AbaCus

The Rating Engine

User manual

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Confidentiality notice

Trademarks

Document version

2.0

About This Guide

The AbaCus User Manual is a reference and a training material for AbaCus users. The manual provides an overview of the AbaCus application and all included functionality related to AbaCus.

All chapters in this manual follow the same outline, which is described below.

- A description of the contents in the chapter.
- A screen shot, showing the current screen, or part of a screen.
- A description of the settings and the screen contents.
- Step-by-step instructions describing how to make settings and how to use the functionality.

Prerequisite knowledge

Users of AbaCus are expected to having attended an AbaCus training held by Basset Telecom Solutions or by a local trainer that have attended the AbaCus training.

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Chapter 1

Application Overview

Overview

Introduction

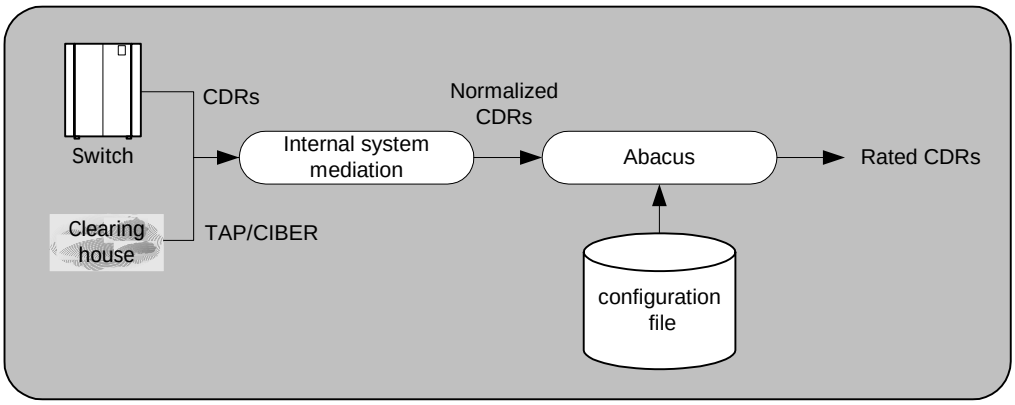
This chapter describes the purpose of the AbaCus system and the general parts of the application. It also gives an overview of the user interface.

In this chapter

This chapter is organized as follows.

AbaCus Overview

AbaCus is a rating system intended as a component in a more complex system, or just as a stand-alone rating application. It reads filtered CDR and roaming files along with customer data, and classifies and rates the call information. The rated calling data files are copied to a directory ready to be used by the target system.



The AbaCus system consists of two parts, the rating engine and the configuration interface. The rating engine is the Decode32 application that reads the call data files, executes the classification and rating, and writes the data to the output files. The configuration interface is what is mainly described in this manual. That is the interface to the .ini-files where the rules for the classification and rating are set up.

Features and functions

Below is a list of the main features and functions in the AbaCus system.

Switch Formats
AbaCus has separate settings for each switch type since the rules for classification of call types may differ from one switch to another.

CDR Filters
AbaCus uses filters e.g. to exclude irrelevant CDRs in the rating process.

CDR modification
AbaCus can modify a CDR format to a standard output format. It is also possible to modify CDRs and then filter the data after modification in an iterative way.

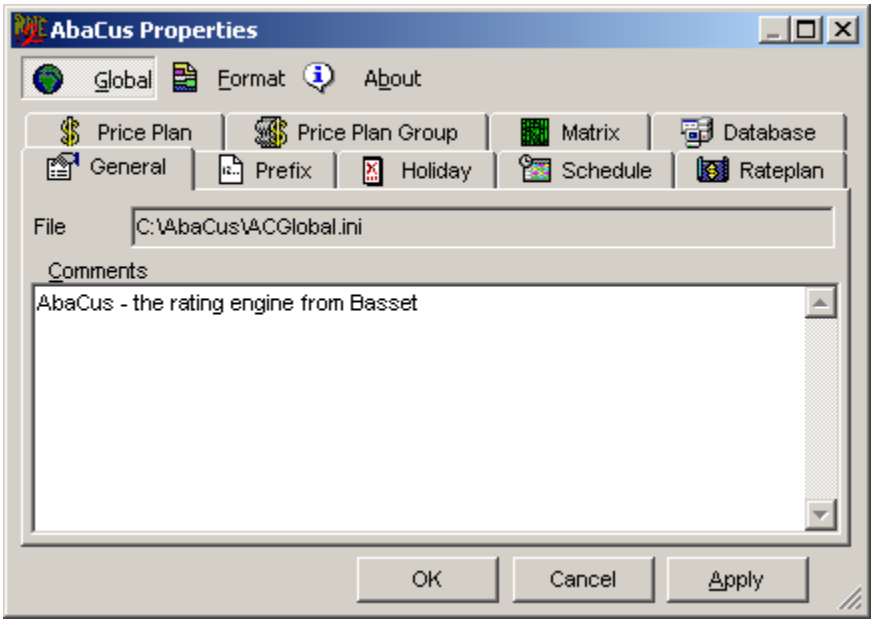
Classification
AbaCus classifies each call before the rating.

