a credit note from your vendor related to items you did or did not return, you need to post a credit note receipt in purchasing.

Posting credit notes works the same way as invoice posting, except that credit notes require a negative quantity. When you post a credit note, you will post an item return (negative receipt) in parallel if no separate item return has been posted before. If the inventory model group does not allow physical negative inventory, posting the item return to the vendor therefore is only possible if the item is still on stock.

Like in invoicing, in crediting you also have to distinguish between transactions related to an item and transactions, which are not. For credit notes related to items, you will choose the purchase order form, whereas registering other credit notes applies an invoice journal.

Ways of crediting

When posting a credit note receipt in an invoice journal for a refund not referring to an item invoice, you need to take into account that this crediting does not affect item statistics and inventory value.

If you need to reverse a packing slip receipt, but not an invoice receipt, you may do this posting a packing slip with a negative quantity as shown in Section 3.7.2.

Packing slip reversal

3.7.1 Crediting Item Returns

If you want to post a credit note for an invoiced item, you need to access the purchase order form. If the setting for the parameter *Safety level of invoiced orders* on the *Updates* tab of the accounts payable parameters is not set to “Locked”, you may post credit notes in the original purchase order. Otherwise, you need to enter a new purchase order to register the credit note.

Setup for credit notes

If invoiced orders are not locked, you got following options to post a credit note for an item:

- Credit note without subsequent delivery of a replacement, registered in the original order line (complete or partial)
- Credit note with replacement, registered in the original order line
- Credit note in a new order line
- Credit note in a new purchase order (purchase type „Purchase order“ or „Returned order“)

Crediting in original line

If you want to register a credit note in the original purchase order line, you may enter the credited quantity with a negative sign in the column *Receive now* on the tab *Quantity*. Pushing the button *Posting/Invoice*, you will open the posting form where you select “Receive now” in the lookup field *Quantity*.

If you expect a replacement from your vendor, you should select the checkbox *Credit remaining quantity* on the tab *Other* of the posting form. This way the credited quantity will show as open quantity in the order line again. If you do not expect a replacement, clear this checkbox in order to avoid a deliver remainder quantity.

Posting of credit notes

The posting form works like posting an invoice, after entering the credit note number into the column *Invoice* you may post the credit note pushing the button *OK*.

If the checkbox *Deductions requirement* in the inventory model group of the item concerned is selected, you need to post a separate packing slip (item return) before posting the credit note (negative invoice), however.

New line or order

If you want to enter a new purchase order line for the credit note, you may enter it with a negative quantity in the original purchase order or in a new one as well.

Marking

In order to avoid unintended changes of the inventory value when entering a new order or order line for the credit note, you should push the button *Inventory/Marking* in the new order line. In the marking form, you put a checkmark to mark the original order line. The inventory value of the new line entered for crediting now will exactly offset the inventory value received from the original line.

Without marking, Dynamics AX calculates the outgoing inventory value of the credit note according to the inventory model group of the item, applying the FIFO model as an example.

Returned order

If you choose the purchase type “Returned order” for the new order to enter the credit note, following restrictions apply:

- *RMA number*
needs to be entered in the *Create purchase order* form when you select the purchase type “Returned order” there.
- *Quantity*
in the order line needs to be negative.
- *Return action*
needs to be selected on the tab *Setup* of the order line before posting.

In order to create a new purchase order or a new line in the original order for crediting, you may choose the button *Function/Create credit note* in the header or line part of the purchase order form.

Create credit note function

The *Create credit note* function works like copying purchase orders (see Section 3.4.5). Unlike the regular copy function, creating a credit note also reverses the quantity sign and additionally marks and reserves the original order line to ensure neutral inventory transactions.

Finally, the *Create credit note* function settles the open vendor transaction of the original invoice.

Transaction settlement

Otherwise, you may manually settle the open vendor transaction of the invoice when registering the credit note, if the original invoice has not been paid and settled.

For this purpose, you may push the button *Functions/Open transaction editing* in the crediting purchase order. In the *Open transaction editing* form, you may put a checkmark into the column *Mark* for the invoice concerned. After marking, you simply close the form that has not got a button *OK*.

When posting the credit note then, the open vendor transaction of the invoice will close. Otherwise, you need to settle invoice and credit note in the open transaction editing as described in Section 8.2.2 later.

When working with settlements, you need to take into account that there is no manual settlement if automatic settlement is selected in the posting profile (tab *Table restrictions*) or in the accounts payable parameters (tab *Settlement*).

3.7.2 Other Ways of Crediting

If you receive a credit note from a vendor refunding a price variance, there will not be an item return usually. The easiest way to post such a refund nevertheless is to post an item return with the original price and a new invoice with the new price. You may do this in a single purchase order, of course.

Refund

If this is not suitable, for example if you have already shipped the credited goods, you may register a credit note in an invoice journal (see Section 8.4.4) like an invoice for the credited amount with a negative sign.

In order to adjust the inventory value, you may then register a miscellaneous charge transaction in the original invoice. After selecting the appropriate invoice in the invoice inquiry (*Accounts payable> Inquiries> Journals> Invoice*), you want to push the button *Misc. charges/Adjustment* accessing the form *Allocate misc. charges*. The setup of the *Misc. charges code*, which you need to select, may be a *Debit type* "Item" and a *Credit type* "Ledger account" referring to the same ledger account, which you did select in the invoice journal for posting the credit note.

Information on the general use of miscellaneous charges is available in Section 4.4.4 of this book, more detailed information on the *Allocate misc. charges* form in the online help of that form.

Packing slip reversal

If you need to reverse a packing slip receipt not referring to an invoice, you may insert a negative quantity into the column *Receive now* on the *Quantity* tab of the purchase order line concerned.

Then you may post the item return by pushing the button *Posting/Packing slip*. Dynamics AX will open the posting form, where you select "Receive now" in the lookup field *Quantity*.

3.7.3 Case Study Exercise

Exercise 3.16

Credit note

The goods received in exercise 3.10 show serious defects. You agree to return them to your vendor receiving the credit note VC01. The vendor will not send a replacement. Which ways do you know to register the credit note?

You decide to register the credit note in the original order line. Enter the data required and post the credit note. Which status does the order show after posting the credit note?

4 Sales and Distribution

The primary responsibility of sales and distribution is to provide customers with your goods and services. In order to fulfill this task, sales and distribution needs to manage material requirements of customers by processing sales orders through picking, shipping and invoicing.

4.1 Business Processes in Sales and Distribution

Before we start to go through the details, the lines below should give an overall picture of business processes in sales and distribution.

4.1.1 Basic Approach

Starting point for sales and distribution are correct master data, in particular customer and item data.

In the course of sales order processing, master data copy to transaction data. Sales quotations and sales orders therefore receive item and customer data as a default. You may modify these default data in transactions, as an example if your customer requests a different delivery address. If such a modification applies for future orders as well, you should change the customer record, which contains the appropriate master data in this case.

Sales order processing is very similar to purchase order processing, as it mirrors the purchasing process. Figure 4.1 shows the primary steps of sales order processing.

Master Data
Transaction data
Sales order processing

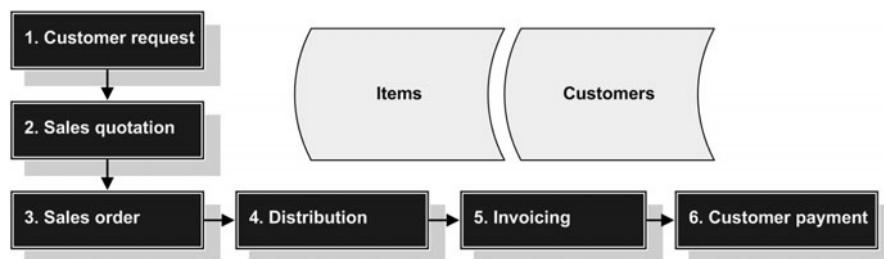


Figure 4.1: Sales order processing in Dynamics AX

If we disregard prior marketing activities, sales order processing starts with a request from a customer or prospect. Answering this request, the sales team will create a quote and send it to the possible or actual customer.

Sales Quotation

Based on the sales quotation, Dynamics AX may generate activities to follow up on the quotation.

The CRM module in Dynamics AX provides support for sales quotations as well as marketing activities, campaigns, lead and opportunity management. A detailed description of the options available in the CRM module is beyond the scope of this book, which is why only the basic processing of sales quotations is covered later this chapter.

Sales order

If a customer wants you to supply goods or services, you will register a sales order. Like a purchase order, a sales order consists of a header, which primarily contains customer data, and one or more lines, which contain the ordered items.

If required, you may send an order confirmation to the customer. In order to generate a printout or an electronic version of the confirmation, you need to post it. Posting an order confirmation means to save it, ensuring that you may access the confirmed order data unchanged, no matter if there are modifications on the current order later.

Apart from specific sales orders, you may as well record long-term contracts entering blanket orders in Dynamics AX. If you want to start a specific shipment of a blanket order, you may create a release order for a partial quantity of the blanket order. Release orders then are regular sales orders referring to the blanket order.

Distribution

Depending on the type and settings of the item, master scheduling as part of operations planning covers the requirements in purchasing or production to fulfill the sales order.

In order to ship the item, you may print a picking list to prepare delivery. The internal shipment procedure is finished, when a packing slip posts. The packing slip reduces the physical quantity in inventory as well as the open sales order quantity. You may post a packing slip without previously posting a picking list, if your company does not need picking lists.

Invoicing

After posting the packing slip, you may post an invoice. If you do not require a separate packing slip, you may as well post the invoice without a previous packing slip. In this case, the invoice posts the physical and the financial transaction in parallel.

If you want to record a sales invoice not referring to an item, you may choose to enter a free text invoice. In the lines of a free text invoice, you select ledger account numbers instead of item numbers.

Customer payment

You expect your customer to pay the invoice before the due date with or without cash discount deduction. Section 8.3.4 of this book contains a description of how to post the customer payment settling the invoice in the customer transactions. If the customer does not pay the invoice meeting

the terms of payment, you may process payment reminders in Dynamics AX.

Because of the deep integration of Dynamics AX, all inventory and customer transactions in sales and distribution post to ledger accounts in parallel as described in Section 8.4. In order to keep record of the whole business process, Dynamics AX comprehensively applies the voucher principle to these transactions.

As mentioned, sales order processing mirrors the purchasing process in many ways. Therefore, you will find Dynamics AX functionality in sales to be very similar to the appropriate purchasing function in various areas. For your guidance, Figure 4.2 below shows a comparison of purchasing and sales documents in order processing.

Ledger
integration

Comparison
to purchasing

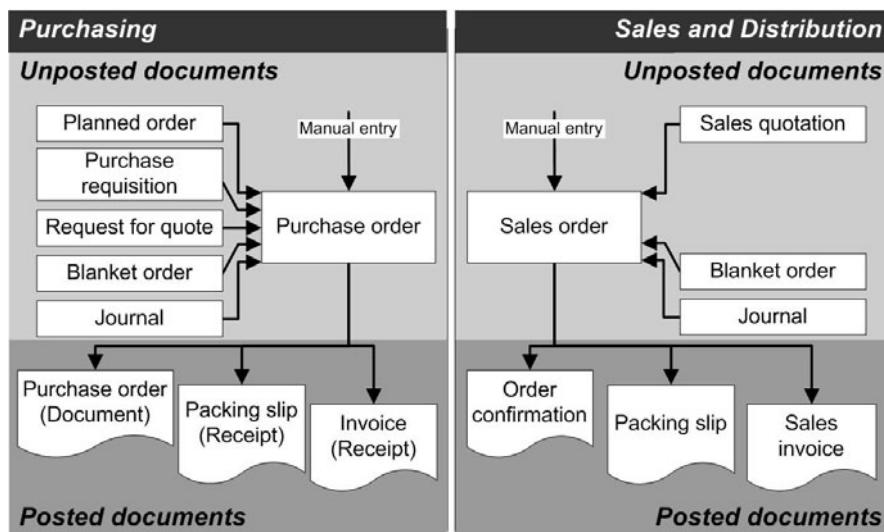


Figure 4.2: Comparison of purchasing and sales documents

4.1.2 At a Glance: Sales Order Processing in Dynamics AX

In order to give an overview of the main steps in sales order processing, this page is here to show the basics. For your convenience, you may post all transactions directly in the sales order form. Of course, you may choose the *Sales Orders* list page instead of the form as well.

Order header

In order to create a new sales order, you want to insert a record in the upper part of the form *Accounts receivable> Sales Order Details* by pushing *Ctrl+N* or the icon . Dynamics AX shows the *Create sales order* form then, where you may select a customer number in the field *Customer account*. Data from the customer like language or currency will transfer to the order header, where you may modify them.

Order lines

In order to register a sales order line, you need to insert a record containing item number, quantity and price into the lower part of the order form. When selecting the item, Dynamics AX will insert appropriate defaults for quantity and price as well as for other data like site or warehouse. Pushing the button *Advanced* (or *Simple*) top right, you may switch between the simple order form shown in Figure 4.3 and an advanced form.

Figure 4.3: Posting the order confirmation in the simple sales order form

Order confirmation

If you want to print the order confirmation, you need to post it pushing the button *Posting/Confirmation*. In the posting form, you should make sure to choose “All” in the *Quantity* field and to select the checkboxes *Posting*

and *Print confirmation*. The button *Printer setup* is available to select a printer for the printout as described in Section 2.1.7. When pushing the button *OK* in the posting form, Dynamics AX will post and print the order confirmation.

In order to post the packing slip in the sales order form, you need to select the option *Posting/Packing slip* that opens the posting form already known. If you want to ship the whole quantity, you should choose "All" in the field *Quantity* and select the checkboxes *Posting* and *Print packing slip*. Pushing the button *OK*, you will post and print the packing slip. Packing slip posting in sales reduces the physical quantity in inventory and sets the order status to "Delivered".

Packing slip

ANSO Technologies Ltd. 10 Downing Street London SW1A 2AA	Telephone Fax Giro Tax exempt number Enterprise number	Anso Technologies Ltd.		
Ship to: Dicol Main Warehouse 16 Delivery Road Aberdeen AB21 9AA	Packing slip Number : SP00001 Ship date : 9/13/2009 Page : 1 of 1 Sales order : SO00001 Requisition : Your ref.: Our ref. : E001 Mode of delivery : Terms of delivery : Ex Works Freight by : Carrier			
Bill to: Dicol Ltd. 10 Invoice Road Aberdeen AB21 9AA				
Item number 4001 Quantity : 10.00	Description A2400E External antenna for M2400S	Ordered Unit 10.00 Pcs.	Delivered	Remaining quantity

Figure 4.4: Printed packing slip

Posting the sales invoice is possible by pushing the button *Posting/Invoice* similar to packing slip posting. In order to invoice shipped items only, make sure to choose "Packing slip" in the field *Quantity* – in parallel to invoicing, choosing "All" would deliver quantities not shipped before. Invoice posting generates an open customer transaction to be paid and sets the order status to "Invoiced".

Invoice

If applicable, you may skip transactions in the process described above. As a minimum, you may post the invoice directly after registering the sales order (Select "All" in the *Quantity* field of the posting form then).

Skipping transactions

4.2 Customer Management

Customer records are required to manage business partners, which receive goods or services. Whereas sales quotations are available for leads and prospects as well, the business partner in a sales order needs to be included in the customer records.

Customer records in sales mirror vendor records in purchasing not only regarding functional principles. Data management in both areas applies list pages and forms, which are very similar for customers and vendors. As an example, you may work with one-time customers, payment terms, cash discounts and posting profiles the same way in customer and vendor records.

4.2.1 Basic Data and Comparison to Vendors Records

Overview

In order to check existing or create new customers, you need to access the form *Accounts receivable> Customer Details*. According to the general structure of forms, the tab *Overview* containing the list of available customers shows first.

As an alternative to the overview in the customer form, you may open the list page *Accounts receivable> Customers*. If you need to see details of a customer shown in the list page, you will double-click on the line of the particular customer to open the related customer form.

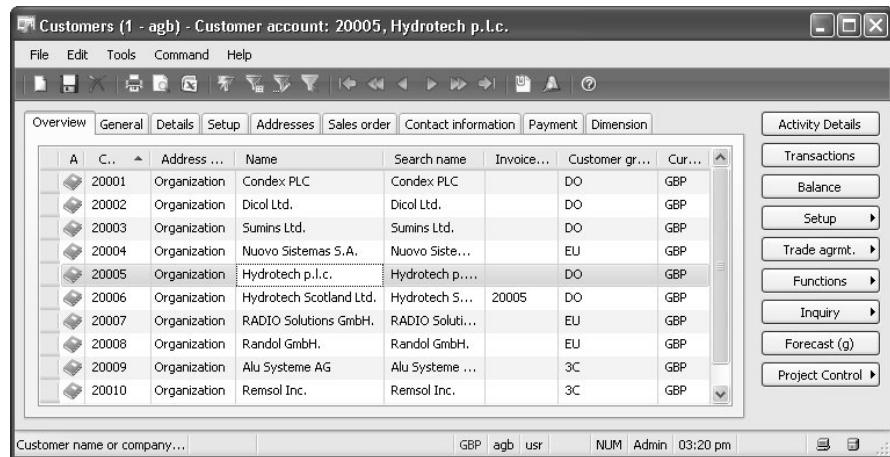


Figure 4.5: The customer form

The customer form contains numerous fields, which are a default for sales orders. Like vendor records, customer records contain a basic group – the customer group to control ledger integration in posting profiles as shown in Section 3.2.3 – and a sales tax group (VAT group) as well as settings for currency, language and blocking.

Since structure and content of the fields in the customer record are very similar to the vendor record (see Section 3.2), the description below only covers deviations and elements, which primarily refer to customer records and which have not been explained for vendor records, therefore.

As an example, in sales it is sometimes required to send an invoice to a customer different from the order customer (e.g. for subsidiaries of an affiliated group). In order to comply with this situation, you may enter a customer number in the field *Invoice account* on the tab *Overview* or *Setup*. A customer number entered there will be the default for the invoice account in the sales orders of the customer concerned. If required, you may change the invoice account in the sales order, however.

Invoices of orders concerned will post to the invoice customer (instead of the order customer), generating an open customer transaction referring to the customer number of the invoice account. Unless chosen different in the lookup field *Invoice address* of the customer record, the invoice will show the address of the invoice account.

Whereas the invoice account number in the customer form refers to a second customer number, which links a separate customer record, the button *Setup/Address* opens the alternative address form to enter several addresses referring to a single customer number.

Comparing vendor record

Invoice account

Alternative address

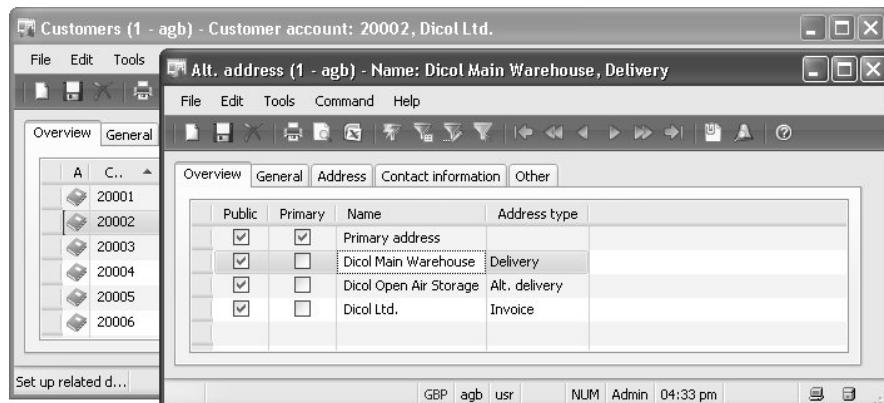


Figure 4.6: Managing alternative addresses

You may as well access alternative addresses on the tab *Addresses* in the customer form, which shows the addresses in a grid. The separate alternative address form offers advanced functionality, however.

The tab *Overview* of this form displays a list of addresses. A customer may show as many alternative addresses as required. In order to distinguish the usage of different addresses, you will choose an *Address type*. After selecting a line, you may access address details on the tab *Address*.

The main address of a customer needs to be marked in the columns *Public* and *Primary*. If you enter an address of the type "Invoice", invoices for the customer will print this address instead of the primary address. An address of the type "Delivery" will be the default for the delivery address in sales orders. Addresses of the type "Alt. delivery" do not show automatically in sales orders. If you want to ship to such an alternative delivery address, you need to choose the required address pushing the button *Setup/Alt. address* in the sales order.

Print management

In order to control printing options like the number of printed copies, you may enter basic settings in the print management setup (*Accounts receivable> Setup> Forms> Form setup*, button *Print management*).

You may override these settings for individual customers in the customer form, pushing the button *Setup/Print management*. After selecting the appropriate original or copy document there, you need to select the option *Override* in the pop-up menu (which opens by right-clicking) before you can enter the individual settings required.

Settings on the customer record transfer to sales orders, where you may override them on order level again.

Credit limit

Many companies also want to apply a credit limit control in sales operations. In order to activate credit limit control, your company needs to specify in the accounts receivable parameters (*Accounts receivables> Setup> Parameters*, tab *Credit rating*) how credit rating should work. Depending on the setup, credit limit control includes only open invoices or as well packing slips or open orders and shows a warning or an error message.

The tab *General* in the customer record contains the field *Credit limit* to enter the credit limit amount for a customer. When entering or posting a sales order, Dynamics AX will check if the customer exceeds the credit limit and display a warning or prevent posting showing an error message.

4.2.2 Case Study Exercises

Exercise 4.1

A new domestic customer wants to order your items. Insert a new record for this customer containing a name (starting with our user ID), a primary address and an appropriate customer and sales tax group. In addition, the terms of payment and the cash discount entered in exercise 3.1 apply.

Deliveries to that customer should go to a different address. Therefore, enter a domestic delivery address of your choice, which should be the default for orders of this customer.

Exercise 4.2

You want to find out about ledger integration. To which summary account in the general ledger will an invoice for your new customer post?

Customer
record

Ledger
integration

4.3 Item Management

Item records are the second core area of master data for sales operations. Like all master data, item records are accessible in a common form for all areas of Dynamics AX.

The following section primarily contains an explanation of item data necessary for sales and distribution. A more general description of item management is available in Section 7.2.

4.3.1 Item Records in Sales

In order to check existing or create new items, you need to access the form *Inventory management> Item details*, which shows a list of available items on the tab *Overview*. Alternatively, you may open the list page *Inventory management> Items*.

Overview

If you want to enter a new item, you have to insert a record in the item form pushing the shortcut key *Ctrl+N* or the icon  . Depending on the setting of the number sequence for items, the item number inserts automatically or needs to be entered manually. In order to complete registering a new item then, you need to enter the item name, item group, inventory model group, dimension group and item type at least.

Creating an
item

Apart from the basic item description in company language, which you may enter in the *Text* field on the *General* tab, you may record item descriptions in foreign languages pushing the button *Setup/Language-Item description*.

Sales related
data

The *Item sales tax group* in the *Sales order* column on the tab *References* specifies, if regular sales tax (VAT) or a reduced rate applies when you sell the item.

Pushing the button *Setup/Default order settings*, you may enter settings for order quantities and lot size on company account level. Site-specific settings are available pushing the button *Setup/Site specific order settings* and selecting the checkbox *Override*. The order setting forms contain data for purchasing, sales and inventory – in order to access sales-related data you will switch to the tab *Sales order*. Marking the checkbox *Stopped* there, you may block the item for sales transactions.

Discount groups

On the tab *Price/Discount* of the item form, the column *Base sales price* does not only contain the base price of the particular item, but also shows the item discount groups for line discount and multiline discount. As shown below, line discount calculation is based on individual order lines whereas multiline discount calculation includes all lines of an order.

Another kind of discounts are total discounts (invoice discounts), which are available on order header level independent from items. In the item record, you may clear the checkbox *Total discount* to exclude an item from the calculation of the total discount, however.

4.3.2 Sales Price and Discount

Sales prices

Apart from the general sales price on the tab *Price/Discount* of the item form, you may enter base prices on site level in the price form. You may access the price form by pushing the button *Price* in the item form.

Whereas the automatic calculation of sales prices is only available for manufactured items in the price form, the item form in Dynamics AX may as well automatically calculate the general sales price for merchandise.

Settings for that general base price calculation are available in the column *Price update* on the tab *Setup* of the item form, where you may choose the *Sales price model* and the *Base price* selection. If you choose “Purchase price” in the *Base price* lookup, price calculation refers to the purchase base price on the tab *Price/Discount*, whereas the selection “Cost price” refers to the cost base price there.

The *Sales price model* specifies, if price calculation is based on the field *Contribution ratio* or on the field *Misc. charges pct.* on the tab *Setup*. The *Sales price model* “None” means that you will enter the sales base price manually.

The other possibilities to set sales prices for an item are similar to purchase price settings including price unit and miscellaneous charges as shown in Section 3.3.2. As for purchase prices, you may push the button *Trade*

agrmt./Sales prices in the item form to access trade agreements for sales prices.

Trade agreements in sales are here to enter prices and discounts dependent on customers and items. Dynamics AX includes following types of trade agreements for this purpose:

- Sales prices
- Line discounts
- Multiline discounts
- Total discounts (Invoice discounts)

A description for managing prices in trade agreement is available in Section 3.3.2. Therefore, the following lines cover discounts only.

Line discounts and multiline discounts refer to order lines. By way of contrast, total discounts specify a discount on header level.

Like prices in trade agreements, discounts may refer to different pricing levels. As an example, discounts may apply to an individual customer, a customer group or all customers. In parallel, you may link items to discount groups for line discounts and multiline discounts.

Table 4.1 shows an overview of the different levels in two dimensions – the item and the customer dimension – that are available to manage line and multiline discounts.

Table 4.1: Discount calculation levels for line discount and multiline discount

	Item number	Item discount group	All items
Customer number	X	X	X
Customer discount group	X	X	X
All customers	X	X	X

In comparison, trade agreements for prices and total discounts only show one dimension. Prices are available per item, which fixes the item dimension to “Item number”, whereas total discounts apply for the whole order, which fixes the item dimension to “All items”.

The setting, which levels (“Table”, “Group”, “All”) to include in price and discount calculation, is available in the form *Accounts receivable> Setup> Price/Discount> Activate price/discount*.

Within the activated elements, discount calculation in Dynamics AX always searches from the specific definition to the general – that is from the customer and item number to the groups and to the general discounts.

Trade agreements

Activate price/discount

Line discounts

Depending on the checkbox *Find next*, only one discount or the total of discounts on several levels applies for a certain order line as shown below.

In order to enter a line discount, you will access the appropriate form pushing the button *Trade agreements*. Depending on the basis for the discount, you may push this button in different menu items:

- Item number based discounts in the item form
- Customer number based discounts in the customer form
- Item group based discounts in the item discount group form (*Accounts receivable> Setup> Price/Discount> Item discount groups*)
- Customer group based discounts in the customer discount groups (*Accounts receivable> Setup> Price/Discount> Customer price/discount groups*)

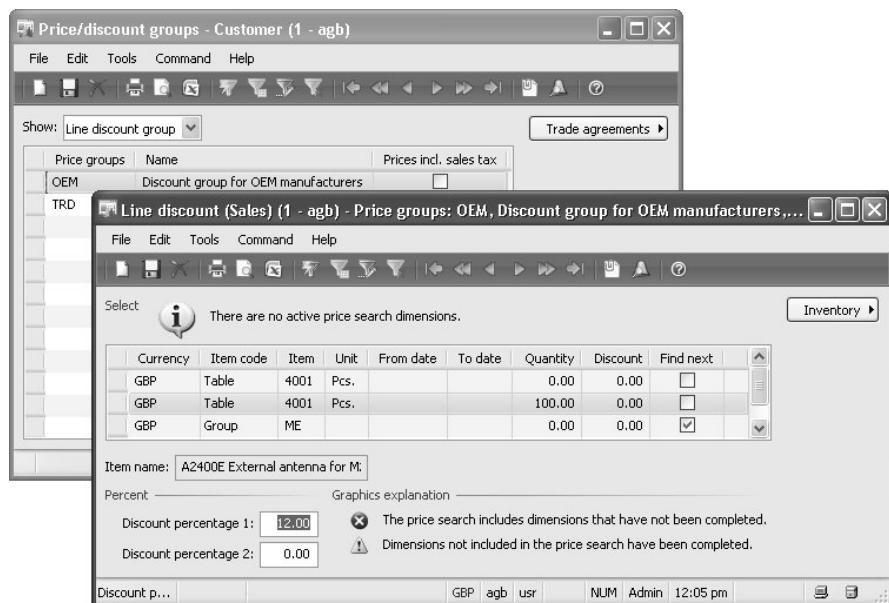


Figure 4.7: Managing line discounts based on a customer discount group

If you want to enter a line discount for a customer discount group as an example, you will access the customer discount groups (*Accounts receivable> Setup> Price/Discount> Customer price/discount groups*) and choose “Line discount group” in the lookup field *Show* there. Pushing the button *Trade agreements/Line discount* you may insert a new line for a line discount.

If you access the line discounts from a customer discount group, you will manage the discounts for that group. In the column *Item code*, you need to specify if the line discount is for an item number, an item discount group or all items.

Accessing discounts

If you want to enter discounts for an individual customer, you will open the line discounts form out of the customer form.

You may as well access line discounts out of the item form or the item discount groups form, however. In this case, you need to specify if the line discount is for a customer number, a customer discount group or all customers in the column *Account code*.

Managing discounts

When entering discounts you have to keep in mind to enter discount percentages in the footer part of the form (see Figure 4.7). The column *Discount* is here to insert a discount amount.

Another important setting is available in the column *Find next*. The checkbox there should only be marked for discounts, which apply in addition to discounts entered on a different level. As an example in Figure 4.7, the discount in a sales order line would be 17 percent, if the checkbox *Find next* was marked for the 12 percent discount line and a discount of 5 percent would apply to the appropriate item discount group.

Similar to price agreements, you may enter line discounts depending on following fields of the trade agreement:

- Period of validity (from/to date)
- Quantity (minimum quantity)
- Unit of measure
- Currency
- Customer dimension level (individual customer, group or all)
- Item dimension level (individual item, group or all)

In addition to the options listed above, pushing the button *Inventory/Dimensions display* you may enter discounts on inventory dimension level like site or color, if the dimension group of the item includes the selected dimension in the price search.

Multiline discount

Whereas line discount calculation is based on individual order lines, multiline discount calculation will include all items in the order, which got the same multiline discount group. You will apply this option, if you want to give a quantity discount based on the total quantity of several items as an example.

Managing multiline discounts works the same way as managing line discounts shown above.

Total discount	Unlike line discounts, total discounts (invoice discounts) are not based on items or item groups. Total discounts refer to the complete invoice and show the option to enter a graduated discount based on the invoice total.
Settings for discounts	A prerequisite for applying trade agreements on group level, you need to enter the appropriate price and discount group in the customer and item record. For customer records, fields to assign discount groups are available on the tab <i>Sales order</i> of the customer form. For item records, fields to assign the line and the multiline discount group are available on the tab <i>Price/Discount</i> in the item form. The checkbox <i>Total discount</i> there is available to exclude an item from total discount calculation.
Ledger integration	For a situation where line discount and multiline discount at the same time apply to a sales order line, the setting in the lookup field <i>Discount</i> on the tab <i>Prices</i> of the accounts receivables parameters controls, how to calculate the total of line and multiline discount. Since discounts affect finance, Dynamics AX includes discount posting in ledger transactions. Concerning ledger transactions as well as concerning revenue calculation in sales, you have to distinguish between line and multiline discounts on the one hand and total discounts on the other hand. Line and multiline discounts are included in item revenue calculation, therefore reducing revenue and gross margin. Regarding ledger integration, you may decide if line and multiline discount reduces the amount posted to revenue accounts or if the discount should post to separate accounts. If you want to post to separate accounts, you have to enter the appropriate account numbers for the option <i>Discount</i> on the tab <i>Sales order</i> of the inventory posting setup as mentioned in Section 4.4.2.
Discounts in sales orders	By way of contrast, total discounts do not reduce the revenue on item level. In addition, you should keep in mind that it is not possible to post total discounts to different ledger account numbers. The account number for total discount transactions is available in the system accounts (<i>General ledger> Setup> Posting> System account</i>), where you may find a line for the posting type “Customer invoice discount” containing the appropriate ledger account. Line discounts immediately show in an order line, if an applicable trade agreement is available. In order to calculate multiline discounts and total discounts, you need to run a calculation after finishing order line entry (see Section 4.4.3). You may enter or change discounts in order lines independent from trade agreement settings. If you change data like the ordered quantity later, which are basis for pricing, Dynamics AX will override your manual discount with the relevant trade agreement, however.

4.3.3 Case Study Exercises

Exercise 4.3

Your company requires an additional price list to cover new sales markets. Insert a new customer price group P-## (## = your user ID) for that price list and attach it to your customer of exercise 4.1.

Price list

The new price list should show a price of GBP 90.00 for the item of exercise 3.4. Record a line for this price accordingly.

Exercise 4.4

You agree with your customer of exercise 4.1 to grant a line discount of 10 percent for all items. Enter a trade agreement for that discount, which only applies to your customer. Make sure to enter a percentage, not a discount amount.

Line discount

Which setting is required to make use of this discount in sales order lines?

4.4 Sales Orders

As soon as a customer orders goods or services, you want to enter a sales order in Dynamics AX. With regard to functionality and structure of forms and list pages, sales orders largely mirror purchase orders. This section therefore primarily contains the description of issues, which are different in sales and purchasing.

4.4.1 Basics of Sales Order Processing

Unlike purchase orders, which are primarily caused by material requirements available inside the Dynamics AX database, sales orders usually originate from sources outside the database.

Starting point

Apart from the manual entry of a sales order, there are only a few other options available within Dynamics AX to generate a sales order, therefore. Possible preliminary steps to a sales order are as follows:

- Sales quotations
- Blanket orders
- Enterprise Portal (web shop)
- AIF framework (exchanging data with other applications)
- Intercompany functionality (orders of another company account)

Sales quotations apply to the CRM functionality as well as to the accounts receivables, which is why you may access them in both menus. In the accounts receivables menu, you may open the list page *Quotation* or the form *Sales Quotation Details*, which show a structure with header and lines similar to purchase or sales orders.

Sales quotations

Pushing the button *Updates* in the quotation form, you may post and print the quotation similar to order confirmation posting in a sales order. Depending on the success of the quote, you may push the *Updates* button later again either to confirm the quote transferring it to an order automatically or to close it if cancelled or lost.

Business relations

The business partner in a sales quotation does not need to be a customer – it may be a lead or prospect as well. For this purpose, you may choose the account type “Customer” or “Business relation” before inserting the customer number or business relation number in the *Create quotation* form when recording a new sales quotation.

Business relations contain pre-customer data for CRM opportunities. Apart from directly entering a business relation in the form *CRM> Business Relation Details*, business relations create automatically when you enter an opportunity or – depending on CRM parameter settings – a lead.

Blanket order

Blanket sales orders in Dynamics AX are sales orders of the order type “Blanket order”. In order to ship and invoice deliveries referring to a blanket order, you need to create release orders. Release orders are regular sales orders linked to a blanket order.

The functionality of blanket orders in sales matches the blanket order functionality in purchasing as shown in Section 3.4.6.

Order processing

When you are finished entering a sales order, you may post and print an order confirmation. The further proceeding depends on the business case and the company settings in Dynamics AX.

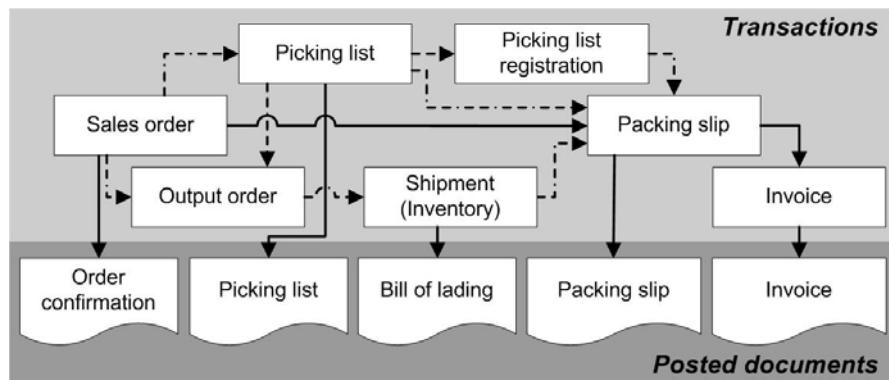


Figure 4.8: Sales order processing in Dynamics AX

Options for processing

As shown in Figure 4.8, we may distinguish four different options to process a sales order in Dynamics AX:

- Simple proceeding, posting packing slip and invoice
- Posting a picking list before packing slip posting
- Registration of the posted picking list before packing slip posting
- Output orders and shipments in inventory applying warehouse locations and pallet transports before packing slip posting

The available options of sales order processing primarily differ in the way picking is done in inventory management.

4.4.2 Order Registration

Like in purchase orders, the order type in sales orders is a core characteristic as well. Sales orders may contain following order types:

- *Order* (regular sales order)
- *Journal* (drafts and templates, not affecting inventory or finance)
- *Subscription* (periodic order, remains open after invoicing)
- *Returned order* (credit notes, see Section 4.6.3)
- *Blanket order* (for blanket orders and contracts)

The order type “Item requirements” shown as additional option is applicable for a specific kind of sales orders generated in the Dynamics AX project module, which is beyond the scope of this book. It is not possible to enter orders of the type “Item requirements” in the sales module.

If you want to enter a sales order manually, you need to insert a new record in the form *Accounts receivable> Sales Order Details* or to push the appropriate action button in the list page *Sales orders*.

Like the purchase order form, the sales order form shows a simple and an advanced mode. You may switch between these two modes pushing the top right button *Advanced* (or *Simple*).

When inserting a new sales order, the order header retrieves various defaults from the customer record. When inserting order lines, you need to select the item number of the ordered items.

Working in sales orders widely matches purchase orders, which is why you may refer to Section 3.4.5 regarding following topics in particular:

- Structure and functions in the order form
- Delivery address in order header and lines
- Sales tax / VAT (see Section 8.2.5 as well)
- Copy function
- Journals (also available in the form *Accounts receivable> Journals> Sales order> Sales journal*)

Order types

Creating an order

4 Sales and Distribution

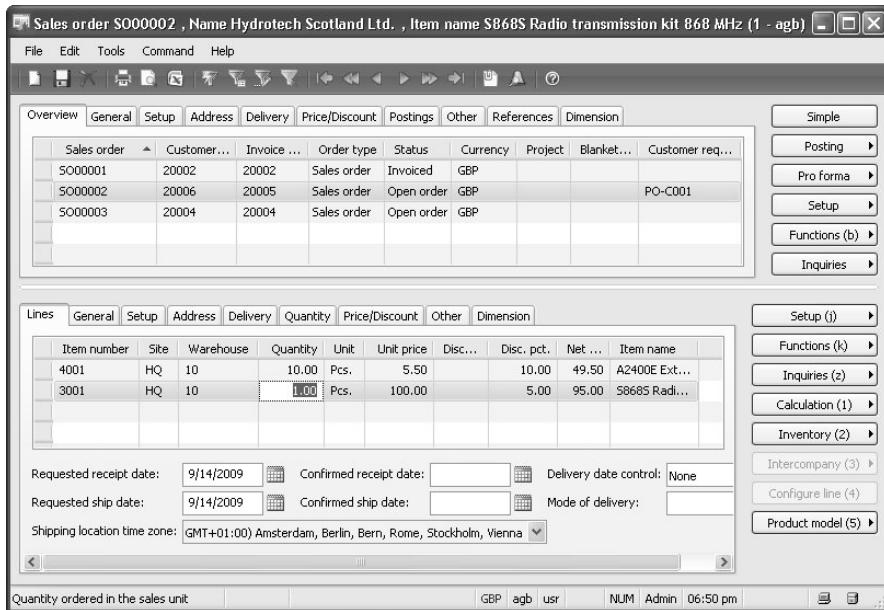


Figure 4.9: Working in the advanced mode of the sales order form

In the description of purchase order processing, you may also find following subjects that apply to sales order processing as well:

- Blanket orders / Release orders (Section 3.4.6)
- Canceling and deleting orders(Section 3.4.7)
- Partial delivery, over and under delivery (Section 3.5.4)
- Order status and inquiries (Section 3.5.5 and 3.6.3)
- Collective documents (Section 3.6.2)

Delivery date

An issue in sales orders, which is quite different to purchase orders, is the delivery date identification. A number of aspects determine the calculation of delivery dates in sales:

- Sales lead time
- Delivery date control
- Availability and item requirements

Date fields

Regarding delivery date, Dynamics AX distinguishes between your shipping date and the date when the customer receives the item on the one hand and between a requested and a confirmed date on the other hand. The delivery date therefore splits into four different fields, which you may find on the tab *Delivery* of the sales order line.

The sales lead-time is the number of days required internally until an item ships. A general setting for the sales lead-time is available on the tab *Shipments* of the accounts receivables parameters. The lead-time specified there applies to the ship date in the order header.

Sales lead-time

Order lines will accept the header ship date, if the ship date calculated according to the sales lead-time of the item is not after the header ship date. You may specify sales lead-times for item records in the order settings (*Inventory Management> Item Details*, button *Setup/Default order settings* or *Setup/Site specific order settings*) and in trade agreements for sales prices.

Making sure the lookup *Delivery date control* on the tab *Delivery* of the order line shows "None", you may choose an earlier delivery date, however.

Delivery date control

If you want to set up calendars of possible shipping days, you may activate *Delivery date control* on the *Shipment* tab of the accounts receivables parameters selecting "Sales lead time" or "ATP". If you choose "ATP", delivery date control includes an item availability calculation within the *ATP time fence*. The selection "Sales lead time" only calculates lead-time and calendar settings.

You may override the parameters settings on the tab *Delivery* of sales order headers and lines. Delivery date control includes following calendar and transport time settings:

- *Inventory management> Setup> Inventory breakdown> Warehouses*, tab *Master planning*
(select shipping calendar for the warehouse)
- *Basic> Setup> Company information*, tab *Other*
(select general shipping calendar)
- *Accounts receivable> Customer Details*, tab *Setup*
(select receipt calendar for the customer)
- *Accounts receivable> Setup> Distribution> Modes of delivery*
(select transport calendar for delivery modes)
- *Inventory management> Setup> Distribution> Transport*
(enter transport times depending on delivery mode, shipping warehouse and receiving address or warehouse)

If delivery date control is activated, Dynamics AX checks if the delivery dates entered in an order are available according to the setup. In order to get a proposal of possible delivery dates, you may push the button *Simulate delivery dates* on the *Delivery* tab in order headers and lines. If necessary, you may deactivate delivery date control for an order or order line to enter a date, which is not in the dates of possible delivery.

In order to check the availability of an item in the sales order form, you may access some inquiries. If you only want to see the actual quantity on hand for the item including inventory dimensions (like site/warehouse),

Availability inquiries

you may push the button *Inventory/On-hand* in the order line. In addition to the actual quantity on hand, the form also displays data referring to reservation and transaction totals (see Section 7.2.6).

The button *Overview* in the *On-hand*-form shows a list of warehouses and other inventory dimensions with their quantities in inventory. Pushing the button *Dimensions display*, you may select the dimensions displayed. If you push the button *Net requirements*, you may see the net requirements form with the possibility to start local master scheduling.

The screenshot shows the SAP On-hand form for item number 4001. The main area displays the following data:

Item name:		A2400E External antenna for M.	
Inventory dimensions		Unit	
Site:	HQ	Unit:	Pcs.
Warehouse:	10		
On-hand		Physical inventory	
Physical inventory:	390.00	Posted quantity:	290.00
Physical reserved:		Deducted:	
Available physical:	390.00	Picked:	
Available for reservation:	390.00	Received:	100.00
Registered:			
Ordered in total:		Ordered in total	
Ordered in total:	1,001.00	Arrived:	
Ordered reserved:		Ordered:	1,001.00
On order in total:	10.00		
Total available:	1,381.00	Various	
Physical cost amount:	293.00	On order:	10.00
Financial cost amount:	849.70	Quotation receipt:	
Cost price:	2.93	Quotation issue:	

Below the table, there are buttons for navigation and status:

- Overview
- Ordered items
- Items on order
- Net requirements
- Intercompany on-hand
- Quantity adjustment
- Counting history
- Dimensions display
- Units (b)

At the bottom, there are buttons for P..., GBP, agb, usr, NUM, Admin, 09:52 am, and standard SAP application icons.

Figure 4.10: The on-hand form referring to an order line

You may as well access the net requirements form pushing the button *Inquiries/Net requirements* directly in the sales order line. The button *Inquiries/Explosion* in the sales order line opens the explosion form, which shows item availability for several BOM levels.

More details on master scheduling and BOM explosion are available in Section 6.3 of this book.

The delivery address of a sales order derives from the primary address or – if specified – from the delivery address of the customer record. In the order form, you may choose to insert an alternative delivery address or any other address available in the global address book pushing the button *Setup/Alt. address*, however. If required, you may as well manually enter a new address in the tab *Address* of the order form.

If you need to ship the lines of a sales order to different addresses, you may enter or select separate addresses on the *Address* tab of the order lines. The settings, whether Dynamics AX should split sales documents like invoices for different addresses or not, are available on the tab *Summary update* of the accounts receivable parameters.

Unlike the delivery address, you may not enter address data for the invoice address in a sales order. The invoice address is the address of the *Invoice account* on the tab *Overview* of the sales order header. The default for the invoice account number derives from the customer record of the order customer, but you may choose a different invoice account number in an order nevertheless.

If the invoice account number in the customer record is empty, Dynamics AX will insert the order customer number into the invoice account of the order. In case the customer record of the invoice account contains an address of the type “Invoice”, that address prints on documents instead of the primary address of the invoice customer.

4.4.3 Pricing

The sales price in an order line comes from the base price in the item record or from applicable trade agreements. Trade agreements containing prices for the customer number take precedence of prices on price group level.

Selecting the price group on the tab *Sales order* of the customer form, you assign a customer to a price group. When you enter a sales order, the price group of the customer defaults to the price group on the tab *Price/Discount* of the order header. If required, you may change the price group in the specific order.

It is as well possible, however, to modify or insert prices in the order lines manually. If you change data that are basis for pricing (e.g. the ordered quantity) later, Dynamics AX will override the manual price with the relevant trade agreement, however.

Delivery address

Invoice address

Sales prices

Discounts If trade agreements include applicable total discounts, multiline discounts or line discounts, the order will retrieve appropriate defaults. If you want to change a discount group in the order header, you may choose the required group on the tab *Price/Discount* similar to the price group.

For the total discount, the order header does not only show the discount group, but also the discount percentage since it is a discount on header level.

The percentage for the line and multiline discount is available on the tab *Price/Discount* in the order line. In addition, there is a separate field for a line discount amount and a multiline discount amount – be aware not to confuse percentage and amount fields. For the line discount, percentage and amount also show on the tab *Overview* of the order lines.

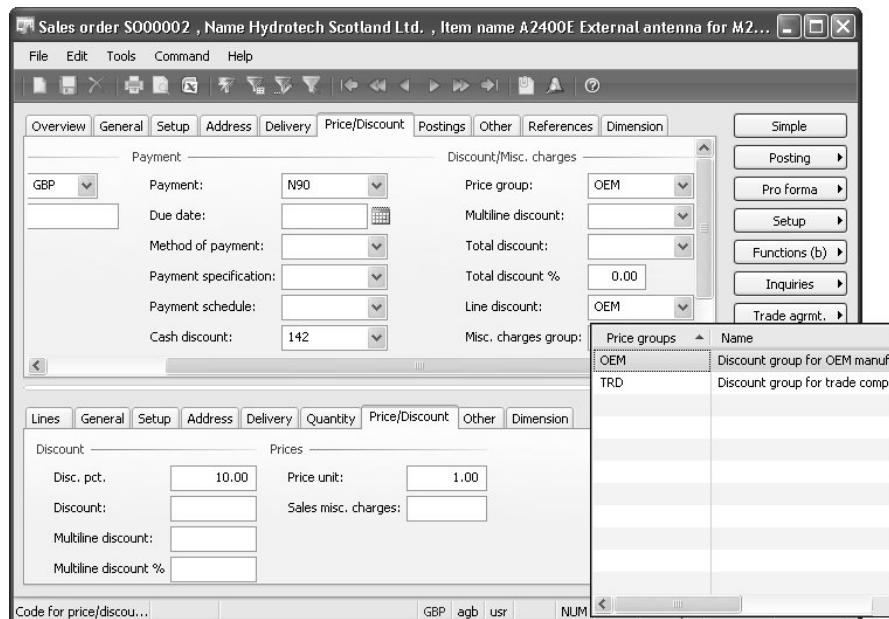


Figure 4.11: Discount groups, percentages and amounts in the order form

Calculation of discounts Dynamics AX will calculate the line discount for a sales order line whenever it stores a line. Unlike line discount calculation, multiline discount and total discount calculation need to be started manually by pushing the button *Calculation/Multiline discount* or *Calculation/Total discount*.

For the total discount, you may skip to start the calculation, if the checkbox *Total discount is calculated automatically* on the tab *Prices* of the accounts

receivable parameters is selected. In this case, Dynamics AX will run a calculation of the total discount whenever you print or post an order.

If you change a multiline or total discount percentage manually, be aware that Dynamics AX discount calculation will override your manual discount with the relevant trade agreement. The same applies to the line discount if you change data like the ordered quantity.

4.4.4 Miscellaneous Charges

Miscellaneous charges in sales and purchase orders are available to manage charges, which are not included in the line price – fees, freight and insurance as an example.

You may enter miscellaneous charges manually in a purchase or sales order. Nevertheless, it is as well possible to record defaults for miscellaneous charges, which automatically insert when you enter an order.

Miscellaneous charges are available on header and on line level. Standard documents only print the total of miscellaneous charges, no matter if they refer to the header or to lines, however.

A prerequisite to apply miscellaneous charges is to record the required charges codes. Miscellaneous charges codes for sales and purchasing are independent from each other, for sales you need to open the form *Accounts receivable> Setup> Misc. charges> Misc. charges codes* and for purchasing *Accounts payable> Setup> Misc. charges> Misc. charges codes*.

Misc. charges codes

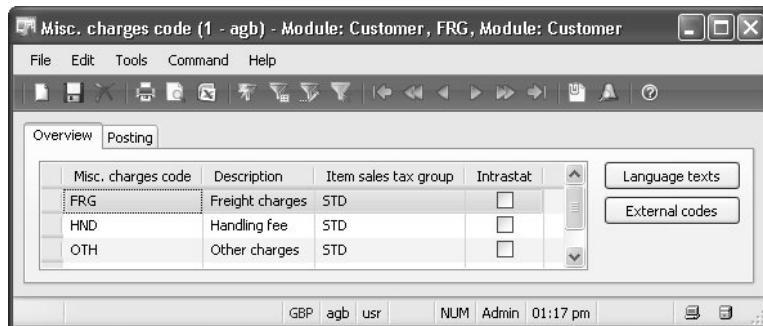


Figure 4.12: Sample miscellaneous charges codes for sales

Apart from the charges code and description on the tab *Overview*, you need to enter ledger integration data on the tab *Posting*.

For sales charges, you will choose “Customer/Vendor” for the *Debit type* in order to print the charges on documents (e.g. invoices) in addition to item

Ledger integration

sales. The *Credit type* usually is “Ledger account” in combination with an appropriate revenue account in the *Credit account* field then.

For purchase charges that show separate on the vendor invoice, you want to choose “Customer/Vendor” in the *Credit type*. The *Debit type* then is “Ledger account” to post to a separate ledger account, or “Item” to include the charges amount in the inventory value.

In addition to the options mentioned above, which apply for charges shown separately on documents, it is also possible to set up codes for internal posting. When setting up these codes, you do not choose the type “Customer/Vendor”.

Manual charges

If you want to apply miscellaneous charges in an order manually, you may push the button *Setup/Misc. charges* in the order header or line concerned. In the misc. charges form, you need to select the appropriate charges code. The column *Category* specifies, if the charge is a fixed amount or if to calculate it depending on line amount or quantity.

Auto-misc. charges

If specific miscellaneous charges should apply automatically for every order concerned, you may specify auto-misc. charges in the form *Accounts receivable> Setup> Misc. charges> Auto-misc. charges*.

The header of that form shows the lookup *Level* where you choose to apply the charges to order headers (*Level* = “Main”) or to lines (*Level* = “Line”). In the grid, you may enter the charges depending on the customer (customer number, group or all customers) and on the item (item number, group or all). For header charges, the item selection is fixed to “All”.

In order to enter the calculation formula for the charge, you may switch to the tab *Lines* then.

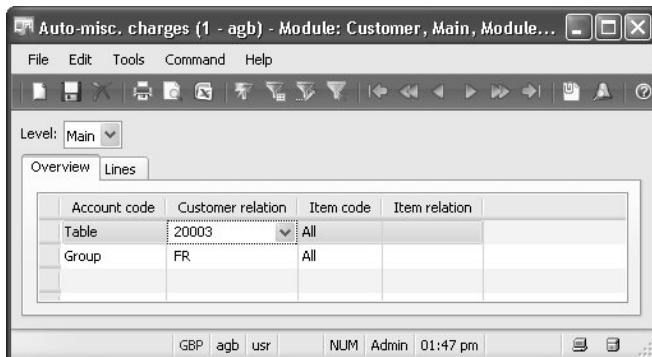


Figure 4.13: Managing auto-misc. charges

As a prerequisite to apply auto-misc. charges in sales orders, the appropriate checkboxes on the tab *Prices* of the accounts receivable parameters have to be selected.

4.4.5 Order Confirmation

If you want to print an order confirmation, you have to post it in Dynamics AX. Like posting and printing a purchase order, posting of an order confirmation does not create inventory or financial transactions.

Posting an order confirmation means to save it unchanging and separate from the current sales order you work on. Therefore, you may keep record of the documents sent to the customer within Dynamics AX.

In order to post and print an order confirmation, you may push the button *Posting/Confirmation* after selecting the appropriate order in the sales order form.

The posting form for the order confirmation is similar to the posting forms in purchasing as shown in Section 3.4.8. Like there, the printer selection works by pushing the button *Printer setup* or marking the checkbox *Use print management destination*.

In the lookup field *Quantity*, you usually select "All". Making sure the checkboxes *Posting* and *Print confirmation* are selected, you may start posting and printing by pushing the button *OK* in the posting form.

As an alternative to confirmation posting in the sales order form, you may as well post the order confirmation selecting the posting form for summary update *Accounts receivable> Periodic> sales update> Confirmation*. In the posting form for summary update, you need to apply a filter pushing the button *Select*.

When an order confirmation has been posted, you may display and reprint the posted confirmation independent from modifications to the current order. Access to posted order confirmations is available in the form *Accounts receivable> Inquiries> Journals> Confirmation* or pushing the button *Inquiries/Confirmation* in the sales order form.

Posting form

Summary update

Inquiries

4.4.6 Case Study Exercises

Exercise 4.5

The customer, whom you have entered in exercise 4.1, orders 20 units of the item, which you have entered in exercise 3.4. Open the *Sales Order Details* form in the accounts receivable menu, leaving it in simple mode. Enter the required sales order including the header and a line then. Which quantity and which price display as default, where do they come from?

Sales order

Switch to the advanced mode of the sales order form and check the delivery address and the price group of your order.

Exercise 4.6

Miscellaneous charges New circumstances require invoicing a handling fee to your customers. Enter a miscellaneous charges code C-## (## = your user ID), selecting the posting type "Customer revenue" and an appropriate revenue account for the credit posting.

Now you need to charge the new handling fee, entering a miscellaneous charge of 10.00 pounds in the sales order header of exercise 4.5.

Exercise 4.7

Order confirmation Post and print the order confirmation for your order, selecting to display a print preview. Can you tell which amount shows in the order line and where the confirmation prints miscellaneous charges?

4.5 Distribution

On the ship date, warehouse needs to finish picking and shipping of the ordered items. Picking means to take required items in the warehouse in order to supply delivery.

In Dynamics AX, you are not required to post picking separately. You may as well ship an item posting a packing slip or an invoice.

Ways of picking If you want to process picking in Dynamics AX, you may choose between three different options depending on system configuration and setup:

- Picking list without registration
- Picking list, followed by picking confirmation (registration)
- Output order and shipment (consolidated picking)

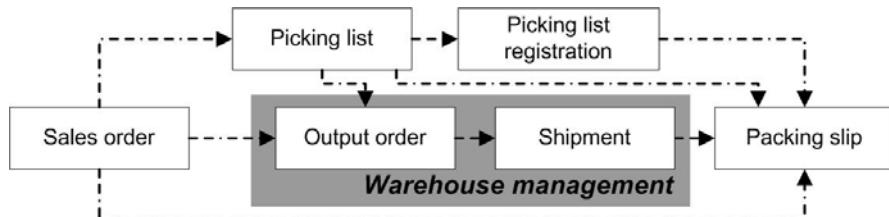


Figure 4.14: Options for picking in Dynamics AX

No matter whether you post picking in Dynamics AX or not, you need to check expected deliveries continuously. In order to support in-time deliveries, there are several forms available to review pending shipments:

- Accounts receivable> Backorder Lines (list page)
- Accounts receivable > Inquiries> Order status> Open sales order lines
- Accounts receivable > Inquiries> Order status > Backorder Lines Details

In addition, you may as well filter on delivery/ship date in the posting form of picking lists and packing slips.

The release picking form (*Inventory management> Periodic> Release sales order picking*), serving to release sales order lines for picking, provides another possibility to select lines for shipping.

Release picking

When you open the form, an advanced filter form displays where you may enter filter criteria to specify which order lines to show. You may change this filter later pushing the button *Select* in the release picking form.

The release picking form shows sales order lines of items, which got a quantity on hand. Pushing the button *Activation* or manually inserting quantities in the column *Activate now*, you may activate and reserve items for picking.

Figure 4.15: Release sales order picking

Customer classification

For the quantities in the column *Activate now*, you may then either post the picking list pushing the button *Release for pick* or create output orders pushing the button *Inventory/Output orders*.

Setup for picking

In order to set priorities for sales order picking, you may enter a *Customer classification group* on the tab *General* of the customer form. This group displays on the left-most column of the release picking form, providing the possibility to filter on this criterion.

Accounts receivable parameters

In order to control the picking process, some settings are required. In particular, you have to check following items related to picking:

- *Accounts receivable parameters (Picking route status)*
- *Inventory model group*

Inventory model group

If the *Picking route status* on the tab *Updates* of the accounts receivables parameters is set to “Completed”, Dynamics AX will immediately reduce the quantity in inventory when you post the picking list. Output order and shipment are immediately closed and picking list registration is not required.

If the *Picking route status* is set to “Activated”, Dynamics AX will not change the quantity in inventory when you post the picking list. Depending on the inventory model group of the item, you need to update either the *Picking list registration* or the *Output order* next.

On the tab *General* of the item form, every item is assigned to an inventory model group. In order to set up inventory model groups, you may access the form *Inventory management> Setup> Inventory> Inventory model groups*.

Inventory model groups contain two checkboxes on the tab *Setup*, which are core settings for picking:

- *Picking requirements*
if selected, picking (picking list or output order) has to be posted before posting a packing slip
- *Consolidated picking method*
if selected, the shipment functionality is active to pick multiple orders in picking routes and pallet transports as shown in Section 4.5.2

Regarding the consolidated picking method in the inventory model group, you have to take into account, that following settings may override them:

- *Warehouse settings*
(*Inventory management> Setup> Inventory breakdown> Warehouses*, tab *Warehouse management*)
- *Item settings (item form, button Setup/Warehouse items)*
(tab *Locations* in the warehouse item form)

Items new in Dynamics AX 2009 related to picking and distribution include the standardization of picking procedures. Whereas in version 4.0 the accounts receivables parameter *Set inventory transactions to Picked* skips picking registration when posting a picking list, the appropriate setting of the parameter *Picking route status* in Dynamics AX 2009 does not skip but automatically end output orders and shipments.

New in
AX 2009

4.5.1 Picking List

Posting of a picking list is possible out of several forms:

- Sales order form (*Accounts receivable> Sales Order Details*, button *Posting/Picking list*)
- Summary update (*Accounts receivable> Periodic> Sales update> Picking list*)
- Release picking form (*Inventory management> Periodic> Release sales order picking*, button *Release for pick*)

Picking list
posting

After posting and printing the picking list, warehouse personnel will receive the printout.

Picking

If warehouse usually picks items immediately, you might set the parameter *Picking route status* in the accounts receivables parameters to “Completed” in order to avoid manual picking registration. The next step in Dynamics AX then is posting the packing slip.

Picking in sales mirrors inventory registration in purchasing: After picking, the quantity concerned shows the status “Picked” and is not available in inventory any more. Like inventory registration in purchasing, picking is a preliminary transaction not shown separately in inventory transactions.

You need to update the picking list registration, if the parameter *Picking route status* is set to “Activated” while not applying consolidated picking according to the setting in the inventory model group.

Picking list
registration

In order to open the picking list registration form, you may push the button *Posting/Picking list registration* in the sales order form. As an alternative, you may access the form in the menu items *Accounts receivable> Journals> Sales order> Picking list registration* or *Inventory management> Periodic> Picking list registration* as well.

In the *Lines* part of the registration form, you may choose the lines for update by marking the checkbox in the column *Select* as shown in Figure 4.16. Before confirming the picked quantity pushing the button *Updates/Update selected* or *Updates/Update all*, you may adjust the quantity in the *Pick quantity* column.

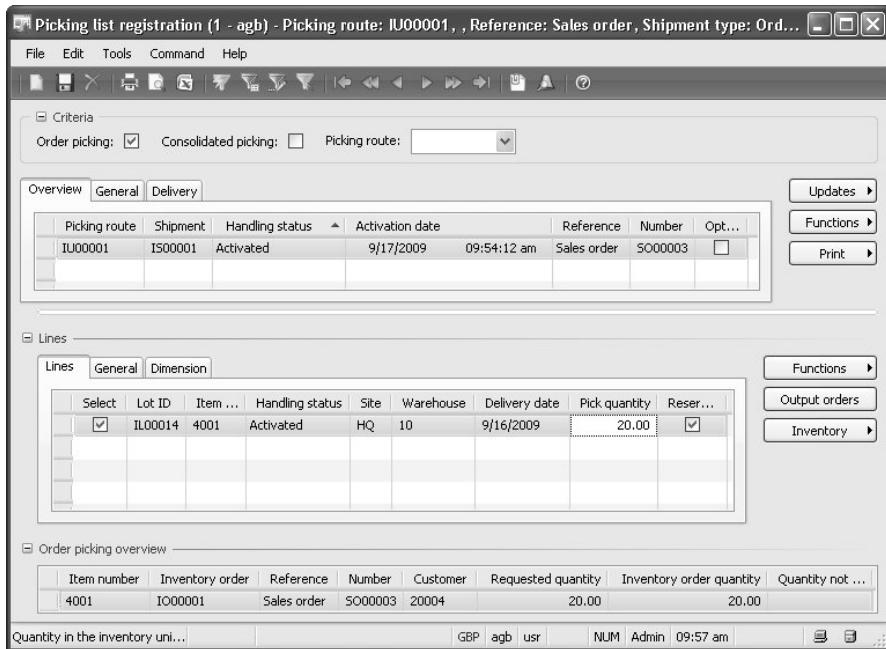


Figure 4.16: Picking list registration

Manual picking

Apart from picking list and picking list registration, there is another way to pick items: Pushing the button *Inventory/Pick*, you may post picking directly in a sales order line. The functionality of the pick form is similar to the registration form shown in Section 3.5.2.

Reverse picking

In order to reverse picking, you may by post a negative quantity in the pick form.

4.5.2 Output Order and Shipment

Consolidated picking

Consolidated picking in Dynamics AX includes output orders, picking routes and pallet transports, providing the possibility to merge several orders to one shipment.

Even if you do not apply consolidated picking, Dynamics AX will generate output orders and shipments. Usually you do not notice it, because Dynamics AX will post output orders and shipments automatically when posting and registering a picking list.

Prerequisites

As a prerequisite for consolidated picking, you need to manage locations within your warehouses in Dynamics AX. In addition, companies apply-

ing consolidated picking usually work with picking routes and pallet transports, requiring pallet management in Dynamics AX.

In order to activate consolidated picking, you want to select the checkbox *Consolidated picking method* in the inventory model group. Additionally, related settings in the warehouse and in the item record apply as mentioned in the introduction of Section 4.5.

Settings required for shipments in consolidated picking include shipment templates, shipment reservation sequences and shipment reservation combinations. You may access these settings in the menu *Inventory management> Setup> Distribution*.

A detailed description of consolidated picking is beyond the scope of this book, which is why the following lines explain the basics of consolidated picking only.

Dynamics AX automatically generates an output order when you post a picking list. You may as well create an output order manually pushing the button *Inventory/Output order* in the sales order line, however.

Output order

In order to access output orders, you may open the form *Inventory management> Inquiries> Output orders*. As a preparation for shipments, you may create or change reservations pushing the button *Inventory/Reservation* in the output order form.

If required, you may as well delete an order in the output order form – as an example if you want to stop the picking process for a sales order.

Shipments in inventory are based on output orders. If you do not apply consolidated picking, Dynamics AX creates shipments of the type “Order picking” automatically in parallel to output orders when posting the picking list. In this case, you do not need to go through the steps described below like activating the shipment.

Creating a shipment

However, if you do use consolidated shipping, you may create shipments in the form *Inventory management> Shipments* manually in order to continue with the picking process. Depending on the options in the shipment form (button *Functions/Options*), inserting a record in the shipments will start a wizard.

Since a shipment of the type “Consolidated picking” contains one or more output orders, you have to assign output orders to the shipment. If you do not go through the wizard, you need to assign them manually pushing the button *Add* in the shipment lines. The shipment lines form is accessible pushing the button *Show lines* in the shipment form.

When working with shipments and output orders, you should be aware that Dynamics AX might create new shipments or add output orders to an

	existing shipment automatically. Appropriate settings are available in the shipment templates.
Shipment list	If you want to print a shipment list in order to support item picking in the warehouse, you may push the button <i>Print/Shipment list</i> in the shipments form.
Activate shipment	Pushing the button <i>Functions</i> in the shipment form, you may activate the shipment. Activating generates pallet transport (<i>Inventory management> Pallet transports</i>) for lines, which may be shipped in complete pallets. In order to ship smaller quantities, picking routes (<i>Inventory management> Picking routes</i>) need to be activated.
Complete shipment	In order to complete a shipment, you need to complete pallet transports or picking routes. Apart from the menu items <i>Inventory management> Picking routes</i> and <i>Inventory management> Pallet transports</i> you may as well open the appropriate forms pushing the button <i>Inquiry</i> in the shipment. If you do not apply pallet transports, you may complete the shipment in the picking list registration form (see Section 4.5.1 above), which is as well available pushing the button <i>Inquiry/Picking routes</i> in the shipment form. Finally, you may finish the shipment pushing the button <i>Functions/Send</i> in the shipment and posting the packing slip then.
Bill of lading	In order to create a bill of lading for the carrier who will ship the items, you may access the bill of lading form pushing the button <i>Inquiry/Bill of lading</i> in the shipment.
	<h3>4.5.3 Packing Slip</h3> <p>Posting the packing slip (delivery note) is the last transaction in the picking and shipping process.</p>
Ledger integration	If ledger integration is activated for packing slip posting, Dynamics AX will post transactions in the general ledger in parallel to inventory transactions. These ledger transactions will reverse when you post the related invoice. There are two relevant settings to enable packing slip posting to the general ledger:
	<ul style="list-style-type: none">- The checkbox <i>Post packing slip in ledger</i> in the accounts receivable parameters (tab <i>Updates</i>) needs to be marked.- In addition, the checkbox <i>Post physical inventory</i> in the inventory model group (tab <i>Setup</i>) of the sold item needs to be marked.
Posting form	You may open the posting form for packing slips either pushing the button <i>Posting/Packing slip</i> in the sales order form, or accessing the summary update form <i>Accounts receivable> Periodic> Sales update> Packing slip</i> .

The posting form shows the familiar format. Which option to select in the lookup field *Quantity*, depends on the previous procedure:

- You should select "Picked" in the *Quantity* field, when processing picking lists or shipments before posting the packing slip. Dynamics AX then inserts the picked quantity in the column *Update* on the tab *Lines* of the posting form.
- If you select "All" in the *Quantity* field, Dynamics AX will insert the total remaining quantity in the *Update* column on the tab *Lines*.
- If you select "Deliver now" in the *Quantity* field, Dynamics AX will insert the quantity of the order line column *Deliver now*.

Selecting the checkboxes *Post* and *Print packing slip*, Dynamics AX will post and print the packing slip after pushing the button *OK* in the posting form.

Like in purchasing, you may post partial deliveries as well as over and under deliveries (see Section 3.5.4). Regarding updates of the order and document status, please also refer to the appropriate purchase order status as described in Section 3.5.5.

In order to see the inventory transactions after packing slip posting, you may push the button *Inventory/Transactions* in the order line concerned. After posting a packing slip, the issue status of the inventory transaction is "Deducted". The posting date of the packing slip shows in the column *Physical date* of the inventory transaction, the *Financial date* will remain empty until you post the invoice. If you want to know the packing slip number, you may switch to the tab *Update*.

Transaction inquiry

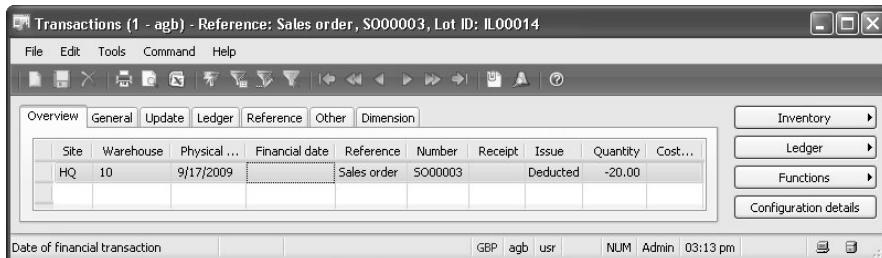


Figure 4.17: Inventory transaction after packing slip posting

In order to access posted packing slips, you may choose the form *Accounts receivable> Inquiries> Journals> Packing slip* or push the button *Inquiries/Packing slip* in the sales order form. After selecting a packing slip on the tab *Overview* of the inquiry form, you may switch to the tab *Lines* displaying the packing slip lines.

Packing slip inquiry

Ledger transactions If you want to see related general ledger transactions, you may open the voucher transactions form pushing the button *Voucher* on the *Overview* tab of the packing slip inquiry or the button *Ledger/Physical voucher* in the inventory transactions. Details concerning the ledger integration of inventory transactions are available in Section 8.4.2.

4.5.4 Case Study Exercises

Exercise 4.8

Packing slip You need to find out, which order lines are available for shipping. The inquiry should not be limited to your orders; it should also include other orders available in your company. Which possibilities do you know?

You want to ship the items ordered in exercise 4.5 posting a packing slip. Before posting, check following items in the sales order:

- Order status and document status
- Inventory quantity of the ordered item (button *Inventory/On-hand*)
- Inventory transaction related to the order line
(button *Inventory/Transactions*)

Post and print a packing slip for the complete order quantity directly out of the sales order form, selecting a print preview as printing destination.

Now review the status of the items on the checklist above again. What is different after packing slip posting?

Exercise 4.9

Picking list Your customer of exercise 4.1 orders another 20 units of the item entered in exercise 3.4. Enter an appropriate sales order.

Warehouse this time requires a picking list. Therefore, you want to post a picking list containing 10 units of the ordered item. Leaving aside consolidated picking, can you tell which setting controls if you need to do picking list registration? If required, update the picking list registration.

Then post the packing slip for the picked items.

Exercise 4.10

Packing slip inquiry You want to see the packing slip of exercise 4.9. Therefore, open the packing slip inquiry out of the sales order concerned. In a second step, open the packing slip inquiry choosing the appropriate menu path. Check packing slip header and lines and try to find out, if there are related ledger transactions.

4.6 Invoicing

Posting the sales invoice is the last step in sales order processing. The invoice increases the open customer balance on the one hand and reduces the inventory value on the other hand.

After invoicing all lines of a sales order entirely, the sales order is completed. Payment for the invoice then runs through a separate process in finance as shown in Section 8.3.4.

If you want to invoice items, you need to apply a sales order that you ship and invoice. You are free to post the sales order invoice with or without separate packing slip posting, however.

If you want to post invoices not referring to item records, you may apply free text invoices as shown in Section 4.6.2. In the lines of a free text invoice, you need to enter ledger numbers instead of item numbers. Such an invoice has no connection to items and therefore no impact on inventory and supply chain management.

4.6.1 Invoicing Sales Orders

Posting a sales invoice works similar to posting the packing slip. You may open the posting form for invoices either pushing the button *Posting/Invoice* in the sales order form, or accessing the summary update form *Accounts receivable> Periodic> Sales update> Invoice*. If you need to post collective invoices, you may consider appropriate settings similar to collective purchase invoices described in Section 3.6.2.

The posting form shows the familiar format. Which option to select in the lookup field *Quantity*, depends on the previous procedure:

- If you post a packing slip receipt prior to the invoice, you will select "Packing Slip".
- If you select "All" or "Deliver now" in the posting form, Dynamics AX will post a delivery for quantities not yet shipped.

Like in purchasing, you may select individual packing slips for invoicing pushing the button *Select packing slip* when choosing "Packing Slip".

The button *Totals* in the posting form is available to check the totals that you are going to post. Pushing the button *OK* in the posting form, you post the invoice then.

Posting the invoice posts general ledger transactions, inventory transactions, customer transactions and transactions in other sub-ledgers like sales tax, if applicable. If all lines are invoiced completely, the order status will change to "Invoiced".

**Ways of
invoicing**

Posting form

**Posting the
invoice**

- Transaction inquiry** In order to see the inventory transactions after posting an invoice, you may push the button *Inventory/Transactions* in the order line. The issue status of the inventory transaction is “Sold”, the posting date of the invoice shows in the column *Financial date* of the inventory transaction.
- Invoice inquiry** In order to access posted sales invoices, you may choose the form *Accounts receivable> Inquiries> Journals> Invoice* or push the button *Inquiries/Invoice* in the sales order form. After selecting an invoice on the tab *Overview* of the inquiry form, you may switch to the tab *Lines* displaying the invoice lines.
- Ledger transactions** If you want to see related general ledger transactions, you may open the voucher transactions form pushing the button *Voucher* on the *Overview* tab of the invoice inquiry or the button *Ledger/Financial voucher* in the inventory transactions. Details concerning the ledger integration of inventory transactions are available in Section 8.4.2.
- Transaction origin** If you push the button *Origin* in the voucher transactions form, the transaction origin form displays, showing the transactions in all modules related to the selected invoice as shown in Section 3.6.3. As an example for sales invoices, Figure 4.18 displays a domestic invoice for an item, which has been shipped with a separate packing slip.

Module	Voucher	Date	Number	Text	Curr...	Amount currency	Amount
2a 1	Ledger	SI00001	9/13/2009	10310 Customer invoice SI00001	GBP	-29.30	-29.30
2a	Ledger	SI00001	9/13/2009	10921 Customer invoice SI00001	GBP	29.30	29.30
2a	Ledger	SI00001	9/13/2009	10922 Customer invoice SI00001	GBP	-29.30	-29.30
2a	Ledger	SI00001	9/13/2009	20010 Customer invoice SI00001	GBP	58.16	58.16
2a	Ledger	SI00001	9/13/2009	35210 Customer invoice SI00001	GBP	-8.66	-8.66
2a	Ledger	SI00001	9/13/2009	40210 Customer invoice SI00001	GBP	-49.50	-49.50
2a	Ledger	SI00001	9/13/2009	51310 Customer invoice SI00001	GBP	29.30	29.30
2b	Customer	SI00001	9/13/2009	20002 Customer invoice SI00001	GBP	58.16	58.16
2b	Inventory	SI00001	9/13/2009	4001 Financial	GBP	-29.30	-29.30
	Sales tax	SI00001	9/13/2009	35210 Sales tax	GBP	-8.66	-8.66

Name: Dicol Ltd.
Table: Customer transactions

Figure 4.18: Transactions of a sales invoice in the transaction origin form

Classifying the transactions of the invoice as shown in Figure 4.18, you may distinguish following kinds of transaction:

Table 4.2: Transactions of the sales invoice in Figure 4.18

Transaction	General ledger	Sub-ledger
Packing slip reversing	Account 10921 offsetting account 10922	[1]
Inventory	Account 51310 for COGS offsetting stock account 10310	[2a] Financial inventory transaction for item 4001 [2b]
Customer	Summary account 20010 offsetting tax account 35210 and revenue account 40210	[3a] Customer and sales tax transaction [3b] [4b] [5]

Invoices will only post packing slip reversing transactions, if a prior packing slip has posted to the general ledger.

The ledger accounts in all transactions depend on the business case and on the company setup in Dynamics AX. Therefore, you may notice additional or missing transactions if you compare the transactions of other invoices to the example in Figure 4.8. As an example, you may miss the sales tax transaction for invoices to foreign countries.

For more information on the transactions shown, please refer to following sections of the book:

- Section 3.2.3 regarding customer transactions (explaining similar vendor transactions)
- Section 8.2.5 regarding ledger posting groups for sales tax
- Section 8.4.2 regarding ledger integration of inventory transactions

Items new in Dynamics AX 2009 related to invoicing include the enhanced functionality for packing slip selection when posting the invoice.

New in AX 2009

4.6.2 Free Text Invoices

Free text invoices are required to post and print sales invoices, which do not refer to an item number.

Functionality

The structure of free text invoices is similar to sales orders: Every free text invoice consists of a header and one or more lines. Instead of item numbers, the lines of a free text invoice contain ledger accounts.

After registering a free text invoice, you may post and print it. The only posted document available in free text invoices is the invoice – it is not possible to post an order confirmation for example.

Credit note

Entering a negative amount, you may register credit notes in the free text invoice form. You need to take into account, that free text invoices and credit notes do not affect item statistics and inventory valuation, however.

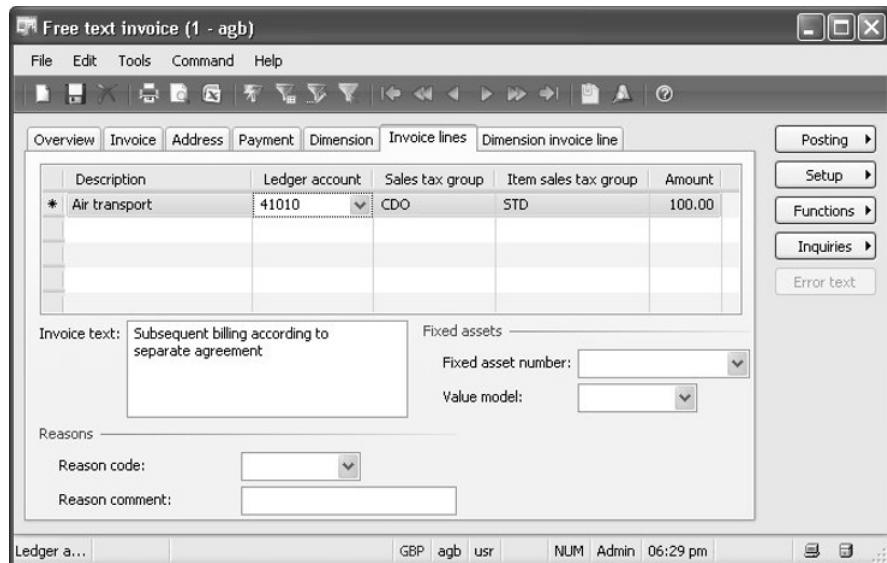


Figure 4.19: Registering an invoice line of a free text invoice

Free text invoice registration

In order to enter a free text invoice, you want to access the form *Accounts receivable> Free Text Invoice Details* or the list page *Free Text Invoices*. Like in a new sales order, you need to enter the customer number in the header part of a free text invoice before registering lines.

Unlike the sales order form, the free text invoice does not show a separate *Create new-form* for registering a new invoice – you simply insert a new line in the *Overview* tab of the free text invoice form. Another clear difference is the lines part, which you will find on the separate tab *Invoice lines*.

In the invoice lines, you may register the description, the ledger account number and the amount. If a longer description referring to the line is required, you may enter it in the invoice text field in the lower part of the form. If sales tax (VAT) applies, you should pay attention to the sales tax and item sales tax group.

In addition to ledger accounts, you may also assign fixed assets to a free text invoice. This way you may sell fixed assets, entering the fixed asset number in the lower part of the *Invoice lines* tab pane.

In order to post a free text invoice, you need to push the button *Posting/Free text invoice* in the free text invoice form. After posting, you may see the posted invoice pushing the button *Inquiries/Invoice* in the free text invoice form.

Free text invoices also display in the general invoice inquiry *Accounts receivable>Inquiries>Journals>Invoice*. In the invoice inquiry, you may recognize free text invoices by the missing order number and different invoice numbers (if a separate number sequence applies).

4.6.3 Credit Notes and Item Returns

If a customer returns items and receives a replacement or a financial compensation, you need to post a credit note in sales. Other types of credit notes apply when crediting a customer not actually returning items or crediting a price variance.

In order to process item returns, you may access the form *Accounts receivable>Return Order Details* or the list page *Accounts receivable>Return Orders*. Return orders are sales orders of the type "Returned order", showing the sales order number on the tab *General* of the return orders form.

Posting and inquiry

Return orders

RMA number	Customer account	Invoice account	Return reason code	Deadline	Return status
ST00001	20002	20002		9/18/2009	Created

Item...	Site	Warehouse	Quantity	Unit	Unit pr...	Net ...	Item name	Qty ret...	Return...
4001	HQ	10	-2.00	Pcs.	5.50	-11.00	A2400E ...		Awaiting

Figure 4.20: Registering an item return in the return order form

	<p>Except for return orders assigned to a disposition code without item return, return orders do not show in the regular sales order form until you post the item arrival, however.</p>
Disposition code	<p>Disposition codes (<i>Accounts receivable> Setup> Sales order> Returns> Disposition codes</i>) are a prerequisite to process return orders. The core setting in a disposition code is the field <i>Action</i>, which controls handling of a defective item – returning, replacing, scrapping or crediting without returning.</p>
Processing return orders	<p>After inserting the header of a return order, you may push the button <i>Functions/Find sales order</i> to copy the original invoice lines into the return order. As an alternative, you may also enter return order lines with a negative quantity manually.</p> <p>Pushing the button <i>Functions/Send return order</i> you may print a RMA document to send it to your customer. If required, you may create a sales order pushing the button <i>Functions/Create replacement order</i> for sending a replacement in advance.</p>
Credit only	<p>If you do not want your customer to return the item, you may choose an appropriate disposition code on the tab <i>General</i> of the return order line. In this case, you may immediately post the credit note in the sales order form (<i>Accounts receivable> Sales Order Details</i>) or in the summary update <i>Accounts receivable> Periodic> Sales update> Invoice</i>.</p>
Item return	<p>When receiving returned items related to return orders, you need to post an item arrival journal (<i>Inventory management> Journals> Item arrival> Item arrival</i>) like an item receipt in purchasing.</p> <p>On the tab <i>Default values</i> of the item arrival journal header, you will choose "Sales order" for the <i>Reference</i>, selecting the return order number in the lookup field <i>RMA number</i>. Since a <i>Disposition code</i> is required to post the item return, you may enter it in the header to default the journal lines. In order to create the journal lines then, you may either push the button <i>Functions/Create lines</i> or enter journal lines manually.</p> <p>After posting the item arrival journal pushing the button <i>Post</i>, the status of the return order line updates to "Registered". If required, you may print an acknowledgement of the receipt, pushing the button <i>Functions/Send acknowledgement</i> in the return order form then.</p> <p>In order to complete item receipt, you want to post the packing slip pushing the button <i>Functions/Packing slip</i> in the return order or <i>Posting/Packing slip</i> in the sales order form.</p>
Credit note	<p>In order to credit the item return finally, you may push the button <i>Posting/Invoice</i> in the sales order form or choose the summary update <i>Accounts receivable> Periodic> Sales update> Invoice</i>.</p>

As an alternative to return orders, you may credit customer in the regular sales order form as well. Like in purchasing (see Section 3.7.1), there are following options available:

- Credit note without subsequent delivery of a replacement, registered in the original order line (complete or partial)
- Credit note with replacement, registered in the original order line
- Credit note in a new order line
- Credit note in a new sales order

If you register a credit note in a new order or order line, you should select the original invoice in the *Return lot ID* on the tab *Setup* of the order line before posting. The inventory value of the crediting line then will exactly match the inventory value of the original delivery.

Dynamics AX automatically inserts the return lot ID, if you choose the button *Functions/Find sales order* in the return order form or the button *Functions/Create credit note* in the sales order form.

If you do not select a return lot ID, Dynamics AX will apply the *Return cost price* on the tab *Setup* of the crediting order line for inventory valuation.

If a customer is not required to return a defective item, you may select the checkbox *Scrap* on the tab *Setup* of the crediting order line. When posting the invoice (credit note), Dynamics AX indeed posts an item receipt as well, but an inventory loss will automatically post at the same time.

In return orders, the checkbox *Scrap* is controlled by the dispositions code.

You may register and post customer refunds in the free text invoice form as mentioned in Section 4.6.2. If a refund applies to an item, you should avoid registering a free text invoice, since it does not affect item statistics and inventory valuation, however.

In case of crediting a price variance, it is better to enter a new sales order containing a line with a negative quantity and the old price and a second line with a positive quantity and the right price. Applying *Inventory/Marking* as shown in Section 3.7.1, you may connect the two transactions to offset inventory value.

Items new in Dynamics AX 2009 related to credit notes in sales include the return order functionality to process item returns.

Other ways of crediting

Inventory valuation

Scrap

Refund

New in AX 2009

4.6.4 Case Study Exercises

Exercise 4.11

You want to invoice the items shipped in exercise 4.8. Before posting the invoice, check following items:

Invoice

- Order status and document status of the sales order
- Inventory transaction related to the order line
(button *Inventory/Transactions*)

Post and print the invoice directly out of the sales order form, checking the invoice total in the posting form before posting.

Now review the status of the items on the checklist above again. What is different after invoice posting?

Exercise 4.12

Partial invoice

You want to invoice the items picked and shipped in exercise 4.9. Post and print the invoice directly out of the sales order form, making sure to invoice only shipped items.

Exercise 4.13

Shipping with invoice

Your customer of exercise 4.1 orders another unit of the item entered in exercise 3.4. This time you do not post a packing slip, you want to ship the item with the invoice.

Enter an appropriate sales order and immediately post the invoice. After posting the invoice, review the order status, the document status and the inventory transaction.

Exercise 4.14

Invoice inquiry

You want to see the invoice posted in exercise 4.11. Therefore, open the invoice inquiry and check the invoice header and lines as well as the related ledger transactions.

In exercise 4.2, you were looking for the summary account for your customer. Can you find the ledger transaction for this account? Finally, open the transaction origin form and check, to which modules your invoice has been posting.

Exercise 4.15

Free text invoice

You want to invoice specific services, for which no item record is available, to your customer of exercise 4.1. Enter a free text invoice choosing an appropriate revenue account and post the invoice.

What is the difference between a free text invoice and an invoice related to a sales order?

Exercise 4.16

Credit note

Your customer complains defects on the items invoiced in exercise 4.11. You agree to an item return before crediting the invoice.

Enter an appropriate return order and post the item receipt applying a suitable disposition code. After posting the packing slip return, you want to post and print the credit note.

4.7 Direct Delivery

Direct deliveries mean shipping goods from a vendor directly to a customer. Avoiding an own warehouse in between, you save time and expenses for transportation and stocking.

4.7.1 Processing Direct Deliveries

In order to process direct deliveries, you may find two different options in the sales order form:

- *Create purchase order*
- *Create direct delivery*

Both options require entering a sales order for the customer, who receives the items. When registering an order for direct delivery, a separate warehouse is the only difference to a regular order. Applying a specific warehouse for direct deliveries avoids mixing direct deliveries and regular inventory transactions in the warehouse.

When you are finished registering the sales order, you may create the related purchase order by pushing the appropriate option in the button *Functions* of the sales order form.

The option *Functions/Create purchase order* generates a purchase order, which refers to the sales order. You may see that reference in the header on the tab *References* as well as in the lines looking at the item reference on the tab *Other* and at the marking form (button *Inventory/Marking*). Processing of purchase and sales order works like processing regular orders, including packing slips and invoices. Purchase delivery is to your warehouse or your company address.

The option *Functions/Create direct delivery* generates a purchase order as well, but links it closer to the sales order. Purchase delivery is to the customer address, modifications of the address in the sales order as well as changes of quantity or delivery date will synchronize the purchase order.

For direct deliveries, you do not post a packing slip in the sales order. If you are required to print a packing slip for the customer, you may select the checkbox *Print sales documents* in the posting form for the packing slip receipt in purchasing as shown in Figure 4.21.

When posting the packing slip receipt for a direct delivery in purchasing, Dynamics AX automatically posts the related sales packing slip. Invoice posting in sales then is independent from the purchase invoice, however.

Sales order

**Create
purchase
order**

**Create direct
delivery**

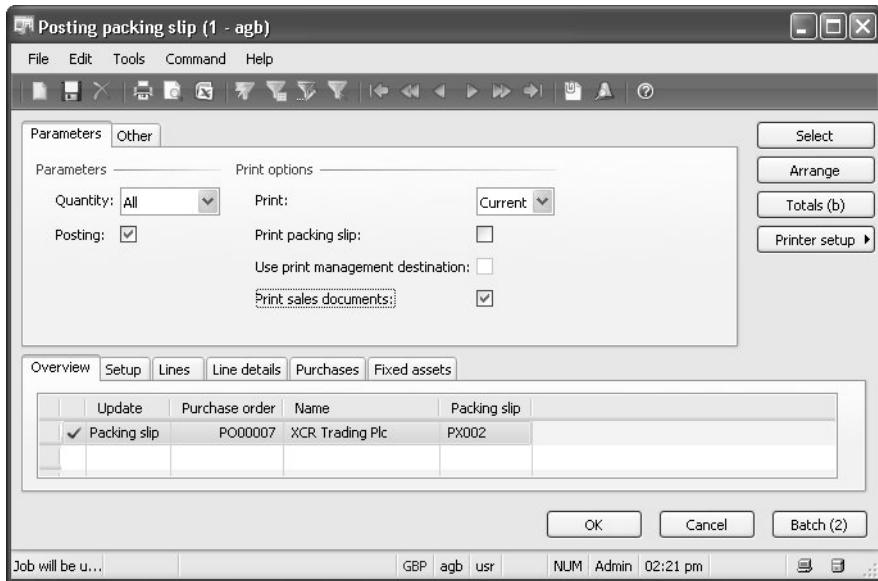


Figure 4.21: Sales packing slip printing when posting a packing slip receipt

References

If you need to know the sales order line related to a purchase order line or the other way around, you may take to look at the item reference on the tab *Other* of purchase or sales order lines.

In the header of purchase or sales orders, you may see the reference on the tab *References*. In the sales order form, you may also push the button *Inquiries/Purchase order* to open the related purchase order.

4.7.2 Case Study Exercise

Exercise 4.17

Direct delivery

Your customer orders 100 units of the item entered in exercise 3.4. In order to avoid stocking that large quantity in your warehouse, you want to process a direct delivery. Enter an appropriate sales order and choose the option *Create direct delivery* to generate a purchase order for you vendor of exercise 3.2.