Pricing
The price of a call can consist of a number of components, such as airtime, toll and a fixed charge, making the pricing process very flexible. Different rates can be used for different parts of a single call, during different time periods per day (e.g. peak, off peak), for different days in the week, holidays, or for different date intervals. The price can also differ depending on the customer, using rate plans.

Output formats
AbaCus writes the rated call information to files of any textual record format.

The AbaCus Configuration Interface

The AbaCus configuration interface is the interface to the .ini-files where the rules for the classification and rating are set up. The **AbaCus Properties** window is the main window in this interface. This chapter describes the main contents of this window.



The AbaCus Toolbar

On the top of the screen there is a toolbar consisting of three items.

These items, along with the belonging settings tabs, will be described in detail in the following chapters. However, here is an overview.

Global The Global tabs contain the settings that are general for all switch brands, e.g. schedules and holiday dates.

Format The Format tabs contain the settings that are specific for a certain switch brand, e.g. file formats and classification rules.

About Apout displays information about the AbaCus system. This information includes the version number and release notes for the current and previous versions.

At times the **AbaCus toolbar** has a fourth option, **Errors**. This option appears if AbaCus experience problems, e.g. with the settings files. This issue is described in detail in **Error handling**.

Command Buttons

On the bottom of the **AbaCus Properties** window there is a set of command buttons used for saving settings and to quit AbaCus. Please be aware that no setting changes are saved unless **OK** or **Apply** are clicked.

OK Click **OK** to quit AbaCus and save your settings.

Cancel Click **Cancel** to quit AbaCus without saving your settings.

Apply Click **Apply** to save your setting without closing AbaCus. The **Apply** button is enabled only if changes have been done.

AbaCus Tools

Most of the settings tabs in the Abacus configuration interface have a toolbar. The content of the toolbar varies depending on the settings tabs. Only the tools relevant for the current settings are displayed. At times, the tools are disabled, meaning they have no relevance for the moment, e.g. the Find tool is disabled if an item list is empty.

Example of a tab toolbar.

Below the general tools are described. Some tools apply only to a certain tab and will be described in the corresponding chapter.

Add
This tool is used to add new items in item lists. Click Add to create a new item.

Edit
This tool is used to make changes to items in item lists. Click to select an item, then click Edit.

Cut
This tool is used to move items. Click to select an item and click Cut. The item is now moved to the Clipboard. See Paste on how to add the item to a new position.

Copy
This tool is used to copy items. Click to select an item and click Copy. The item is now copied to the Clipboard. See Paste on how to add the item to a new position.

Paste
This tool is used to add items in the Clipboard to new positions. Click to select the position where to put the item and click Paste.

Delete
This tool is used to remove items. Click to select an item, then click Delete. If Shift is pressed when the Delete symbol is clicked, the deletion confirmation dialog box is not displayed.

Import

Find
With this function it is possible to search for values in item lists.

Move up/Move down
In item lists, the order of the items can be changed. Click to select an item, then click the Move up or Move down tool to move the item up or down the list.

Chapter 2

Technical Overview

Overview

Introduction

This chapter gives an overview of the technical aspects concerning the AbaCus functionality.

In this chapter

This chapter is organized as follows.

AbaCus and Decode32

Abacus is configured and executed from inside Decode32 as a filter. The following criteria must be fulfilled before using Abacus in Decode32.