Your vendor then confirms shipping the item with packing slip PS004. You want to post the packing slip receipt in the purchase order. In the next step, check the status of the sales order, then post and print the sales invoice.

After receiving the purchase invoice VI002, you post the invoice receipt.

5 Manufacturing

The primary responsibility of manufacturing is to produce finished goods. To meet this task, manufacturing needs to consume purchased items as well as work center capacity (men and machinery). The manufacturing process may include the production and stocking of semi-finished goods. Semi-finished goods themselves are items that are included in the bill of materials to produce finished goods.

5.1 Business Processes in Manufacturing

Before we start to go through the details, the lines below should give an overall picture of business processes in manufacturing.

5.1.1 Basic Approach

Like in purchasing and sales, correct master data are an essential prerequisite to control manufacturing successfully.

Item data contain a description of material characteristics. The bill of materials (BOM) describes the structure of finished or semi-finished items, consisting of components – raw material, parts or semi-finished products.

Work center groups and work centers are the place providing capacity to execute operational services. Dynamics AX knows different types of work centers: Human resources, machines, tools and vendors. Routes and operations describe the work required to produce finished goods.

In the course of production order processing, master data copy to transaction data. You may modify these default data in transactions, as an example if choosing a different bill of materials in a specific production order.

Figure 5.1 shows the steps required in the manufacturing process.

Master data

Transaction data

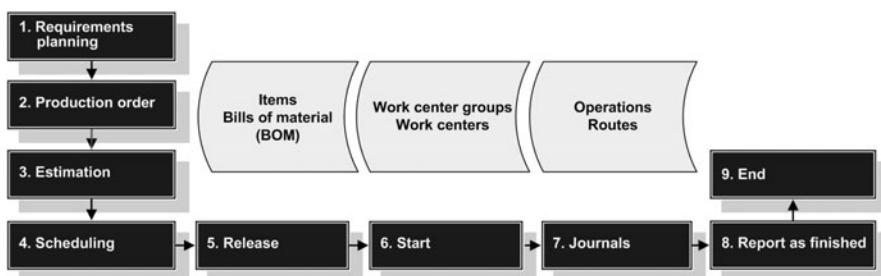


Figure 5.1: Production order processing in Dynamics AX

Material requirement	The identification of material requirements in operations planning (master planning, see Section 6.3) is the first step in the manufacturing. Depending on item coverage settings, the item demand comes from different sources: Master scheduling may include sales forecasts as well as current sales quotations, sales orders, quantity in inventory and coverage settings for minimum stock.
Production orders	As a preliminary step to production orders, master scheduling in operations planning generates planned production orders, which you may transfer to actual production orders. Apart from transferring planned orders, you may create production orders in the following ways: <ul style="list-style-type: none">– Manual entering a production order– Creating a production order out of a sales order line– Creating a production order for a semi-finished item out of the finished item production order (sub-production)
	A production order consists of an order header, which refers to the produced item, and order lines. Unlike purchase and sales orders, which contain item lines only, production orders contain two separate types of lines: BOM item lines and route operation lines. Item and operation lines of a production order show in two different forms, which you may access pushing the appropriate button in the production order.
	Depending on parameter settings, you need to execute all subsequent steps of production order processing from estimation to ending the order individually or skipping steps you do not require in a certain order.
Estimation	Estimation is the first step in order processing after creating a production order. Estimation is necessary to determine items and work centers, required to manufacture the product, in terms of quantity and costs.
Scheduling	Whereas estimation only calculates item quantity and work center capacity demand without timing it, scheduling as the next step calculates exact dates for production. Depending on the scheduling direction, Dynamics AX calculates the start and end date for production order based on available capacity.
Release	Releasing a production order means to hand it over from the front office to the shop floor. When releasing the order, you will usually print the production papers.
Start	As soon as manufacturing of a production order should actually start, you need to set the order status to "Started". At this time, you may start to post item and working time consumption referring to the order.
	When starting an order, you usually will print the picking list and post automatic consumption of items and work center capacity depending on applicable settings.

In the course of the manufacturing cycle, the shop floor consumes material and work center capacity. Reporting of this consumption is done by posting production journals.

Depending on production settings, journal posting is done manually or automatically (applying scheduled figures). In order to report working time consumption, you may as well apply the module *Shop Floor Control*.

When manufacturing is completed for the whole or a partial quantity of the finished product, you want to post reporting as finished. After posting, the reported quantity of the finished product is available in inventory.

Ending a production order is the last step in production order processing. At this stage, actual costs are calculated for the production order and finally posted to the general ledger.

Yet in the course of production order processing before, production journals for material and working time consumption on the one hand and finished product receipts on the other hand post to ledger accounts. These postings for work in progress (WIP) and finished items depend on parameters as well as on item and work center settings as shown in Section 8.4.3.

According to the general principle for processing transactions in Dynamics AX, the voucher principle also applies to transactions in manufacturing. You have to register a transaction in a journal, before you can post it. Transactions posted automatically also comply with that principle by automatically generating journals before posting. Figure 5.2 shows an overview of the documents in production order processing.

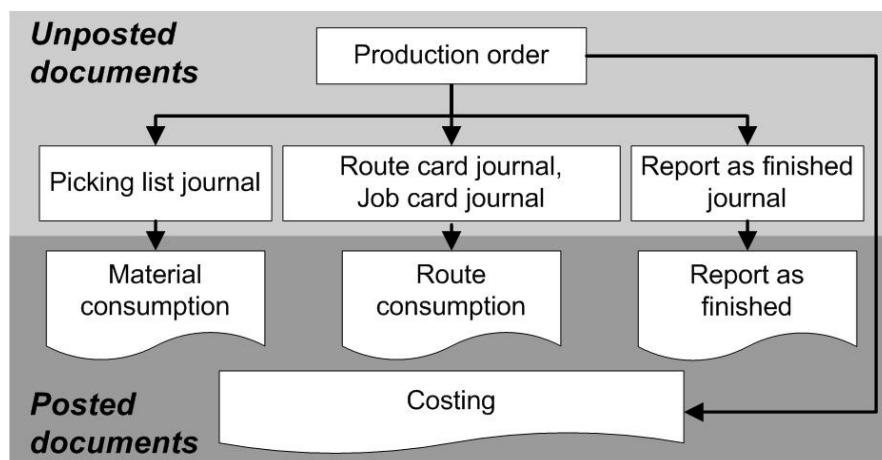


Figure 5.2: Posted and unposted documents in the production module

Production journals

Report as finished

End

Ledger integration

Voucher principle

5.1.2 At a Glance: Production Order Processing in Dynamics AX

In order to give an overview of the main steps in production order processing, this page is here to show the basics. For your convenience, you may post all transactions directly in the production order form. Of course, you may choose the *Production Orders* list page instead of the form as well.

Entering an order

In order to create a new production order, you want to insert a record in the form *Production> Production Order Details* by pushing *Ctrl+N* or the icon . Dynamics AX shows the *Create production order* form then, where you may select the *Item number* of the manufactured item. Data from the item like quantity, BOM number and route number will transfer to the production order. Pushing the button *OK* in the create order form, you will insert a new production order.

In the production order form, you may edit material components pushing the button *BOM* and route operations pushing the button *Route*.

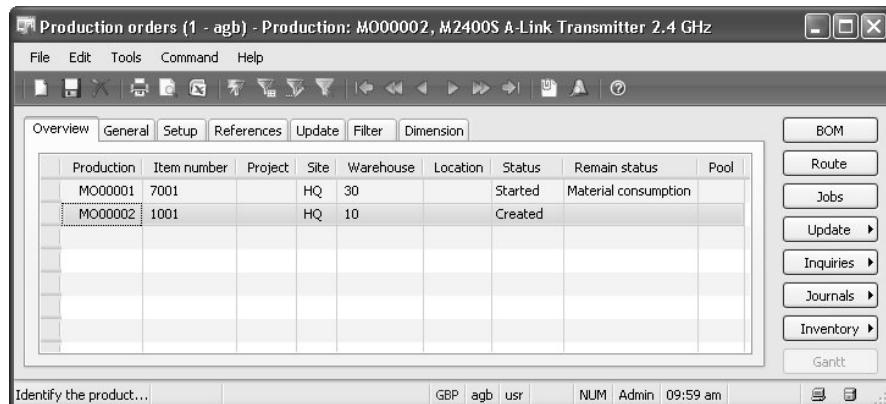


Figure 5.3: The production order form

Changing the status

Processing the production order changes the order status. You do this pushing the button *Update*, choosing the option *Estimation, Scheduling (Operations scheduling or Job scheduling)* and *Release* one after the other. When changing the status, you may select certain parameters – e.g. regarding production paper printing or the planning direction – on the tab *General* of the update form in each step.

You may print production papers (job card, route card) when releasing the order and picking lists when starting it. If you need to print production papers later, you may choose the required document in the menu item *Production> Reports> Production papers*.

As soon as the production order should go to the shop floor, you want to push the button *Update/Start* posting automatic material and route consumption in parallel. If you start an order without executing the previous steps before, Dynamics AX executes them automatically when starting.

In order to post the consumption of items that have to be recorded manually, you may push the button *Journals/Picking list*. Pushing the button *Picking list/Create lines* in the production journal, you may create a proposal for the picking list lines. Selecting “Remaining quantity” in the create lines dialog box will default open quantities to the journal lines. If required, you may enter the warehouse and other dimensions in the journal lines before posting the picking list by pushing the button *Post*.

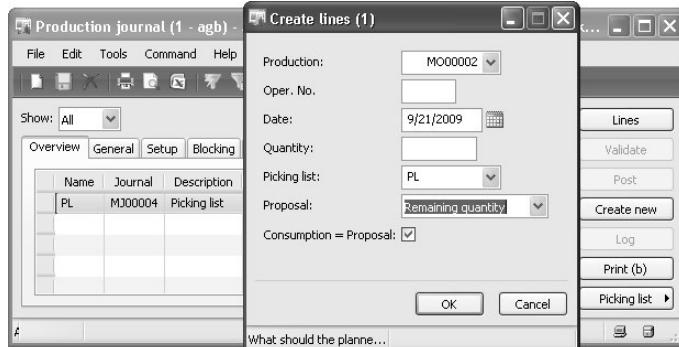


Figure 5.4: Creating a proposal for the picking list lines

Depending on the scheduling type (*Operations scheduling* or *Job scheduling*), you may report actual working time either on route level (button *Journals/Route card*) or on job level (button *Journals/Job card*). For reporting jobs, job scheduling is a prerequisite.

There is no proposal when manually reporting working times. You may push the button *Create new* in the journal header and insert the operation/job number, hours and good quantity in the lines before pushing the button *Post*.

When reporting as finished pushing the button *Update/Report as finished*, the inventory quantity of the finished item increases. Depending on item settings, you need to record the warehouse and other dimensions like a batch number. If you want to ignore missing consumption postings, you may select the checkbox *Accept error* on the tab *General* in the update form.

When posting of all transactions for the production order has been finished, you may cost and close the order pushing the button *Update/End*.

Start

Material consumption

Route consumption

Report as finished

Costing

5.1.3 Multisite Functionality in the Production Module

Since manufacturing is the core part of supply chain management, the multisite functionality to manage subsidiaries in Dynamics AX affects production module in particular. In an overview, multisite functionality shows following implications to the production module:

- Sites as an inventory dimension are included in inventory quantity and transactions
- Production units represent plants for capacity management
- Site-specific master data: Bills of materials and routes
- Master planning on site level
- Site-specific production parameters

Parameters

You may access site-specific production parameters in the form *Production> Setup> Parameters by site* if you want to set different parameters per site. It depends on the selection in the lookup field *Parameter usage*, if a company applies site-specific production parameters. You may find that selection in the general production parameters (*Production> Setup> Parameters*).

5.2 Items and Bills of Materials

All materials required for production in Dynamics AX need to be included in the item records. Apart from actual items in inventory like finished products, semi-finished products and raw material or parts, item numbers are as well required for phantom items or services like subcontracting.

Bill of materials

Bills of materials (BOM) control the items that a finished product contains. You may assign a single bill of materials to several items. On the other hand, you may as well assign several bills of material to a single item. You will require this, if the bills of materials are valid for a certain period or depend on the lot size as an example.

Variants

In order to manage item variants, Dynamics AX includes the item dimensions *Configuration*, *Size* and *Color* making it possible to separate variants by quantity and value in inventory. Applying configuration groups and configuration rules, you may process a make-to-order production. A detailed description of item configurations is beyond the scope of this book, however.

5.2.1 Item Records in Manufacturing

There is no difference in Dynamics AX for finished products and raw materials or parts regarding general master data in the item record (*Inventory management> Item details*).

Details on general item data are available in Section 7.2 of this book. The lines below only cover item data specifically required for manufacturing, therefore.

The item type – shown in the right-most column on the tab *Overview* of the item form – needs to be “BOM” for finished and semi-finished products, since only items of this type may refer to a bill of materials. You will set the item type when inserting an item. Later on, you may change the type of an item pushing the button *Functions/Change item type* in the item form.

As with purchasing and sales, defaults for production are available on the tabs *References* and *Price/Discount* in the item form as well as on related forms opening by pushing the button *Setup/Default order settings* or *Setup/Site specific order settings*. In the forms for default and site-specific order settings, you may find the settings for production like lot size and order quantity on the tab *Inventory*.

In the item form, the *Base cost price* column on the tab *Price/Discount* specifies the general cost price for the item. A site-specific cost price is available pushing the button *Price* in the item form as described in Section 7.2.4.

If the inventory model group of an item refers to a value model “Standard cost”, you need to activate a cost price in the item price form, selecting a costing version that refers to the costing type “Standard cost”.

The checkbox *Phantom* on the tab *References* sets a default, which applies when inserting the item in BOM lines. Phantom items are semi-finished products referring to a bill of materials and possibly a route. When estimating a production order, Dynamics AX explodes BOM lines of the type “Phantom”, however. As a result, the production order contains the components of the phantom item instead of the phantom item itself.

If the item type of an item is “Item”, it will be purchased from a vendor. If the item type is “BOM” – for finished or semi-finished items – you may choose to purchase the item nevertheless by selecting the checkbox *Stop explosion* on the tab *References* of the item form.

For the items concerned, master scheduling in Dynamics AX will generate planned purchase orders instead of planned production orders. The main vendor defaulting into the planned purchase order comes from the field *Vendor* on the tab *References* of the item form.

Item type

Quantity and price

Phantom item

Item coverage

If you are required to override the general settings of the item record for a certain site, warehouse or other inventory dimension, you may access the item coverage form (button *Setup/Item coverage*). On the tab *General* there, you may find the *Vendor account* to enter a dimension-specific main vendor as well as the *Planned order type* lookup field (instead of the checkbox *Stop explosion*), where you may select whether to create a purchase or a production order.

Flushing principle

The *Flushing principle* on the tab *References* of the item form controls, if production orders should post automatic consumption of BOM lines, which are in the BOM of the item.

The flushing principle shows following options:

- *Start* (automatic consumption when starting the production order)
- *Finish* (automatic consumption when reporting as finished)
- *Manual* (no automatic consumption)

As a prerequisite for the automatic consumption based on that item setting, the lookup selection *Automatic BOM consumption* on the tab *General* of the update form for starting a production order or reporting as finished needs to be “*Flushing principle*”. The default for the lookup field *Automatic BOM consumption* in the update form is available on the tab *Automatic update* of the production parameters.

Calculation group

Another setting for production, available on the tab *References* of the item form, is the *Calculation group* for *BOM calculation*. If you select a calculation group in an item record, that group overrides the general calculation group in the inventory management parameters (*Inventory management> Setup> Parameters*, tab *Bills of materials*) when calculating costs for the item.

You may access calculation groups in the form *Inventory management> Setup> Bills of materials> Calculation groups*. Calculation groups control the basis for calculating the cost price and sales price of items and therefore serve the same purpose as *Cost categories* for work centers and routes (see Section 5.3.4).

5.2.2 Bills of Materials (BOM)

A bill of materials (BOM) primarily is a list of items and quantities. The main purpose of a bill of materials is to specify the components (raw material or parts) of a finished item.

BOM structure

Items, which are part of a BOM, may themselves consist of other items and therefore refer to a secondary BOM. Such items are semi-finished goods constituting a multi-level product structure.

As shown in Figure 5.5, bills of materials in Dynamics AX are independent from items. You may assign one or several bills of materials to an item.

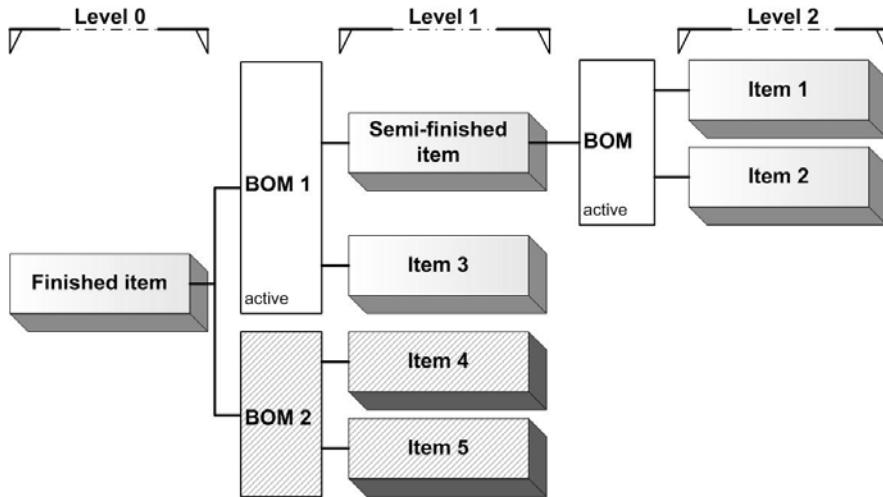


Figure 5.5: Example of a multi-level product structure

In order to apply a bill of materials in production, it has to be approved. Bills of materials, which you want to apply as a default in production orders and in master planning, in addition need to be activated. The active BOM needs to be unique for a certain period, quantity and site.

If a single bill of materials is assigned to several finished items, you may approve and activate the BOM independently for the different items. As an example referring to Figure 5.5, you might assign and activate BOM 1 as well as BOM 2 for other finished items, no matter if they are approved or activated for the first finished item.

You may find bills of materials in two different areas: In production on the one hand, where they are the basis for calculating of component item requirements, and in sales on the other hand, where simple bills of materials specify kits in sales orders.

For items of the item type "BOM", you may access available bills of materials in the item form (*Inventory management> Item details*, button *BOM/Lines*) as well as in the BOM form (*Inventory management> Bills of material*). Although both forms manage the same BOM records, the structure of the forms is different.

Since understanding the data structure is easier in the BOM form, we look at this form first, accessing it in the menu item *Inventory management> Bills of material*. The upper part for the BOM form shows a list of available bills

Areas of BOM usage

Accessing BOMs

BOM form

of material, whereas the lower part shows the finished items assigned to the BOM selected in the upper part.

In order to enter a new bill of materials, you want to insert a record in the upper part of the BOM form. Depending on the settings of the number sequence, the BOM number inserts automatically or has to be entered manually. If applying site-specific bills of materials, you may enter the site in the column *Site*. Otherwise, you will leave the site empty to specify a general bill of material.

In the next step, you want to insert a new record in the lower part of the form, registering the item number of the finished product to which the BOM applies. If the BOM is only valid for a certain period, you may enter the *From date* and the *To date*. If the BOM assignment depends on the lot size, you may enter a *From qty.* In order to assign separate bills of materials to different sites, you may additionally register the site in the assignment line. If you want to assign the BOM to a second finished item, you need to insert a second assignment line.

Pushing the button *Lines*, you may open the BOM lines form to enter the components of the finished product.

The screenshot shows the SAP BOM (1 - agb) application window. The title bar reads "BOM (1 - agb)". The menu bar includes File, Edit, Tools, Command, and Help. The toolbar contains various icons for file operations like Open, Save, Print, and Filter. Below the toolbar are two tabs: "Overview" (selected) and "Configuration route".

The main area displays a table with columns: BOM, Name, Site, Item group, Approved by, and Approved. The table contains four rows:

BOM	Name	Site	Item group	Approved by	Approved
BM00001	BOM M24005	HQ	FP	E001	<input checked="" type="checkbox"/>
BM00002	BOM for housing M24005	HQ	SP	E001	<input checked="" type="checkbox"/>
BM00003	BOM V24005		FP	E001	<input checked="" type="checkbox"/>
BM00004	M24005 (starting from 100 pieces)	HQ	FP	E001	<input checked="" type="checkbox"/>

On the right side of the screen, there are several buttons:

- Lines
- Designer
- Approve
- Configuration rules
- Functions >
- Approve (b)
- Activation
- Send electronically

Below the table, there is a section titled "Versions" with a smaller table:

Item number	Site	From date	To date	From qty.	Active	Approved by	Approved
1001	HQ			100.00	<input checked="" type="checkbox"/>	E001	<input checked="" type="checkbox"/>

At the bottom of the window, there is a status bar with currency (GBP), language (agb), user (usr), and system information (NUM Admin 05:22 pm).

Figure 5.6: Assigning a bill of materials in the BOM form

Approval and activation

Only approved bills of materials are available for manufacturing, when creating a production order. In order to approve the bill of materials and the BOM assignment (*Version*), you need to push the button *Approve* in the upper and lower pane of the BOM form. When approving the BOM as-

segment in the lower pane, you may approve the BOM itself in parallel, though.

If you want to default the bill of materials in production orders and in master planning, you need to activate the BOM assignment pushing the button *Activation*. Activated BOM assignments show a checkmark in the column *Active*.

In order to enter a new bill of materials, which is similar to an existing one, you may apply the copy-function. The copy-function is available in the BOM lines pushing the button *Functions/Copy*.

When accessing the bill of materials pushing the button *BOM/Lines* in the item form, Dynamics AX shows only bills of materials assigned to the item selected in the item form. If a bill of materials is assigned to several items, you need to keep in mind that modifying the bill of materials in this form applies to all other items concerned as well.

If you want to enter a new bill of materials in the BOM lines form accessed from the item record, you need to push the button *Create BOM*. Choosing to create a new line in the upper part of the form is only applicable, if you want to assign the item to an existing bill of materials.

BOM copy

BOM in item form

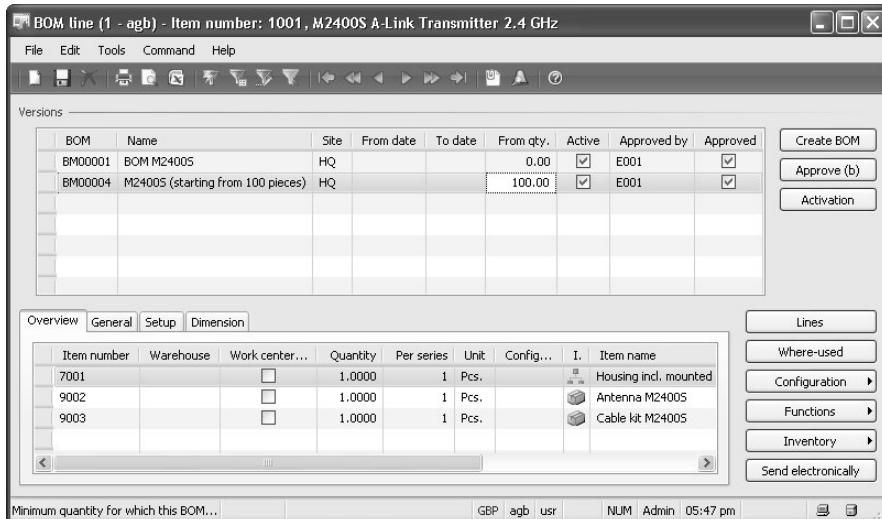


Figure 5.7: Bill of materials lines accessed from the item form

Dynamics AX also applies the term “Versions” for the assignment of bills of materials to items. This term is just another name for the BOM assignment, however.

BOM versions

BOM lines	<p>BOM lines contain raw materials and parts required for producing the finished item. They are available in the lower part of the BOM lines form opened from the item record. If you want to access the BOM lines in the BOM form described before, you need to push the button <i>Lines</i> opening the BOM lines in a separate form.</p> <p>When inserting a new BOM lines, you need to register the item number and quantity at least. Two other important fields are available on the tab <i>General</i>: The operation number and the line type.</p>
Assigning operations	<p>Master planning as well as scheduling a production order calculates material requirements in a way, which requires all components to be available at the start date of the production order.</p> <p>If you do not need certain components until a later date, you may select the operation number (<i>Oper.No.</i>) of the route operation, for which the component is required, in the BOM line. The operation numbers available derive from the route assigned to the finished item. If you want to select the operations number, you will open the BOM lines out of the item form, therefore.</p>
Line type	<p>The line type is another important setting, controlling the explosion of a BOM line. In a BOM line, following line types are available for this purpose:</p> <ul style="list-style-type: none">- <i>Item</i> Semi-finished or purchased item, material requirement in inventory- <i>Phantom</i> Semi-finished item, replaced by its components when estimating a production order- <i>Production</i> Semi-finished item, which creates a sub-production order when estimating the production order of the finished item- <i>Vendor</i> Service item for subcontracting <p>BOM lines of the line type “Item” generate a material requirement in inventory. Master scheduling will combine requirements of different orders and warehouse replenishing proposals according to item coverage settings in order to generate production or purchase orders. There is no direct link between the order for the semi-finished item and the original production order of the finished product, therefore.</p> <p>If the item type of the BOM line is “Item” in the item record, master scheduling will generate purchase orders. If the item type is “BOM”, it will be a production order except for following settings, where purchase order applies:</p>

- the checkbox *Stop explosion* in the item record is selected
- the *Planned order type* in the item coverage (item form, button *Setup/Item coverage*, tab *General*) is "Purchase order"

If a bill of materials is site-specific, you may select a picking warehouse in the column *Warehouse* of the BOM lines. For general bills of materials, which do not refer to a certain site, entering of a picking warehouse in the BOM lines is not possible. You may select the checkbox *Work center consumption* on tab *General* of the BOM lines, however, which refers to the picking warehouse of production units.

If you are looking for an easy way to manage bills of materials, you may want to use the BOM designer. The BOM designer is available pushing the button *BOM/Designer* in the item form or the button *Designer* in the BOM form.

Picking warehouse

BOM designer

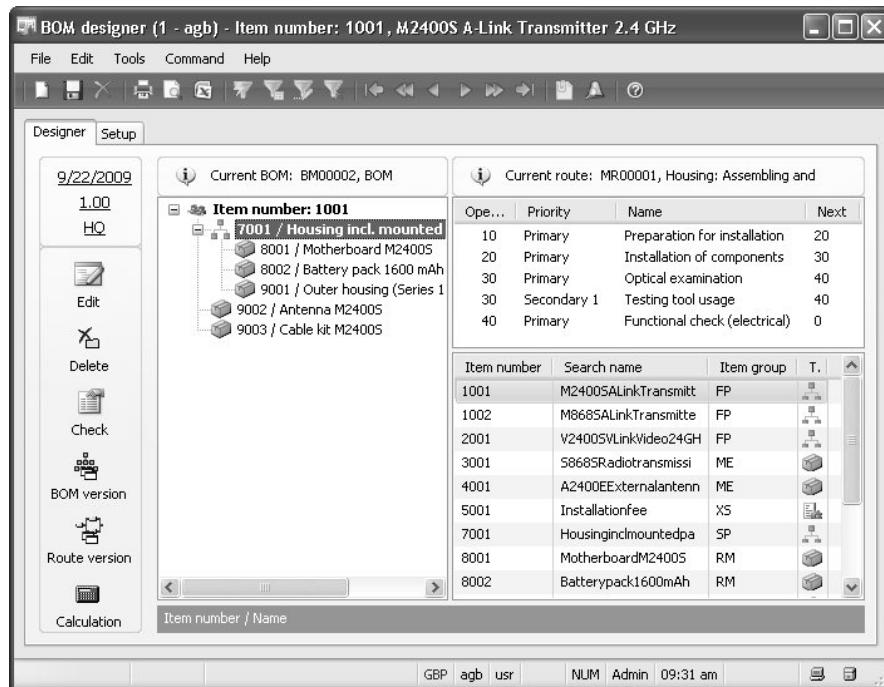


Figure 5.8: The BOM designer

The BOM designer shows a multi-level structure of the bill of materials with the option to insert items into the selected BOM by simply dragging and dropping them from the right pane into the left pane. If you open the

BOM designer from the item form, it does not only show the bill of materials, but also the route of the selected item.

In order to change settings for BOM designer display, you may switch to the tab *Setup* in the BOM designer form.

Where-used When accessing the bill of materials, it shows the components of an item. If you need to know for a component, in which items it is included, you want to access the where-used form. You may access the where-used form, which shows all related bill of materials and the finished items assigned, pushing the button *BOM/Where-used* in the item form after selecting the component.

New in AX 2009 Items new in Dynamics AX 2009 related to BOM administration include the option to manage separate bills of materials per site.

5.2.3 Case Study Exercises

Exercise 5.1

Components Your company wants to produce a new finished item, which consists of two components. You want to enter these components in Dynamics AX, registering an item with the item number I-##-C1 and the item name “##-Component 1” (## = your user ID) as well as an item with the item number I-##-C2 and the item name “##-Component 2”. In case the number sequence for the item number is automatic, leave the automatic number.

Select an appropriate item group (raw material/parts) and an inventory dimension group, which only contains site and warehouse as active dimensions, for the components then. The inventory model group should be a group referring to the inventory model “FIFO”. Enter the main site for purchasing and inventory in the default order settings. In the site-specific order settings, select the main warehouse for purchasing and inventory.

On the tab *References* in the item form of both items, choose the flushing principle “Manual” and an item sales tax group with the standard tax rate for purchasing. In addition, select your vendor of exercise 3.2 to be the main vendor for the items. The unit of measure for the items is “Pieces”, the base purchase price and the base cost price is GBP 100.00.

Exercise 5.2

Finished item For the finished item, enter an item with the item number I-##-F (if no automatic number sequence is assigned) and the item name “##-Finished product” (## = your user ID). Select an appropriate item group (finished product) and an inventory dimension group, which only contains site and warehouse as active dimensions. The inventory model group should be a group referring to the inventory model “FIFO”. Enter the main site for

inventory and sales in the default order settings. In the site-specific order settings, select the main warehouse for purchasing and inventory.

On the tab *References* in the item form, choose an item sales tax group with the standard tax rate for sales. The unit of measure for the items is "Pieces", the base cost price is GBP 500.00 and the base sales price GBP 1,000.00.

Make sure to choose the right item type for the finish product in order to assign a bill of materials.

Exercise 5.3

Now that item records for the finished item and its components are available, enter a bill of materials for the finished item of exercise 5.2 choosing the appropriate button in the item form.

BOM

The BOM applies to the main site and contains two units of the first and one unit of the second item entered in exercise 5.1. The warehouse to pick the components should be the main warehouse. When you are finished entering the components, approve and activate the BOM.

5.3 Work Centers and Routes

Work centers and work center groups specify resources, which execute the operational services in the manufacturing process. Work centers include working places and personnel as well as machines, tools and vendors (subcontractors). They provide the available capacity, which master planning then compares with capacity requirements.

Capacity requirements calculate from routes, which specify work centers and working time consumption necessary to produce a certain item.

Beside items and bills of materials, work centers and routes therefore are the second area of master data required for production order processing.

5.3.1 Production Units

Production units represent plants for capacity management. Dynamics AX manages production units separate from the dimension "Site", which is available in material management. You may assign several production units to a single site, therefore.

If you want to enter a production unit, you need to access the form *Production> Setup> Production units*. Apart from a code and name, you need to assign a site to a production unit. On the tab *General*, you may enter a picking warehouse, which applies to BOM lines that show a mark in the checkbox *Work center consumption*.

In order to link a production units to a work centers, you need to access the work center groups form (*Basic> Work center groups*).

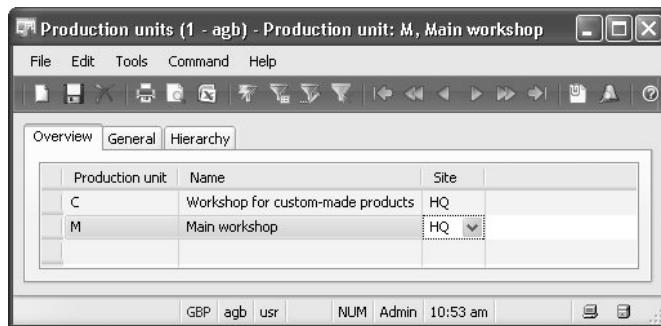


Figure 5.9: Linking a site to a production unit

Production units are not included in inventory transactions, but you may apply them in the production module for filtering forms that refer to work centers.

New in AX 2009

Production units to group work centers are a new item related to the multisite functionality in Dynamics AX 2009.

5.3.2 Work Center Groups

A work center group in Dynamics AX collects similar work centers to a group. It is required for following purposes:

- Operations scheduling
- Defaults for related works centers

Operations scheduling

Dynamics AX includes two types of scheduling, which may run alternatively or successively: Operations scheduling and job scheduling.

Operations scheduling calculates manufacturing time according to the work center or work center group in routes. Usually a route contains work center groups, which is why operations scheduling is on work center group level in most cases. In a later step, job scheduling in a production order will determine the most favorable work center of the group.

The available capacity of a work center group is total capacity of its work centers. When applying a work center group, you need to assign at least one work center therefore.

Defaults

The fields entered in the work center group provide the defaults when creating a new work center referring to the group. If required, you may change the defaults when editing works centers, however.

Operations scheduling will apply settings of the work center group, job scheduling the settings of the selected work center.

An exception applies to the assignment of production units and sites: You cannot assign them on work center level; assignment is only available for work center groups.

In order to manage work center groups, you may access the form *Basic> Work center groups*. You may insert a new work center group as a new record there.

When entering a work center group, the work center type specifies an important difference between work center groups. Following types are available:

- *Machine* (default)
- *Human Resources*
- *Tool*
- *Vendor* (for subcontracting)

Usually, you do not require separate work centers for a machine and its operating staff. You will manage them in a common work center of the type "Machine". If you want to manage tools, you typically might enter tool usage as a secondary operation in routes as shown in Section 5.3.4.

In order to specify the operating hours of a work center group, you want to assign a calendar on the tab *General* of the work center group form. Together with the efficiency percentage, the calendar determines the available capacity of a work center.

Production unit

Accessing groups

Work center type

Calendar

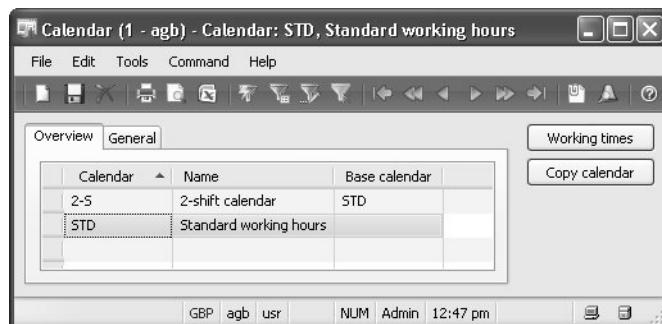


Figure 5.10: Managing calendars in the calendar form

Before you may assign a calendar to a work center, the calendar needs to be available in the form *Basic> Calendar*. In order to enter a new calendar – as an example if a department got deviating working times – you may

insert a record in the calendar form or copy an existing calendar pushing the button *Copy calendar*.

In order to assign working days and working hours, you may push the button *Working times* in the calendar form. In the working times form, you may insert and manage individual dates in the upper pane, entering the working hours for a day in the lower pane. Usually you create working days and hours automatically pushing the button *Compose working times*, however.

Working time templates

As a prerequisite for composing working times automatically, you need to set up working time templates. Working times templates are available in the form *Basic> Setup> Calendar> Working time templates*, where you specify the weekly working hours on the tabs *Monday* to *Sunday* after selecting the appropriate template on the tab *Overview*.

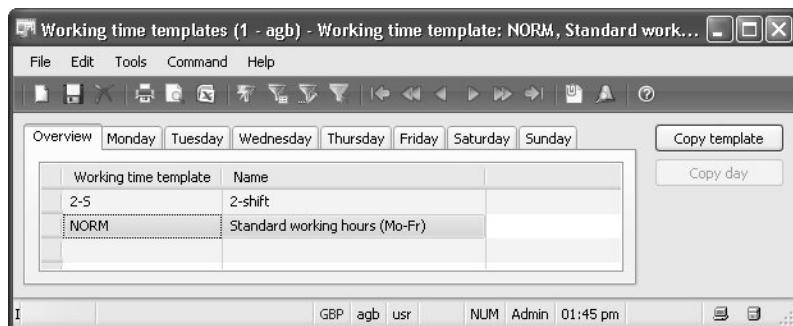


Figure 5.11: Working time templates specifying daily working hours

When choosing to run *Compose working times* in the working times form then, you may select a working time template to default daily working times.

Work center defaults

The work center type and calendar of a work center group are a default for related work centers. You may change them for individual work centers. Taking into account the relationship between operations scheduling and job scheduling, you should make sure to apply useful settings, however.

Work center groups as well provide defaults for the other fields in the work center form. You may find more details on these fields in the following section.

5.3.3 Works Centers

Work centers are the lowest level for managing resources in Dynamics AX. Therefore, they are the basis for job scheduling. Every work center refers

to a work center group, which gives the defaults for various fields in the work center record.

You may open the work center form by pushing the button *Work centers* in the work center group. When inserting a new work center, you need to take into account that the work center identification needs to be unique – not only within the work centers, but also within work center groups.

Accessing work centers

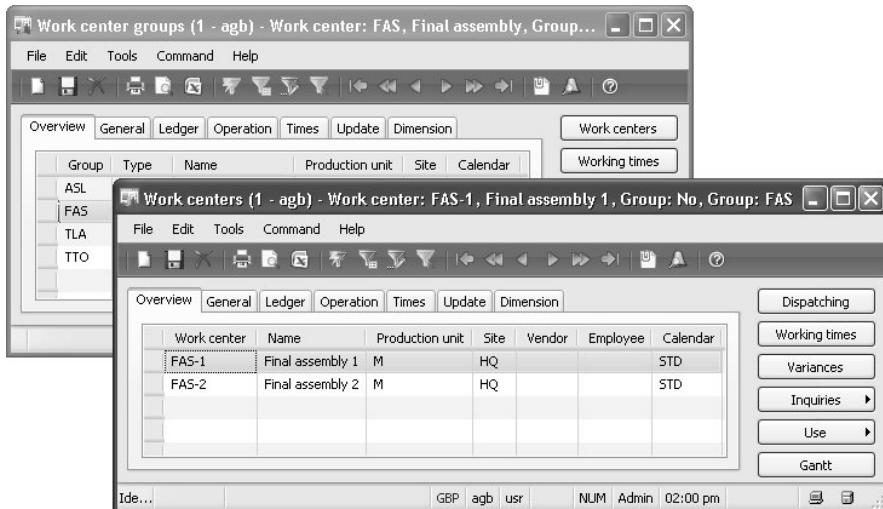


Figure 5.12: Managing work centers

On the tab *General* in the work center form, you may enter an efficiency percentage, which reduces or increases the scheduled time of a route. The default for the efficiency percentage is 100.

Efficiency percentage

If you enter a new work center, which is 25 percent faster than the other work centers as an example, you may enter 125 in the efficiency percentage, therefore. When scheduling an operation usually lasting 10 hours, the scheduled time for this work center will be only 8 ($= 10 * 100/125$) hours.

The checkbox *Finite capacity* controls, if scheduling is based on limited capacity utilization for the selected work center. If you select the checkbox, Dynamics AX does not schedule operations of different orders to run at the same time on that work center. Otherwise, scheduling calculates every production order separately not taking into account the other orders at the same work center.

Finite capacity

If you want to apply finite capacity, you need to make sure additionally that the master plan for master scheduling on the one hand and the update

form for operations and job scheduling on the other hand select to include finite capacity.

Unit of time

The unit of time for scheduling a work center is hours. If you need a different unit of time for a work center, you may enter a conversion factor in the field *Hours/time* on the tab *Times* of the work center form. If you need to record minutes for the times entered in the routes as an example, you will insert $1/60 = 0.0167$ in the field *Hours/time*.

If the unit of measure is not a unit of time in a certain work center, you may select an alternative *Capacity unit* on the tab *General* of the work center form. The field *Capacity* in this case contains the conversion factor to hours.

Defaulting routes

The tabs *Operations* and *Times* in the work center form contain defaults for route operations. These defaults apply, when you select the work center or work center group in a route.

Ledger integration

The tab *Ledger* in the work center form contains the ledger accounts, which apply for posting route consumption to the general ledger. When posting a route card or job card journal in production, Dynamics AX in parallel posts the cost amount of the consumed working time to the ledger accounts specified in the field group *Accounts-WIP* of the work center form. The accounts in the field group *Accounts-Costing* apply, when costing and ending a production order.

As shown in Section 8.4.3, you may as well specify to apply other settings for ledger integration in the production parameters, however.

5.3.4 Routes and Operations

A route contains the required operations to produce an item. It therefore is a supplement to the bill of materials, which contains the required material.

Like bills of materials, routes show planned figures, which give the targets for production. In the course of manufacturing, your workshop reports actual figures in production journal transactions. Comparing and analyzing target and actual figures gives the possibility for improvements.

In order to describe the operations in manufacturing sufficiently, a route needs to contain following data at least:

- Task to be performed (operation)
- Provider (Work center)
- Sequence (next operation)
- Duration (setup time, run time)
- Finished item (item number)
- Required material (bill of materials)

Operations, available in the form *Production> Setup> Routes> Operations*, are a prerequisite to set up a route in Dynamics AX.

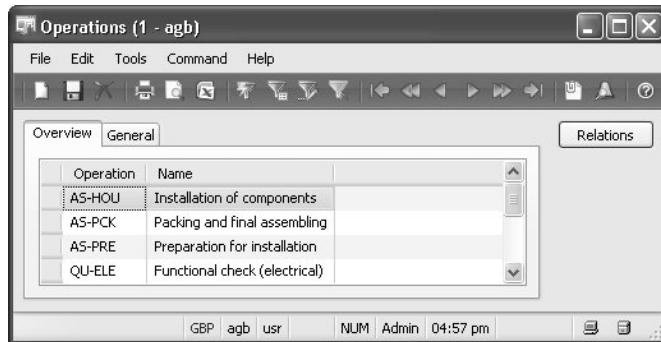


Figure 5.13: The operations form

Operations are independent from routes, containing only a unique code and a name to describe the performed activity. Required details like allowed time or work center are not available in the operation itself, but in the operation lines of assigned routes.

You may select an operation in as many routes as required. Pushing the button *References* in the operations form, you may see the routes referring to the selected operation.

The sequence of operations is not specified in the operation record, but in the route. You may distinguish two types of operation sequences:

- Simple sequence
- Complex sequence

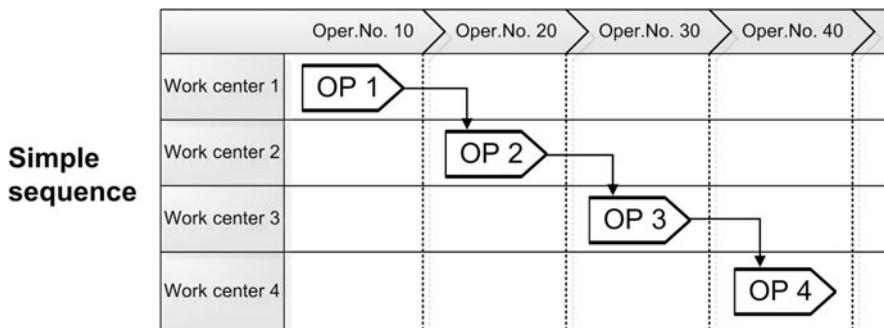


Figure 5.14: Simple operation sequence

Simple sequence

If the checkbox *Route network* on the tab *General* of the production parameters is cleared, simple operation sequences apply. Routes therefore only contain operations that are scheduled one after the other.

Complex sequence

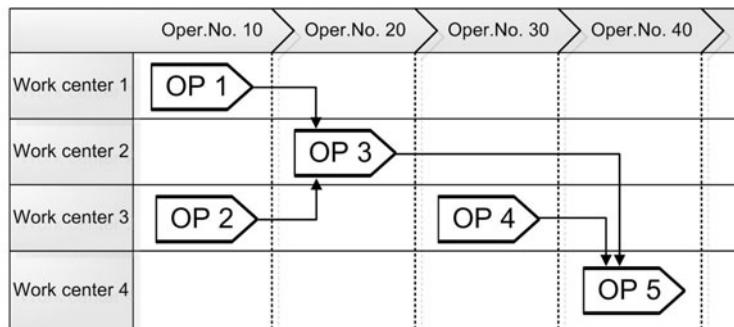


Figure 5.15: Complex operation sequence

Complex sequence

If the checkbox *Route network* is selected, however, you need to enter the next operation in every operation of a route. Therefore, complex operation sequences are available, where you may connect a certain operation to several independent prior operations.

No matter if simple or complex operation sequences apply, you may specify parallel operations on several work centers by setting up a secondary operation selecting the *Priority* "Secondary" for a route operation.

If the options in the route do not meet your specific requirements, you may set up an intermediate level of a virtual semi-finished item in the structure of a finished product. The line type of the BOM line, which contains that virtual item, should be "Production" to connect the production orders concerned closely to the production order of the finished item.

Managing routes

Managing routes in Dynamics AX is similar to managing bills of materials. As with bills of material, assignment of routes is only possible for items of the item type "BOM".

For the items concerned, you may access the route form pushing the button *Route* the item form as well as selecting the separate menu path *Production> Route Details*. Although both forms manage the same route records, the structure of the forms is different – similar to the different forms for bill of materials if accessed from the item form or from the menu.

If you want to work in list pages, you may as well access the list page *Production> Routes* to manage routes.

When choosing to manage routes in the form *Production>Route Details*, the upper pane of the route form shows a list of all routes available, whereas the lower part shows the finished items assigned to the route selected in the upper part.