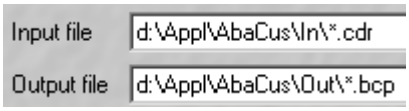
- Decode32 version 19.8.A59*** or higher.
- Abacus support files must be copied to the Windows System32 folder. The support files are Basset.dll, mscomctl.ocx, mscomct2.ocx and msflxgrd.ocx.

The Abacus configuration interface can be started by opening a filter in Decode32 and clicking **Format specific settings**. Then the interface is started using the .ini file corresponding to that specific filter. If the Abacus configuration interface is started by clicking the ACConfig.exe file, a file browser window is opened where the correct .ini file has to be selected.

Decode32 Configuration
To configure Decode32 to run Abacus, the following steps must be performed.

- Add a new filter to Decode32.
- Name the filter in the **Filter name** text box.
- Select Abacus in the **Output format** list box.

- Define the input file path for Abacus in the **Input file** text box.
- Define the output file path for Abacus in the **Output file** text box.



- To access the AbaCus configuration interface, click the **Format specific settings** button.

- A schedule needs to be defined in Decode32 if AbaCus should run on a specific interval.

Decode32 functionality used by Abacus
This list describes all functionality used by Abacus but that is configured in Decode32.

- Setup filter
  - Filter name
  - Input file
  - Output file
  - Old file (on exist setting)
- Schedules
- Messages
- Service functionality

AbaCus Files

The following system files are used by AbaCus.

Decode32.ini This file contains settings made in Decode32.

ACGlobal.ini This file contains the general settings data that apply to all AbaCus filters that have been configured in Decode32.ini. These settings are the ones made on the different settings tabs found under the Global option in the AbaCus toolbar. There is only one ACGlobal.ini file.

ACFltnnn.ini This file contains filter specific settings, applying to a specific filter with identity *nnn* as defined in Decode32.ini. There is one ACFltnnn.ini file for each AbaCus filter.

ACRatePl.ini This file links the rate plan names to the ID numbers seen on the **Rateplan** tab. It also defines the default rate plan. The file is updated by the server when the subscriber information is cached.

ACCount.ini This file contains current values of global system counters. The file is updated by the server as each incoming CDR file has been processed.

AbaCus Fields

AbaCus has a number of predefined fields, AbaCus special fields, which are used during the rating process. Below is a list of these fields.

Cost The total price for a rated data record.

Counter Input file data record counter used internally to identify records. The maximum value is 2 billions. If the maximum value is reached, the Counter value starts from one again and the value of the Rollover field (see below) is increased by one.

CriterionMatch Contains the value of the last criterion that matched, and was part of, a "match some" list (normal list, hash table or binary tree).

Cycle Billing cycle taken from the subscriber file. The value is used for cut-off handling in the classification process.

Duration The length of a call. The value is calculated by AbaCus.

End of call A date/time field containing the date and time when a called was finished.

Extra sub info This field contains a value taken from the Misc-field when the <resolve rate plan> command is executed in the classification process.

File counter An input file counter used internally to identify files. The maximum value is 2 billions. If this value is reached, the File counter value starts from one again.

Hit list If containing a number of values, a comma-separated list containing the steps that have been executed in the classification process, as set on the Classification tab. The values stored are the GUID field or, if the GUID value does not exist, the name of the classification step.

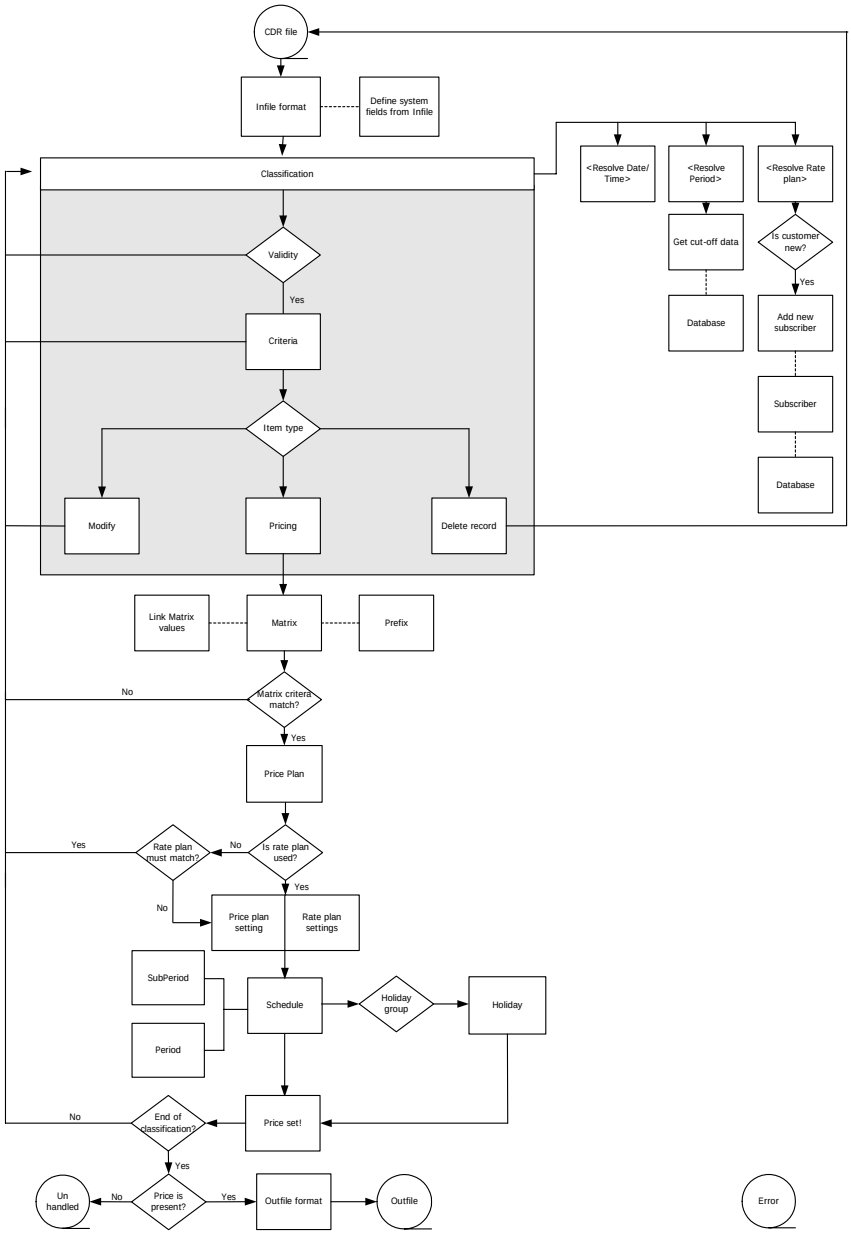
HWeekday This value is taken from the schedule, indicating on which weekday the rated call was made. The value is a number from 1 to

	8 where 1 to 7 represents the weekdays, starting on Monday, and 8 representing holiday.
Matrix	The ID number for the matrix that was used to rate the call. If more than one matrix has been used, the ID for the matrix last used is stored.
Now	The date and the time when a record was processed by AbaCus.
Original Duration	The real duration of a call, without any modifications.
Period	This field is contains the start and end dates of the billing cycle.
Prefix X	The value that latest matched the X-axis criteria in a matrix.
Prefix Y	The value that latest matched the Y-axis criteria in a matrix.
Price Plan	The price plan that was used to rate the call.
Rateplan	The rate plan that was used to rate the call.
Rollover	This field is related to the Counter field. Each time the Counter field reaches its maximum value of 2 billions, The Rollover field is increased by one.
Start of Call	A date/time field indicating the start time of the call.
Time Period	A comma-separated list containing ID and length of each time period that have been used in the rating process, as specified on the Schedule tab. The format is: <period ID>:<period length>','next period…
Weekday	Weekday is the same as HWeekday apart from not having the 8 value for holidays.
Volume #1	This field has the same function as Duration but concerns data traffic.
Volume #2	See Volume #1.
Volume #3	See Volume #1.
Volume Cost #0	Price based on volume: Duration of a call.
Volume Cost #1	Price based on volume: Volume #1.

Volume Cost #2	Price based on volume: Volume #2.
Volume Cost #3	Price based on volume: Volume #3.
Volume Pricing Info #0	Comma-separated list displaying time based pricing information as period, price plans etc.
Volume Pricing Info #1	Comma-separated list displaying volume based pricing information as period, price plans etc.
Volume Pricing Info #2	Comma-separated list displaying volume based pricing information as period, price plans etc.