In order to enter a new route, you need to insert a record in the upper pane of the route form. Depending on the settings of the number sequence, the route number inserts automatically or has to be entered manually. In the next step, you may insert one or more records in the lower pane of the route form assigning finished products to the route. As with bills of materials, you may enter validity dates, from-quantities and inventory dimensions like the site to create routes for specific settings.

Before you may select a route in a production order, you need to approve the route and the route assignment (*Version*) pushing the buttons *Approve* in the route form. If you want to default the route in production orders and in master scheduling, you need to activate the route assignment pushing the button *Activation*.

Pushing the button *Route*, you may open the route operations form containing required route operations. In the upper pane of the route operations form, you may insert the operations with their operation number one after the other.

If production parameters specify complex operation sequences, you need to enter the number of the next route operation in the column *Next* in every line except for the last operation.

The lower pane of the route operations contains detailed data for every operation. On the tab *Overview*, you may select site and work center or work center group. Defaults from the work center – e.g. the route group and the cost categories described below – transfer to the route operation, where you may modify them on the tabs *General*, *Setup* and *Times* as required.

If different operation details apply for an operation depending on the item produced (e.g. if the work center depends on the item), you may insert a second line in the lower pane of the route operations form, selecting the appropriate *Item code* and *Item relation*.

If the shop floor should execute operations in parallel, you may enter two operations with the same operation number, but a different priority, in the upper pane of the route operations form. As an example in Figure 5.16, the operation number 30 shows two parallel operations – one with priority “Primary” and one with priority “Secondary 1”.

Route operations

Route details

Secondary operation

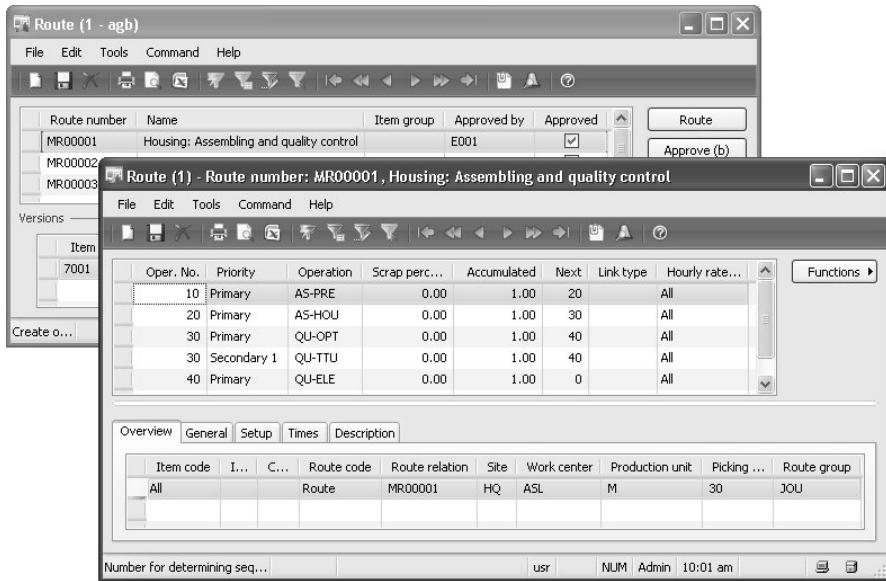


Figure 5.16: Managing route operations

Route groups

An essential setting for the posting of working time consumption related to an operation is the route group in the right-most column on the tab *Overview*. If you want to apply automatic posting of time consumption (actual = estimate), you need to select a route group with appropriate settings for automatic route consumption.

In order to access route group settings, you may choose the form *Production> Setup> Routes> Route groups*. In addition to the checkboxes controlling automatic posting of route consumption, you may find parameters regarding estimation and cost calculation on the tab *General* of the route group form.

The estimation and costing checkboxes control, if to include related operations in cost calculation. For regular operations, either the checkboxes for time based cost calculation or the checkbox for quantity based cost calculation will be selected.

Cost categories

On the tab *Setup* of the route form, you may find fields to choose applicable cost categories for the operation. In addition to the route group, cost categories are a second setting to control estimation and cost calculation. You may assign different cost categories for setup time, run time and quantity. When assigning cost categories you should make sure, however, that the appropriate checkbox in the route group is selected to include time or quantity in cost calculation.

You may access cost category settings in the form *Production> Setup> Routes> Cost categories*. Cost categories contain two important settings, the cost price and the cost group.

In order to manage a cost price, you may push the button *Price*, which opens the cost category price form. In that form you may enter a cost price with a start date, assigned to a costing version (for costing versions, please refer to Section 7.2.4). In order to apply the price, you want to activate it pushing the button *Activate*.

Cost groups are available to classify different types of costs in cost calculation as described in Section 5.4.1 of this book.

On the tab *Times* of the route operations form, you may find allowed times for the operation, split into setup time, run time, queue times and transit time. The figure you may enter in the field *Run time* is the time, which the workshop needs to process the quantity of the product entered in the field *Process qty*.

Times

If the *Process qty.* is 1.00, the run time is the time in hours to produce one unit. You may apply other units of time, selecting a conversion factor *Hours/time* in the route operation or a capacity unit in the work center as described in Section 5.3.3.

The total processing time of an operation calculates according to following formula then:

$$\text{PROCESSING TIME} = \frac{\text{Setup time} + (\text{Run time} \times \text{Quantity})}{\text{Efficiency percentage of the work center}}$$

In order to calculate the total lead-time, you need to add queue and transit times.

If workshop does not require all components of the bill of materials to be available when starting the first operation, you may link items in the bill of materials to a specific operation of the route as shown in Section 5.2.2.

Assigning material

Items new in Dynamics AX 2009 related to route administration include sites and production units in routes.

New in AX 2009

5.3.5 Case Study Exercises

Exercise 5.4

In order to better understand the function of route groups and cost categories, you want to set them up.

Setup

Register a route group ## (## = your user ID) for manual posting of working time consumption. Estimation and costing should be based on setup time and run time.

In the next step, you want to set up a new cost category ## with an appropriate cost group of your choice and an activated cost price of GBP 100.00.

Exercise 5.5

Work center In order to produce the finished product of exercise 5.2, a new work center is required.

Enter a new work center group W-## (## = your user ID) referring to the main site and an appropriate production unit. The name of the group is “##-assembly” and the type “Machine”. Choose the regular calendar for the work center calendar. The ledger accounts for the work center may be similar to existing work centers. For the route group and the cost categories, choose the elements entered in exercise 5.4.

Pushing the button *Work centers* you switch to the work center form, where you want to register the new work center W-##-1. You may leave the defaults from the work center group in the work center record without changes.

Exercise 5.6

Operation In order to produce your product, you need a new operation. Register that operation ## (## = your user ID) with the name “##-processing”.

Exercise 5.7

Route Manufacturing your product also requires a new route. You may enter this route based on the elements set up in previous exercises.

After selecting your item of exercise 5.2 in the item form, open the route form pushing the appropriate button. Insert a new route, which contains the operation of exercise 5.6 as the only route operation. The route operation refers to the work center group of exercise 5.5 on the main site. The run time for production is one hour per unit.

Finally approve and activate the route.

5.4 Production Orders

A production order is the request to manufacture a certain product. Apart from the item number and the order quantity of the finished or semi-finished item, production orders contain data regarding required materials and work centers.

The production status displays progress of a production order. Therefore, the status will update with every step in the sequential flow of order processing.

5.4.1 Basics of Production Order Processing

You may create a production order either manually or automatically. For automatic creation, following options are available:

- Automatic generation in master scheduling
- Transfer of a planned production order to a production order (see Section 6.3.4)
- Automatic generation from the BOM line of another production order (sub-production, see Section 5.4.3)
- Creating a production order directly out of a sales order line by pushing the button *Inquiries/Production*

Master planning parameters control, if master scheduling creates a production order or a planned production order (see Section 6.3.3).

If you create a production order manually, the first status is “Created”. The status “Created” is the only status, which allows deleting a production order. If you need to delete a production order in a later status, you first need to reset the status.

After creating a production order, it runs through the manufacturing cycle updating the order to following status:

- Created
- Estimated
- Scheduled
- Released
- Started
- Reported as finished
- Ended

The order status changes every time you update the production order, pushing the button *Update* in the order form, or running a periodic activity in the menu *Production> Periodic> Update* or *Production> Periodic> Scheduling*. Depending on parameter settings, you may skip certain steps. In this case, Dynamics AX will automatically run the omitted steps, applying standard parameter settings, when you start a subsequent step.

If you want to reset the status of an order, you may push the button *Update/Reset status* in the production order form. When resetting the status, you should keep in mind that Dynamics AX reverses all posted transactions referring to that status.

When updating an order choosing an option in the button *Update* of the production order form, an update form displays. In the update form, you may push the button *Default values*, if you require default values that are different to the standard defaults. Pushing the button *User default* in the default values form will apply customized default values to all users.

Starting point

Order status

Default values

Parameters	The production parameters (<i>Production> Setup> Parameters</i> or <i>Production> Setup> Parameters by site</i>) include the tab <i>Status</i> , where you may set from which status to which status production orders may be updated. These settings apply, when you want to skip production steps as well as when you reset the status.
Journals	As a precondition to post transactions in manufacturing, you need to set up the required journals in the form <i>Production> Setup> Journal names</i> . Picking lists, route cards, job cards and report as finished journals refer to different journal names, which you need to set up selecting the appropriate <i>Journal type</i> .
Calculation	Cost calculation requires two basic settings: Cost groups and costing sheets.
Cost groups	Cost groups are available to classify and group different types of costs in cost calculation as well as to specify different margins for sales price calculation. You may access the cost group form in the menu item <i>Inventory management> Setup> Bills of materials> Cost group</i> or in the menu item <i>Production> Setup> Routes> Cost groups</i> . The <i>Cost group type</i> of a cost group distinguishes following cost types: <ul style="list-style-type: none">- <i>Direct materials</i> (material consumption)- <i>Direct manufacturing</i> (work center operations)- <i>Indirect</i> (overhead margins)- <i>Undefined</i> (unspecific cost classification) In the column <i>Default</i> , you should select one cost group per <i>Cost group type</i> to specify appropriate default groups. In order to assign items to a cost group, you may select the appropriate cost group on the tab <i>General</i> in the item form. For items not assigned to a specific cost group, the default cost group for the cost group type "Direct materials" applies. Route operations are not assigned to a cost group directly. As shown in Section 5.3.4, route operations refer to cost categories, which then refer to cost groups. In order to get a clear structure of costs for estimation and costing, you may set up costing sheets accessing the form <i>Inventory management> Setup> Bills of materials> Costing sheet setup</i> . The costing sheet has got two different purposes: <ul style="list-style-type: none">- Classify costs by cost groups- Specify rules for calculating overhead costs In order to display a useful overview of different cost types when producing an item, the costing sheet contains lines for the different cost groups. If you want to enter a new line for a cost group in the costing sheet setup
Costing sheet setup	

form, you need to select the *Node type* “Cost group” when inserting the record.

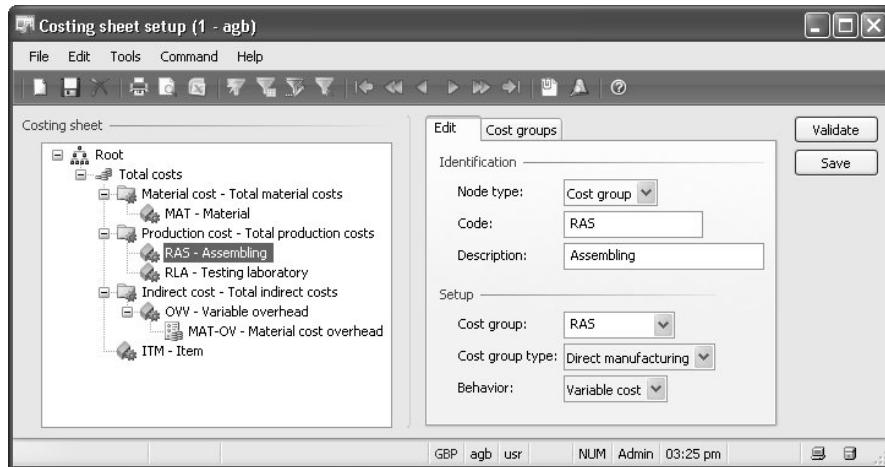


Figure 5.17: Setting up an easy costing sheet

If you want to specify calculation rules for overhead costs, you need to select a costing sheet line with a cost group of the cost group type “Indirect”.

You may insert a calculation line for overhead costs assigned to the indirect cost line then. The *Node type* of that calculation line needs to be “Surcharge” or “Rate”. After selecting a *Code* on the tab *Calculation* to specify the basis for the calculation, you may enter a percentage or rate in the lower pane of the form. The calculation needs to be assigned to a costing version (see Section 7.2.4) and activated. Ledger accounts for posting indirect costs to the general ledger need to be entered on the tab *Posting*.

Before closing the costing sheet setup, you need to save your changes pushing the button *Save*.

Items new in Dynamics AX 2009 related to cost calculation include the option to specify a costing structure and to calculate overheads in the costing sheet setup as well as to enter a cost group in the item form.

New in
AX 2009

5.4.2 Order Registration

Order structure

You may access production orders in the form *Production> Production order Details* or in the list page *Production> Production orders*. Like all documents, production orders contain a header with data common for the whole order like the order number, the item number of the finished product, the order quantity and the delivery date.

Unlike sales or purchase orders, production orders include two different types of lines:

- BOM lines (required material)
- Route lines (required work center operations)

In order to access the BOM lines that contain the items required for manufacturing, you may push the button *BOM* in the production order. Pushing the button *Route* in the production order, you will access the work center operations.

Defaults

When creating a new production order, Dynamics AX copies the active bill of materials and route of the finished item into the production order.

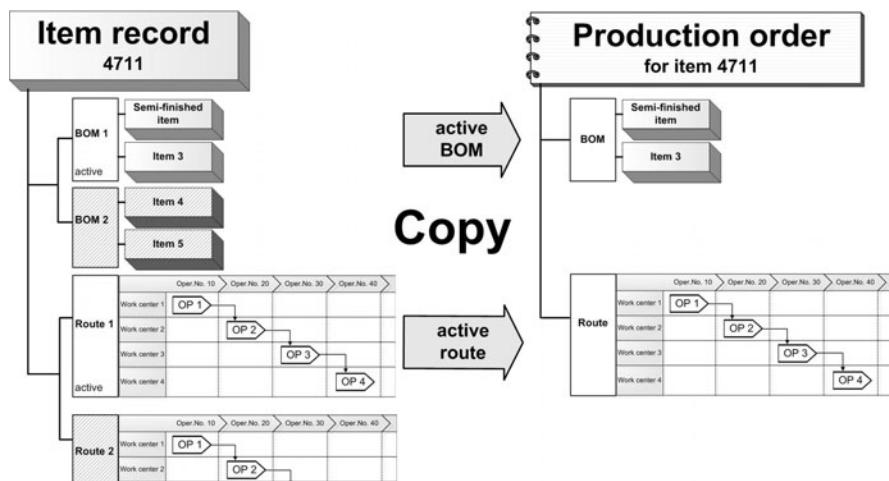


Figure 5.18: Copying BOM and route when creating a production order

Production orders therefore contain a copy of BOM and route, which you may modify according to the specific requirements of a certain production order. If there are several active bills of materials and routes available for a finished item, Dynamics AX selects the applicable version based on site, validity date, order quantity and item configuration.

Creating an order

If you want to enter a production order manually, you will insert a record in the form *Production> Production Order Details* or to push the appropriate action button in the list page *Production orders*. When inserting a new header, Dynamics AX shows the *Create production order* form, where you will choose the item number of the finished product. Depending on the selected item, Dynamics AX inserts several defaults.

If required, you may change the defaulted values, selecting a different route number as an example. If you do not want to choose a different BOM or route, but need to adapt BOM or route lines in the order, you may access the lines pushing the button *BOM* or *Route* in the create order form.

You may as well change settings of a production order later. If estimation or scheduling has been executed, however, you should update estimation and/or scheduling after changing the production order to ensure correct production data. If production papers have been printed already, you might need to reprint them with updated data.

Figure 5.19: Creating a production order

Pushing the button *OK* in the create order form, Dynamics AX will insert the production order that shows the status “Created”. In the course of production, you may update the status pushing the button *Update* or run-

ning an appropriate periodic activity. A summary of executed status updates is available on the tab *Update* of the production order.

References

Production orders, which are not created manually in the production order form, show a reference to their origin on the tab *References* of the production order form. The original order displays in the reference type and number, if a production order refers to another order.

If you have created the production order out of a sales order line, the reference type is "Sales order". In production orders generated as sub-production for the BOM line of another production order, the reference type is "Production line".

5.4.3 Estimation

Estimation is the first step after creating a production order. Primary task of estimation is to calculate the specific requirement of material and work center capacity to execute a production order. The basis for the calculation is the bill of materials and the route of the order.

In order to run estimation, you want to push the button *Update/Estimation* in the production order form. In the estimation form, you may choose a profit setting for the sales price calculation.

Cost estimation

In parallel to the calculation of required quantities and times, estimation calculates estimated costs based on the cost price of material components and route operations. The markup of the calculated sales price derives from the cost groups of the items and route operations.

After estimation, you may check the cost estimation pushing the button *Inquiries/Price calculation*. On the tab *Overview Estimation* of the calculation form, you may see the list of the individual estimation lines. The tab *Costing sheet* shows a summary according to the costing sheet setup.

Material requirement

Material requirements create inventory transactions when estimating. The appropriate inventory transactions of the items concerned look similar to the inventory transactions of open sales and purchase order lines.

Sub-production

For BOM lines of the line type "Production", estimation creates and estimates sub-production orders. Sub-production orders are regular production orders linked to the main production order with regard to scheduling and inventory transactions.

Purchase order

For BOM lines of the line type "Vendor", estimation generates a purchase order. The purchase order is required for subcontracting, applying a service item in the BOM line.

Phantom item

For BOM lines of the line type "Phantom", estimation replaces the BOM line by the components of the phantom item BOM.

5.4.4 Scheduling

Scheduling of a production order is necessary to calculate exact dates for material and work center requirements. You may distinguish two types of order scheduling: Operation scheduling and job scheduling. Whereas operations scheduling is the first step, determining dates on an aggregate level of capacity planning, job scheduling breaks down to details:

- Split work center groups to work centers
- Split operations to jobs

Unlike operations scheduling, which calculates capacity requirements per day, job scheduling calculates exact start and end times.

Dynamics AX generates jobs when running job scheduling, splitting the route operations of a production order to individual tasks. These individual tasks differ in the job type, which corresponds to the different time fields like *Setup time* and *Run time* on the tab *Times* of the route operation. On the tab *Setup* of the operation's route group, you may find the setting, which job types are available for a certain operation.

Job management is independent from route management. You need to decide whether to schedule capacity and post actual time consumption on operations level or on detailed job level, therefore. Jobs apply their own table, which you may access pushing the button *Jobs* in the production order or *Inquiries/Jobs* in a production route.

Jobs are not available for a production order, if you skip job scheduling.

Jobs

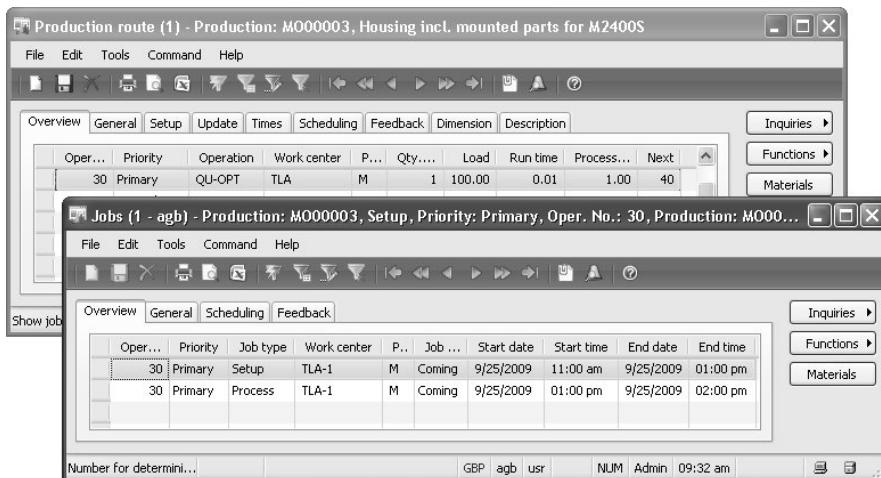


Figure 5.20: Accessing jobs related to a production route operation

Scheduling parameters In order to run scheduling, you will push the button *Update/Operations scheduling* or *Update/Job scheduling* in the production order form. If you want to run scheduling for several orders, you may access the corresponding periodic activities available in the menu item *Production> Periodic> Scheduling*.

On the tab *General* of the update form for scheduling, you may set following parameters:

- *Scheduling direction*
possibility to select an option of forward and backward scheduling
- *Schedule reference*
select the checkbox to schedule sub-productions in parallel
- *Finite capacity and Finite material*
select the checkbox to check work center or item availability

In addition, you may select to skip certain job types on the tab *Cancellation*. As an example, this might be useful if it is possible to skip queue time for a specific production order of high importance.

Steps of scheduling Dynamics AX does not require running operations scheduling and job scheduling one after the other. Depending on your requirements, you may omit operations scheduling or job scheduling.

If you do not select operations or job scheduling at all, scheduling runs automatically when selecting to update to a later status like *Release*. In this case, the *Scheduling method* on the tab *Automatic update* of the production parameters specifies, whether Dynamics AX runs operations scheduling or job scheduling.

5.4.5 Releasing

At the time you want to transfer the production order to the shop floor, you will release the production order pushing the button *Update/Release*.

Production papers On the tab *General* of the update form for releasing, you usually choose to print the production papers like job card or route card.

In addition, selecting the checkbox *References* on that tab you may release referenced sub-production orders in parallel as well.

5.4.6 Starting

As soon as you start a production order pushing the button *Update/Start*, you may post inventory and time transactions referring to that order.

If you do not want to start production of the whole quantity, you may enter a partial quantity on the tab *General* of the update form for starting. Inserting an appropriate *From Oper.No* and *To Oper.No*, you may as well decide not to update starting of all order operations together.

In order to select whether to post automatic route consumption (working time consumption), you may switch to the field group *Route card journal* on the tab *General* of the update form.

**Route
consumption**

The field *Route card* gives the journal name for posting, showing a default from the production parameters. In order to control posting of *Automatic route consumption*, following options are available:

- *Route group dependent* (automatic consumption, dependent on the route group of the operation – see Section 5.3.4)
- *Always* (automatic consumption of the whole route)
- *Never* (no automatic consumption)

The checkbox *Post route card now* then controls, if Dynamics AX posts the consumption journal. If automatic route consumption is selected but not posted, Dynamics AX leaves an unposted journal for manual editing.

Controlling automatic BOM consumption in the field group *Picking list journal* of the update form works similar to the automatic route consumption. In order to control *Automatic BOM consumption* depending on the item consumed, you may choose the option *Flushing principle* referring to the corresponding field on the tab *References* of the item form (see Section 5.2.1).

**Item
consumption**

Selecting the appropriate checkbox in the update form, you may additionally choose to print the picking list. In order to print a complete picking list, you should also select the checkbox *Complete picking list journal*. Otherwise, the picking list only contains items, which are included in the picking list journal generated for automatic consumption.

Picking list

5.4.7 Case Study Exercises

Exercise 5.8

Your company needs five pieces of the finished item entered in exercise 5.2. Enter an appropriate production order and check the bill of materials and the route in the order.

**Production
order**

Exercise 5.9

Run an estimation for your production order of exercise 5.8. When the estimation is finished, check the price calculation. In the next step, update the order choosing to run operations scheduling, job scheduling and releasing one after the other.

Change status

When you start the order then, make sure to print a complete picking list as a print preview. You do not want to post the picking list. Is it possible to apply these settings as a default for all users?

5.5 Production Journal Transactions

Reporting of actual material and working time consumption in production journals is required to update scheduling and to analyze production performance.

Production journals to post consumption include following types:

- *Picking list* (to post item consumption)
- *Route card* (to post time consumption referring to operations)
- *Job card* (to post time consumption referring to jobs)

Another journal type available – *Report as finished* – does not refer to item consumption, but refers to finishing production receiving the finished product in inventory.

Creating journals

Production journals create automatically for automatic route and item consumption, when you start a production order or report it as finished. Production journals also create automatically, if registrations transfer from the module *Shop Floor Control*.

If BOM lines or route operations require manual recording in the production module, you need to create production journals. Manual journals apply to following lines, therefore:

- Operations assigned to a route group, which does not show checkmarks for automatic route consumption
- Items showing a flushing principle “Manual”

Ledger-integration

Item and route consumption post to ledger accounts, when you end and cost a production order.

Applying ledger accounts for WIP (work in progress), you may post consumption to clearing accounts in the general ledger in parallel to productions journal transactions already before ending the order, however.

As a prerequisite for posting item consumption to WIP accounts, the checkbox *Post picking list in ledger* needs to be selected on tab *General* of the production parameters. In addition, the checkbox *Post physical inventory* on the tab *Setup* in the inventory model group of the picked item needs to be marked as well.

Similar to ledger transactions for packing slips in purchasing and sales, general ledger transactions for route/job consumption journals and picking lists will reverse when you end and cost the production order.

5.5.1 Picking List

Picking list journals are available to post item consumption. You may access them pushing the button *Journals/Picking list* in the production order form or selecting the menu item *Production>Journals>Picking list*.

Journals are unposted vouchers, consisting of a header and a lines part. When accessing picking list journals, you may see a list of registered journals. The lookup field *Show* at the top of the journal header form allows choosing whether to show posted journals or open journals.

If you want to enter a new journal, you need to insert a new line in the journal header form. After selecting an appropriate journal name, you may switch to the journal lines pushing the button *Lines*. As an alternative, you may choose the button *Create new* to create a new journal as well.

In order to support picking list registration, you may push the button *Picking list/Create lines* in the journal header form instead of the button *Create new*.

In the *Create lines* dialog box, you may then choose which items to include in the proposal. Selecting “Remaining quantity” in the field *Proposal* will default the open BOM line quantity of the order estimation to the column *Proposal* of the picking list lines. If you select the checkbox *Consumption=Proposal*, the column *Consumption* in the journal lines will receive the proposal quantity in parallel. In this case, you may immediately post the journal without needing to enter quantities manually.

Figure 5.21 shows an example of the lines in a picking list journal, which are generated by a consumption proposal. The last line in the journal line form has been entered manually, which is why the quantity in the column *Proposal* is empty.

In order to enter picking list lines manually, you need to insert a new record in the journal lines form. In that record, you will enter the *Consumption* quantity and select a *Lot ID* to link the consumption to a BOM line. If you select the checkbox in the column *End*, the BOM line will be set to finished, no matter if you consume the total estimated quantity or less.

If you need to register an item consumption not included in the BOM lines of the production order, you may insert a picking list line recording the item number and leaving the lot ID empty. Dynamics AX in this case automatically creates a corresponding BOM line on the order and inserts the lot ID into the picking list line.

Picking list structure

Consumption proposal

Journal lines

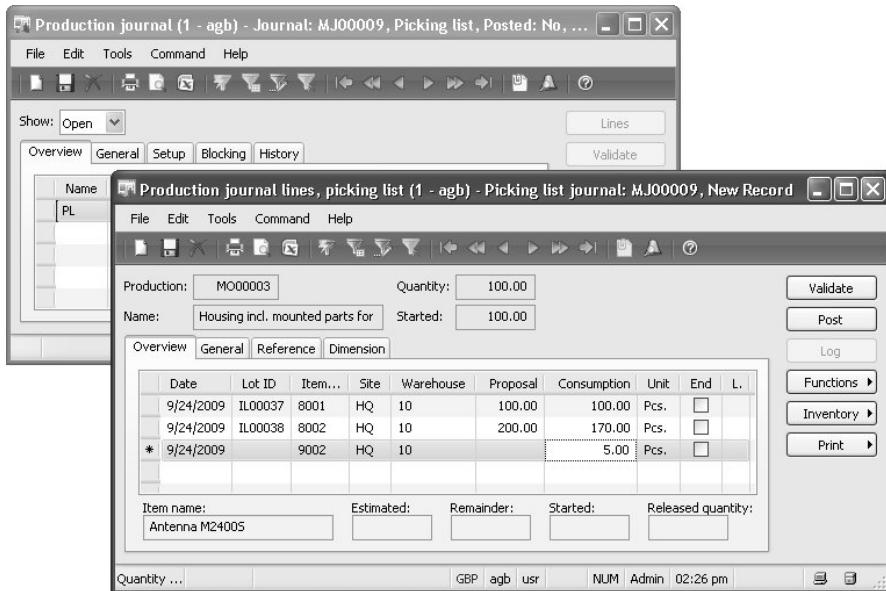


Figure 5.21: Registering picking list lines

Posting the picking list

When you are finished with picking list registration, you may post the journal pushing the button *Post* in the journal header or lines. The posted transactions are similar to the packing slip transactions of sales orders, reducing the quantity on inventory of the picked items.

In inventory valuation, the journal posting applies a preliminary valuation. Financial valuation posts when you end and cost the production order. Costing a production order is the corresponding action to invoicing a sales order.

Inquiries

As soon as the picking list is posted, you may see the transactions in the picking list journal when selecting “All” or “Posted” for the lookup field *Show*. The posted journal shows a checkmark in the column *Posted* and does not allow modifications.

You may see the posted transactions as well pushing the button *Inquiries/Production posting* in the production order form or accessing the inquiry form *Production> Inquiries> Production posting*.

Reverse picking list

If you want to reverse a posted picking list journal, you may register and post a picking list journal with negative quantities (similar to credit note posting). In order to facilitate registration, you may select “Full reversal”

in the field *Proposal* when pushing the button *Picking list/Create lines* to create a picking list proposal.

5.5.2 Working Time Registration

Depending on the choice you made for scheduling the production order, you may select either route cards or job cards in order to record working time consumption.

If you did not perform job scheduling, there are no records in the job table for the selected orders. You are required to report work center consumption in route cards for these orders, therefore.

If you apply job scheduling, you want to register jobs in job cards usually.

Transactions in the module *Shop Floor Control* usually transfer to job card journals. If selected, transferring to route card journals is also possible, however.

You may access route card journals pushing the button *Journals/Route card* in the production order form or selecting the menu item *Production> Journals> Route card*. For job cards, choose the button *Journals/Job card* or the menu item *Production> Journals> Job card*.

Entering of journal headers and lines for work center consumption works like entering picking list journals. Except for automatic consumption, you do not have the option to create a consumption proposal for route cards or job cards, however.

When inserting a journal line for work center consumption, you need to select the operation number or the job identification, the number of hours, the produced quantity and – if applicable – the defective quantity of the finished product. In a job card, you may register start time and end time instead of the number of hours.

When you are finished with the journal registration, you may post the journal pushing the button *Post* in the journal header or lines.

When registering the last operation or job in a journal line, you may select the checkbox in the column *Production report as finished*. In this case, you will post a report as finished journal for the good quantity of the finished item in parallel to the route card or job card.

You may find a default for this setting on the tab *Journals* of the production parameters.

After posting the route card or job card, you may see the posted transactions when accessing the corresponding journal form or pushing the button *Inquiries/Production posting* in the production order form.

Route card

Job card

Journal registration

Posting

Report as finished

Inquiries

5.5.3 Case Study Exercises

Exercise 5.10

Purchasing components

In order to process the production order of exercise 5.8, the required components need to be available in inventory.

Enter a purchase order, purchasing nine units of the first and five units of the second item of exercise 5.1 from your vendor of exercise 3.2. When you are finished entering the purchase order, post the packing slip receipt and invoice receipt.

Exercise 5.11

Picking list

You may now pick the components required for the production order of exercise 5.8.

Enter and post a picking list journal, picking nine units of the first and five units of the second item. Picking should be done from the warehouse to which you have posted the items in exercise 5.10.

Exercise 5.12

Job card

Choosing a job card, you want to record the working time required to process manufacturing.

Enter and post a job card line referring to the production order of exercise 5.8, producing five units in the time between 8:00 AM and 1:30 PM. You do not want to post reporting as finished in parallel.

5.6 Reporting as Finished and Ending Production

In the cycle of a production order, reporting as finished and ending are the last steps.

Posting physical transactions, reporting as finished increases the inventory quantity of the finished product. Ending the order then is the final step of order processing, costing the order and posting financial transactions.

5.6.1 Reporting as Finished

Reporting as finished physically receives the finished item in inventory. In Dynamics AX, there are three options to report a production order as finished:

- Updating the status of the production order
- Posting a report as finished journal
- Reporting as finished in the time registration for the last operation

Since Section 5.5.2 already includes reporting as finished, when posting the time registration for the last operation, the description below shows the other two options.

In order to report as finished by updating the order status, you may push the button *Update/Report as finished* in the production order form or select the periodic activity *Production> Periodic> Update> Report as finished*. If you want to report only a part of the whole order quantity, you may adjust the *Good quantity* on the tab *Overview* or *General* of the update form.

If you do not expect any further quantity to report as finished for the selected production order, you should mark the checkbox *End job*. If applicable, Dynamics AX will clear a remaining open quantity then.

If you did not post all estimated consumptions, you may select the checkbox *Accept error* on the tab *General* to post the report as finished update nevertheless.

Similar to production order starting (see Section 5.4.6), you may post automatic item and route consumption when reporting as finished.

In the item record, you may select the flushing principle “Start” to post consumption when starting the production order, and “Finish” to post consumption when reporting as finished. Therefore, you may choose to consume some items at the start and other items at the end of a production order.

Route operations do not show that possibility. You need to decide for all automatic operation postings of an order, to post when starting or reporting as finished in common.

Apart from the status update, you may also report as finished in a production journal. You may access that journal pushing the button *Journals/Report as finished* in the production order form or selecting the menu item *Production> Journals> Report as finished*.

Posting a report as finished journal of a production order works similar to posting a packing slip receipt of a purchase order. Inventory physically receives the item with a preliminary value; the quantity in inventory includes the quantity received then.

If you want to post the items to clearing accounts in the general ledger when reporting as finished, ledger integration needs to be activated for reporting as finished. You may apply the required setting by selecting the checkbox *Post report as finished in ledger* on tab *General* of the production parameters. In addition, the checkbox *Post physical inventory* on the tab *Setup* in the inventory model group of the finished item needs to be selected as well.

Updating the status

Automatic consumption

Production journal

Posting

Ledger integration

General ledger transactions for reporting as finished will reverse when you end and cost the production order.

5.6.2 Ending and Costing

Ending a production order is required to cost-account and close the order. In finance, WIP ledger transactions for production journals reverse. BOM-item and route consumption as well as finished item receipt post to the final ledger accounts.

Therefore, you need to end a production order in time. Otherwise, the finished item is still included in the WIP account balance instead of the stock account balance.

Ending a production order closes the order. Since it is not possible to post any transaction for a closed production order, you should not end the order until you are sure all transactions have been posted.

Costing

When costing the order in the course of the ending routine, Dynamics AX calculates actual costs for all item and route consumption transactions as well as the cost price of the finished item. If standard cost valuation applies to the finished item, costing posts differences to the actual cost price to deviation accounts.

The screenshot shows the Microsoft Dynamics AX Calculation form. The title bar reads "Calculation (1 - agb) - Production: MO00001, Housing incl. mounted parts for M2400S". The menu bar includes File, Edit, Tools, Command, and Help. The toolbar has various icons for file operations like Open, Save, Print, and Undo/Redo. Below the toolbar is a navigation bar with buttons for Overview Estimation, Overview Costing, General, Calculation, and Costing sheet. The main area is a grid table with the following columns: T., Pr..., Level, Item/Work center, Unit, Estimated..., Realized..., Estimated cost..., and Realized cost... . The rows show various components and routes for production order MO00001, with values such as 100.00, 100.00, 16,020.00, and 15,824.75. A status bar at the bottom shows "Production the line refers to.", currency codes GBP, agb, usr, and time 06:35 pm.

T.	Pr...	Level	Item/Work center	Unit	Estimated...	Realized...	Estimated cost...	Realized cost...
	MO00001	0	7001	Pcs.	100.00	100.00	16,020.00	15,824.75
	MO00001	1	8001	Pcs.	100.00	100.00	10,000.00	10,000.00
	MO00001	1	8002	Pcs.	200.00	199.00	1,000.00	995.00
	MO00001	1	9001	Pcs.	100.00	100.00	3,000.00	3,000.00
	MO00001	1	ASL	Hours	1.00	1.00	50.00	50.00
	MO00001	1	ASL	Hours	10.00	9.00	500.00	450.00
	MO00001	1	TLA	Hours	2.00	2.00	140.00	140.00
	MO00001	1	TLA	Hours	1.00	1.00	70.00	70.00
	MO00001	1	TTO	Hours	2.00		140.00	
	MO00001	1	TTO	Hours	1.00	1.00	70.00	70.00
	MO00001	1	TLA	Hours	5.00	5.00	350.00	350.00
	MO00001	1	MAT-OV		100.00	100.00	700.00	699.75

Figure 5.22: Comparing estimation and costing in the calculation form

Inquiries

You may compare actual costs to estimated material and time consumption costs pushing the button *Inquiries/Price calculation* in the production

order form. On the tab *Overview Costing* of the calculation form, you may compare quantities and costs in the estimation and in costing on item and operation line level. The tab *Costing sheet* shows a summary of the estimation or of costing according to the costing sheet setup.

In order to see the transactions generated when ending the order you may choose the menu item *Production> Inquiries> Production> Production posting* or the button *Inquiries/Production posting* in the production order form.

In the production posting form, the transactions posted when ending and costing the production order show the type “Costing”. In order to see related ledger transactions, you may push the button *Ledger/Voucher*.

Similar to posting invoices in purchasing or sales, costing a production order posts financial transactions for the items consumed and reported as finished.

The ending date of the production order shows in the field *Financial date* of the inventory transactions. The receipt status of the inventory transaction for the item reported as finished is “Purchased” and the issue status is “Sold” for the items consumed.

In the first step of ledger posting, costing reverses the WIP ledger transactions posted through picking list journals, route card journals, job card journals and report as finished journals.

In the second step, costing posts following ledger transactions to close the order in finance:

- Consumption to the stock accounts of components
- Consumption to the work center costing accounts
- Receiving to the stock account of the finished item

Ledger accounts applying to the item transactions are set in the inventory posting setup (*Inventory management> Setup> Posting> Posting*). Ledger accounts for work centers may derive from settings in the work center form or in cost categories.

As an alternative, you may choose production groups to specify applicable ledger accounts. The selection, which setting finally applies for posting is available in the production parameters (see Section 8.4.3).

5.6.3 Case Study Exercise

Exercise 5.13

Report the whole quantity for the production order of exercise 5.8 as finished, choosing the button *Update* in the production order form. On the tab *General* of the update form, select the checkboxes *End job* and *Accept error*.

Inventory transactions

Ledger integration

Ending production

Finally, you may end the production order, locking it for further postings. When ending is done, open the price calculation inquiry to compare estimation and costing.

6 Operations Planning

The primary responsibility of operations planning is to make sure, that items are available when they are required while meeting the target of high economic efficiency at the same time. Operations planning therefore finds itself caught between the demands of high supply readiness on the one hand and low inventory on the other hand.

6.1 Business Processes in Operations Planning

In Dynamics AX, long-term forecasting and short-term master planning is covered by the operations planning module, which shares the module name "Master planning" with short-term planning.

6.1.1 Basic Approach

Operations planning includes forecasting to identify item demand on a long-term basis on the one hand and master planning with the master scheduling process to calculate requirements and planned orders on a daily basis on the other hand.

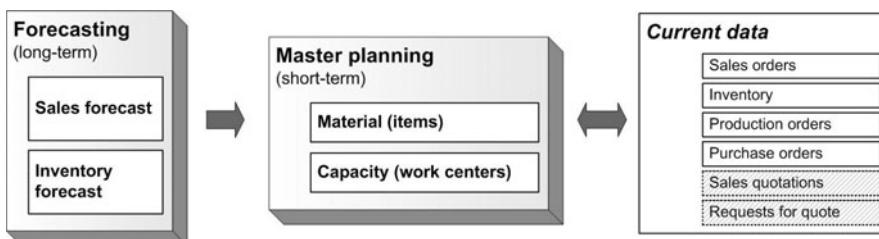


Figure 6.1: Operations planning in Dynamics AX: Forecasts and master planning

Forecasting is a long-term prognosis for planning and budgeting purposes. It includes versions of sales as well as purchase and inventory forecasts, which show different scenarios for the total forecast as a result.

Master planning covers a short-term planning period for daily business. Based on current inventory and orders, master scheduling calculates material requirements to schedule purchasing and production. Like in forecasting, you may run different scenarios of master planning in parallel. Dynamics AX therefore distinguishes a static master plan for current master scheduling and a separate dynamic plan for simulation.

Planning structure

Forecasting

Master planning

6.1.2 At a Glance: Master Planning in Dynamics AX

Before we start to go through the details of master planning, this page shows the basics on the example of the net requirements of a finished item.

Net requirements

As a basis for analyzing net requirements, you want to enter a sales order with a line containing a finished item. Pushing the button *Inquiries/Net requirements* in the order line, you may access the net requirements form for the item. If existing production orders and the quantity in inventory do not cover the item requirements, you may push the button *Update/Master scheduling* to run local master scheduling for the item.

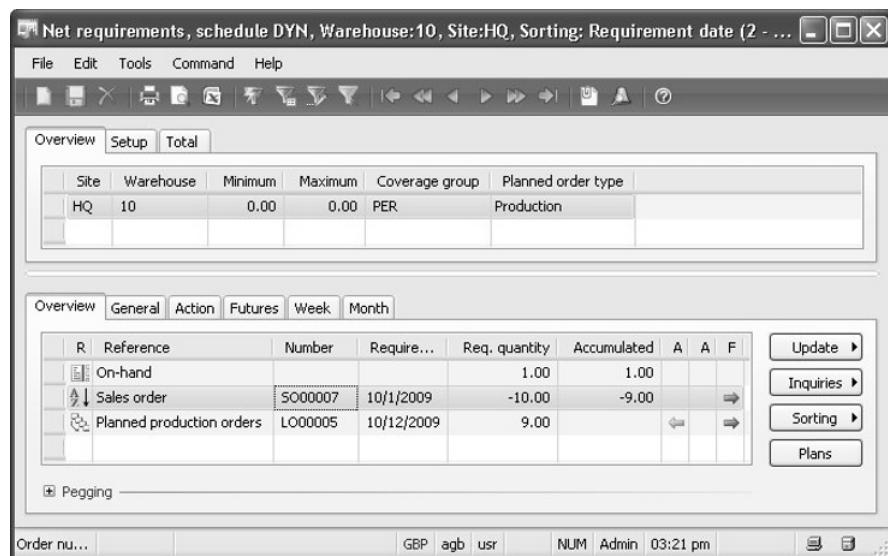


Figure 6.2: The net requirements form after running local master scheduling

Master scheduling

Master scheduling generates a planned production order to produce the finished item showing the earliest delivery date possible. The arrows in the column on the right side of the list show proposals calculated in master scheduling avoiding to miss delivery dates. Details are available on the tab *Action* and *Futures*.

Simulation

Master scheduling is possible in multiple scenarios, distinguishing between static and dynamic plans. The static plan is the operations plan used in purchasing and production. If applying a dynamic plan for simulation purposes, this plan will be the default for master scheduling in the net requirements form. In order to switch between the different plans, you may push the button *Plans* in the net requirements form.

6.2 Forecasting

Forecasting is a long-term prognosis, required to estimate and adjust future capacities of item supply and work centers. In parallel, forecasting also is the basis for budgeting in finance. In order to support planning of alternative scenarios for business development, you may record multiple forecasts in parallel.

Forecasting in Dynamics AX does not only include sales forecasts. You may as well record purchase forecasts, which might be the basis for long-term supply contracts with vendors as an example.

6.2.1 Basics of Forecasting

When entering forecast figures in Dynamics AX, you need to select a forecast model. Forecast models represent different planning scenarios.

Forecast models refer to forecast plans, which are the basis for calculating forecasts in forecast scheduling. You may include forecast plans in master scheduling as well.

Forecast
settings

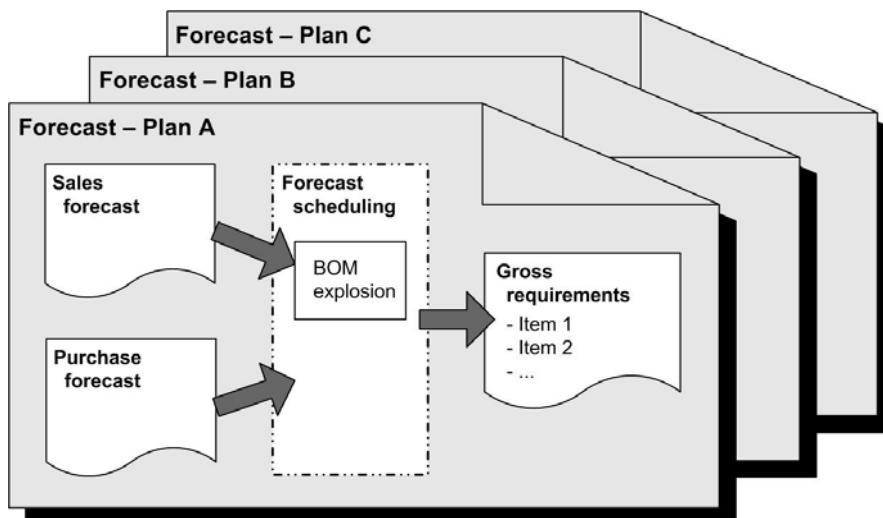


Figure 6.3: Forecasting in Dynamics AX

Forecasting sales with estimated sales figures is the starting point of the forecasting process. You may enter sales figures on item or on item group level.