The Rating Process

This section gives a rough description of the dataflow during the rating process. Understanding this section makes it easier to comprehend this manual and the details of the AbaCus functionality.



Step	Description
1. CDR file	The input file containing the call data that should be rated.
2. Informat	The format of the input file is defined on the Informat tab.

	Step	Description
		the Informat tab.
	Define system fields	On the Define tab, the input file fields containing the values for the AbaCus system fields are specified.
3.	Classification	The settings on the Classification tab are central for the rating process. All steps in the process are specified in a tree view and AbaCus executes the steps sequentially from top to bottom. Operations that can be performed are: Delete Modify Pricing Resolving of data and variables
	Validity	For each classification step, AbaCus checks if the step is effective for the current date.
	Criteria	Each classification step can have criteria, setting the rules for when a step should be executed. The criteria can consist of a sequence of rules.
	Operation: Modify	This option changes values, or set new values, to fields and variables. A modify item can also include pricing.
	Operation: Delete	The delete option makes it possible to remove records that are not interesting for rating. Delete steps are usually inserted in the beginning of the classification process to get rid of unnecessary data. When a record is deleted, AbaCus quits the classification sequence, writes the record on the deleted records file, reads the next call data record and starts from the top again.
	Operation: Pricing	This is where the prices are set. These settings include references to the matrixes, which in the next step connects to the price plans.
4.	Matrix	The matrixes contain references to the price plans. Two values, an X-axis value and an Y-axis value, are used to qualify to the right price plan.

	Step	Description
	Link matrix values	The Link matrix tab specifies which values should be sent to the respective matrix. The values can be input file, output file, or AbaCus system values.
	Matrix criteria match	If the current values match any of the matrix values, a price plan is found. If not, AbaCus proceeds to the next classification step.
5.	Price plan	The price plan holds the details for the pricing, such as the price for each part of a call and connections to rate plans and schedules.
	Is rate plan present?	Rate plans place customers in certain categories, e.g. "VIP customers". Rate plan settings overrule price plan settings and if a rate plan is present both for the customer and in the price plan, the rate plan settings will be used.
	Rate plan must match?	AbaCus can be set to require a rate plan match. In this case, AbaCus goes to the next step in the classification process if a match wasn't found. If the must match isn't selected, and no rate plan match in the current price plan, the price plan settings are used.
6.	Pricing	
	Schedule	To produce a correct rating, AbaCus checks the Schedule settings.
	Period	The schedule settings divide days into different periods, e.g. peak and off peak periods.
	Subperiod	Each call can also be divided into different parts, being differently rated. E.g. the first minute is charged with a higher rate.
	Holiday	AbaCus keeps track of holiday dates for a correct rating.
7.	Price set!	Now, AbaCus should have set a price.
	End of classification?	AbaCus checks if the classification sequence has come to the end.
	Pricing	If a price has been set, a record is written to the output file. The output file format is defined on the Outformat tab. If AbaCus

Step	Description
	hasn't been able to set a price, and the classification sequence is finished, the record can be written to a file containing unhandled records.

Chapter 3

Global Settings

Overview

Introduction

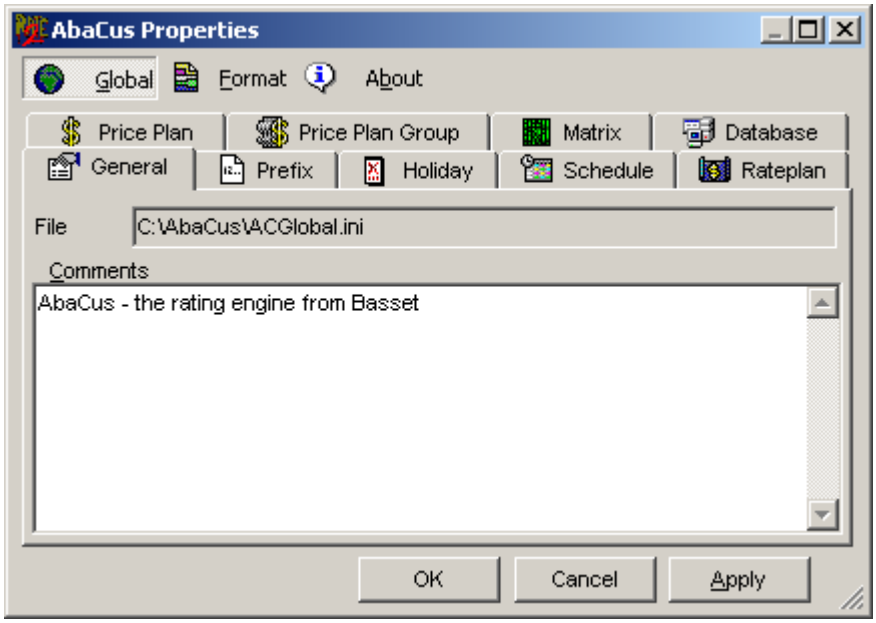
This chapter describes the settings that are general for all filters and switch brands, e.g. settings for schedules and holidays. The **Global: Settings** tabs are displayed when the **Global** option is selected on the AbaCus Toolbar.

In this chapter

This chapter is organized as follows.

General

On the **General** tab you can make comments about the global AbaCus settings.

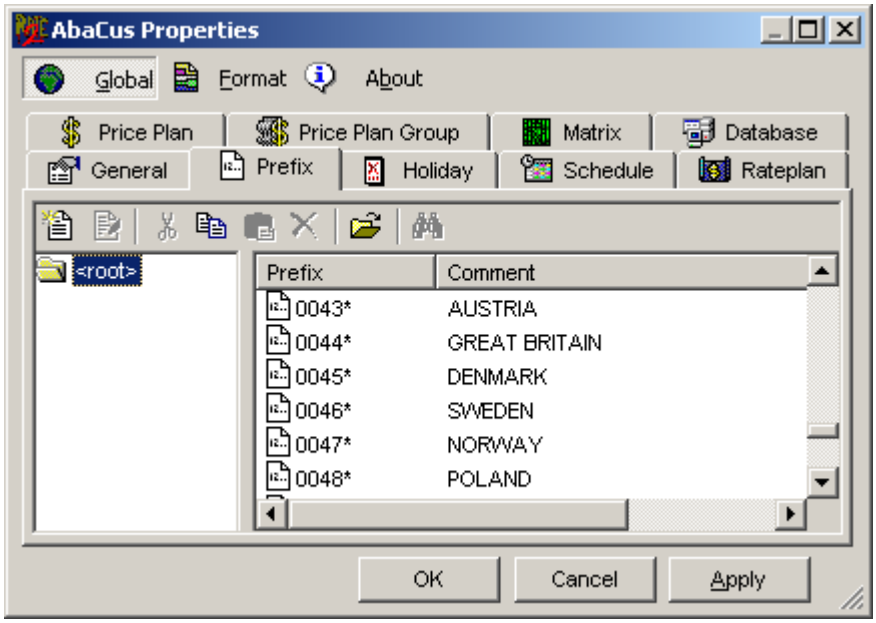


Comments
In the **Comments** text box any appropriate text regarding the current filter can be typed.

Prefix

The **Prefix** tab lists all AbaCus prefixes. Prefixes are used when building matrixes where they work as wildcard values or value lists. E.g. the digits used for international calls can be defined as a prefix. If this prefix matches the called number, AbaCus can find the price plan for international calls.

The prefixes entered will be displayed on the **Global: Matrix** tab when the matrixes are defined. When connecting price plans to certain parameter values, the prefix list can be used to select the values. Please refer to the **Global: Matrix** chapter for more information.



The **Prefix** tab is divided into two different parts.

- Prefix groups
- Prefix list

Each part is described below.

Prefix groups

Prefix groups can be used to organize prefixes into a logical order.

Prefix list

The prefix list includes all prefix items for the selected prefix group. The list has two columns, prefix and comment.

Prefix
Prefix is the value of the prefix item.

Comment
Comment is a description of the prefix item. This value can be left blank.

To add a prefix to the prefix list, follow these steps.

1. Click the folder in the prefix groups workspace where you want to add the prefix.
2. Click anywhere in the prefix list workspace.
3. Click the **Add** symbol to create a new prefix item. The item appears in the list.
4. Enter the prefix value.
5. Enter a description in the comment column.