Sales forecast

	Since forecast scheduling and master scheduling is based on item numbers, you need to enter an item allocation key if you do not enter forecasts per item number. Item allocation keys are groups, containing a percentage for every item included in the key.
Purchase forecast	In parallel or after finishing sales forecasting, you may enter a separate forecast for purchasing. In the next step, you may align sales and purchase forecasts in an inventory forecast.
Forecast scheduling	When you are finished registering forecast figures, you may run forecast scheduling to calculate the gross requirements of finished items, based on their bills of materials. As a result of forecast scheduling, Dynamics AX creates planned purchase and production orders covering the gross requirements of forecasting. These planned orders refer to the selected forecast plan.
	If a purchase forecast has been entered, Dynamics AX generates planned purchase orders covering the purchase forecast. In addition, Dynamics AX may generate planned purchase orders for requirements not covered by the purchase plan.
	Since forecast scheduling refers to a long-term prognosis, it does not include the current inventory as well as current sales and purchase orders in the calculation.
Master scheduling	You may integrate forecasts into master scheduling. In the master plan settings, you may select the way master scheduling calculation should include forecast figures, therefore.
6.2.2 Forecast Settings	
Forecast models	Forecast models represent the different scenarios for forecasting. In order to register forecasts, you need to set up at least one forecast model in the form <i>Inventory management> Setup> Forecast> Forecast models</i> .
	If you want to apply a structure to forecasts, grouping forecasts by region as an example, you may set up two-stage forecasts assigning sub-models to a main model. In order to specify sub-models, you will insert main models and sub-models first. In a second step, after selecting the main model on the tab <i>Overview</i> of the forecasts model form, you will assign sub-models on the tab <i>Submodel</i> .
	In order to protect forecasts, that are assigned to a certain forecast model, from modifications, you may select the checkbox <i>Stopped</i> in the forecast model. As an example, you might block an annual forecast when it is finished, inserting a separate forecast model for the next year.

Whereas forecast models apply when entering forecasts, forecast plans are the grouping element of separate scenarios in the master planning module applying to forecast scheduling.

In order to assign forecast models to forecast plans, you need to access the form *Master planning> Setup> Plans> Forecast plans*. Sub-models of the (inventory) forecast model are included, when assigning the main model on the tab *General* of the forecast plans form. In addition, you may choose if to include sales or purchase forecasts.

On the tab *Time fences* of the forecast plan, you are to enter the period in days (starting from the day of calculation), which should be covered by forecast scheduling.

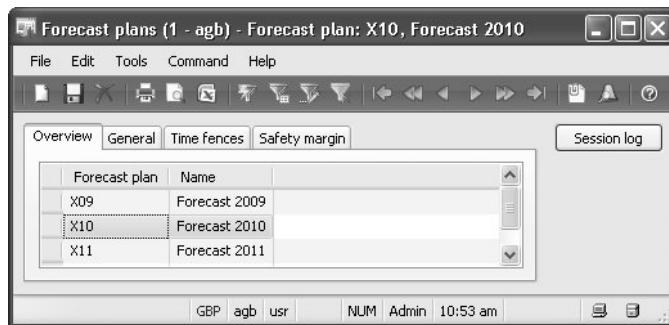


Figure 6.4: The forecast plans form

You may enter the current forecast plan in the master planning parameters (*Master planning> Setup> Parameters*). The current forecast plan is the default for displaying forecast scheduling results.

Another important setting for item forecasts is the coverage group, which specifies how to summarize net requirements. More information on coverage groups is available in Section 6.3.3 later in this chapter.

If you do not want to enter forecasts for individual items, you may apply item allocation keys entering a forecast total for a group of items. You may specify item allocation keys in the form *Inventory management> Setup> Forecast> Item allocation keys*. After selecting or inserting an item allocation key, you may push the button *Lines* to enter the item numbers that are assigned to the key together with their percentage of the group total.

Forecast plan

Parameters

Item allocation keys

6.2.3 Forecasts and Forecast Scheduling

Register forecasts

You may record forecasts in the options available in the menu tree node *Inventory management> Periodic> Forecast> Entry*. As an alternative, you may choose the button *Forecasting* or *Forecast* in the administration form of the particular master table, for example in the item form or the customer form.

In the forms referring to items and item groups, you may register sales forecasts as well as purchase forecasts. Sales forecasts are also available in the customer and customer group form, purchase forecasts in the vendor and vendor group.

Sales forecast

If you want to access the sales forecast form for an item group as an example, you may push the button *Sales* in the form *Inventory management> Periodic> Forecast> Entry> Item group*. In the sales forecast form, you may insert a record selecting the appropriate (forecast) model. If you want to enter different scenarios, you may register different models in several lines.

In the date column, you will enter the start date of the individual forecast period – as an example the first of a month if you enter a line per month. If you choose an allocation method in the pane *Allocation* in the middle of the form, you might register one line for the whole forecast time fence.

In order to enable gross requirement calculation, you have to enter either an item number or an item allocation key.

Model	Date	Customer...	Customer gr...	Item ...	Item allocation...	Sales qu...	Unit	Amount	Curr...
F10	4/1/2010			1001		100.00	Pcs.	37,000.00	GBP
F10	1/1/2010	DO		FP		10.00		5000.00	GBP

Date	Sales quantity	Unit	Amount	Currency
1/1/2010	10.00		5,000.00	GBP
2/1/2010	10.00		5,000.00	GBP
3/1/2010	10.00		5,000.00	GBP

Figure 6.5: Registering a forecast in the sales forecast form

If you choose to register a purchase forecast independent from the sales forecast, you may enter it in parallel to the sales forecast, selecting the button *Forecast/Purchase* in the appropriate master table form. You may include the purchase forecast in parallel to the sales forecast in forecast scheduling then.

In addition to sales and purchase forecasts, you may select the button *Inventory forecast* in appropriate master table forms. The inventory forecast shows the result of purchase and sales forecasts, broken down to item numbers and individual periods.

You may want to see the results of forecasts to prepare future purchasing of raw materials, parts and components, which require exploding bills of materials, as well as merchandise.

For this purpose, you may run forecast scheduling selecting the menu item *Master planning> Periodic> Forecast scheduling*. In the update form for forecast scheduling, you need to choose the forecast plan, for which to run the calculation.

The results of forecast scheduling are available in the gross requirements form, which you may access pushing the button *Inquiries/Gross requirement* in the item form. As a default, the form shows the forecast plan set up as current forecast plan in the master planning parameters. Pushing the button *Plans* in the gross requirements form you may select a different scenario, however.

Gross requirements, schedule X10, Warehouse:10, Site:HQ, Sorting: Requirement date (1 - a...)																																																		
File Edit Tools Command Help 																																																		
<input type="button" value="Overview"/> <input type="button" value="Setup"/> <input type="button" value="Total"/>																																																		
Site	Warehouse	Minimum	Maximum	Coverage group	Planned order type																																													
HQ	10	0.00	0.00	PER	Purchase order																																													
<input type="button" value="Overview"/> <input type="button" value="General"/> <input type="button" value="Action"/> <input type="button" value="Futures"/> <input type="button" value="Week"/> <input type="button" value="Month"/>																																																		
<table border="1"> <thead> <tr> <th>R</th> <th>Reference</th> <th>Number</th> <th>Require...</th> <th>Req. quantity</th> <th>Accumulated</th> <th>A</th> <th>A</th> <th>F</th> </tr> </thead> <tbody> <tr> <td></td> <td>Planned purchase orders</td> <td>FP00122</td> <td>1/29/2010</td> <td>8.00</td> <td>8.00</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>BOM line</td> <td>FP00039</td> <td>1/29/2010</td> <td>-7.00</td> <td>1.00</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>BOM line</td> <td>FP00040</td> <td>1/29/2010</td> <td>-1.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Planned purchase orders</td> <td>FP00123</td> <td>2/26/2010</td> <td>8.00</td> <td>8.00</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						R	Reference	Number	Require...	Req. quantity	Accumulated	A	A	F		Planned purchase orders	FP00122	1/29/2010	8.00	8.00					BOM line	FP00039	1/29/2010	-7.00	1.00					BOM line	FP00040	1/29/2010	-1.00						Planned purchase orders	FP00123	2/26/2010	8.00	8.00			
R	Reference	Number	Require...	Req. quantity	Accumulated	A	A	F																																										
	Planned purchase orders	FP00122	1/29/2010	8.00	8.00																																													
	BOM line	FP00039	1/29/2010	-7.00	1.00																																													
	BOM line	FP00040	1/29/2010	-1.00																																														
	Planned purchase orders	FP00123	2/26/2010	8.00	8.00																																													
<input type="button" value="Update"/> <input type="button" value="Inquiries"/> <input type="button" value="Sorting"/> <input type="button" value="Plans"/>																																																		
<input type="checkbox"/> Pegging																																																		
Reference to ...		GBP	agb	usr	NUM Admin 07:25 pm																																													

Figure 6.6: Gross requirements form showing forecasting results

Purchase forecast

Inventory forecast

Forecast scheduling

Gross requirements

Item requirements resulting from forecasts are not only available in the gross requirements form. Selecting a forecast plan in lookup field *Plan* in the list page *Master planning> Planned orders* or pushing the button *Plan* in the planned orders form (*Master planning> Planned order details*), you may access forecast results as well.

Ledger budget

If you want to apply sales and purchase forecasts for budgeting in finance, you may transfer them to ledger budgets. Transferring requires to run the appropriate periodic activity for sales and/or purchase in the menu *Inventory management> Periodic> Forecast> Update* selecting the ledger budget, which should receive forecast figures.

6.2.4 Case Study Exercises

Exercise 6.1

Forecast settings

You require a sales forecast for items that you have set up in previous exercises – the merchandise item of exercise 3.4 and the finished item of exercise 5.2. Your forecast should be in a scenario separate from other forecasting scenarios.

To meet this constraint, you want to insert a new forecast model F-## (## = your user ID) without applying sub-models. In a second step, you want to register a new forecast plan Y-#. You need to assign your forecast model to this forecast plan and to include sales forecasts in the plan. The number sequences required may be the same that you find in existing forecast plans.

Exercise 6.2

Sales forecast

For next quarter, you expect your customer of exercise 4.1 to order 200 units of your merchandise item and 100 units of your finished item on the last day of each month.

You need to record these figures in a sales forecast, applying your forecast model of exercise 6.1. When you are finished, you want to start forecast scheduling for your forecast plan, checking the results afterwards.

6.3 Master Planning

Dynamics AX master planning covers the short-term calculation of material and capacity requirements. It is the basis for the daily work in purchasing and production management, therefore.

Master planning includes relevant information of items and work centers, master data as well as transactions, in all areas of Dynamics AX, ranging from the current quantity in inventory to purchase orders, production orders and sales orders as well as forecast plans, if selected.

The result of master planning are planned orders for purchasing, production and inventory transfer on the one hand, and action and future messages to adjust existing orders on the other hand.

6.3.1 Basics of Master Planning

Data regarding item transactions – including orders – and quantity in inventory are an essential basis for master planning. In addition, master planning may cover sales quotations, requests for quote and a forecast, for which you may apply a probability percentage or reduction principle.

Starting point

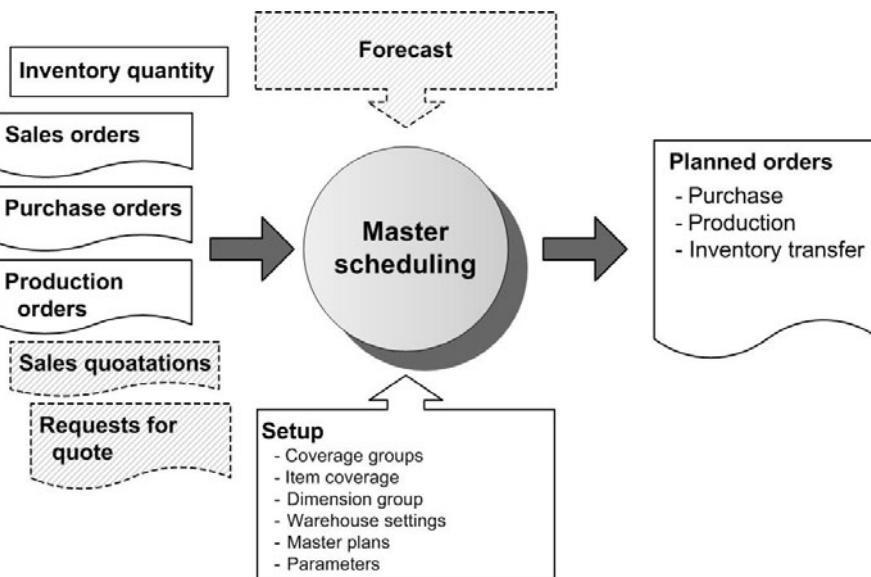


Figure 6.7: Elements of master planning

Scenarios	As with forecasting, you may apply several scenarios in master planning as well. A scenario is represented by a master plan, which contains the settings for the scenario. These settings include which elements to cover in scheduling as well as calculation principles for planned orders.
Planning strategy	Master planning parameters specify, whether you apply a one master plan strategy or a two master plan strategy. Master scheduling usually is a batch job, which runs every night calculating net requirements for all items. The result of that calculation is available in the <i>static master plan</i> . The static plan is the master plan to be used in purchase and production management for scheduling orders. It is the default plan when accessing the planned orders forms, therefore. On the other hand, the sales department needs a plan to run simulations in order to check possible delivery dates in sales orders. Therefore, sales requires running a master scheduling simulation locally, which is for the individual item only. The result of that simulation is available in the <i>dynamic master plan</i> .
One plan strategy	If you enter the same master plan for the static and the dynamic master plan in the master planning parameters, you run a one master plan strategy. Planned orders of current master scheduling simulations in sales update the static plan, which is used in purchasing and production. Depending on your company's requirements, this is useful or not.
Two plan strategy	In order to apply a two master plan strategy, you need to enter a different master plan for the static and the dynamic plan. When running the batch job for static master scheduling in the night, it usually copies the static plan into the dynamic plan in order to base simulations on the current static plan. In this case, simulations in sales will start applying a common data basis with purchase and production management in the morning. Simulation throughout the day do not change planned orders in the static plan, thereby avoiding problems in purchasing and production caused by planned orders changing every moment.
Coverage method	The coverage group specifies the method of calculating lot size and delivery dates. You may set a general coverage group in the master planning parameters. If items differ in lead-time and cost price very much, you should enter different coverage groups in the item records, however.
Master scheduling	Master scheduling, which usually runs in the night, generates planned purchase orders, production orders and inventory transfer orders based on item requirements and settings for master planning.

When master scheduling is finished, you may check and edit the planned orders. In the planned orders form, you may transfer planned orders to purchase orders, production orders and inventory transfer orders.

**Planned
orders**

6.3.2 Master Planning Setup

Before running master scheduling, you need to finish the setup determining the way of requirements calculation in Dynamics AX.

You may regard a master plan as a scenario, which contains requirements calculations independent from other scheduling scenarios. Usually, companies apply one or two master plans depending on the planning strategy.

Master plans

You may access master plans selecting the menu item *Master planning> Setup> Plans> Master plans*.

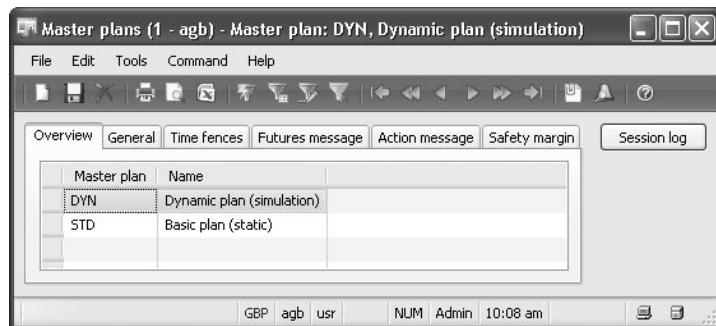


Figure 6.8: The master plans form

Selecting the appropriate checkboxes on the tab *General*, you may choose for a certain master plan to include following items:

- Current inventory
- Inventory transactions (open orders)
- Sales quotations (reduced by a probability to be entered)
- Requests for quote in purchasing
- Forecasts

In order to include forecasts and the results of forecast scheduling, you need to select the appropriate forecast plan on the tab *General* of the master plan. You may choose the lookup field *Reduction principle* to reduce the forecast figures. If you want to apply a reduction principle, you need to enter a reduction key (see Section 6.3.3) on tab *Other* of the coverage group form of the groups concerned.

Scheduling setup	<p>On the tab <i>General</i> of the master plans form, you may find the scheduling method controlling whether to run operations scheduling or job scheduling (see Section 5.4.4) for planned production orders. Among other settings for scheduling planned production orders, you may also select if to apply finite capacity.</p>
Futures messages	<p>On the tab <i>Time fences</i> of the master plans form, you may choose to override the time fences determined in the coverage group or in the item coverage.</p>
Action message	<p>On the tab <i>Futures message</i>, you may choose if master scheduling may set the requirement date in planned orders to a date, which is after the actual requirement date, if it is not possible to meet the actual requirement date because of delivery times. Applying those settings, you prevent impossible dates like a delivery date before today.</p>
Master planning parameters	<p>On the tab <i>Action message</i>, you may select to postpone planned purchase orders to a later date, if it is not necessary to receive the item as early as the planned order date specifies.</p> <p>Parameters for master planning are available in the form <i>Master planning> Setup> Parameters</i>. One of the core settings concerns the planning strategy: If you apply a one master plan strategy, you will insert the same master plan into the current static and the current dynamic master plan.</p> <p>If you apply a two master plan strategy, you will select different master plans. In addition, usually you want to select the checkbox <i>Automatic copy</i> to reset the dynamic plan to the status of the static plan when running master scheduling.</p> <p>Master planning parameters also contain the general coverage group. This group applies for items, which do not specify a coverage group in the item record.</p>
Warehouse settings	<p>If master scheduling should not include the quantity in inventory of certain warehouses – e.g. a consignment stock managed by the customer – you may select the checkbox <i>Manual</i> on the tab <i>Master planning</i> of the warehouse form (<i>Inventory management> Setup> Inventory breakdown> Warehouses</i>).</p> <p>You may additionally select in the warehouse form, if the warehouse should be refilled from another warehouse (main warehouse). Master scheduling will generate item transfer proposals, if the item concerned is assigned to a dimension group, for which the checkbox <i>Coverage plan by dimension</i> is selected in the dimension “Warehouse”.</p>
Sites	<p>In parallel to specifying separate calculation of item requirements for warehouses in the dimension group, you may select if to calculate net requirements on sites level.</p>

Items new in Dynamics AX 2009 related to master planning include the option to calculate net requirements per site as well as improved accuracy and calculation speed.

New in
AX 2009

6.3.3 Item Coverage and Item Settings

Coverage groups as well as item settings control the calculation of lot sizes and dates of planned orders, generated by master scheduling.

In order to access coverage group administration, you may select the menu item *Master planning> Setup> Coverage> Coverage groups*.

Coverage
group

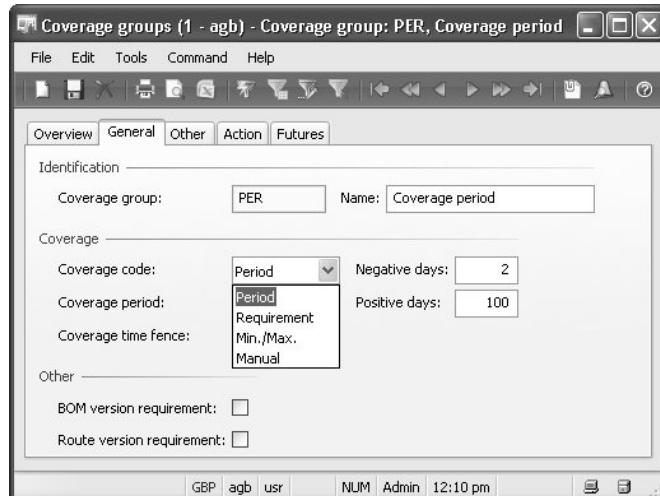


Figure 6.9: Managing a coverage group

The core setting of a coverage group is the coverage code, which specifies the coverage principle. The coverage principle controls, how requirements summarize into a planned order.

Coverage
principle

In Dynamics AX, following options are available for the coverage principle as shown in Figure 6.10:

- *Period* (Summarizing requirements within the coverage period)
- *Requirement* (Separate planned orders for every requirement)
- *Min./Max.* (Replenishing to maximum quantity when inventory falls below minimum quantity)
- *Manual* (No generating of planned orders)

Master scheduling generates a planned order, if the calculated inventory at a date is below the minimum quantity or below zero, if you did not enter a minimum quantity in the item record.

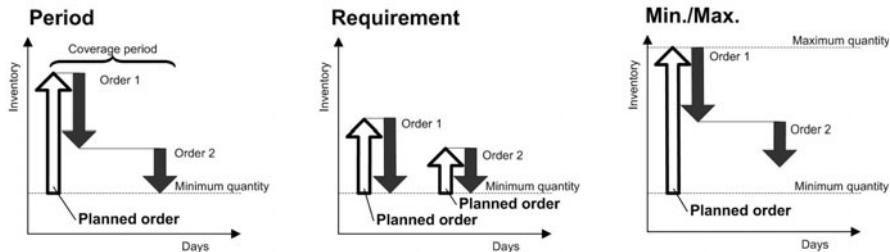


Figure 6.10: Coverage principles in Dynamics AX

Period settings

The *Coverage time fence* as well as the time fence fields on the tab *Other* of the coverage group form set the periods to be included in master scheduling. Depending on the planning strategy and the lead-time of the items, the number of days entered in the time fence fields will cover some weeks or months.

The *Positive days* on the tab *General* sets the time fence to include the current quantity in inventory for covering requirements and should correspond to the lead-time or the coverage time fence depending on the order history.

On the tab *Other*, the *Firming time fence* determines the period, for which master scheduling does not create a planned order but a purchase or a production order. If there is no main supplier available in the item record or the applicable trade agreement (supposing the checkbox *Find trade agreement* in the master planning parameters is selected), master scheduling will generate a planned purchase order, nevertheless.

Reduction keys

Settings related to forecasts on the tab *Other* include the time fence for forecasts as well as an appropriate reduction key.

Reduction keys (*Master planning> Setup> Coverage> Reduction keys*) control the percentage applied for reducing forecast figures in the course of time. If you want to apply percentages, you need to make sure that the master plan shows a reduction principle "Percentage".

Action message

Action messages activated on the tab *Action* of the coverage group form are messages from master scheduling to adjust purchase and production orders as well as planned orders. The aim of action messages is to optimize quantities and dates of item receipts.

Unlike futures messages, action messages only show proposals for optimizing (like postponing a purchase order, which is too early). Item availability is as well granted, if you disregard action messages.

If you select to apply futures messages on the tab *Futures*, you may choose "Requirement date" for the lookup field *Basis date* on the tab *Action*. In this case, actions will be based on the date when the item is actually required.

Unlike action messages, futures messages show actual problems of item availability, which will cause delays in order fulfillment.

You may assign coverage groups to items on three different levels. Master scheduling will identify the applicable coverage group in following order:

- *Item coverage* (button *Setup/Item coverage* in the item form)
- *Item record* (tab *General*)
- *Master planning parameters* (tab *General*)

Since lot sizes and therefore the coverage principle depend on the cost price and the lead-time of an item, you should group items with similar characteristics to coverage groups.

The inventory dimension groups determine, which inventory dimensions are calculated separately in master scheduling. The dimension group specifies therefore, if master scheduling calculates per site or per warehouse as an example.

You may access dimension groups in the form *Inventory management> Setup> Dimensions> Dimension groups*, selecting the checkbox *Coverage plan by dimension* for dimensions to be calculated separately in master scheduling. In order to assign a dimension group to an item, you will access the tab *General* in the item form (see Section 7.2.2).

In addition to the coverage group and the dimension group, the item coverage is another important setting for master scheduling.

Pushing the button *Setup/Item coverage* in the item form, you may access the item coverage form, where you may enter a minimum and – if applicable – a maximum quantity for the item. Depending on the dimension group of the item, you may register item coverage settings per site, warehouse or other dimensions like color or configuration.

In order to apply specific settings for a certain warehouse as an example, you may select a coverage group on the tab *General* of the item coverage form, which is different from the coverage group in the item record. In addition, you may choose a different main vendor and a different planned order type if you want to produce an item in one site but order it from an external vendor in another site as an example.

Futures

Assigning coverage groups

Dimension groups

Item coverage

Seasonal minimum The lookup field *Minimum key* on the tab *General* is available to apply a seasonal trend for the minimum quantity. If you select a minimum key, you may check the results on the tab *Min./Max.* of the item coverage form.

In order to set up minimum keys, you may access the form *Master planning> Setup> Coverage> Minimum/Maximum keys*, entering a factor per period.

6.3.4 Master Scheduling and Planned Orders

Master scheduling is required to generate planned orders for purchasing, production and inventory transfer, based on item requirements and coverage settings.

You may run master scheduling on two different occasions:

- Local master scheduling (availability check, e.g. in a sales order line)
- Global master scheduling (Regular master scheduling for all items)

Global master scheduling Global master scheduling is the basis for releasing orders in purchasing and production in daily business. You may start global master scheduling choosing the menu item *Master planning> Periodic> Master scheduling*. Depending on the company size and item structure, master scheduling involves extensive calculations causing a heavy server load. Usually it runs as a batch job in the nighttime, therefore.

In the update form of master scheduling, you need to select the master plan to calculate. Usually you choose the current static master plan for global master scheduling. You do not need to run the current dynamic master plan separately, if the checkbox *Automatic copy* in the master planning parameters is selected.

The second selection in the master scheduling update form is the calculation principle, for which you may choose between following options:

- *Regeneration*
Complete calculation, deleting all existing planned orders
- *Net change*
Generating action and futures messages for all requirements, planned orders only for new requirements, however
- *Net change minimized*
Like net change, new messages limited to new requirements

When selecting the static plan, only the principle “Regeneration” is available, however. In order to base scheduling on the current settings, you should choose “Regeneration” for dynamic plans as well, if there are changes of coverage settings like the minimum quantity in items.

On the tab *Scheduling helper* of the update form, you may choose settings for distributed master scheduling on several servers.

Unlike global master scheduling, you will run local master scheduling to check item availability and possible delivery dates for a certain item only. You may access local master scheduling in the net requirements form, which is available in the item form or in the order lines pushing the button *Inquiries/Net requirements*.

The net requirements form shows the result of the last master scheduling run for the dynamic master plan. If a one master plan strategy is in place, the lines shown are the same as those used purchasing and production management. If the master planning parameter *Automatic copy* is selected, this also applies for a two master plan strategy as long as no local master scheduling has run and nobody has been working in the static plan editing and releasing planned orders.

Pushing the button *Update/Master scheduling* in the net requirements form, you may start local master scheduling. Local master scheduling updates the current dynamic master plan for the selected item and its components. When looking at the results, you need to take into account that not all dependencies of other items are covered by the calculation, especially regarding work center capacity requirements.

Master scheduling generates planned orders, which you may access in the form *Master planning> Planned Order Details* or in the list page *Master planning> Planned Orders*.

Local master scheduling

Planned orders

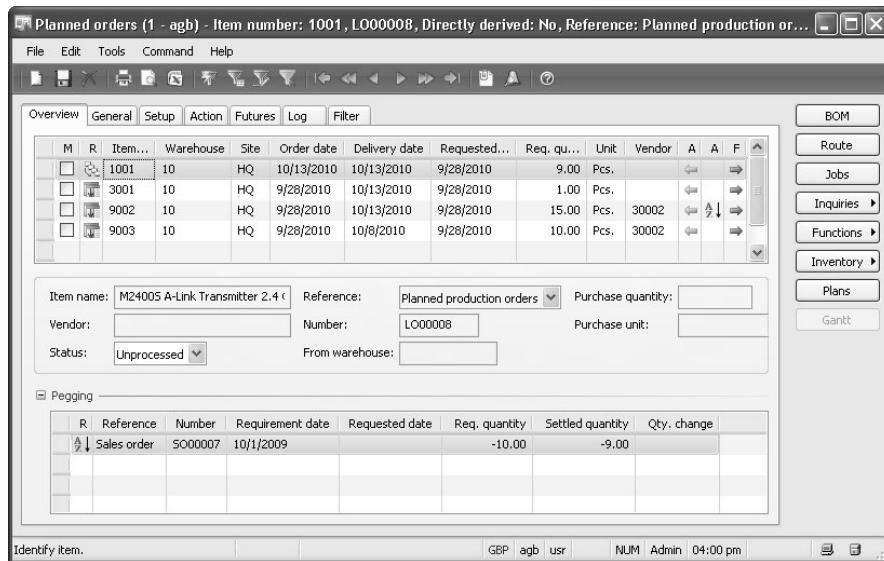


Figure 6.11: Planned orders after completing master scheduling

When accessing the planned orders form, the default plan is the current static master plan. Pushing the button *Plans* you may select the current dynamic or any other master plan.

In the master planning menu, the planned order form shows planned orders for purchasing as well as for production and inventory transfers. The icons in the column *R(efERENCE)* and the field *Reference* in the middle pane of the planned order form show if a line contains a planned order for production, sales or inventory transfer.

In the menu *Accounts payable*, the menu item for planned orders refers to planned purchase orders, in the menu *Production* to planned production orders.

Editing a planned order

The upper pane of the planned orders form shows the proposals calculated to cover item requirements. Apart from the delivery date and the requested quantity, the column *Requested date* shows the date necessary to cover the requirement in time. The columns on the right side show action and futures messages, which you may see on the appropriate tabs in detail.

The tab *Log* shows purchase, production and transfer orders, which have been transferred to actual orders by firming planned orders. These orders do not show on the tab *Overview* any more.

Pushing the plus sign (+) in the *Pegging* section at the bottom of the planned orders form, you may see the requirements, which are covered by the planned order. In the example of Figure 6.11 you may see, that the planned production order for item 1001 covers the sales order SO00007 shown in the *Pegging* section.

Firming an order

You may edit the delivery date and requested quantity in the planned orders. For planned purchase orders, you need to make sure that a vendor number shows in the column *Vendor*.

If your company applies a status management before firming planned orders, you may change the status by pushing the button *Functions/Change planned order status* or by directly editing the field *Status* in the middle pane of the planned orders form.

If you want to firm several planned orders at one push, you may select the checkbox *Marking* of the lines concerned. Selecting is possible by clicking the checkboxes individually or collectively, choosing the button *Functions>Select planned order*.

After selecting, you may generate purchase orders, production orders and transfer orders pushing the button *Functions/Firm*. If you want to create a request for quote (see Section 3.4.4) instead of a purchase order, you may choose the button *Functions/Change to request for quote*.

Net requirements

In order to get an overview of the net requirements related to a planned order, you might push the button *Inquiries/Requirement profile* in the planned order form. The requirement profile shows the net requirements form, which is the common form also available to show net requirements out of the item form or the order lines.

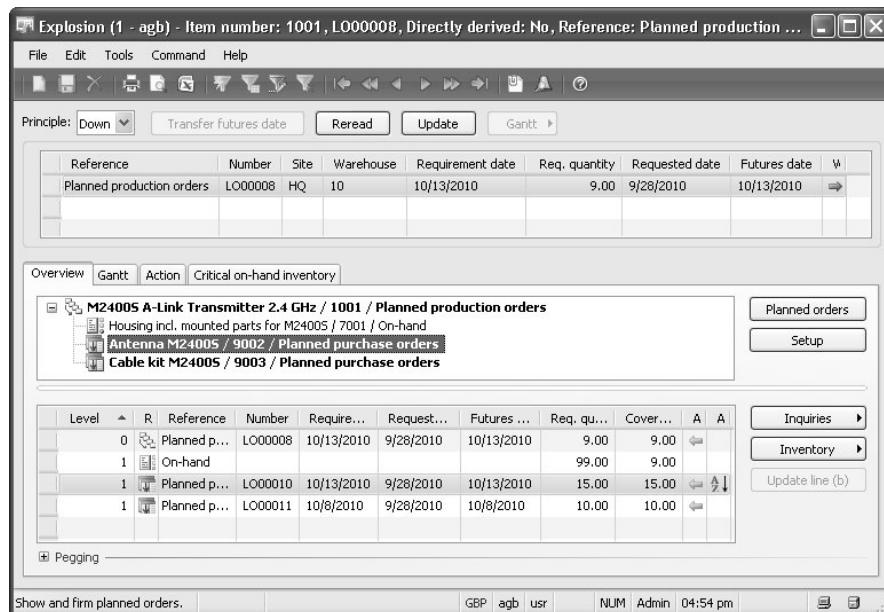


Figure 6.12: The explosion form to analyze availability for a BOM structure

The button *Inquiries/Explosion* in the planned order form opens another inquiry form, which is available in order lines as well. This form – the explosion form – shows the item availability including components of all BOM levels.

Explosion

If you select “Down” in the lookup field *Principle* at the top of the explosion form, the form shows semi-finished items and raw materials or parts of all BOM levels for the selected item. If you select “Up” for the principle, the form will show a where-used analysis.

For company groups applying intercompany purchase and sales, the menu item *Master planning> Periodic> Intercompany master scheduling* is available. A description of the intercompany functionality is beyond the scope of this book, however.

Intercompany scheduling

6.3.5 Case Study Exercises

Exercise 6.3

Min./Max.
principle

You want to apply a Min./Max. coverage principle to your finished item of exercise 5.2. Select an appropriate coverage group in the item record and enter a minimum quantity of 500 units and a maximum quantity of 1000 units in the item coverage of the item.

When you are finished, you should run local master scheduling in the net requirements form and check the result.

In the second step, you change the minimum quantity to one unit. After running local master scheduling a second time, can you explain the result?

Exercise 6.4

Period
principle

You want to apply a coverage principle summarizing requirements per period for your finished item of exercise 5.2 now. Choose an appropriate coverage group in the item record and delete the Min./Max. record in the item coverage.

Your customer of exercise 4.1 orders 100 units of the finished item. Enter a sales order for this requirement without posting a packing slip or invoice.

You may run local master scheduling in the net requirements form now. Check the results and enter a second order of your customer containing 150 units of the finished item for the same delivery date as the first order.

Start local master scheduling a second time and check the result again.

7 Inventory Management

The primary responsibility of inventory management is to control the item stock by quantity and value. To meet this task, you may change inventory in Dynamics AX only by posting inventory transactions, which you need to register in vouchers before.

The current quantity in inventory therefore always is the total of item issue and receipt transactions. Most of the transactions are not a result of business processes registered within the inventory management module; they create automatically in other modules. As an example, when posting a purchase packing slip receipt in the accounts payable module, you post a receipt transaction in the inventory management in parallel.

7.1 Principles of Inventory Transactions

Before we start to go through the details, the lines below should show the principles of transactions in inventory management.

7.1.1 Basic Approach

The core area of master data in inventory management is item data. Inventory management controls stock per item number. Depending on the inventory dimension group, you may separate quantity and value on stock by up to nine dimensions. These dimensions include warehouse and location as well as serial numbers or item configurations.

Master data

In order to change the quantity on hand, you need to post an item transaction. Depending on the direction of the item transactions, you may distinguish three different types:

Types of transactions

- Item receipts (inward transactions)
- Item issues (outward transactions)
- Inventory transfers

Item receipts increase the quantity on hand. They include packing slip receipts in purchasing, customer returns in sales, reporting as finished in production as well as positive inventory counting adjustments and manual journals in inventory.

Item issues on the other hand include vendor returns in purchasing, packing slips in sales, picking lists in production as well as negative inventory counting adjustments and manual journals in inventory.

Inventory transfers are possible applying a transfer order or a transfer journal. Transfer orders support the transfer of items from one warehouse

to another, with the option to post and print picking list and shipment. Transfer journals are not only available for transfers from one warehouse to another; you may as well apply them to other dimensions, changing a serial or batch number as example.

Although you will register an inventory transfer in a single line, the posted transactions will show two lines: One for the item issue in the old warehouse and one for the item receipt at the new warehouse.

Transaction integration

As mentioned at the beginning of the chapter, most of the inventory transactions do not originate in the inventory management module, but derive from other parts of Dynamics AX. Therefore, you have to enter all data required for the inventory transaction (like warehouse, quantity and price) at the transaction origin in the other module – e.g. the purchase order.

As soon as an inventory transaction shows in Dynamics AX, you may see the reference to the transaction origin including voucher number and date.

Quantity and value

In order to grant an exact inventory valuation, Dynamics AX distinguishes between the physical transaction to cover the quantity and the financial transaction to cover the value.

For illustration purposes, Figure 7.1 shows the physical and the financial part of an inventory transaction related to a purchase order.

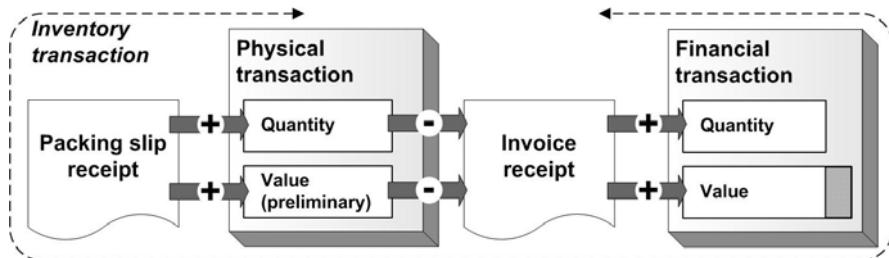


Figure 7.1: Physical and financial transaction in inventory for a purchase order

The physical transaction in Dynamics AX causes a change of the quantity on hand in inventory. As an example in purchasing, posting the packing slip receipt posts the physical transaction.

In terms of inventory quantity, the transaction is already finished when posting the packing slip, therefore. Inventory valuation only receives a preliminary cost price, however. The value of the packing slip therefore shows in the field *Physical cost amount* separate from the *Financial cost amount*, which shows the actual inventory value.

The second part of the inventory transaction is the financial transaction, containing valued (invoiced) quantity and cost amount. As an example in purchasing, posting the invoice receipt posts the financial transaction.

When posting the invoice, Dynamics AX reverses the related preliminary posting of the packing slip and posts the financial quantity and cost amount of the invoice. Quantity and amount of the invoice are included in the financial inventory value then.

The differentiation between the physical and the financial transaction applies to every inventory transaction, no matter in which module it originates. The way of posting depends on the origin, however.

For receipt transactions in purchase orders, the packing slip receipt posts the physical transaction and the invoice receipt the financial transaction.

In production, reporting as finished of finished items posts the physical transaction. The financial transaction posts when you end and cost the production order.

For issue transactions in sales orders, the packing slip posts the physical and the invoice the financial transaction similar to purchasing.

In production, posting the picking list of BOM components posts the physical transaction. As with receiving finished items, the financial transaction of BOM components posts when you end and cost the production order.

Receipt transaction got their final financial value when posting the invoice (except for later manual adjustments). The financial value of issue transactions frequently is not known, however, and therefore not final when posting the invoice. As an example, you may receive the purchase invoice showing a higher than the preliminary amount after posting the related sales invoice.

Except for items referring to a standard cost prize, you need to reevaluate issue transactions in an inventory closing procedure. Inventory closing, usually running at the end of each month, recalculates the financial value of issue transactions based on the value of receipt transactions.

Unlike other transactions, transaction journals in inventory management do not post physical and financial transaction in two separate steps. They post physical and financial transaction in parallel.

Inventory journals post to general ledger accounts depending on applicable settings (see Section 8.4) the same way as inventory transactions generated in other modules.

Vouchers

Receipt transactions

Issue transactions

Inventory closing

Journal posting

Ledger integration

7.1.2 At a Glance: Inventory Journal Transactions in Dynamics AX

Inventory journals are available to record a change of the quantity on hand in inventory, which is independent from orders in purchasing, sales or production. For your convenience, the example below shows a manual item receipt in an inventory profit/loss journal. In regular business, such transactions will be an exception, since a missing end-to-end business process usually is the reason for receiving an item without a purchase, production or customer return order.

Registering a journal

If you want to access an inventory transaction journal, you may choose the form *Inventory management> Journals> Profit/Loss*. Inventory journals are vouchers and therefore consist of a header and a lines part. Unlike purchase or sales orders, inventory journals do not show header and lines in a common form. Header and lines show in two separate forms.

Journal header

In order to register a transaction, you want to insert a record in the journal form by pushing *Ctrl+N* or the icon . In the next step, you need to select a journal name in the column *Name*. The journal number in the column *Journal* defaults from the number sequence.

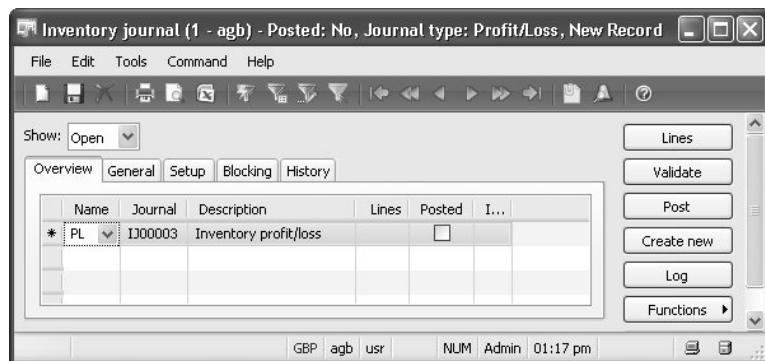


Figure 7.2: The inventory profit/loss journal form

If you want to support later analysis, you may enter a short text explaining the transaction in the column *Description*. The column *Lines* shows the number of registered lines of a journal.

If somebody works in a certain journal currently, the journal shows a red "X" in the column *I(n use)*. You may see the user blocking the journal on the tab *Blocking*. It is not possible to access the line of that journal until the other user leaves the journal concerned.

The checkbox *Posted* shows a checkmark, if a journal has been posted already. You may see posted journals after selecting "All" or "Posted" in the lookup field *Show* displaying in the upper part of the form.

As an alternative for creating a journal as a new record, you may push the button *Create new* inserting a header record and immediately switching to the lines.

Otherwise, you need to push the button *Lines* in order to access the journal lines. In the journal lines form, you may select the item number before inserting site, warehouse and other dimensions like batch number or locations depending on applicable settings.

In order to control the display of dimension columns, you may push the button *Inventory/Dimensions display*.

Lines

Date	Item number	Site	Warehouse	Batch...	Serial n...	Quantity	Cost price	Cost amount	L..
*	9/30/2009	4001	HQ	10		10.00	2.93	29.30	

Figure 7.3: Registering a journal line

Defaults for warehouse, quantity and cost price derive from the item record. The default for the quantity is 1.00, if the default or site-specific order settings of the item do not include a default inventory quantity. You may override all defaults (except the cost price of standard cost items).

If you enter a positive quantity, the transaction will be an item receipt, whereas a negative shows an item issue. Since there is no cost price adjustment from an invoice to a receipt transaction in an inventory journal, you need to ensure a correct cost price when registering such a journal.

In order to post the journal after recording the last line, you may push the button *Post* in the journal header or lines.

Before posting, you may push the button *Validation* running a check of posting problems. The validation does not check all possible problems, however, which is why you may receive an error message when posting on rare occasions, even if the validation did not show a problem.

Defaults

Posting the journal

7.2 Item Management

Since all business processes related to inventory require item data, item records are the core element of master data in supply chain management.

Item records contain all physical items in Dynamics AX like raw materials, parts, semi-finished products and finished products. In addition, item records also include items like service or phantom items, which do not exist physically, but are required in order management or bills of materials.

7.2.1 Item Records

Overview

Descriptions of parts of the item record functionality is available in Section 3.3, 4.3, 5.2.1 and 6.3.3, covering the options required in purchasing, sales, production and master planning. This section does not include these topics, therefore. Apart from general features of the item form, the focus in this section is on item data in inventory and on inventory valuation.

You may access item management choosing the form *Inventory management> Item details* or the list page *Inventory management> Items*. The list page or the tab *Overview* of the form show a list of available items. All item records need to include following mandatory entries to be stored in the database:

- Item number
- Item group
- Inventory model group
- Dimension group

Other core item data, which you should consider when inserting an item, are the item type, the sales tax groups, the units of measure and the cost price.

Creating an item

When you insert an item as a new record in the item form, it needs to contain at least the mandatory data listed above. Many companies apply record templates (see Section 2.2.2) for creating new item records, which in addition to mandatory fields contain defaults for other fields as well.

The item number needs to be unique and inserts automatically. Depending on the setting of the number sequence for item numbers (*Inventory management> Setup> Parameters, tab Number sequences*), manual assignment may as well be necessary, however.

Item type

The item type controls the structure of an item: Items that are bought from a vendor – like raw materials, parts and merchandise – refer to the item type “Item”. The item type “BOM” applies to items, which refer to a bill of materials or route – like finished items in production or kits in sales.

The item type “Service” applies to services, which are included in the item records, but do not show an inventory quantity. When setting up these items, you have to assign a specific item group and inventory model group to grant correct inventory valuation and ledger postings.

If you want to change the item type of an existing item, you may push the button *Functions/Change item type*.