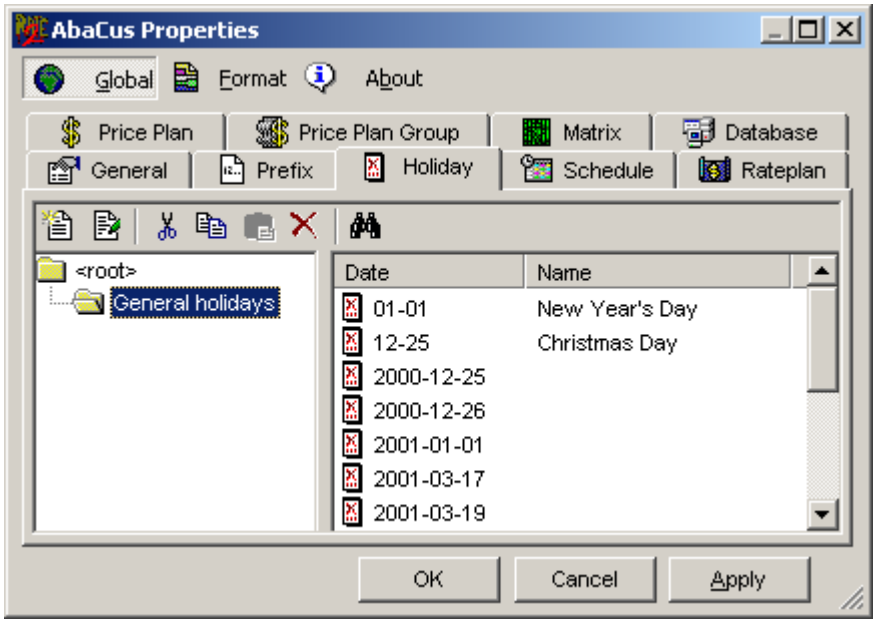
To edit an existing prefix item, double click the item and change the settings.

Holiday

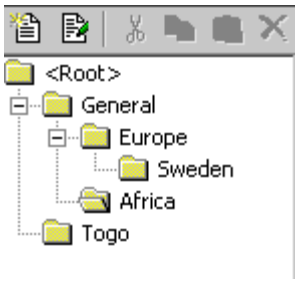
The **Holiday** tab is used to specify and group dates for the **Schedule** function. When creating a schedule, holiday groups can be used to define the dates that will be rated with holiday prices. The **Holiday** tab of the **Global** settings is divided into two different parts.

- Holiday groups
- Holidays

Each part is described below.



Holiday groups



On the **Holiday groups** window, holidays can be organized in folders. Holiday groups are used when creating schedules, where each schedule can be given a reference to a holiday group. Then each schedule has a package of holiday dates, with only one reference.

The holiday groups are organized in a tree view. To add a folder item to the tree view, select the folder in the tree view that will act as parent folder for the new folder and click the **Add** button.

Note! Entries in subfolders inherit the settings made in the parent folders.

Holidays

Holidays are specific dates that should be rated with holiday prices.

Date	Name
01-01	New Years Day
12-24	Christmas Eve
12-25	Christmas Day
2001-04-13	Easter
2001-05-01	First of May
2001-08-28	My Birthday

Each holiday entry consists of a date and a name. The date can be entered without a year. This is useful for holidays occurring on the same date every year, e.g. Christmas Eve.

AbaCus adds a symbol to each entry, indicating in which folder a holiday was added. Below is a description of the symbols.