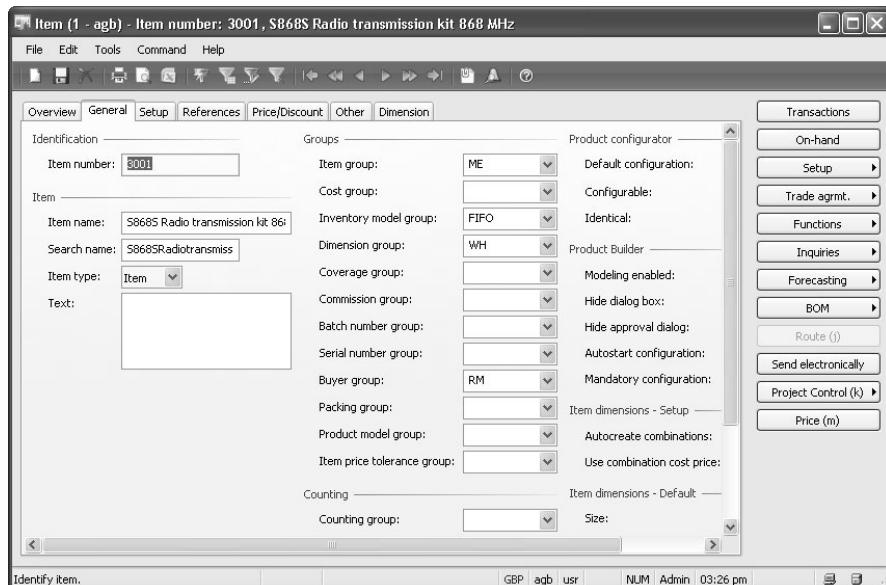


Figure 7.4: The tab General in the item form

The default for the item name and the search name derives from the item number. You may override the default, entering a short text in the item name.

The place to enter a longer description is the field *Text* on the tab *General*. If you require descriptions in foreign languages, you may push the button *Setup/Language-Item description*.

The main purpose of item groups is to classify items, which should post to the same ledger accounts in finance. Therefore you will need at least as many item groups, as there are different stock and revenue accounts in finance distinguishing inventory items. You may find more details on the inventory posting setup in Section 8.4.2.

When setting up a new item, you have to keep in mind that you should not change the item group after registering the first transactions of the

Item name

Item group

item. Even if Dynamics AX does not prevent you from changing the item group, it will cause headache in finance when doing inventory reconciliation, if you do not carefully check the consequences of changing the group in the particular case.

Item groups do not only control ledger integration, they also are a filtering and sorting criteria in many reports.

Units of measure

If you need a new unit of measure, you want to set it up in the units form (*Basic> Setup> Units> Units*) before you may assign the unit of measure to an item. The form *Basic> Setup> Units> Fixed units* in addition specifies generally, which units to apply as base units for weight and length.

You may enter a unit conversion calculation in the units form, pushing the button *Setup/Unit conversion*. Depending on the particular unit, you want to register a conversion factor between two units applying to all items or a specific conversion per item number.

When entering a new item, Dynamics AX will insert the default unit available in the inventory management parameters. The unit of an item should not be empty, since unit conversion is not possible for an empty unit.

If the units of an item are different in sales, inventory and purchasing, you may assign different units on the tab *References* of the item form. The unit in the item record is the default when registering a transaction for the item, e.g. a sales order line. If necessary, you may select a different unit in the order line then. When choosing a different unit, the unit requires a unit conversion to the inventory unit, however.

Number groups

When entering a batch or serial number in a transaction, the number needs to be available in the batch or serial numbers table (*Inventory management> Inquiries> Dimensions*). If you want Dynamics AX to generate batch or serial numbers automatically, you need to enter appropriate groups in the number group form (*Inventory management> Setup> Dimensions> Number groups*).

On the tab *General* of the number group form, you may assign a number sequence and specify the structure of the number group. In addition, you may specify which transaction should generate numbers.

The dimension group on the tab *General* in the item form controls, if batch or serial numbers apply to an item. If they do, you may select a batch or serial number group, which also shows on the tab *General* in the item form, to generate batch or serial numbers for the item automatically.

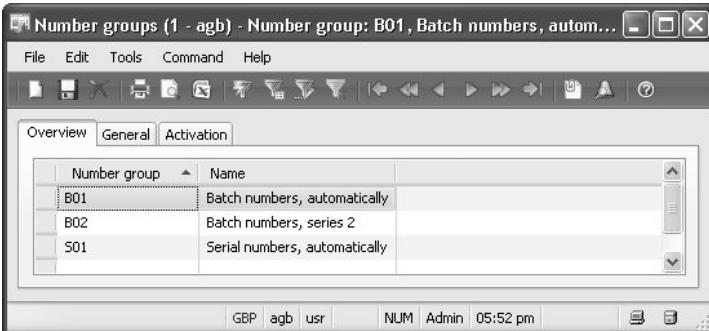


Figure 7.5: Managing number groups for batch and serial numbers

7.2.2 Inventory Dimension Groups

Inventory dimensions control the level of inventory management. Applying dimensions, you may separate inventory quantity and transactions to a more detailed level than the item number.

Inventory dimensions therefore are a prerequisite in Dynamics AX to show the quantity of an item on a certain warehouse or of a certain color.

Dynamics AX includes nine inventory dimensions, separated into two groups:

- Item dimensions (configuration, size, color) show characteristics of an item
- Storage dimensions (site, warehouse, location, pallet, batch number, serial number) apply to inventory structures

If you need other dimensions, you may rename the dimensions *Size* and *Color* on the tab *Editing* of the dimension group form. Item dimensions and the storage dimension *Pallet ID* are not available, if the appropriate configuration key in system administration is not active.

If you record an inventory transaction of an item, the dimension group of the item controls which inventory dimension you need to insert. If the batch number dimension is active in the dimension group of the item as an example, you need to enter batch numbers.

If the multisite functionality (see Section 2.4.4) is active in a company account, Dynamics AX activates the dimensions *Site* and *Warehouse* in all dimension groups. You have to register the site in every inventory transaction therefore.

Dimensions

Dimension groups

Sites

Managing dimension groups

In order to access dimension group management, you want to access the form *Inventory management> Setup> Dimensions> Dimension groups*. The dimension group form shows three panes: The main pane containing the list of dimension groups in the upper part of the form, the item dimensions panes and the storage dimensions pane.

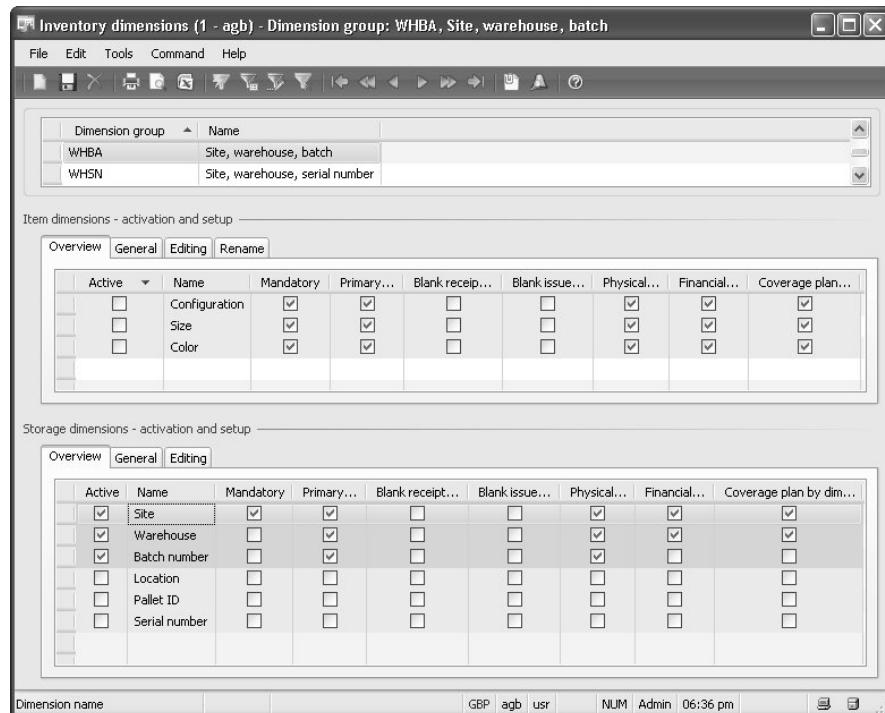


Figure 7.6: The dimension groups form

After selecting a dimension group in the upper pane, you may edit dimension settings of the dimension group in the lower panes.

Settings

If you require an additional dimension group, you will insert a new record in the upper pane. In the next step, you may set up the item and storage dimensions of the dimension group selecting the checkboxes as explained in Table 7.1.

On the tab *General* in the item and storage dimension pane, you may additionally select if purchase and sales prices in trade agreements should be available for the dimension concerned (see Section 3.3.2).

Table 7.1: Dimension settings

Parameter	Explanation
<i>Active</i>	Dimension is available for transactions of the item
<i>Mandatory</i>	Dimension must be specified in every transaction and journal (e.g. order line)
<i>Primary stocking</i>	Dimension must be specified in every transaction and is a default for displaying in the on-hand inquiry
<i>Blank receipt allowed</i>	Dimension value is not required for inward transactions (only available, if <i>Primary stocking</i> is not active)
<i>Blank issue allowed</i>	Dimension value is not required for outward transactions (only available, if <i>Primary stocking</i> is not active)
<i>Physical inventory</i>	Item availability calculation distinguishes different dimension values
<i>Financial inventory</i>	Inventory valuation distinguishes different dimension values (necessary to calculate a value and cost price per warehouse as an example)
<i>Coverage plan by dimension</i>	Master planning distinguishes different dimension values when calculating item coverage (see Section 6.3.3)

In order to avoid invalid dimension values in posted transaction, it is not possible to change inventory-related settings of a dimension group as soon as a transaction refers to the dimension group. For the same reason, it is not possible to change the dimension group of an item, if there is an inventory quantity or open transaction.

If you need to change dimension settings for an item, you may choose one of the following options:

- If you only want to include an additional dimension (e.g. pallets), you may choose a dimension group that looks like to old dimension group except for including the new dimension. Temporarily applying a group allowing blank issue for the new dimension, you may transfer existing stock to the new dimension.
- The secure option to do the dimension change is to close (delete or post) all open transactions and orders concerned, and to post transactions issuing the complete stock physically and financially. After inventory closing, you may assign the new group and post transactions according to the stock actually on hand in the warehouse.

Changing dimensions

Aspects for setup	When setting up dimension groups, you should activate only dimensions actually required in your business processes. In addition, you should apply a limited number of dimension groups. System load, complexity and time for registration increase with the number of dimensions in use. On the other hand, you need to activate all dimensions required. As an example, you may see the quantity on hand per warehouse only if the dimension <i>Warehouse</i> is active for the items concerned. If you need a certain dimension for some, but not all transactions of an item, the best way is to apply a pseudo-value for transactions where the dimension is not applicable. As an example, if warehouse locations are not applicable to all your warehouses, you will insert a pseudo-location as a default for warehouses without locations.
Service items	If the multisite functionality is active, you need to apply a dimension group with active dimensions <i>Site</i> and <i>Warehouse</i> for service items as well. The reason is that the inventory dimension <i>Site</i> frequently refers to a finance dimension (e.g. <i>Department</i>), providing the possibility to analyze the revenue of a service item in finance per site as an example.
Dimensions in inquiries	When looking at reports and inquiries of inventory quantity and inventory value, you need to take into account that only those queries show a reliable result, which comply with the dimension setup. Therefore, it is not useful to report inventory value and cost price per warehouse, if the checkbox <i>Financial inventory</i> is not selected in the applicable dimension group. Item issue transactions do not include the warehouse regarding inventory valuation if not selected, which causes a result different to what you expect.
Dimensions display	The default for displaying the dimension columns in forms – e.g. the order lines in the sales order form – is available on the tab <i>Inventory dimensions</i> in the parameters form of all relevant modules (e.g. <i>Accounts receivable> Setup> Parameters</i>). When showing a form – e.g., the sales order form –, you may change the display of dimension columns, pushing the button <i>Inventory/Dimensions display</i> .
New in AX 2009	Items new in Dynamics AX 2009 related to inventory dimensions include the new dimension “Site” to implement the multisite functionality.

7.2.3 Inventory Model Groups

Inventory model groups include settings for the valuation method on the one hand and for item handling on the other hand. They are very important for inventory valuation and ledger integration, therefore.

You may access the form to manage inventory model groups selecting the menu item *Inventory management> Setup> Inventory> Inventory model groups*. The tab *Overview* displays a list of available groups there, switching to the tab *Setup* you may access particular settings.

Accessing model groups

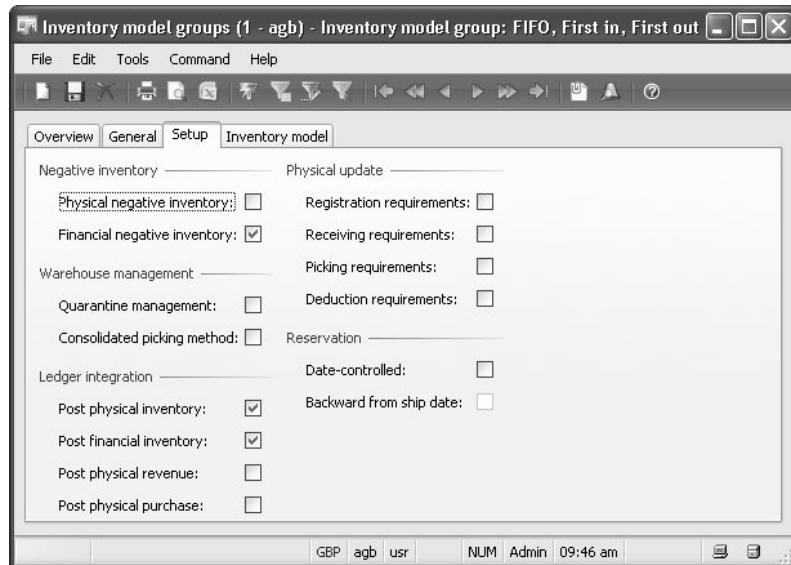


Figure 7.7: Available settings in the inventory model group

The checkboxes *Quarantine management*, *Consolidated picking method*, *Registration* and *Picking requirements* as well as *Receiving* and *Deduction requirements* control the item handling in warehouses.

Item handling

The parameters *Quarantine management* and *Consolidated picking method* control the automatic generation of internal orders.

If you select the checkbox *Quarantine management*, Dynamics AX will automatically create a quarantine order (see Section 7.4.4) when you post an item receipt. This concerns posting an item arrival journal or a packing slip receipt for purchase orders and customer returns as well as reporting as finished in production.

If you select the checkbox *Consolidated picking method*, Dynamics AX will automatically create an output order of the type “*Consolidated picking*”, which needs to be processed in an inventory shipment (see Section 4.5.2).

If you select the checkbox *Registration requirements*, you need to post an inventory registration through an item arrival journal or a registration

directly in the purchase order line, before you may post the packing slip receipt (see Section 3.5.2). The checkbox *Picking requirements* similar applies to picking and picking list posting before packing slip posting in sales.

The checkboxes *Receiving requirements* and *Deduction requirements* control, if you need to post a packing slip in sales or purchasing before posting the invoice.

Negative inventory

Whereas you do not allow a negative physical inventory for stock items usually, you will accept a financial negative inventory in most cases. A financial negative inventory is there, if you post a sales invoice before posting the purchase invoice of the items sold.

When setting the parameters for negative inventory, you need to consider dimension groups: Dynamics AX will check negative physical or financial inventory of an item for dimensions, which show a checkmark in the parameter *Physical inventory* or *Financial inventory*.

Inventory model

Selecting an inventory model (FIFO, LIFO, average or standard cost) on the tab *Inventory model*, you specify the inventory valuation method, which is the way Dynamics AX links issue transactions to receipt transactions in terms of valuation.

Details on inventory valuation methods are available in Section 7.3.1, details on ledger integration in Section 8.4.2.

Changing model group settings

If you change the *Inventory model* or *Ledger integration* settings on the tab *Setup* of an inventory model group after posting item transactions, reconciliation of inventory and finance may become very difficult.

Before you do changes of these settings, you should carefully plan the consequences the same way you do when changing a dimension group.

Aspects for setup

The number of required inventory model groups depends on the requirements of your company for processing items. Usually you need to apply at least two groups, one for stock items and one for service items. The inventory model group for service items should allow physical and financial negative quantity and deactivate ledger integration.

New in AX 2009

Items new in Dynamics AX 2009 related to inventory model groups include the new options for standard cost valuation (see Section 7.2.4) as well as the receiving and deduction requirements.

7.2.4 Cost Price Settings

Core settings regarding the inventory valuation of an item are available on the tab *Inventory model* of the inventory model group: The lookup field *Inventory model* controls, if the valuation method is FIFO, LIFO, weighted average or standard cost. For the methods FIFO, LIFO and weighted average, you may additionally select the checkbox *Fixed receipt price* if you want to apply a standard cost price for item receipts only.

On the tab *Price/Discount* in the item form, you may enter a basic cost price, which does not apply for the valuation method "Standard cost", however.

All other valuation methods apply the basic cost price in the item record as a default for the cost amount of item receipts in inventory journals and counting journals, if no site-specific cost price applies. You should make sure a correct price applies, therefore.

The cost price per site – as well as a standard purchase and sales price per site – is available in the item price form, which you may access pushing the button *Price* in the item form.

Before you may enter a record in the item price form, the appropriate costing version (*Inventory management> Setup> Costing version*) needs to be available. Costing versions contain separate versions of prices, which may differ in calculation. The *Costing type* "Standard cost" is required for versions, which apply to standard cost prices in the item price form.

In order to register a new cost price in the item price form, you need to select the tab *Pending prices*. Choosing the price type "Cost" for a cost price, you may select the costing version in the column *Version*. If a fixed *Site* and *From date* do not default from the costing version, you may enter it.

Valuation method

Item cost price

Costing version

Item price form

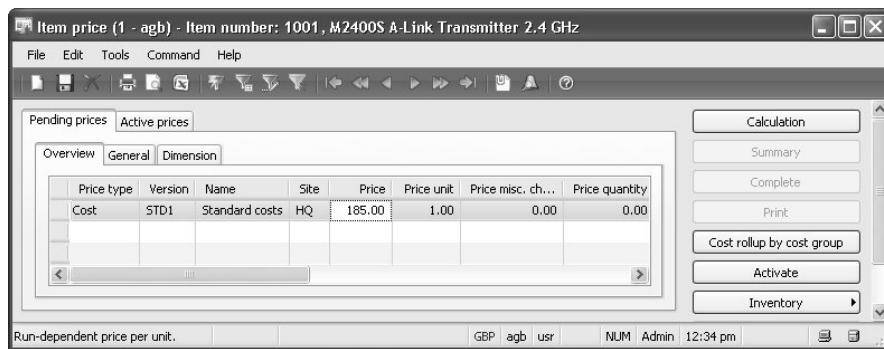


Figure 7.8: The item price form

For finished or semi-finished items referring to a bill of materials, you may push the button *Calculation* in order to run a cost calculation. When you are finished entering the pending price, you may activate it pushing the button *Activate* in the item price form. Active prices then show on the tab *Active prices* of the form.

If you want to enter cost prices for an item based on the item dimensions Configuration, Size and Color, you need to select the checkbox *Use combination cost price* in the item form.

New in AX 2009

Items new in Dynamics AX 2009 related to cost price settings include the new option to enter prices for sites and costing versions in the price form.

7.2.5 Transactions Inquiry

If you want to know inventory transactions or the quantity on hand of an item, you may push the button *Transactions* or *On-hand* in the item form. Both selections are as well available as an option in the button *Inventory* in many other forms (e.g. the sales order lines).

Another possibility to access inventory transactions and the quantity on hand is available through the menu items *Inventory management> Inquiries> On-hand* or *Inventory management> Inquiries> Transactions> Transactions*.

Transactions form

When accessing the inventory transactions out of the item form, the transactions form will show all transactions of the item concerned. In the columns *Reference* and *Number*, you may see the original voucher.

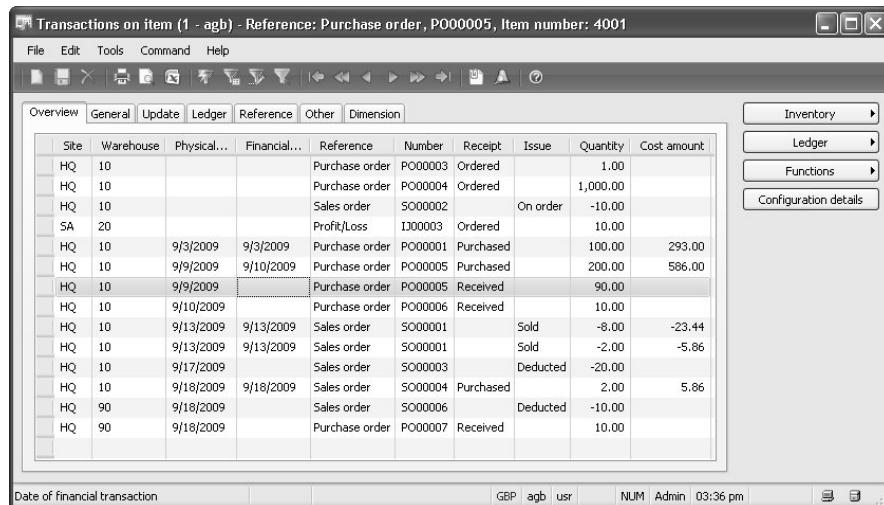


Figure 7.9: Inventory transactions of an item in the transactions form

In addition to posted transactions, the transactions form also shows future transactions not posted yet. These transactions include order lines in sales, purchasing and production, for which no packing slip or invoice has been posted. You may recognize the lines concerned by the empty physical and financial date. In addition, the transactions show a receipt status "Ordered" or an issue status "On order".

Unposted transaction

When posting a packing slip in purchasing or sales as well as a picking list or a report as finished journal in production, Dynamics AX will apply the posting date to the physical date in the inventory transaction. The status of the transaction changes to "Received" or "Deducted". On the tab *Update*, you may see the preliminary inventory value of the transaction in the field *Physical cost amount*.

Physical transaction

The financial date in an inventory transaction updates, when you post the invoice in purchasing or sales as well as when you end and cost the production order. The status of the transaction changes to "Purchased" or "Sold". The inventory value of the transaction is available in the column *Cost amount* then.

Financial transaction

Dynamics AX does not change the posted financial cost amount any more. If you post an adjustment of the inventory value in the course of inventory closing or in a manual adjustment, the difference applied is available separately in the field *Adjustment* on the tab *Update* of the transaction.

Picking / Registration

Inventory picking and registration (see Section 3.5.2) represent special steps of an inventory transaction. When you post a picking or registration transaction, it will change the quantity on hand as well as the status of the inventory transaction. Unlike packing slip transactions, picking and registration do not post an unchanging voucher, however.

When you post a packing slip then, you may see the date of the picking or registration posting in the field *Inventory date* on the tab *General* of the inventory transaction. However, if you do not post a packing slip but cancel the registration, it is not possible to see the original registration in the inventory transaction any more.

Arrived status

When you work in the warehouse module applying pallets and inventory locations, you may additionally face a receipt status "Arrived". Dynamics AX sets this status when posting an item arrival journal, for which pallet transports are activated. Transactions showing this status are not included in the quantity on hand in inventory.

Apart from data showing on the tab *Overview*, data on the tab *Update* contain valuable information in inventory transactions. The columns *Physical*, *Financial* and *Settlement* group the fields on this tab.

Voucher data

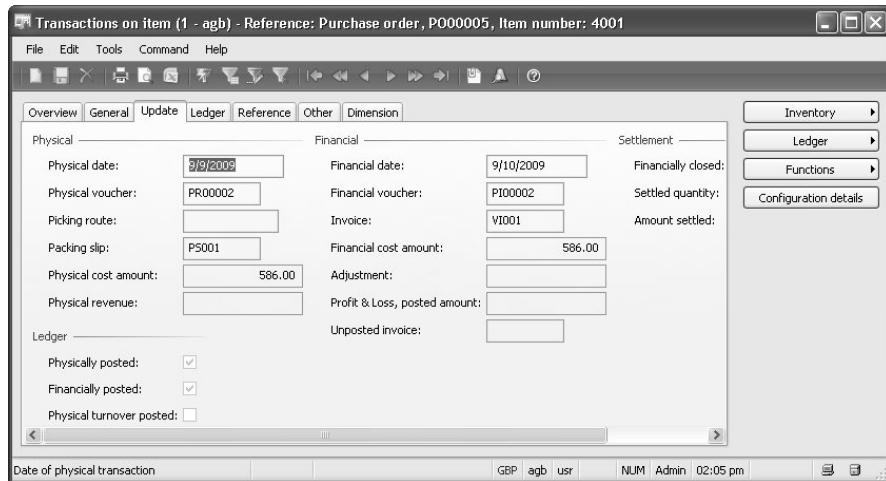


Figure 7.10: Voucher data in an inventory transaction

The field group *Physical* displays date, number and preliminary value of the packing slip. Invoice data are available in the field group *Financial*.

If the value of a transaction adjusts according to the valuation method when closing inventory or according to manual adjustments, the value difference shows in the field *Adjustment*. The original *Financial cost amount* therefore does not change any more, all later adjustments add in the field *Adjustment*.

The field group *Settlement* shows if an inventory transaction is settled by inventory closing already. If the quantity of a transaction completely settles matching item issues or receipts, inventory closing inserts the closing date in the field *Financially closed* and closes the transaction by setting the lookup *Value open* on the tab *General* to "No". However, by registering a manual adjustment to a closed transaction, you may reopen it again later.

Ledger integration

The checkbox *Physically posted* in a transaction shows that the packing slip has been posted to the general ledger. As a prerequisite, the ledger integration for physical transactions needs to be active in the inventory model group of the particular item.

Assuming ledger integration for financial transactions is active, the checkbox *Financially posted* shows that the invoice has been posted. For purchase invoices, the checkbox is marked after invoice posting even if ledger integration is not active for an item, though. The reason for this is that the purchase invoice always posts a ledger transaction for the item: To a stock account for the receipt transaction if ledger integration is active or to an expense account for immediate consumption otherwise.

7.2.6 Quantity on Hand

In order to see the current quantity on hand for an item, you may push the button *On-hand* in the item form. The tab *Overview* of the on-hand form displays a list of inventory quantities, grouped by the inventory dimensions that are selected as primary stocking dimensions for the item.

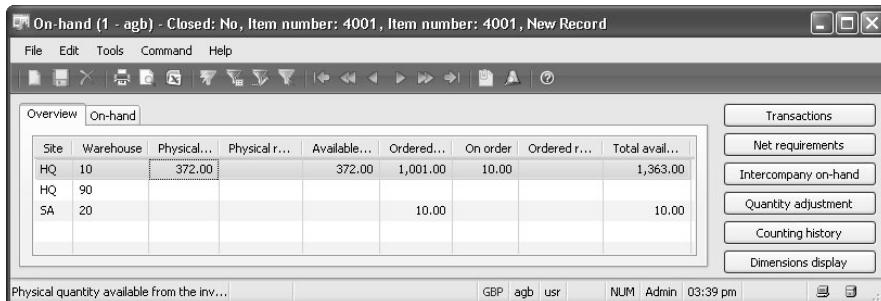


Figure 7.11: On-hand overview of an item

You may push the button *Dimensions display* in the on-hand form to open a dialog box, which allows selecting displayed dimension columns. This dialog box is available in many other forms (e.g. the sales order lines) as well, pushing the button *Inventory/Dimensions display*.

If you select to show an additional column for the batch number as an example, the lines in the form will display the quantity per batch. In order to see the overall quantity of an item, you may clear all dimensions for displaying.

In order to see detail data of an on-hand record, you may switch to the tab *On-hand*. Apart from the physical inventory, which is the actual quantity in inventory, the form shows the current average cost price as well as availability data.

The physical inventory is the total of transactions, which show following status:

- *Posted* (Invoiced quantity of purchasing deducting sales)
- *Received* (Purchase packing slip receipt, adds to posted quantity)
- *Deducted* (Sales packing slip, deducts from posted quantity)
- *Registered* (Registration and item arrival, adds to posted quantity)
- *Picked* (Picking in sales, deducts from posted quantity)

Dimensions display

On-hand details

The screenshot shows the SAP On-hand details screen for item number 4001. The interface is divided into several sections:

- Identification:** Item number (4001), Dimension No., Closed (unchecked).
- Inventory dimensions:** Configuration, Size, Color, Site (HQ), Warehouse (10), Batch number, Location, Pallet ID, Serial number.
- On-hand:**
 - Physical inventory: 372.00
 - Physical reserved: [empty]
 - Available physical: 372.00
 - Available for reservation: 372.00
 - Ordered in total: 1,001.00
 - Ordered reserved: [empty]
 - On order in total: 10.00
 - Total available: 1,363.00
 - Physical cost amount: 234.40
 - Financial cost amount: 855.56
 - Cost price: 2.93
- Physical inventory:** Posted quantity: 292.00, Deducted: 20.00, Picked: [empty], Received: 100.00, Registered: [empty].
- Various:** Arrived: [empty], Ordered: 1,001.00, On order: 10.00, Quotation receipt: [empty], Quotation issue: [empty].
- Units:** Radio buttons for Inventory unit (selected), Sales unit, Purchase unit, Other units. Unit: Pcs.
- Transactions:** Net requirements, Intercompany on-hand, Quantity adjustment, Counting history, Dimensions display.
- Bottom:** Identify item, currency (GBP), user (agb), date (04/04 pm), and system status (NUM Admin).

Figure 7.12: On-hand details

The field *Arrived* shows the quantity after posting an item arrival journal in the warehouse module referring to a pallet transport. The quantity arrived is not included in the physical quantity. When posting the related pallet transport, the status of the quantity changes to “Registered”. included in the physical quantity then.

All data shown in the on-hand form refer to the selected dimensions. As an example, the dimensions selected in Figure 7.12 are the site “HQ” and the warehouse “10”. Therefore, a filter applies showing quantity and cost amount on warehouse “10” only. When looking at the cost price and cost amount you need to take into account, that these figures are reliable only for dimensions with separate financial inventory according to the dimension group settings.

Past inventory

If you want to know the physical inventory on a date in the past, you may select a report in the menu path *Inventory management> Reports> Status> Physical inventory*. When selecting dimensions like warehouse or serial number in these reports, you need to take into account again, that cost amounts shown in the appropriate columns are only reliable for dimensions with separate financial inventory according to the dimension group settings.

7.2.7 Case Study Exercises

Exercise 7.1

In order to investigate the functionality of dimension groups, you want to create a new dimension group D-## (## = your user ID). You should set up this dimension group in a way that the dimensions *Site*, *Warehouse* and *Batch number* are required in every transaction. For the warehouse dimension, separate financial inventory valuation should apply.

Dimension group

Exercise 7.2

In order to prepare the next exercise, you want to enter a new inventory model group X-## (## = your user ID) with FIFO valuation, assigning the inventory model "FIFO". The ledger integration for physical and financial inventory should be active. A negative financial inventory is allowed, all other checkboxes remain cleared.

Inventory model group

Then you should set up a second inventory model group S-## for standard cost valuation, which got the same settings as the first group, except that the inventory model is "Standard cost" and a negative physical inventory is possible.

Exercise 7.3

You want to examine the consequences of the settings in the dimension group and the inventory model group entering a new item I-##-S to show a standard cost price and an item I-##-O to show the FIFO valuation.

Item record

Therefore, you choose your inventory model group S-## for the item I-##-S and X-## for the item I-##-O. The dimension group for both items is the group you have set up in exercise 7.1. All other settings of the items may be similar to exercise 3.4.

In addition, you need to register and activate a standard cost price for the item I-##-S. Enter a standard cost price of GBP 50.00 for the main site in the item price form.

Exercise 7.4

You want to enter a purchase order referring to your vendor of exercise 3.2, which contains a line of 100 units of the first and 100 units of the second item entered in exercise 7.3. Enter GBP 60.00 in the purchase price of both order lines.

Inventory transactions

Try to find out, if you may post a packing slip receipt without inserting a batch number. Choosing the option *Go to the main table form* in the batch number column, you may create the batch number B001 for both items in the batch table. In the purchase order lines, you may insert the batch number afterwards.

When you are finished, you may post the packing slip receipt and the invoice receipt for the complete quantity. If you look at the item transactions and the quantity on hand, can you explain the difference of the cost amount and the cost price of the two items?

Note: If required, you may show the column for the dimension *Batch number* in the order lines pushing the button *Inventory/Dimensions display*.

7.3 Inventory Valuation

Based on the deep integration of all parts of the application, Dynamics AX provides a very accurate calculation of inventory values. Therefore, apart from the valuation methods of average or standard costs, you may choose an end-to-end FIFO or LIFO valuation as well.

Valuation principle

The basis of inventory valuation is a simple principle:

- Receipt cost amounts are provided by the receipt transaction
- Issue cost amounts are calculated according to the valuation model

The cost amount of the issue transaction derives from the receipt transactions, which refer to the issue according to the valuation model (FIFO, LIFO, average). It is not possible to enter the cost price and cost amount in an issue transaction, therefore.

Standard cost price

A special case is the valuation according to standard cost price, for which Dynamics AX provides two different options:

- Fixed receipt price
- Standard cost

The option “Fixed receipt price” is available in connection with the valuation methods FIFO, LIFO and average cost. Applying this option fixes the receipt cost price in advance, preventing to change it when recording a transaction.

Unlike the fixed receipt price, the inventory model “Standard cost” provides true standard costs, applying the standard cost price of an item for all issue and receipt transaction.

The difference between the methods “Standard cost” and “Fixed receipt price” shows, when changing the standard cost price of an item. Whereas the standard cost method immediately posts an adjustment of inventory value, the fixed receipt price method does not directly post a difference. For this method, the new price only applies to new receipts – existing inventory will issue to the old price until it is consumed completely.

As a prerequisite for applying the standard cost method, the multisite functionality needs to be active in the company account concerned.

Items new in Dynamics AX 2009 related to inventory valuation include the inventory model “Standard cost”. The way of previous versions to calculate standard cost prices is still available as “Fixed receipt price”.

New in
AX 2009

7.3.1 Valuation Method

Dynamics AX provides following valuation methods – available in the field *Inventory model* of the inventory model group – to calculate the cost amount of issue transactions:

- FIFO
- LIFO
- LIFO date
- Weighted average
- Weighted average date
- Standard cost

Inventory
model

Receipt transactions get their financial value when you post the related financial transaction (invoice). Except for the standard cost method, the different transaction types therefore provide the receipt cost price and amount as follows:

Valuation of
item receipts

- *Purchase order receipts*
Amount of the invoice line
- *Production receipts*
Cost amount of picked BOM line items and consumed work center time, calculated when ending and costing the order
- *Sales item return*
Original value of the returned item; return cost price entered in the return/sales order line, if not assigned to an original sales order
- *Other receipts*
Cost amount entered in the journal line

The cost price and amount of item issues always complies with the average cost price when posting the transaction. The valuation method applies when closing inventory. Inventory closing in Dynamics AX determines the assignment of item receipts to item issues according to the inventory model (FIFO, LIFO or average). The cost price and amount of an issue transaction then calculates based on assigned receipts.

Valuation of
item issues

The issue price and amount therefore is not final until you have posted the financial transaction (invoice) of all assigned receipts and inventory closing is finished.

An exception is the valuation according to standard cost price (“Standard cost” and “Fixed receipt price”), for which Dynamics AX applies the standard cost price immediately for issue transactions as well.

Standard cost price	For items of the inventory model "Standard cost", inventory closing is not required because all receipts and issues immediately post the standard cost price available in the item price form. When activating a new standard cost price, Dynamics AX immediately applies an adjustment of inventory value for the current stock, which posts in inventory and in the general ledger. The new standard cost price therefore may apply to issues of that stock right away.
Fixed receipt price	The checkbox "Fixed receipt price" in the inventory model group applies in connection with the valuation methods FIFO, LIFO or average cost. When selecting this option, the cost price entered in the item form or the item price form specifies a fixed cost price for receipt transactions. The cost price and amount calculates according to the valuation method and therefore always complies with the standard cost price of the item, as long as you do not change the item cost price. When you change the item cost price, consumption of existing stock in inventory will comply with the old cost price calculating the cost amount of issue transactions according to the valuation method. Therefore, inventory closing is also required for the option "Fixed receipt price".

Following table shows an overview of the different valuation methods available in Dynamics AX:

Table 7.2: Inventory models controlling the valuation methods in Dynamics AX

Inventory model	Explanation
FIFO <i>First In First Out</i>	Item issues refer to the oldest item receipt still on stock
LIFO <i>Last In First Out</i>	Item issues refer to the newest item receipt on stock that is available when closing inventory
LIFO date	Like LIFO, limiting the assignment of issues to receipts before the particular issue
Weighted average	The cost price of item issues is the average cost price of the inventory quantity when closing inventory
Weighted average date	Like "Weighted average", calculating the average cost price for the particular issue date
Standard cost	The cost price of item issues and receipts is equal to the active standard cost price of the item

Example

Table 7.3 is here to show a short example of the cost price calculation for the different valuation methods. Basis of the example are three receipt

transactions showing different cost prices and an issue transaction in between:

Table 7.3: Posted transactions for comparing valuation methods

Date	Transaction	Quantity	Cost amount
July 1	Receipt	10	100
July 2	Receipt	10	200
July 3	Issue	10	(to be calculated)
July 4	Receipt	10	300

After inventory closing, the cost amount of the issue shows following figure depending on the valuation method:

Table 7.4: Valuation of the item issue in Table 7.3

Model	Amount	Explanation
FIFO	100	From receipt on July 1
LIFO	300	From receipt on July 4
LIFO date	200	From receipt on July 2
Weighted average	200	Average of all receipts
Weighted average date	150	From receipt on July 1 and July 2

In addition to the inventory model, you need consider item dimension settings when calculating the cost amount of an item issue. Assigning of issues and receipts is not possible across dimensions with separate financial inventory according to the dimension group settings.

If separate financial inventory is activated for the dimension *Warehouse*, issues of a warehouse "20" will only assign receipts to warehouse "20"(including transfers) as an example. If separate financial inventory is not active for the dimension *Warehouse*, assignments comply with the date sequence independent from the warehouse in the transactions.

Marking is another option, influencing the automatic assignment according to the inventory model. Markings work like lots for inventory valuation, assigning the cost amount of a specific receipt to a specific issue. In order to mark a transaction, you may push the button *Inventory/Marking* in transactions inquiries, order lines or journal lines.

Dimensions

Marking

7.3.2 Inventory Closing and Adjustment

Reasons for closing

When you post an issue transaction, Dynamics AX always applies the average cost price (except for the standard cost model). In order to calculate the correct cost price and amount according to the valuation method (*Inventor model*) of the item, you need to close inventory. Inventory closing does not affect items assigned to the inventory model "Standard cost", however.

You need to close inventory periodically – usually as part of the month closing procedure in finance – in order to show correct item costs in finance and to close inventory transactions. After closing inventory, it is not possible to post inventory transactions in the closed period any more. If you need to post a transaction in a closed period, you may cancel inventory closing.

Inventory closing form

Inventory closing is available in the form *Inventory management> Periodic> Closing and adjustment*, displaying a list of previous closings. If you want to close a period, you need to push the button *Close procedure*.

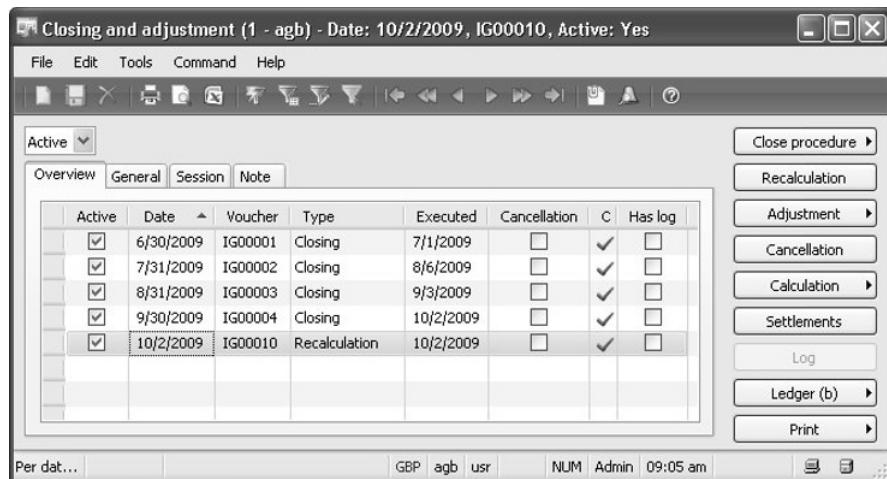


Figure 7.13: The inventory closing and adjustment form

The first and second option in the close procedure, checking open quantities and cost prices, provide reports to assess inventory transactions. You may run these reports to take corrective actions in case of missing or wrong transaction before actually closing a period. Dynamics AX does not require these steps before closing, however.

In order to close an inventory period, you push the button *Close procedure/3.Close* in the inventory closing form. Depending on the number of transaction, it might be useful to run closing as a batch job not within regular business hours.

As a prerequisite to close a period in inventory, the accounting period needs to be open. As far as applicable, you should finish posting invoice receipts for all item receipts in purchasing, as well as ending and costing production orders that are reported as finished. Concerned item receipts then show their financial cost amount, minimizing the number of open transactions as far as possible.

After closing inventory, you may see posted adjustment transactions pushing the button *Settlements* in the inventory closing form. If you need to cancel inventory closing, you may push the button *Cancellation*. The button *Recalculation* calculates and posts adjustment transactions like inventory closing, but does not actually close a period.

If you want to adjust the inventory value of an item manually, you may push the button *Adjustment* in the inventory closing form. You may choose the option *Adjustment/On-hand* to adjust the cost price and amount of the current inventory quantity on the level of inventory dimensions. Choosing the other option, pushing the button *Adjustment/Transaction*, you may adjust the cost amount of individual receipt transactions.

In the adjustment form, you may choose the items or transactions concerned by pushing the button *Select*. In the records of the adjustment form, you may then insert a positive or negative adjustment amount either manually or by choosing the appropriate option of the button *Adjustment* to receive a proposal. Pushing the button *Post* in the adjustment form posts the adjustment.

7.3.3 Case Study Exercises

Exercise 7.5

You want to order 100 units of the first and 100 units of the second item of exercise 7.3 from your vendor of exercise 3.2. Enter an appropriate purchase order choosing the batch number B001 and a purchase price of GBP 120.00 in both order lines.

When you are finished entering the order, you should post the packing slip and invoice receipt for the whole order quantity. In the posting date (packing slip date) on the tab *Setup* of the posting form, you should enter the day after the posting date of exercise 7.4 (e.g. July 2, if exercise 7.4 has been on July 1).

Prerequisites

Form buttons

Adjustment

Purchase order

After posting the invoice, check the inventory transactions as well as the inventory quantity and value (cost amount) of the two items.

Exercise 7.6

Sales order

Your customer of exercise 4.1 orders 150 units of the first and 150 units of the second item of exercise 7.3. Enter an appropriate sales order choosing the batch number B001 in both order lines. Then you may post the sales invoice for the whole order quantity. For the invoice date on the tab *Setup* of the posting form, you should enter the day after the posting date of exercise 7.5 (e.g. July 3, if exercise 7.5 has been on July 2).

After posting the invoice, check the inventory transactions as well as the inventory quantity and cost amount of the two items again.

Exercise 7.7

Closing inventory

You want to perform a *Recalculation* in the inventory closing form in order to calculate the correct inventory value of your items according to the valuation method. In the recalculation form, select an appropriate filter to limit calculation to your items and set the recalculation date to the posting date of exercise 7.6 (e.g. July3).

Then check the cost price and amount of the inventory transactions and the inventory quantity for the two items. Which changes come from recalculation, can you explain the result?

7.4 Business Processes in Inventory

The only way to change the inventory quantity or value of an item is to post an inventory transaction. Most business processes causing changes of inventory do not origin in inventory management, however, but refer to procedures in other areas like purchasing, sales or production. These processes automatically generate inventory transactions in the background.

Descriptions of processes in these areas are already available in the appropriate previous section of the book. Below you may find business processes within inventory management, therefore.

7.4.1 Inventory Structures and Parameters

As a prerequisite to record inventory transactions, inventory management setup as well as item master data have to be available.

Warehouse structure

In order to show a structure in inventory, Dynamics AX provides three dimensions for grouping inventory within a company account: Site, warehouse and location. Depending on the applicable dimension group, you need to record these dimensions in an inventory transaction.

Within a site, warehouses are the upper grouping level of inventory. In order to specify additional structures between warehouse and location, you may organize locations applying following elements:

- Aisle
- Rack
- Shelf
- Bin

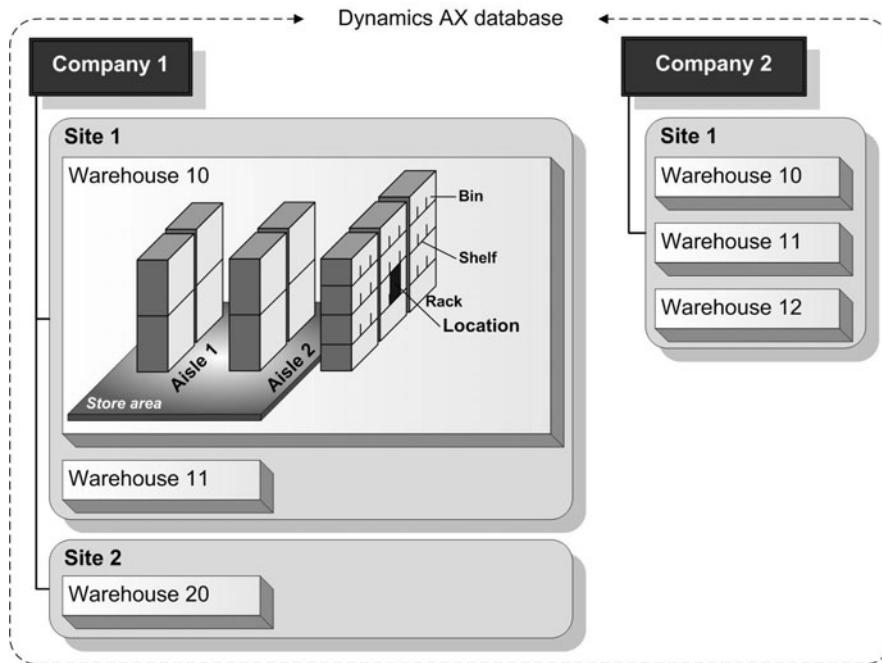


Figure 7.14: Warehouse structures in Dynamics AX

In addition, you may group locations by store areas and store zones. As an example, by assigning store zones to items pushing the button *Setup/Warehouse items* you may grant reefer items to be stored in chilled locations only.

In order to set up a new warehouse, you need to access the form *Inventory management> Setup> Inventory breakdown> Warehouses*. Inserting a new record, you enter a unique code as well as a description for the warehouse and assign the warehouse to a site.

In the column *Type*, you may select if the warehouse is a regular warehouse, a quarantine warehouse or a transit warehouse for items in transit.

Warehouse

When working with quarantine warehouses you need to take into account, that quarantine only locks items by posting a quarantine order (see Section 7.4.4) and not by posting a simple inventory transfer to the quarantine warehouse.

On the tab *General* of the warehouse form, you may assign an appropriate quarantine warehouse to regular warehouses, if you apply quarantine.

On the tab *Master planning*, you may enter specific settings for the warehouse related to master planning. The tabs *Warehouse management* and *Location names* control warehouse locations.

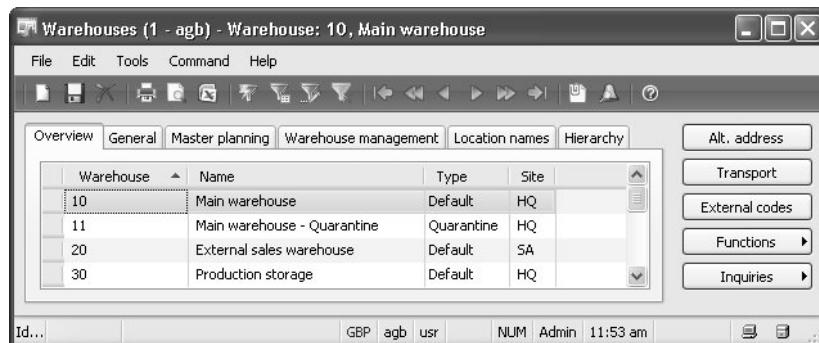


Figure 7.15: Managing warehouses in the warehouse form

Location

The further organization of warehouses including aisles and locations as well as the setup and assignment of store areas and store zones is available in the items of the menu path *Inventory management> Setup> Inventory breakdown*. A detailed description of location and pallet management in inventory is beyond the scope of this book, however.

Inventory dimensions

When setting up warehouse structures, be aware that the dimension group of the item controls, which inventory dimensions apply to inventory transactions. If you want to apply locations in a warehouse as an example, the dimension group of all items concerned needs to include an active dimension *Location*, therefore. Since locations then apply to all warehouses, you need to set up at least one (pseudo-)location for every warehouse.

Journals

Apart from warehouse structures, you need to set up inventory journals before you may record journal transactions in inventory. Journals are available to register manual transactions in inventory. When setting up journals, we may distinguish two groups:

- Inventory journals
- Warehouse management journals

Inventory journals are available to register general transactions like item receipt, issue, transfer and inventory counting. In order to configure inventory journals you may access the form *Inventory management> Setup> Journals> Journal names, Inventory*. You need to set up at least one journal name for the *Journal type* "Movement", "Profit/Loss", "Transfer", "BOM" and "Counting", before you can enter and post the transactions concerned. Assigning an appropriate number sequence in the column *Voucher series*, you may apply separate number sequences for different journals.

Warehouse management journals are available to register item receipts from vendors and customers (for item returns) in item arrival journals and item receipts of finished goods in production. In order to configure warehouse management journals you may access the form *Inventory management> Setup> Journals> Journal names, warehouse management*.

Inventory parameters are available in the form *Inventory management> Setup> Parameters*. Among others, they contain settings for number sequences, the default unit of measure, calculation group and defaults for journal names. On the tab *Inventory dimensions*, you may choose for every journal which dimension to display as default.

Items new in Dynamics AX 2009 related to warehouse settings include assigning warehouses to sites referring to the multisite functionality.

Parameters

New in AX 2009

7.4.2 Journal Transactions

You want to apply journals in inventory management in order to record transactions independent from other areas like purchasing, sales or production.

Since inventory transactions affect financial values, the voucher principle applies. You need to register a journal in a first step and post the transaction separately in a second step, therefore. Every journal consists of a journal header and at least one line.

Journal structure

Inventory journals in Dynamics AX show a common structure. Nevertheless, following journals are available to fit the different transaction types:

- Profit/Loss
- Movement
- Transfer
- Bills of materials
- Item arrival
- Production input
- Counting
- Tag counting

Movement journals	If you want to record manual item issues or receipts in inventory, you need to choose a journal of the type "Movement" or "Profit/Loss". Movement journals are different to profit/loss journals, because they show the field <i>Offset account</i> . The offset account contains the expense or revenue account for the item receipt or consumption in a movement journal. In profit/loss journals, the offset account derives from the inventory posting setup and does not show in the journal lines. Therefore, you will apply movement journals for posting item consumption of a department, when you need to apply a specific ledger account as an example. Section 7.1.2 at the beginning of this chapter explains how to register and post a profit/loss journal. In order to register a movement journal, you want to insert a new record in the form <i>Inventory management> Journals> Item transaction> Movement</i> . In the field <i>Offset account</i> on the tab <i>General</i> of the journal header, you may enter a default for the offset account required. After switching to the lines, you may insert posting date, item number, applicable inventory dimensions and quantity (negative for item issues). For item receipts, you may change the cost price. The cost price default inserts according to the inventory model (see Section 7.3.1). After making sure to apply the right ledger account in the column <i>Offset account</i> , you may post the movement.
Transfer journals	Unlike movement journals, which apply for issues and receipts, transfer journals are available for transferring an inventory quantity from one dimension combination to another. In most cases, you will transfer from one warehouse or location to another. You may as well post a transfer to change the batch or serial number, however. In order to register an item transfer, you want to choose the form <i>Inventory management> Journals> Item transaction> Transfer</i> . In addition to the data recorded in profit/loss journal lines, you need to enter the applicable inventory dimensions to which the item should transfer. You may enter a negative sign for the quantity to issue the quantity from the from-dimensions and to receive it on the to-dimensions. Dynamics AX posts ledger transactions for item transfers, because transferring a standard cost item between two sites, for which different standard cost prices apply, will change inventory value.
BOM journals	Bill of materials journals, accessible through the menu item <i>Inventory management> Journals> Item transaction> Bills of materials</i> , provide the possibility to post a receipt of a finished items while consuming the components at the same time. Entering a negative quantity, you may as well post disassembling of a finished item.

Unlike the proceeding for other journals, you do not need to enter journal lines manually in a bill of materials journal. In order to create journal lines, you push the button *BOM/Report as finished* in the lines form. In the report as finished form, you want to insert a line selecting the finished item that you want to receive in inventory.

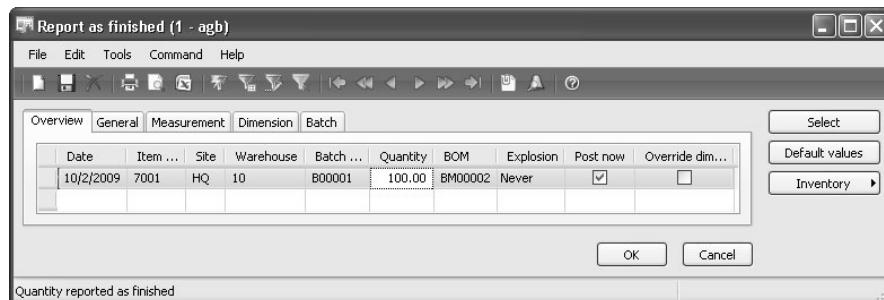


Figure 7.16: Report as finished form for a bill of materials journal

If you put a checkmark in the column *Post now*, the bill of materials journal will immediately post when you close the report as finished form pushing the button *OK*. If the checkbox *Post now* is cleared, the finished item as well as its component lines will show in the bill of materials journal lines, where you may edit them before posting.

Item arrival journals, accessible through the menu item *Inventory management> Journals> Item arrival> Item arrival*, provide the possibility to post item receipts related to purchase orders (see Section 3.5.2) or customer returns (see Section 4.6.3). Production input journals the same way apply for receipts related to production orders.

You may record an item arrival journal the same way you record inventory journals. In order to register the reference to a purchase order, you may switch to the tab *Default values* on the journal header, where you may select the order number in the field *Number* choosing “Purchase order” for the *Reference*. For customer returns, you may want to enter the *Reference* “Sales order” as well as the *RMA number*.

Pushing the button *Functions/Create lines* in the journal header, you may default the order lines to the journal lines. Pushing the button *Post*, you may post the arrival journal. Different to inventory journals, which post physical and financial transaction immediately, you need to post the packing slip and invoice of the purchase order referring to the arrival journal in order to post the physical and financial transaction.

Arrival
journals

If you want to apply warehouse transactions with locations and pallets, you may select appropriate checkboxes in the arrival journal header (tab *Default values*, field group *Mode of handling*).

7.4.3 Inventory Counting

In order to determine the actual quantity in inventory, you will execute inventory counting (stocktaking) in the warehouse physically. Depending on legal and other requirements, you may need to do item counting periodically in order to adjust the quantity in the books to the quantity actually counted.

In Dynamics AX, you will register the counted quantity in inventory journals. When posting the inventory journal, the difference between the counted quantity and the physical quantity available in Dynamics AX will post as an item issue or receipt similar to an inventory profit/loss journal.

You do not need to stop transactions in inventory while counting, because Dynamics AX will calculate counting differences at the counting date entered in the counting journal line. To avoid confusion, you may choose to lock inventory while counting in the inventory parameters, nevertheless.

Inventory journal

In order to register a new counting journal, you may insert a journal header in the form *Inventory management> Journals> Item counting> Counting*. When creating the journal header, you have to choose which inventory dimensions to record in the counting journal.

The screenshot shows a Microsoft Dynamics AX application window titled 'Journal lines, Inventory (1 - agb)'. The window has a standard Windows-style title bar with icons for minimize, maximize, and close. Below the title bar is a menu bar with 'File', 'Edit', 'Tools', 'Command', and 'Help'. The main area contains a toolbar with various icons for file operations like open, save, print, and search. Below the toolbar is a tab bar with 'Overview' (selected), 'General', and 'Dimension'. The main content is a grid table with the following data:

Date	Item ...	Site	Warehouse	Batch ...	On-hand	Counted	Quantity	Employee	L.
9/30/2009	1001	HQ	10	B00002	1.00	1.00			
9/30/2009	3001	HQ	10			2.00	2.00		
9/30/2009	4001	HQ	10		372.00	360.00	-12.00		
9/30/2009	4001	SA	20						
9/30/2009	4001	HQ	90						

On the right side of the grid, there are several buttons: 'Validate', 'Post', 'Log', 'Functions', 'Inventory', and 'Create'. At the bottom of the window, there is a status bar with the text 'Quantity counted w...', currency symbols 'GBP agb usr', and system information 'NUM Admin 04:09 pm'.

Figure 7.17: Journal lines in an inventory journal

In the lines, you got two options to register inventory counting:

- Manual registration
- Create counting lines automatically

If you want to enter a counting journal lines manually, you may insert a line recording counting date, item number, warehouse and applicable dimensions like in any other inventory journal. In the column *Counted*, you need to enter the counted quantity.

In the column *On-hand* you may see the inventory quantity calculated in Dynamics AX according to the posted transactions. The difference between the counted and the on-hand quantity shows in the column *Quantity*, which also is the quantity of the issue or receipt transaction posted when you post the inventory journal.

In order to create lines for counting existing stock automatically, you may push the button *Create/On-hand*, *Create/Items* or *Create/Expired batches* in the counting journal lines. In the *Create counting journal* form, which opens when you push these buttons, you may select a filter for the lines. As an example, you may choose to count only items and inventory dimensions, which show an inventory transaction after the last inventory counting.

In the update form, you may as well filter on counting groups. Counting groups include settings in common for a number of items like the *Counting code*, which controls when to execute counting (periodically, when equal or below minimum stock or when reaching zero stock). You may set up counting groups in the form *Inventory management> Setup> Inventory> Counting groups* and assign items on the tab *General* of the item form.

In order to include settings of the counting code when creating counting lines automatically, you need to select the checkbox *Activate counting code* in the *Create counting journal* form.

After creating counting journal lines, you may print a counting list pushing the button *Print/Counting list* in the journal header form.

Tag counting in the form *Inventory management> Journals> Item counting> Tag counting* is a possibility to pre-register counting lines. The principle of tag counting is to attach numbered tags to the warehouse locations. While counting physically, you write item number, quantity and applicable dimensions like warehouse and serial number on each tag. Then you collect the tags and register them in the tag-counting journal. When posting the tag-counting journal, you do not post inventory transactions, but transfer the lines to a regular counting journal that you may post.

7.4.4 Quarantine

Quarantine is a possibility to exclude quantities of an item from available inventory. You may transfer stock to quarantine either automatically for inspection purposes with every item receipt, or manually when required.

Manual registration

Create lines automatically

Counting group

Counting list

Tag counting

Quarantine settings

Quarantine management in Dynamics AX is based on quarantine orders, which post a temporary transfer to a quarantine warehouse.

As a prerequisite to work with quarantine in Dynamics AX, you need to set up at least one warehouse of the type “Quarantine”. In addition, the inventory dimension *Warehouse* needs to be active in the dimension group of the items concerned.

If you want to apply automatic quarantine for item receipts, you need to assign a quarantine warehouse in the warehouse form (*Inventory management> Setup> Inventory breakdown> Warehouses*) to every regular warehouse concerned. Automatic quarantine applies to items, for which the checkbox *Quarantine management* on the tab *Setup* of the inventory model group is selected.

Manual quarantine

If you want to lock a certain inventory quantity manually, you may choose the form *Inventory management> Periodic> Quality management> Quarantine orders*. The form shows a list of open quarantine orders, selecting the checkbox *View ended* you may also see ended quarantine orders.

In order to record a quarantine order, you need insert a record registering item number, quantity, warehouse and applicable dimensions. The default for the quarantine warehouse in the line derives from the quarantine warehouse of the warehouse entered. All other inventory dimensions for quarantine will retrieve the default from the original dimensions that you have entered. If you want to change quarantine dimensions, you may switch to the tab *Dimension*.

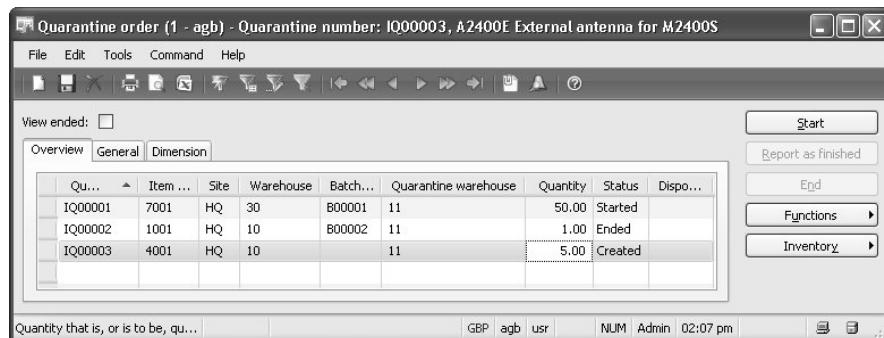


Figure 7.18: Managing quarantine in the quarantine order form

Pushing the button *Start* in the quarantine order form, you will transfer the recorded quantity to quarantine. Transfer to quarantine includes moving to the quarantine warehouse as well as reserving the item for quarantine to block it for issue transactions. In parallel to the quarantine transaction,

Dynamics AX generates a second inventory transaction without date for the future re-transfer to the original warehouse.

In order to end quarantine, you may push the button *End* in the quarantine order form. Dynamics AX will post the re-transfer to the original warehouse and cancel quarantine reservation. If you want to post the re-transfer to a different warehouse or location, you may insert applicable data in the column *Inventory dimensions* on the tab *Dimension* before ending the quarantine order.

The button *Report as finished* in the quarantine is available to post the completion of examinations as an intermediate step. The item is not available in inventory before you end the quarantine order, however. Therefore, in most cases you will apply this step if you post pallet transports in warehouse management separately.

When posting item arrival journals, production input journals or packing slip receipts, Dynamics AX will automatically create and start quarantine orders for items, which refer to an inventory model group with *Quarantine management* selected. The further proceeding of quarantine works as with manual quarantine.

Automatic quarantine

7.4.5 Case Study Exercises

Exercise 7.8

In the main warehouse, you find 100 units of the item I-## that you have set up in exercise 3.4. Register and post an appropriate inventory transaction in a profit/loss journal.

Journal transaction

Exercise 7.9

You want to transfer the quantity received in exercise 7.8 to another warehouse. Register an appropriate inventory transfer journal and post it.

Transfer

After posting, check the inventory transactions as well as the inventory quantity of your item on the selected warehouse.

Exercise 7.10

You want to perform inventory counting on the main warehouse for the item I-## that you have set up in exercise 3.4. The quantity counted is 51 units. You may create a counting journal line either registering it manually or automatically generating it, filtering on your item and the main warehouse.

Counting

After inserting the counted quantity, you should post the journal and check the quantity on hand afterwards.

Exercise 7.11

Manual quarantine

Because of quality issues reported, you want to execute a quality check of the quantity you have transferred in exercise 7.9. Enter a quarantine order, choosing an appropriate quarantine warehouse.

Check the quantity on hand of your item and then start the quarantine order. In the final step, you should end the quarantine order, checking the inventory quantity before and after ending.

8 Finance Administration

The primary responsibility of finance administration is to control and analyze all transactions related to monetary amounts. These transactions occur in business processes all over a company.

Finance management therefore is the heart of business management solutions. In Dynamics AX, a deep integration of the application supporting business processes in all departments grants accurate financial figures, available immediately.

8.1 Principles of Ledger Transactions

Before we start to go through the details, the lines below should show the principles of ledger transactions.

8.1.1 Basic Approach

The core task of finance is to manage accounts in the general ledger, which are the basis for balance sheet and income statement (profit and loss statement). In addition to general ledger, accounting keeps sub-ledgers like accounts receivables, accounts payables, fixed assets and inventory. These sub-ledgers contain detailed data supporting parts of the general ledger. As an example, inventory transactions show details for changes of stock account balances.

General ledger

When posting to sub-ledgers, every monetary transaction in Dynamics AX – an invoice in sales as well as a counting difference in inventory – in parallel posts to the general ledger. As an example, posting a customer invoice affects following areas:

Ledger integration

- Inventory (item transaction)
- Accounts receivable (customer debt)
- General ledger (stock account, revenue account, account for COGS, customer summary account)

A big advantage of the ledger integration as implemented in Dynamics AX is to grant a general ledger, which is always up-to-date. In addition, you may trace all vouchers in finance back to its origin in other modules.

As a basis for ledger integration, Dynamics AX comprehensively applies the voucher principle to transactions: In every part of the application, you have to register a voucher, before you can post it. After posting, it is not possible to modify the voucher any more.

Voucher principle

8.1.2 At a glance: Ledger Journal Transactions in Dynamics AX

In order to record manual ledger transactions in Dynamics AX, you will register a journal. The lines below show how to post a single-line transaction, which is similar to processing an inventory journal (see Section 7.1.2).

Journal header

Accessing the form *General ledger> Journals> General journal* you need to register a voucher header before you may record the journal lines. When inserting a new record (*Ctrl+N*) in the journal header form, you need to select a journal name in the column *Name*. In the column *Description*, you may enter a short text explaining the transaction before switching to the lines form by pushing the button *Lines*.

Lines

In the journal lines form, you need to select the account number in the column *Account* leaving “*Ledger*” for the *Account type*. If you want to post to a sub-ledger like accounts payable, you may as well choose “*Vendor*” for the *Account type* and select the vendor number in the column *Account* as an example. In case sales tax (VAT) applies, it depends on the appropriate checkbox on the tab *Setup* of the journal header, if the amount in the debit or credit column of the journal line includes tax.

In a single-line transaction, you may select the offset account directly in the journal line then.

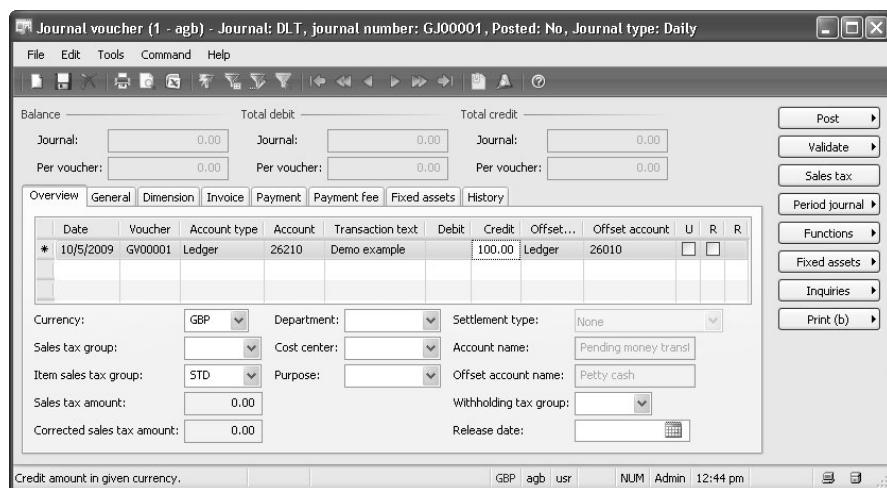


Figure 8.1: Registering a journal line in a general journal

Posting the journal

When you are finished with registering the line, you may post the journal pushing the button *Post/Post*.

8.2 Setting up Finance

Ledger accounts are the core element of master data in finance administration, necessary as a prerequisite for financial transactions as well as for integration settings in other modules. Setting up ledger accounts therefore is one of the first steps in the setup of a new company account.

In Dynamics AX, you want to manage ledger accounts in the chart of accounts form. You are free to choose the structure of the chart of accounts according to the requirements of your company.

In order to comply with different structures of financial reports like balance sheet and income statement, there is a separate possibility to specify several financial statements structures in parallel.

8.2.1 Chart of Accounts

In the chart of accounts, you may distinguish between transaction accounts and auxiliary accounts. Assigning account types, you may further group ledger accounts according to following table:

Account structure

Table 8.1: Structure of ledger accounts

Type	Account type in Dynamics AX
Transaction accounts	Balance Asset Liability
Nominal accounts	Profit and loss Cost Revenue
Auxiliary accounts	Header; Page header Empty header Total; Group total

The main difference between transaction accounts and auxiliary accounts is that posting is only possible to transaction accounts. Auxiliary accounts support a clear structure of the chart of accounts. They are not necessarily required, however.

Transaction accounts include balance accounts on the one hand and nominal account (income statement accounts) on the other hand. Within Dynamics AX, these two types are different in fiscal year closing. Whereas the

balance of nominal accounts will be zero in the opening transactions for the next year, balance accounts will transfer their balance.

Distinguishing between asset accounts and liability accounts may support grouping and selecting of balance accounts in reports. You may as well do without this distinction in the account structure and only use the account type "Balance", however.

As with balance accounts, you are free to split nominal accounts (type "Profit and loss") into cost accounts and revenue accounts as well.

Creating an account

In order to check existing or create new ledger accounts, you need to access the form *General ledger> Chart of Account Details* or the list page *General ledger> Chart of Accounts*. If you want to enter a new account, you have to insert a record including a unique account number, an account name and an account type. For ledger accounts, which receive transactions from other modules according to ledger integration settings (e.g. summary accounts for vendor liabilities), you should select the checkbox *Locked in journal* in order to block manual posting.

Selecting a ledger account category in the appropriate column of the chart of accounts form, you may apply an additional classification of ledger accounts. In order to set up ledger account categories, you may access the form *General ledger> Setup> Ledger account categories*.

L...	Account name	Search name	Account type	Ledger account cat...	Lock...	Balance
10001	Current assets	Current as...	Header		<input type="checkbox"/>	0.00
10010	Inventory	Inventory	Header		<input type="checkbox"/>	0.00
10110	Finished products	Finished pr...	Asset		<input checked="" type="checkbox"/>	0.00
10190	Adjustment of finished products	Adjustmen...	Asset		<input type="checkbox"/>	0.00
10210	Semi-finished products	Semi-finish...	Asset		<input checked="" type="checkbox"/>	15,824.75
10290	Adjustment of semi-finished ...	Adjustmen...	Asset		<input type="checkbox"/>	0.00
10310	Merchandise	Merchandise	Asset		<input checked="" type="checkbox"/>	855.56
10390	Adjustment of merchandise	Adjustmen...	Asset		<input type="checkbox"/>	0.00
10410	Raw materials	Raw materi...	Asset		<input checked="" type="checkbox"/>	14,005.00
10490	Adjustment of raw materials	Adjustmen...	Asset		<input type="checkbox"/>	0.00

Figure 8.2: The chart of accounts form

The column *Balance* in the chart of accounts form shows the account balance of a period, which you may select pushing the button *Balance/Setup* after selecting a transaction account. On the tabs *General*, *Setup* and *Dimension*, you may enter default data and settings for allowed transactions.

After selecting a ledger account in the chart of accounts form, you may directly access related ledger transactions by pushing the button *Transactions*. The transaction form itself contains following buttons to show further information:

- *Voucher* (shows all transactions of the voucher in the general ledger)
- *Origin* (shows related transactions in all modules)
- *Original document* (preview of the printed document)

In order to comply with different regulations for various internal and external reports, in many cases you need alternative groupings of ledger accounts to show business data independent from the account structure in the chart of accounts.

For that purpose, you may set up as many different financial statements as you like. As an example, the financial statements may include a revenue report as well as different versions of the balance sheet and income statement.

You may print a financial statement choosing the menu item *General ledger> Reports> Transactions> Periodic> Financial statement*. Before running a financial statement, you need to complete the setup in following forms of the menu *General ledger> Setup> Financial statement*:

- *Dimension focuses*
- *Row definition*
- *Financial statement* (setting up columns)

Items new in Dynamics AX 2009 related to the chart of accounts include the ledger account categories to classify accounts.

8.2.2 Customer, Vendor and Bank Accounts

When entering a ledger journal line, you may as well select customers, vendors, bank accounts and fixed assets apart from ledger accounts.

Before you may select a certain bank account, you need to set it up choosing the form *Bank> Bank Account Details* or the list page *Bank> Bank Accounts*. In addition to the bank account code and name, you should enter the routing number, identifying the bank, and your bank account number, specified by the bank. The column *Ledger account* needs to contain the ledger account number referring to the bank account.

If your company holds several accounts at a certain bank, you may register a bank group (*Bank> Setup> Bank groups*) that contains the common defaults for address, routing number and contact data for the assigned bank account.

Transaction inquiry

Financial statement

New in AX 2009

Bank accounts

Vendors	As shown in Section 3.2, you may access vendor records in the form <i>Accounts payable> Vendor Details</i> . In order to see the vendor transactions – invoices and payments –, you may push the button <i>Transactions</i> in the vendor form. Apart from the invoice or payment amount, the vendor transaction form shows the open, not yet settled amount in the column <i>Balance</i> .
Transaction settlement	In order to apply a payment to an invoice, you may push the button <i>Functions/Open transaction editing</i> in the vendor form. In the open vendor transaction form, you need to select the checkbox <i>Mark</i> of the transaction lines you want to settle – one or several invoices on the one hand and payments or credit notes on the other hand. In the lookup field <i>Settlement posting date</i> on the upper part of the form, you may choose the settlement date for calculating exchange rate gains or losses in case foreign currencies. As soon as the balance of marked transactions, shown in the field <i>Marked total</i> , is zero, you may post the settlement pushing the button <i>Update</i> . In order to avoid that you need to post settlements separately, you may record a settlement when entering a payment as well (see Section 8.3.4). If you want to cancel a posted settlement, you may access the closed transaction form pushing the button <i>Functions/Closed transaction editing</i> in the vendor form.
Customers	Explanations of the customer record (<i>Accounts receivable> Customer Details</i>) are available in Section 4.2. The way to execute transaction inquiries and to settle transactions is similar to appropriate activities in vendor management.
Creating system accounts	<h3>8.2.3 System accounts</h3> <p>Ledger account settings available in the system accounts apply to automatic ledger transactions, for which other settings are missing or – as with invoice discounts – are not available.</p> <p>You may access system account management in the form <i>General ledger> Setup> Posting> System accounts</i>. In order to enter a system account, you may insert a record selecting the posting type and the assigned ledger account. You may create a basic setup of system accounts pushing the button <i>Create</i> in the system accounts form.</p>
Core system accounts	Core system accounts are as follows:
	<ul style="list-style-type: none">– <i>Error account</i> (applying in case of missing account settings)– <i>Penny difference in default currency</i> (for small payment differences)– <i>Year-end result</i> (account for profit/loss when closing the fiscal year)– <i>Sales tax rounding</i>– <i>Order invoice rounding</i> (sales invoice rounding)

- Purchase invoice rounding-off (purchase invoice rounding)
- Vendor invoice discount, Customer invoice discount

If the checkbox *Interrupt in case of error account* in the general ledger parameters is active and no ledger account is available in the integration settings for a certain transaction, Dynamics AX will display an error message instead of posting to the error account.

8.2.4 Financial Dimensions

In addition to ledger accounts, financial dimensions specify further levels for structuring financial transactions. Based on dimension values posted in a ledger transaction, you may do additional reports and analysis like an income statement for a department or cost center.

The option to report on financial dimension level is important for the multisite functionality: Assigning a financial dimension to the inventory dimension "Site" (see Section 2.4.4), you may report an income statement for subsidiaries within a company account as an example.

You may set defaults for dimension values in master data like ledger accounts, customers or items, which support registering dimension values when recording an order or journal line. On the tab *Dimension* in the chart of accounts form, you may specify if a dimension value is optional or required when posting to the certain account.

In the Dynamics AX standard application, you may find following financial dimensions:

- Department
- Cost center
- Purpose

Supposing an appropriate license is available, you may add as many dimensions as you like. Taking into account practical reasons like structural clearness, probability of wrong entries and effort for registration, you should not set up more dimensions as needed, however.

In order to enter dimension values, you may access the form *Basic> Dimensions* or as well the form *General ledger> Dimensions*, which shows enhanced options for setup and inquiries.

Site

Dimension settings

Dimension values

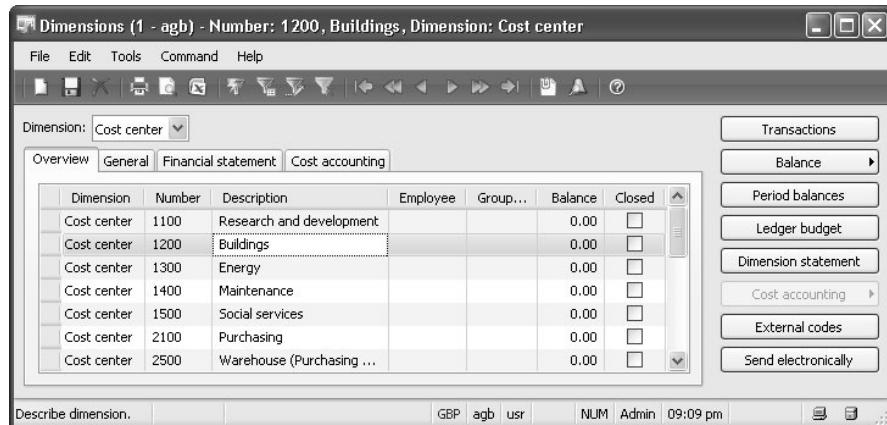


Figure 8.3: Managing cost centers in the dimensions form

When inserting a dimension value line, you want to select the appropriate dimension and to enter the dimension value like the cost center number in the column *Number*. If you want to prevent further postings to a certain dimension value, you may select the checkbox *Locked*.

8.2.5 VAT / Sales Tax Settings

The sales tax/VAT functionality in Dynamics AX applies to different regulations in many countries like the sales tax in the United States or the value added tax in Europe.

Basis for sales tax calculation are sales tax codes, which determine the tax rate. The sales tax code of an invoice line depends on the item sales tax group of the item and the sales tax group of the customer or vendor.

Basic tax setup

A basic setting for tax calculation is if to apply US sales tax: If you do, you need to select the checkbox *Apply U.S. sales tax and use tax rules* on the tab *Sales tax* of the general ledger parameters, which includes sales tax jurisdictions as an additional grouping in tax calculation. In this section, we do not cover the specific issues of US sales tax – for more information on that topic you may refer to the Dynamics AX online help (*Help> Applications and Business Processes> Finance> Setting up and maintaining Finance> Setting up and maintaining General ledger> Setting up US sales tax*).

Apart from general settings in the general ledger parameters, the setup of sales tax/VAT calculation includes following items:

- Sales tax authorities
- Sales tax settlement periods
- Ledger posting groups

- Sales tax codes
- Item sales tax group
- Sales tax groups

The first step in sales tax setup is to enter the competent authorities in the form *General ledger> Setup> Sales tax> Sales tax authorities*, inserting the code, the name and the report layout for tax reporting.

Then you may register applicable periods for tax report (usually a monthly period) in the form *General ledger> Setup> Sales tax> Sales tax settlement periods*. When inserting a new settlement period on the tab *Overview*, you need to assign the competent *Authority* and the *Period interval* on the tab *General*. After inserting the period interval, you may switch to the tab *Periods* where you need to enter the first period manually (e.g. Jan 1 – Jan 31). In order to create following periods automatically, you may push the button *New period*.

Ledger posting groups for sales tax control the ledger accounts, which apply to sales tax posting depending on the sales tax code. You may set up ledger posting groups for sales tax in the form *General ledger> Setup> Sales tax> Ledger posting groups*. Apart from group code and description, you may insert the ledger account for sales tax payable (input tax), sales tax receivable and use tax per ledger posting group. The column *Settlement account* contains the balance account that holds the amount to be paid to the tax authorities.

Sales tax codes control the tax rate and the calculation base. You may enter a new sales tax code in the form *General ledger> Setup> Sales tax> Sales tax codes* inserting code and description as well as assigning ledger posting group and settlement period.

In order to insert calculation parameters, you need to switch to the tab *Calculation*. Pushing the button *Values* in the sales tax code form, you may enter the tax rate.

Dynamics AX determines the sales tax code of an invoice line according to the sales tax code, which is included in the settings of both tax groups – the sales tax group of the customer or vendor and the item sales tax group.

In order to apply a tax code “V175” in a sales invoice line as an example, the line needs to comply with following conditions:

- The item sales tax group (e.g. “STD” for a standard rate) of the item contains the sales tax code “V175”
- The sales tax group of the customer (e.g. “CDO” for domestic customers) contains the sales tax code “V175”

Tax authorities

Settlement periods

Ledger posting groups

Sales tax codes

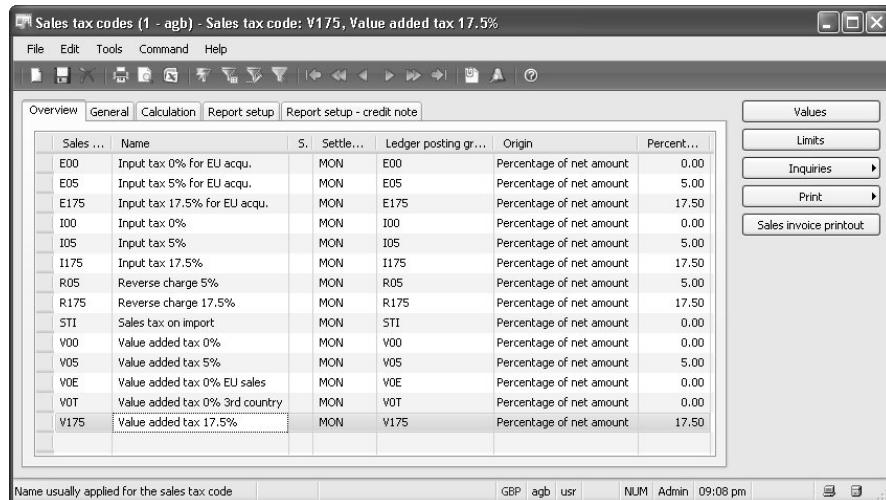


Figure 8.4: Managing sales tax codes

Item sales tax groups

In order to manage item sales tax groups, you may access the form *General ledger> Setup> Sales tax> Item sales tax groups*. Apart from entering tax group identification and description on the tab *Overview*, you want to switch to the tab *Setup* to register applicable sales tax codes for the items belonging to the group.

The assignment of item sales tax groups to individual items is available in the item form, where you should insert the tax group for sales and purchasing on the tab *References* when setting up an item.

Sales tax groups

Sales tax groups, which apply to customers and vendors in the customer or vendor form, are available in the form *General ledger> Setup> Sales tax> Sales tax groups*. As with item sales tax groups, you need to switch to the tab *Setup* to register applicable sales tax codes for the customers or vendors belonging to the group – e.g. all domestic tax codes.

Transactions

When inserting a transaction in a journal or an order, Dynamics AX will default the sales tax code according to the combination of item and customer/vendor. Even before posting, you may show the calculated tax by pushing the button *Sales tax* or *Setup/Sales tax* in journal lines, sales and purchase order headers and lines as well as in posting forms.

If necessary, you may change the tax groups and the tax code in journal or order lines. When you post an invoice, Dynamics AX will post a transaction for sales tax in the general ledger (according to the ledger posting group assigned to the sales tax code) as well as a sales tax transaction in a separate sub-ledger.

In order to calculate the sales tax payable to the authorities for a certain period you may run the periodic activity *General ledger> Periodic> Sales tax payment> Sales tax payment*. As a prerequisite, the reporting codes for the report layout assigned to the sales tax authority has to be set up in the form *General ledger> Setup> Sales tax> External> Sales tax reporting codes*.

Sales tax payment

8.2.6 Case Study Exercises

Exercise 8.1

You want to set up a ledger account for a new expense “## - Consulting” (## = your user ID). Register an appropriate account A-## in the chart of accounts, selecting “Profit and loss” for the account type.

Ledger account

Exercise 8.2

You get a new bank account at your primary bank. Register an appropriate bank account B-##, containing any routing number and bank account number you like. In the column *Ledger account*, you may select a suitable existing ledger account.

Bank account

8.3 Business Processes in Finance

Every business process related to monetary amount generates financial transactions in Dynamics AX, which refer to ledger accounts. Most of the transactions do not originate in accounting, however, but refer to transactions in other areas like purchasing, sales or production. Transactions in these areas automatically generate ledger postings in the background.

Some ledger transactions directly derive from activities in accounting, nevertheless. In order to record these transactions, you will register and post a journal in the general ledger module.

8.3.1 Basics Setup for Journal Transactions

As a prerequisite to register journal transactions in the general ledger of Dynamics AX, the basic setup of the general ledger module has to be finished and the chart of accounts has to be available as described before.

In order to classify transactions by the subject matter, Dynamics AX applies journal names. The setup of journal names is available in the form *General ledger> Setup> Journals> Journal names*. The column *Journal type* controls, which journals may apply to a certain journal name. The most common journal types are as follows:

Journal names

- Daily (General journal)
- Periodic (Periodic journal)
- Post fixed assets (Fixed asset transactions)

- *Vendor invoice recording* (Invoice journal in accounts payable)
- *Vendor disbursement* (Vendor payment)
- *Customer payment* (Payment of customers)

If your company applies invoice register and invoice approval journals in purchasing, you will additionally need the journal types "Invoice register" and "Approval".

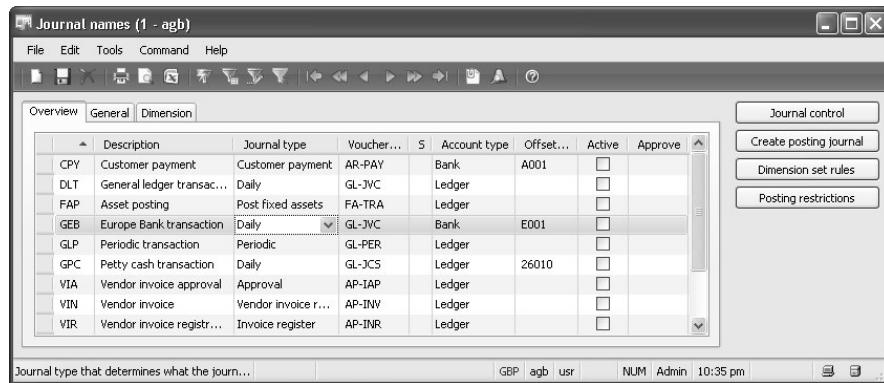


Figure 8.5: Managing journal names

Ledger journals show a common structure independent from the journal type. As a difference between different journals, different fields show in the journal registration forms. In addition, some journals show additional functionality like the payment proposal in the vendor payment journal. If you select different number sequences for journal names, you may distinguish voucher numbers of different journals.

The default for the offset account in journal lines is available in the columns *Account type* and *Offset account* of the journal names form. As an example in Figure 8.5, the default for the offset account in journal lines will be the bank account "E001", if you select the journal "GEB".

Another important setting is the checkbox *Amount incl. sales tax* on the tab *General* of the journal names. If that checkbox is selected, the amount you enter in the journal lines includes sales tax (or input tax) if applicable. Otherwise, the line amount entered is a net amount, to which Dynamics AX will add sales tax.

Approval

If you want to approve a registered journal before somebody may post it, you may select the checkbox *Active* in the journal name. In the column *Approve*, you may insert the user group responsible for approval in this case.

The *Posting layer* on the tab *General* of the journal names usually is “Current”. If you need to cut off certain ledger transaction according to local tax regulations as an example, you may set up separate journals for the posting layers “Operations” and “Tax”. Selecting these journals when posting appropriate transactions as well as in the fiscal year closing procedure, you may print different finance statements based on postings in these layers then.

Posting layer

As with all modules, the parameters form (*General ledger> Setup> Parameters*) contains basic settings for the general ledger module. As an example, you should reject duplicate vouchers in order to avoid confusion when looking at posted documents.

Parameters

8.3.2 General Journals

If you want to post a manual ledger transaction, you need to register a general journal in the form *General ledger> Journals> General journal*.

Apart from the general journal, you may choose a journal optimized for specific transactions like the fixed assets journal, available in the general ledger module, or payment journals, available in the accounts payable and accounts receivable module. If you do not need the specific functionality of a certain journal like the payment proposal, you may as well register the transactions concerned in the general journal.

Journals are vouchers and therefore consist of a header and at least one line. The header combines lines to post together and contains defaults for line registration. In every line, you may override defaults choosing different voucher numbers, posting dates or other transaction data. Before you can post a journal, the balance of every voucher number and the journal balance shown in the header pane of the lines form needs to be zero.

Journal structure

When accessing the general journal form, you may choose to show only open or as well posted journals selecting the appropriate option in the lookup field *Show* at the top of the form. In order to register a new journal, you need to insert a record and select a journal name. In the general journal, you may select all journal names of the journal type “Daily”.

Journal header

On the tab *Setup* of the journal header, you may change defaults like the offset account and currency deriving from the journal name. If somebody works in a certain journal at the same time, the journal shows a red “X” in the column *I(n use)*. The user ID of the user, who blocks the journal, shows on the tab *Blocking*.

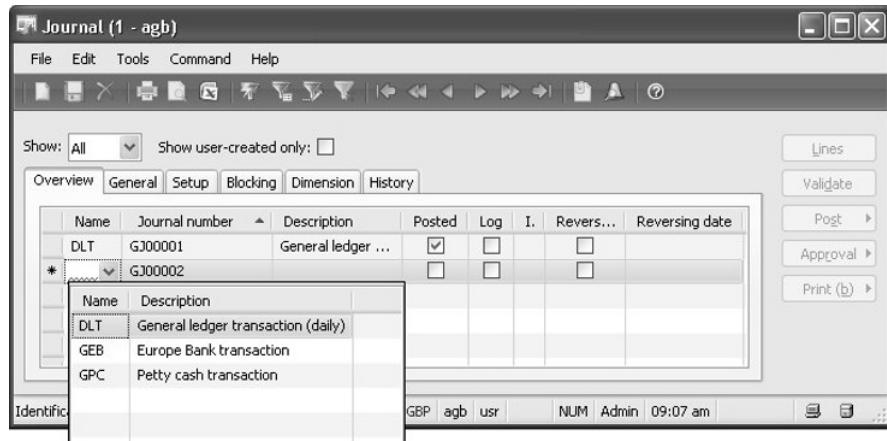


Figure 8.6: Selecting a journal name when inserting a general journal header

Lines

After pushing the button *Lines*, you may record the first journal line. The default for the posting date in a line is the current session date. Dynamics AX retrieves the voucher number from the number sequence of the journal name that you have selected in the header. Depending on your selection in the column *Account type* of the lines, you need to choose a ledger account, vendor, customer, bank account or fixed asset number in the column *Account*.

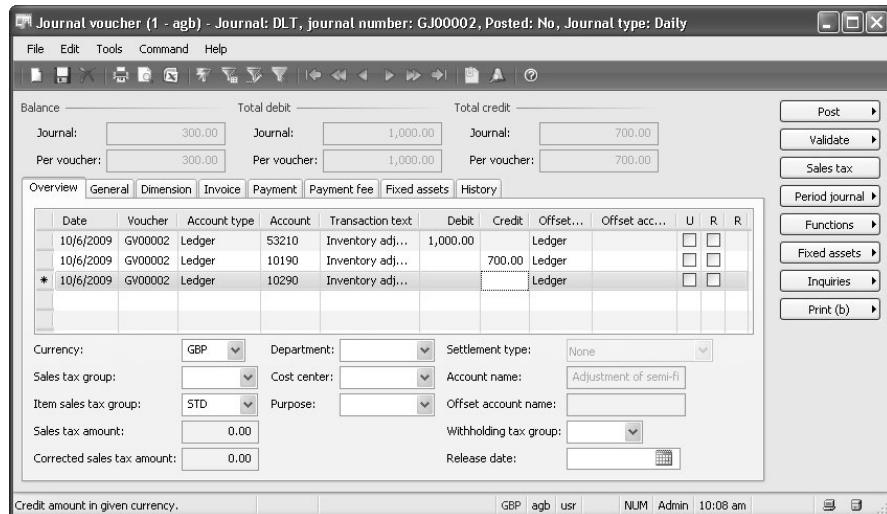


Figure 8.7: Registering a voucher with multiple offsetting lines

Depending on the transaction, you want to enter the amount in the column *Debit* or *Credit*. In a single-line transaction, which shows the same amount for the debit and the credit account, you may enter the offset account type and the offset account in the appropriate columns of the journal line then.

If a transaction splits to more than one offsetting account, you need to register a voucher in multiple lines. In this case, you do not enter an offset account in the first line but in one or more separate offsetting journal lines. As long as the balance of the voucher is not zero, Dynamics AX will insert the same voucher number as in the previous line.

As soon as the voucher balance is zero, the voucher number in the next line will increase (supposing the selection for *New voucher* in the journal name settings is "In connection with balance").

In the top part of the lines form, you may see the balance of the voucher in the selected line and of the complete journal.

If you want to register an invoice in the general journal, you should enter the invoice number on the tab *Invoice* of the journal lines.

Invoice

As a prerequisite for sales tax calculation, you need to record the sales tax group and the item sales tax group on the tab *Overview* or *General* as well.

When you are finished with entering the voucher lines, you may post the journal pushing the button *Post/Post*. In case of incorrect data, Dynamics AX will show an error message and cancel posting.

Posting

If you choose the button *Post/Post and transfer* to post a journal, Dynamics AX will post correct vouchers in the journal and transfer incorrect vouchers to a new journal.

If approval applies according to the settings of the selected journal name, you may not immediately post a registered journal. Instead of pushing the button to post the journal, you want to request approval choosing the button *Approval/Report as ready* in the journal header. The responsible for approval then will choose the button *Approval/Approve* to release the journal for posting.

Approval

If you need to record certain transactions repeatedly, you may select one of two options to support registration:

- Periodic journals
- Voucher templates

Periodic journals are there to register transactions like office rent or monthly installments, which repeat periodically.

Repeating transactions

You may register periodic journals in the form *General ledger> Periodic> Periodic journal* entering a journal header and lines like in a general journal. An alternative way to create a periodic journal is to copy a general journal

Periodic journal

to a periodic journal pushing the button *Period journal/Save journal* in the general journal lines.

The column *Date* in the periodic journal lines specifies the start date for the periodic transactions. In the columns *Units* and *Number of units*, which are also available on the tab *Periodic*, you will enter the frequency of the transaction (e.g. once a month).

In order to post the periodic journal, you need to register a general journal or a purchase invoice journal in every period. In the lines of that journal, you may retrieve the periodic journal pushing the button *Period journal/Retrieve journal*.

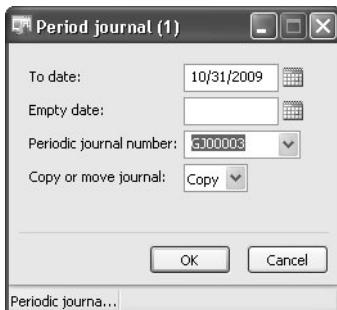


Figure 8.8: Retrieving a periodic journal for posting

When retrieving a periodic journal, the general journal receives the journal lines of the periodic journal, which you may edit and post. In the periodic journal itself, the column *Date* then will show the next date for posting the journal, adding the frequency period. The date, when the periodic journal has been retrieved the last time, is available on the tab *Periodic*.

Voucher template

Unlike periodic journals, voucher templates are templates for copying journals without managing a periodic interval.

In order to record a voucher template, you may push the button *Functions/Save voucher template* in the lines form of a general journal or a purchase invoice journal. Selecting “Percent” for the *Template type* when saving the template, you may apply proportions for the line amounts. When selecting such a template in a journal later, you may enter an amount that will distribute to the lines according to the proportion in the template.

New in AX 2009

Items new in Dynamics AX 2009 related to journal transactions include the option apply voucher templates.

8.3.3 Invoices

Depending on the business case that is the basis for posting a particular invoice, there are different ways to register and post an invoice. In Dynamics AX, you may find following options to post invoices:

- Sales invoice for items shipped to customers (Section 4.6.1)
- Purchase invoice for items received from vendors (Section 3.6.1)
- Free text invoice for a sales invoice not related to items (Section 4.6.2)
- Manual sales invoice in a general journal (not to be printed)
- Purchase invoice in an invoice journal or a general journal, not referring to items

In a general journal (*General ledger> Journals> General journal*), you may register sales invoices that are not printed in Dynamics AX like invoices written manually or printed in a separate upstream application like a POS solution.

When entering a sales invoice in a general journal, you will select the account type “Customer” and enter the invoice number as well as the terms of payment or cash discount on the tab *Invoice* of the journal lines. Before posting, you should check if correct sales tax groups apply.

Unlike the accounts receivable, the accounts payable module does not contain a free text invoice. In order to register a purchase invoice not referring to an item receipt, you will record a journal therefore. In purchasing, you may find following journals to register and approve invoices:

- *Invoice register – Invoice approval journal*
- *Invoice Pool Excl. Posting Details – Invoice journal*
- *Invoice journal*
- *General journal*

In the invoice register (*Accounts payable> Journals> Invoices> Invoice register*), you may record purchase invoices for subsequent approval with or without referring to a purchase order.

The structure of the journal header and lines is similar to the structure of the general journal, limiting the account type to “Vendor”. If the invoice refers to a purchase order, you should select the purchase order number in the appropriate field on the tab *Overview* or *General* to support approval.

Before you may post an invoice register pushing the button *Post/Post*, you need to select the employee responsible for approval in the field *Approved by* on the tab *Overview* of the journal line.

When posting the invoice register, Dynamics AX posts a vendor transaction. The checkbox *Approved* in that transaction is not selected, however,

Sales invoice

**Purchase
invoice**

**Invoice
register**

which is why the invoice is not included in payment proposals. The related ledger transactions post to interim accounts, specified in the posting profile settings, instead of applicable stock and vendor summary accounts. You may find the settings for the interim accounts in the columns *Arrival* and *Offset account* on the tab *Setup* of the form *Accounts payable> Setup> Posting profiles*.

Invoice approval

In the next step, the responsible employee may approve the posted invoice register in the invoice approval journal.

Invoice approval starts with inserting a new header in the invoice approval journal (*Accounts payable> Journals> Invoices> Invoice approval journal*). After switching to the approval journal lines, you may push the button *Fetch vouchers* to retrieve the posted invoice register.

The fetch voucher form shows available invoice registers in the upper pane, which you may select pushing the button *Select*. Closing the fetch voucher form by pushing the button *OK* will transfer selected invoices to the approval journal lines.

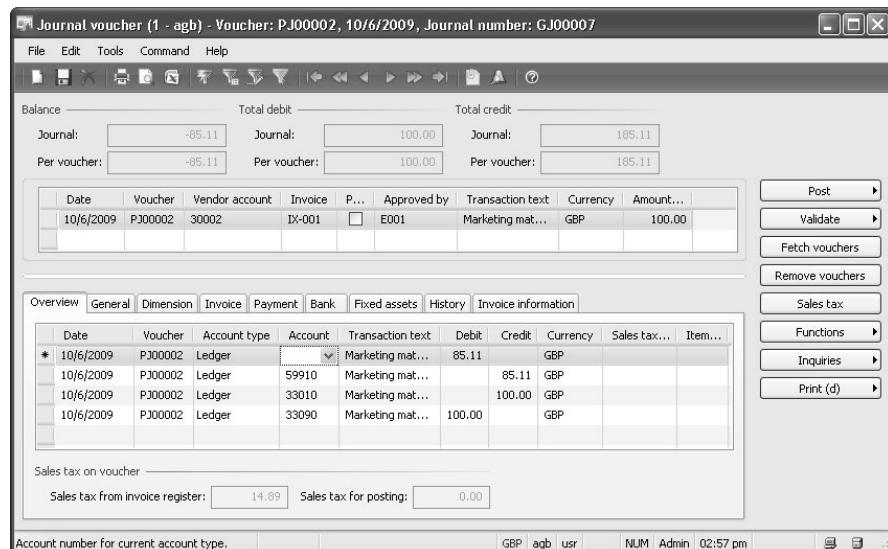


Figure 8.9: The invoice approval journal lines after fetching an invoice register

If the invoice does not refer to a purchase order, you need to select an expense account before posting the approval by pushing the button *Post/Post*.

If the invoice refers to a purchase order, you want to push the button *Functions/Purchase order* that opens the posting form for the purchase order

invoice. In the posting form, you may post the invoice as described in Section 3.6 then.

In order to show open invoice register approvals, you may access the form *Accounts payable> Inquiries> Invoice pool*. As an alternative to the invoice approval journal, you may as well approve posted invoice registers referring to a purchase order by pushing the button *Purchase order* in that form.

Apart from invoice register and invoice approval journal, the form *Accounts payable> Journals> Invoices> Invoice Pool excl. posting details* provides another possibility to pre-register purchase invoices.

Unlike the invoice register, which actually posts a vendor transaction as well as ledger transactions, the invoice pool is a way to save a purchase invoice without further consequences within Dynamics AX. You may transfer an invoice pool record to invoice journal lines, however.

In order to register an invoice in the invoice pool, you want to insert a new record in the invoice pool form. When you are finished with entering posting date, vendor number, amount, vendor invoice number and other applicable data, you may close the form.

The invoice journal, which you may access in the form *Accounts payable> Journals> Invoices> Invoice journal*, is the main form to register invoices not referring to purchase orders. In the invoice journal, you may as well record new invoices or retrieve invoices from the invoice pool excl. posting.

As with every voucher, you need to insert a header record in the invoice journal before you may switch to the lines. If you want to retrieve an invoice from the invoice pool in the journal lines, you may push the button *Functions/Invoice pool excl. posting* transferring the appropriate invoice by pushing the button *Accept* there.

When you are finished with transferring or manually inserting invoice journal lines including vendor number, vendor invoice number, transaction text, amount, offset account and terms of payment as well as other data like sales tax and cash discount if applicable, you may post the invoice pushing the button *Post/Post*.

Invoice pool inquiry

Invoice pool excl. posting details

Invoice journal

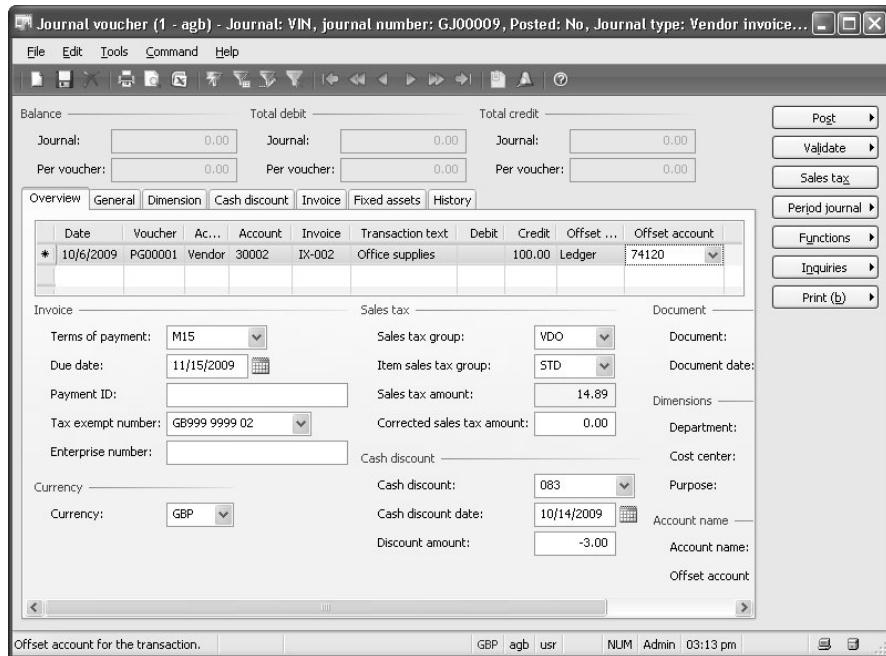


Figure 8.10: Registering invoice journal lines

General journal

As an alternative to the journals in the accounts payable menu, you may post purchase invoices in the general journal as well. As with recording a sales invoice in the general journal, you need to enter the invoice number as well as the terms of payment and the applicable cash discount on the tab *Invoice*, before posting the journal by pushing the button *Post/Post*.

8.3.4 Payments

Posting an invoice creates an open transaction for the vendor liability or the customer debt.

Open transactions

You may access open transactions pushing the button *Functions/Open transaction editing* in the customer form (*Accounts receivable> Customer Details*) and the vendor form (*Account payable> Vendor Details*). The button *Transactions* in the customer or vendor form shows all transactions, selecting the checkmark *Show open only* you may limit the form to show only open transactions.

In order to print open transactions you may choose the report *Accounts receivable> Reports> Transactions> Customer> Open transactions* for customers and the report *Accounts payable> Reports> Transactions> Invoice> Open invoice transactions* for vendors.

You may record payments received from customers in the general journal or in the customer payment journal (*Accounts receivable> Journals> Payments> Payment journal*).

Customer payment

After inserting a record in the customer payment journal header, you may switch to the lines where you will enter customer number, transaction text, paid amount and offset account. If the customer has paid to your bank account, you will choose "Bank" for the offset account type.

If you want to apply a payment line to an invoice, you may push the button *Functions/Settlement*. In the settlement form, you may choose the paid invoices by selecting the checkbox in the column *Mark*. If the invoice amount and the paid amount show minor differences and you want to close the invoice nevertheless, you may select the checkbox *Full settlement* in the settlement form. The difference will post an additional payment discount. After closing the settlement form (no button *OK* available) the marking will apply and Dynamics AX will show the payment journal lines again.

As an alternative to enter and settle payment lines manually, you may also choose the button *Enter customer payment* in the payment journal header to create and settle payment lines by selecting paid invoices.

When you are finished with recording payment lines, you may post the customer payment journal pushing the button *Post/Post* in the header or the lines.

If you want to register payments to vendors, you may again enter a general journal or the specific payment journal. The payment journal for vendors is available in the menu item *Accounts payable> Journals> Payments> Payment journal*.

Vendor payment

You may register vendor payment lines manually as you do when registering a customer payment. In most cases, you require additional support and control of outgoing payments, however. Dynamics AX provides the payment proposal and the payment status for that purpose.

If you want to prevent paying a certain invoice, you may clear the checkbox *Approved* on the tab *General* of the vendor transaction. The payment proposal will not include the invoice until you set the approval-checkmark in the transaction again.

Block payment

The payment proposal supports to choose which vendor invoices to pay. In order to run a payment proposal, you may push the button *Payment proposal/Create payment proposal* in the journal lines of a vendor payment journal.

Payment proposal

In the dialog box of the payment proposal, you may choose the payment date, the available amount for payment, the proposal type (due date or

cash discount) as well as a filter on vendor and transaction data, pushing the button *Select*.

After closing the dialog box by pushing the button *OK*, Dynamics AX will show the payment proposal form, where you may check and edit the payment proposal. In order to modify the proposal, you may edit the payment amount or delete lines in the upper pane of the form. On the tab *Cash discount*, you may adjust the discount date. Pushing the button *Transfer* in the payment proposal form, you may transfer the lines to the payment journal.

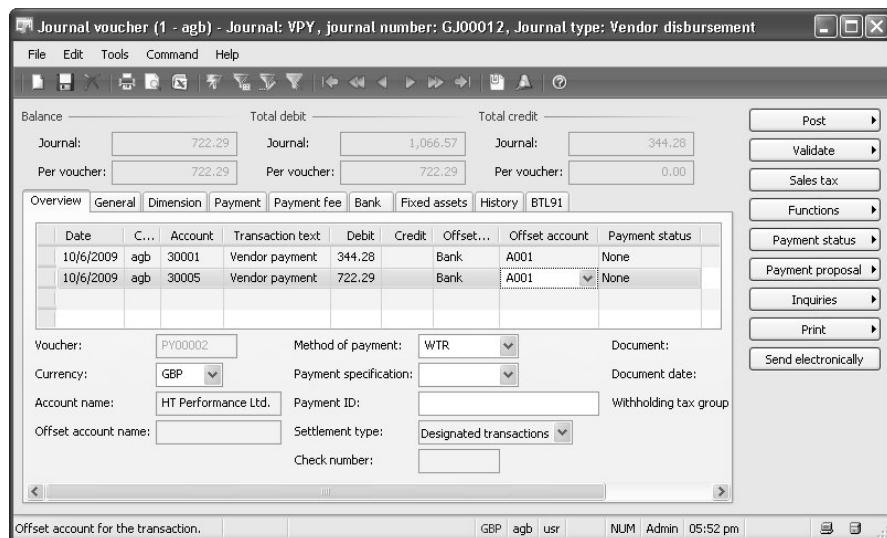


Figure 8.11: Registering lines in a vendor payment journal

The payment proposal marks a settlement for the selected invoices. Before posting the vendor payment, you may edit the proposal pushing the button *Payment proposal/Edit payment proposal* in the journal lines.

Method of payment

Methods of payment, which you may access in the form *Accounts payable> Setup> Payment> Methods of payment*, are an important setting for the further processing of vendor payments.

Usually you will need two methods of payment at least: One for manual transfers and one for electronic banking. In the field group *Posting* of the methods of payment, you may enter a bank (or ledger) account to specify from which account you want to pay. This account therefore is the default for the offset account, when selecting the method in a payment. In order to support bank reconciliation by posting to a bridging account (see below),

you may select the checkbox *Bridging posting* and enter the bridging account number.

For methods of payment related to electronic payment, you should select the status “Sent” for the *Payment status* to prevent posting of a payment before generating a payment export file. Further settings for electronic payments like the file formats are available on the other tabs.

In order to assign a default method of payment to a vendor, you need to access the tab *Payment* in the vendor form. This default will transfer to purchase orders and vendor transactions, where you may change it as well as in the payment journal.

Before generating and posting the payment, you may print the journal pushing the button *Print/Journal* for controlling purposes.

In order to generate an export file for electronic payment, you may push the button *Functions/Generate payments* in the payment journal lines after selecting an appropriate method of payment. If you require an export file, you need to generate it before posting the payment.

When generating the payment, Dynamics AX will set the payment status of the journal to “Sent”. If required, you may also manually change the payment status pushing the button *Payment status*.

In order to finish the payment procedure, you may push the button *Post/Post* in the payment journal to post the payment from the selected bank or ledger account.

If the payment does not directly post to the bank account but to a bridging account as selected in the payment method, you need to post a transfer from the bridging account to the bank account when receiving the appropriate bank statement.

In order to post this transfer, you need to insert a new journal in the general journal form. In the general journal lines, you push the button *Functions>Select bridged transactions*, where you select and accept the transaction concerned.

The functionality to post centralized payments supports a company structure within Dynamics AX, where a central company processes payments of an affiliated group. As a prerequisite to register centralized payments, you need to set up appropriate permissions as well as a virtual company account (see Section 2.4.3) containing the table collection *CentralizedPayments* for the companies concerned.

Payment journals and payment proposals show the company in the column *Company accounts*. When posting a payment applying centralized payments, you may settle invoices in other companies. More information on centralized payments is available in the Dynamics AX online help

Print journal

Generate payment

Payment status

Posting

Bridging posting

Centralized payment

(Help> Applications and Business Processes> Finance> Working with Finance> Working with accounts payable> Pay for product or service overview> Generate and submit vendor payments> Select invoices to pay> About centralized vendor payments or the appropriate help text for centralized customer payments).

New in AX 2009

Items new in Dynamics AX 2009 related to payments include the option to execute centralized payments for several companies as well as the button *Enter customer payment* in the customer payment form.

8.3.5 Reversing Transactions

In Dynamics AX, you may find two different types of transaction reversals: Manually entered reversals for corrections and automatic reversals for accruals.

Transaction reversal

The transaction reversal, which is available for ledger, vendor and customer transactions (e.g. free text invoices), provides a simple way to correct wrong vouchers in finance.

It is not applicable for transactions referring to inventory, purchase orders or sales orders, however. In order to reverse these transactions, you need to register an appropriate document in the original module like a customer return order (see Section 4.6.3) in the accounts receivables.

In order to reverse a transaction in finance, you need to access the transaction inquiry available by pushing the button *Transactions* in the appropriate master data form (chart of accounts, vendor form or customer form). After selecting the required transaction, you may push the button *Reverse transaction*, which opens a dialog box to enter the posting date for reversal.

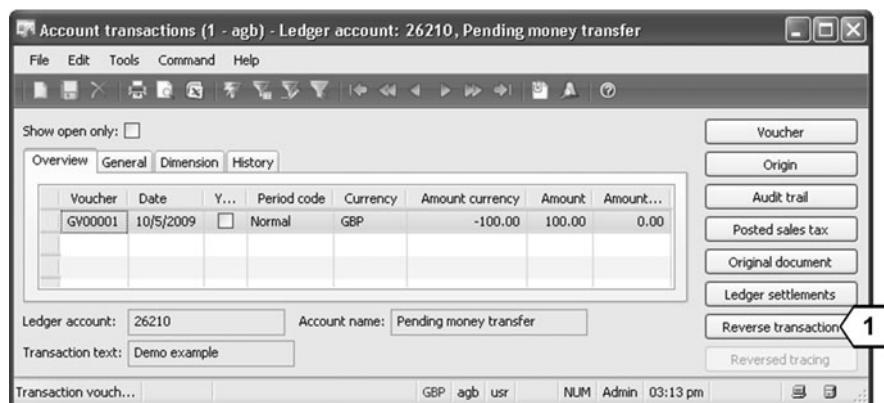


Figure 8.12: Reversing a ledger transaction

Transaction reversal will post a new transaction, offsetting the original transaction. If required, you may reverse the reversal as well.

Unlike manual transaction reversals, which apply to adjust incorrect transactions, reversing entries are transactions generated automatically to reverse accruals in a later period.

In order to generate a reversing entry, you may select the checkbox *Reversing entry* and insert a *Reversing date* on the tab *Overview* of the journal lines when entering the general journal for the original transaction. In the general journal header, the checkbox *Reversing entry* and the reversing date are available as a default for the lines.

When you post a general journal applying automatic reversal, Dynamics AX will automatically post a second transaction reversing the original transaction in parallel.

Items new in Dynamics AX 2009 related to transaction reversals include the option automatically reverse accruals.

Automatic reversal

New in AX 2009

8.3.6 Case Study Exercises

Exercise 8.3

You want to register the transactions of the exercises below in your own journals. For that purpose, you want to register a journal name G-## (## = your user ID) with the type "Daily", a journal name I-## with the type "Vendor invoice recording" and a journal name P-## with the type "Vendor disbursement". Choose an existing number sequence for all of the journal names.

Journal names

Exercise 8.4

You want to withdraw GBP 100.00 from the bank account entered in exercise 8.2 to put it to petty cash. Register an appropriate transaction in a general journal, choosing your journal name G-#. You may select an existing ledger account for petty cash.

General journal

Check the balance and transactions of the bank account and of the petty cash account before posting. Then post the transactions and check balance and transactions again.

Exercise 8.5

The vendor, which you have entered in exercise 3.2, sends the invoice VI51 showing a total of GBP 50.00. The invoice concerns expenses, for which you have entered the ledger account A-## in exercise 8.1.

Purchase invoice

Selecting an invoice journal in the accounts payable menu, you want to record this invoice choosing your journal name I-#. The terms of payment and the cash discount entered in exercise 3.1 apply to the invoice.

Check the vendor balance and transactions of your vendor as well as the ledger balance and transactions of your expense account before posting. Then post the invoice and check balance and transactions again.

Exercise 8.6

Vendor payment

You want to pay the invoice VI51 that you have posted in the previous exercise. Register the payment, choosing a vendor payment journal applying your journal name P-##. Withdrawing applicable cash discount, you want to pay from your bank account B-## entered in exercise 8.2.

Check the vendor balance and the bank account balance before posting. Then post the payment and check the balances again, in addition controlling the voucher transaction and the transaction origin of the payment transaction.

Exercise 8.7

Transaction reversal

Your vendor of exercise 3.2 sends the invoice VI52, showing a total of GBP 30.00. Register and post the invoice like you did in exercise 8.2.

Afterwards you notice that the invoice is incorrect, wanting to reverse the transaction. Check the vendor balance and transactions of your vendor as well as the ledger balance and transactions of your expense account before reversing. Then reverse the invoice and check balance and transactions again.

8.4 Ledger Integration

One of the main advantages of an integrated business solution like Dynamics AX is, that business cases, which you have registered anywhere in the application, are available for all parts of the company immediately.

When looking at a sales order invoice as an example, posting the invoice does not only generate the document required, it also affects other areas generating following transactions:

- Inventory transaction reducing inventory value
- General ledger transactions to revenue, COGS, stock and customer debt accounts
- Customer transaction for the open invoice in accounts receivable
- Sales tax transactions as applicable

Depending on the business case, the invoice may additionally post transactions for commission, discount or cash payment as an example.

8.4.1 Basics of Ledger Integration

Ledger integration – the integration of the general ledger in finance with the other areas of the application – is one of the core characteristics of an integration business solution (ERP solution).

In Dynamics AX, transactions in all areas like sales, purchasing, inventory or production, which are relevant to finance, automatically post to the general ledger.

A number of settings control, if and which ledger accounts apply for different transactions. For the areas purchasing, sales, inventory and production covered in this book, you may find following settings:

- Summary accounts for vendor liabilities and customer debts in the posting profiles for accounts payable/receivable
- Ledger accounts for inventory transactions in the inventory posting setup
- Ledger accounts for production transactions in work centers, cost categories and production groups

In addition, specific settings are available for particular transactions like sales tax, cash discount or miscellaneous charges.

Vendor posting profiles control the assignment of vendor transactions to summary accounts in the general ledger. You may find more details on vendor posting profiles in Section 3.2.3. Similar settings apply for customers.

Basic settings

8.4.2 Ledger Integration in Inventory

When posting inventory receipts and issues to the general ledger, Dynamics AX distinguished between two different types of transactions as shown in Section 7.1.1 as well:

- Physical transaction (Packing slip)
- Financial transaction (Invoice)

Physical and financial transactions refer to different ledger accounts.

For physical transactions, you may decide if to post to the general ledger. Relevant settings in this regard include the checkbox *Post physical inventory* in the inventory model group and the checkbox *Post packing slip in ledger* in the accounts payable or accounts receivable parameters.

Vendors and customers

In the production module, a similar checkbox in the production parameters applies. Physical transactions in production are picking list and report as finished transactions.

Physical transaction

Financial transaction	For financial transactions, the checkbox <i>Post financial value</i> in the inventory model group is available to choose if to post inventory transactions to the general ledger. If you clear this checkbox for an inventory model group, ledger integration for the items assigned is not active. Posting a purchase invoice directly posts to an expense account for consumption. Inventory issues do not post ledger transactions. You will apply this setting for service items.
Ledger assignment	In order to control which ledger accounts apply for automatic ledger posting referring to an inventory transaction, you may access the inventory posting setup (<i>Inventory management> Setup> Posting> Posting</i>).

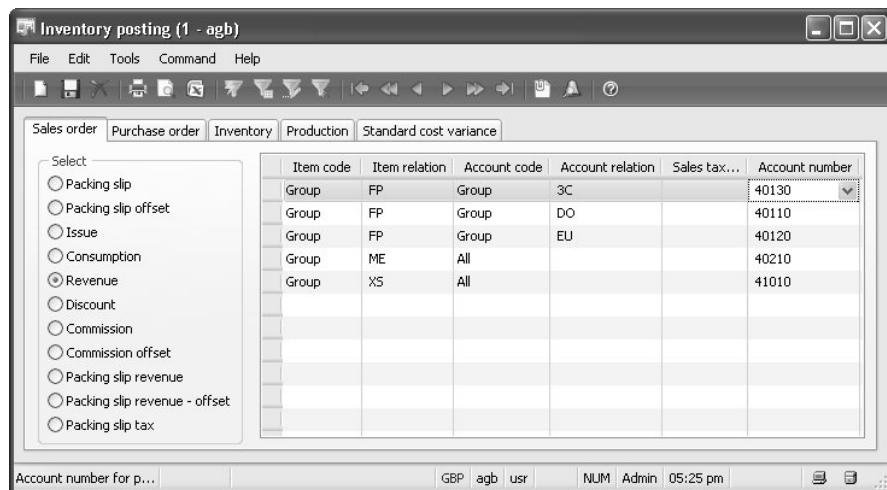


Figure 8.13: The inventory posting setup, showing account settings for revenue

The inventory posting setup form includes account settings for following transactions:

- Packing slips and invoices in sales (tab *Sales order*)
 - Packing slips and invoices in purchasing (tab *Purchase order*)
 - Journal transactions in inventory (tab *Inventory*)
 - Picking lists, reporting as finished and costing of production orders (tab *Production*)
 - Standard cost variances (tab *Standard cost variance*)

Each of these tabs shows a list of available transactions in the left pane. After selecting a transaction in the left pane, you may choose the ledger accounts applying for the ledger transaction in the right pane.

The inventory posting setup depends on the combination of two dimensions: Items and customers/vendors. For the item dimension as well as for the customer (tab *Sales order*) or vendor (tab *Purchase order*) dimension, ledger settings are available on three levels:

- *Table* (Individual item, customer or vendor)
- *Group* (Item group, customer group or vendor group)
- *All*

When posting a transaction, Dynamics AX always searches for the specific setting (“Table”) first, then for the group setting and finally for the general setting (“All”). If you post a sales invoice as an example, settings for the customer and item number got the highest priority, followed by group settings. In the field group *Posting* on the tab *Ledger and sales tax* in the accounts receivable parameters, you may choose if the search order should prioritize the item or the customer/vendor dimension.

Ledger account assignment is not only possible in the inventory posting setup form. You may as well access these settings pushing the button *Posting* in the item group form or the button *Setup/Inventory posting* in the customer or vendor group form. When accessing the posting setup from a group form, it shows the ledger settings for the selected group.

In the transaction combinations form (*Inventory management> Setup> Posting> Transaction combinations*) you may select, which dimensions levels are available in the inventory posting setup. Since reports for the reconciliation between inventory and the general ledger like the report *Inventory management> Reports> Status> Physical inventory> Physical inventory by item group* refer to the item group, you will select the item group for the item dimension usually.

As an example for automatic ledger transactions, the lines below show the transactions for sales order processing if ledger integration is selected for packing slip and invoice posting (physical and financial transactions).

When posting the packing slip for the sales order, Dynamics AX posts a ledger transaction to the ledger accounts selected for *Packing slip* and *Packing slip offset* in the inventory posting setup.

When posting the invoice, Dynamics AX will reverse the ledger transactions of packing slip posting, and post a ledger transaction to the account *Issue* against *Consumption*. In parallel, a customer debt to the summary account specified in the posting profile posts against the account *Revenue* and the sales tax account if applicable.

If the inventory posting setup includes settings for the line discount in the option *Discount*, the discount posts to that account. Otherwise, the discount does not post separately but reduces the revenue amount.

Transaction combinations

Available combinations

Example in sales

Standard cost price	For items assigned to an inventory model “Standard cost” (see Section 7.3), you may find important settings on the tab <i>Standard cost variance</i> of the inventory posting setup. This tab shows settings for the ledger accounts to post the difference between the actual cost price of the purchase invoice and the applicable standard cost price for different cases like <i>Purchase price variance</i> . For items assigned to an inventory model group that specifies a fixed receipt price, settings for posting the price difference are available on the tabs <i>Purchase order</i> and <i>Inventory</i> .
Service item	For items assigned to the item type „Service“, you should apply a separate item group and inventory model group. In the item group, ledger integration is not active. In sales, Dynamics AX then posts a ledger transaction of the revenue account against the customer summary account and does not post to the issue and consumption account.
Change of settings	In order to avoid problems when reconciling inventory and general ledger, you should not change integration settings in the inventory model group, parameters and inventory posting setup for items, which are on stock or show open inventory transactions. This includes changing the setup itself as well as changing the assignment of active items to item groups.
Parameters	To comply with that situation, production parameters contain following options in the lookup field <i>Ledger posting</i> controlling ledger integration: <ul style="list-style-type: none">– Item + Work center– Item + Category– Production groups The setting in the production parameters is the default for production orders. You may change the setting for a certain production order, for example if you want to apply specific settings for prototype production.
Item + Work center	If you choose “Item + Work center” in the ledger posting parameter, Dynamics AX applies the ledger account settings of the inventory posting setup to item transactions. For work center operations, the ledger account settings on the tab <i>Ledger</i> of the work center apply.
Item + Category	If you choose “Item + Category” in the ledger posting parameter, Dynamics AX again applies the ledger account settings of the inventory posting setup to item transactions. For work center operations, the ledger account

settings of the applicable cost category (*Production> Setup> Routes> Cost categories*, tab *Ledger-Works centers*) apply, however.

If you choose “Production group” in the ledger posting parameter, Dynamics AX applies the ledger account settings of the posting group (*Production> Setup> Production> Production groups*). You may select the applicable production group in the production order; a default is available in the item record of the finished product.

When processing a production order, Dynamics AX posts following ledger transactions to ledger accounts selected as specified in the ledger posting parameter:

- *Picking list*
Account *Picking list* against *Picking list offset account*
- *Work center operation*
Account *WIP issue* against *WIP account* (WIP = “Work In Process”)
- *Report as finished*
Account *Repost as finished* against *Report as finished offset account*

When costing the production order, Dynamics AX reverses all these transactions and posts the final finished item receipt, component issue and work center issue to the ledger accounts selected as specified in the ledger posting parameter.

Production groups

Transactions

Appendix

Appendix A: Setup of the Test/Learning Company

The sample company “Anso Technologies Ltd.”, situated in London, is a small supplier of radio transmission devices. In order to use its resources efficiently, Anso Technologies focuses on development and sales. Production is done primarily by external subcontractors, Anso itself does only limited work for high-quality products internally.

An affiliated company in the USA works as sales office. Together with the London-based headquarters company, it uses a common Dynamics AX database.

Whereas the US-based subsidiary only got one warehouse, the head office got several warehouses like an interim storage for production in addition to a main and a quarantine warehouse. A separate site within the headquarters company “Anso Technologies Ltd.” has been set up to manage a sales office in the UK.

The range of products includes two categories: Merchandise, which is purchased at low prices and sold unchanged, and high-quality products, for which final assembly and quality control is done in-house.

Customers and vendors of Anso Technologies are situated in the UK (domestic) as well as in other EU countries and in third countries. Tax setup has to be done for all of these situations, therefore.

Appendix B: Setup Checklist

The checklists below show the most essential steps to set up a new Dynamics AX database. You can use these checklists as a guideline to do the basic setup of Dynamics AX.

The section “Basic Setup” contains necessary configuration steps for all functional areas covered by the book. They have to be done before you can start to use the particular module. Master data and other essential settings are shown in the section afterwards. Depending on the specific requirements of a certain installation, additional setup is required in most cases.

Basic Setup

Table B.1: Basic setup of a Dynamics AX database

No.	Name	Menu Item	Chapter
1.1	Configuration	Administration> Setup> System> Configuration	
1.2	Company accounts	Administration> Company accounts	2.4.2
1.3	User groups	Administration> Setup> User groups	2.3.1
1.4	Users	Administration> Users	2.3.2
1.5	Virtual company accounts	Administration> Setup> Virtual Company accounts	2.4.3

Table B.2: Basic setup of a company account

No.	Name	Menu Item	Chapter
2.1	Dimensions	Basic> Dimensions	8.2.4
2.2	Multisite activation	Administration> Setup> System> Multisite activation	2.4.4
2.3	Sites	Inventory management> Setup> Inventory breakdown> Sites	2.4.4
2.4	Dimension link	Inventory management> Setup> Posting> Dimension link	2.4.4
2.5	Warehouses	Inventory management> Setup> Inventory breakdown> Warehouses	7.4.1
2.6	Chart of Accounts	General ledger> Chart of Account Details	8.2.1
2.7	Exchange rates	General ledger> Setup> Exchange rates	2.5.2
2.8	Bank Accounts	Bank> Bank Account Details	8.2.2
2.9	Address format	Basic> Setup> Addresses> Address format	2.5.5
2.10	Countries	Basic> Setup> Addresses> Country/region	2.5.5
2.11	Postal codes	Basic> Setup> Addresses> ZIP/postal Codes	3.2.1

2.12	Number sequences	Basic> Setup> Number sequences> Number sequences	2.5.1
2.13	Company information	Basic> Setup> Company information	2.4.2
2.14	Transaction texts	Basic> Setup> Transaction text	
2.15	System accounts	General ledger> Setup> Posting> System accounts	8.2.3
2.16	Periods	General ledger> Setup> Periods> Periods	2.5.3
2.17	Units	Basic> Setup> Units> Units	7.2.1
2.18	Unit conversion	Basic> Setup> Units> Unit conversion	7.2.1
2.19	Fixed units	Basic> Setup> Units> Fixed Units	7.2.1

Table B.3: General ledger – basic setup

No.	Name	Menu Item	Chapter
3.1	Ledger posting groups	General ledger> Setup> Sales tax> Ledger posting groups	8.2.5
3.2	Sales tax authorities	General ledger> Setup> Sales tax> Sales tax authorities	8.2.5
3.3	Sales tax settlement periods	General ledger> Setup> Sales tax> Sales tax settlement periods	8.2.5
3.4	Sales tax codes	General ledger> Setup> Sales tax> Sales tax codes	8.2.5
3.5	Sales tax groups	General ledger> Setup> Sales tax> Sales tax groups	8.2.5
3.6	Item sales tax groups	General ledger> Setup> Sales tax> Item sales tax groups	8.2.5
3.7	Journal names	General ledger> Setup> Journals> Journal names	8.3.1
3.8	Parameters	General ledger> Setup> Parameters	

Table B.4: Accounts payable – basic setup

No.	Name	Menu Item	Chapter
4.1	Terms of payment	Accounts payable> Setup> Payment> Terms of payment	3.2.2
4.2	Vendor groups	Accounts payable> Setup> Vendor groups	3.2.3
4.3	Posting profiles	Accounts payable> Setup> Posting profiles	3.2.3
4.4	Parameters	Accounts payable> Setup> Parameters	

Table B.5: Accounts receivable – basic setup

No.	Name	Menu Item	Chapter
5.1	Terms of payment	Accounts receivable> Setup> Payment> Terms of payment	(3.2.2)
5.2	Customer groups	Accounts receivable> Setup> Customer groups	4.2.1
5.3	Posting profiles	Accounts receivable> Setup> Posting profiles	4.2.1
5.4	Form setup	Accounts receivable> Setup> Forms> Form setup	4.2.1
5.5	Parameters	Accounts receivable> Setup> Parameters	

Table B.6: Inventory management – basic setup

No.	Name	Menu Item	Chapter
6.1	Item groups	Inventory management> Setup> Item groups	
6.2	Transaction combinations	Inventory management> Setup> Posting> Transaction combinations	8.4.2
6.3	Posting	Inventory management> Setup> Posting> Posting	8.4.2
6.4	Inventory model groups	Inventory management> Setup> Inventory> Inventory model groups	7.2.3

6.5	Dimension groups	Inventory management> Setup> Dimensions> Dimension groups	7.2.2
6.6	Costing versions	Inventory management> Costing versions	7.2.4
6.7	Journal names	Inventory management> Setup> Journals> Journal names, Inventory	7.4.1
6.8	Warehouse journals	Inventory management> Setup> Journals> Journal names, warehouse management	7.4.1
6.9	Parameters	Inventory management> Setup> Parameters	7.4.1

Table B.7: Production – basic setup

No.	Name	Menu Item	Chapter
7.1	Production units	Production> Setup> Product units	5.3.1
7.1	Working time templates	Basic> Setup> Calendar> Working time templates	5.3.2
7.2	Calendar	Basic> Calendar	5.3.2
7.3	Journal names	Production> Setup> Journal names	5.4.1
7.4	Route groups	Production> Setup> Routes> Route groups	5.3.4
7.5	Cost groups	Inventory management> Setup> Bills of materials> Cost groups	5.4.1
7.6	Cost categories	Production> Setup> Routes> Cost categories	5.3.4
7.7	Calculation groups	Inventory management> Setup> Bills of materials> Calculation groups	5.2.1
7.8	Costing sheet setup	Inventory management> Setup> Bills of materials> Costing sheet setup	5.4.1
7.9	Parameters	Production> Setup> Parameters	
7.10	Parameters by site	Production> Setup> Parameters by site	

Table B.8: Master planning – basic setup

No.	Name	Menu Item	Chapter
8.1	Coverage groups	Master planning> Setup> Coverage> Coverage groups	6.3.3
8.2	Master plans	Master planning> Setup> Plans> Master plans	6.3.2
8.3.	Forecast models	Inventory management> Setup> Forecast> Forecast models	6.2.2
8.4	Forecast plans	Master planning> Setup> Plans> Forecast plans	6.2.2
8.5	Parameters	Master planning> Setup> Parameters	6.3.2

Master Data and Further Essential Setup**Table B.9: Further essential setup**

No.	Name	Menu Item	Chapter
9.1	Employees	Basic> Employee details	2.3.2
9.2	User relations	Administration> Setup> User relations	2.3.2
9.3	User profiles	Administration> Setup> User profiles	2.1.5
9.4	Terms of delivery	Accounts payable> Setup> Distribution> Terms of delivery	3.2.1
9.5	Cash discounts	Accounts payable> Setup> Payment> Cash discounts	3.2.2
9.6	Methods of payment (Purchasing)	Accounts payable> Setup> Payment> Methods of payment	8.3.4
9.7	Activate trade agreements (Purchasing)	Accounts payable> Setup> Price/Discount> Activate price/discount	3.3.2
9.8	Vendor price/ discount groups	Accounts payable> Setup> Price/ Discount> Vendor price/discount groups	3.3.2
9.9	Item discount groups	Accounts payable> Setup> Price/ Discount> Item discount groups	4.3.2

9.10	Price tolerance setup	Accounts payable> Setup> Price/Discount> Price tolerance setup	3.6.1
9.11	Activate trade agreements (Sales)	Accounts receivable> Setup> Price/Discount> Activate price/discount	4.3.2
9.12	Customer price/discount groups	Accounts receivable> Setup> Price/Discount> Customer price/discount groups	4.3.2
9.13	Misc. charges codes (Purchasing)	Accounts payable> Setup> Misc. charges> Misc. charges codes	4.4.4
9.14	Misc. charges codes (Sales)	Accounts receivable> Setup> Misc. charges> Misc. charges codes	4.4.4
9.15.	CRM parameters	CRM> Setup> Parameters	4.4.1
9.16	Return action (Purchasing)	Accounts payable> Setup> Purchase order> Return action	
9.17	Disposition codes	Accounts receivable> Setup> Sales order> Returns> Disposition codes	4.6.3
9.18	Dimension focuses (Financial statement)	General ledger> Setup> Financial statement> Dimension focuses	8.2.1
9.19	Row definition	General ledger> Setup> Financial statement> Row definition	8.2.1
9.20	Financial statement	General ledger> Setup> Financial statement> Financial statement	8.2.1
9.21	Date intervals	General ledger> Setup> Periods> Date intervals	8.2.1
9.22	Document management parameters	Basic> Setup> Document management> Parameters	2.2.3
9.23	Document types	Basic> Setup> Document management> Document types	2.2.3
9.24	Global search tables	Basic> Setup> Data Crawler> Table setup	2.1.6
9.25	Start data crawler	Basic> Setup> Data Crawler> Data crawler	2.1.6

Appendix

9.26	Batch-Server	Administration> Setup> Server configuration	2.1.7
9.27	Database log	Administration> Setup> Database log	2.2.2

Table B.10: Master data

No.	Name	Menu Item	Chapter
10.1	Tax exempt numbers	General ledger> Setup> Sales tax> External> Tax exempt numbers	3.2.1
10.2	Vendors	Accounts payable> Vendor details	3.2.1
10.3	Items	Inventory management> Item details	
10.4	Customers	Accounts receivable> Customer details	4.2.1
10.5	BOM	Inventory management> Bills of materials	5.2.2
10.6	Work centers and Work center groups	Basic> Work center groups	5.3
10.7	Operations	Production> Setup> Routes> Operations	5.3.4
10.8	Routes	Production> Route details	5.3.4

Appendix C: Icons and Shortcut Keys

Table C.1: Basic icons and shortcut keys

Shortcut Key	Command	Description
	<i>Ctrl+N</i>	<i>File/New</i> Create a record
	<i>Alt+F9</i>	<i>Command/Delete record</i> Delete a record
	<i>Alt+F4</i>	<i>File/Exit</i> Close form or workspace
	<i>Esc</i>	Close form without saving
	<i>Ctrl+P</i>	<i>File/Print</i> Print auto-report
		<i>View/Favorites pane</i> Show/hide favorites pane
	<i>Ctrl+W</i>	<i>Windows/Open new workspace</i> Open an additional workspace
	<i>Ctrl+X</i>	<i>Edit/Cut</i> Cut (content of one field)
	<i>Ctrl+C</i>	<i>Edit/Copy</i> Copy (field or record)
	<i>Ctrl+V</i>	<i>Edit/Paste</i> Paste (content of one field)
	<i>Ctrl+F</i> (<i>Ctrl+K</i>)	<i>Edit/Find</i> Find (opens the field filter window)
	<i>Ctrl+F3</i>	<i>Edit/Filter/Advanced Filter/Sort</i> Open window for advanced filtering
	<i>Alt+F3</i>	<i>Edit/Filter/Filter By Selection</i> Set filter using the content of the selected field
	<i>Ctrl+G</i>	<i>Edit/Filter/Filter By Grid</i> Open filter line
	<i>Shift+Ctrl+F3</i>	<i>Edit/Remove Filter/Sort</i> Clear filter
		<i>Command/Document handling</i> Document management
		<i>View/Notifications</i> Show notifications
	<i>F1</i>	<i>Help/Help</i> Help on forms

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