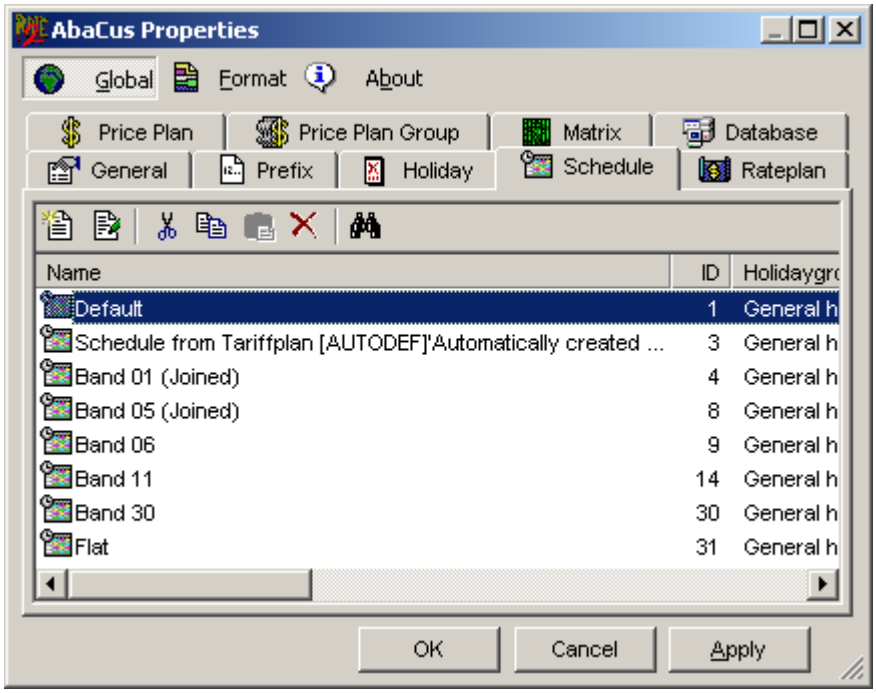
Current folder
The holiday was added to the current folder.

Parent folder
The holiday was added to the closest parent folder.

Grand parent folder
The holiday is present in a folder two levels up or more.

Schedule

An operator might want to use different rates during different times of the day, or different rates for different parts of a specific call. The **Schedule** tab is used to define time periods. A schedule also includes a holiday group. Holiday groups are defined on the **Holiday** tab. The schedules are then connected to the price plans, enabling AbaCus to find the correct rates for each call.



When the **Schedule** tab is opened, a list of all existing schedules is displayed. The list includes the following information.

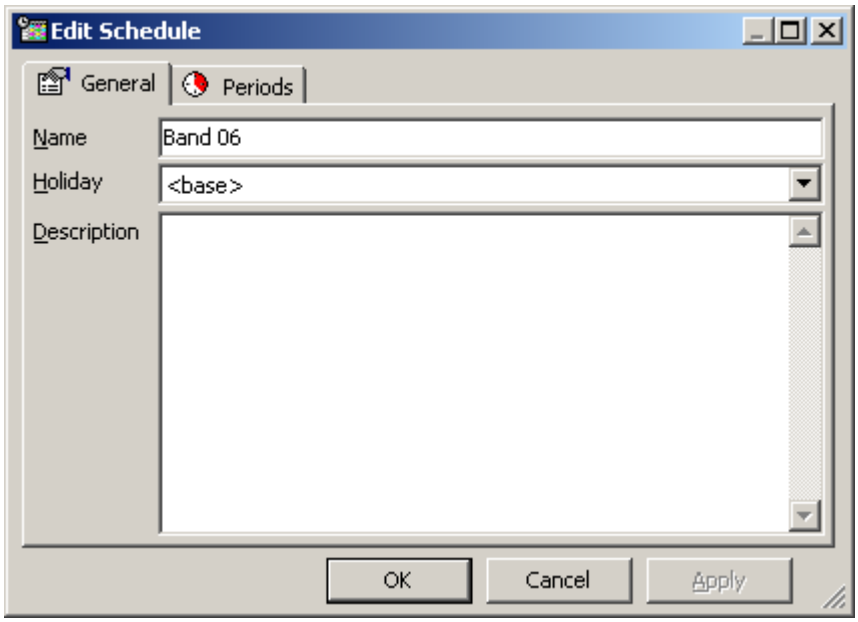
Name	The name of the schedule, set on the **General** tab.
ID	ID is a sequential identification number for each schedule, set by AbaCus.
Holiday group	This field is a link to a holiday group that contains all holiday dates that should apply for the current schedule. Holiday groups are defined on the **Global: Holiday** tab.
Items	The number of time periods defined for the current schedule. The time periods are defined on the **Periods** tab.
Monday – Sunday, Holiday	A comma-separated list displaying all periods set, specified for each day.

When adding new schedules, or editing existing schedules, the **Edit Schedule** window appears. This window consists of three tabs.

- General
- Periods

These tabs are described in the following sections.

General



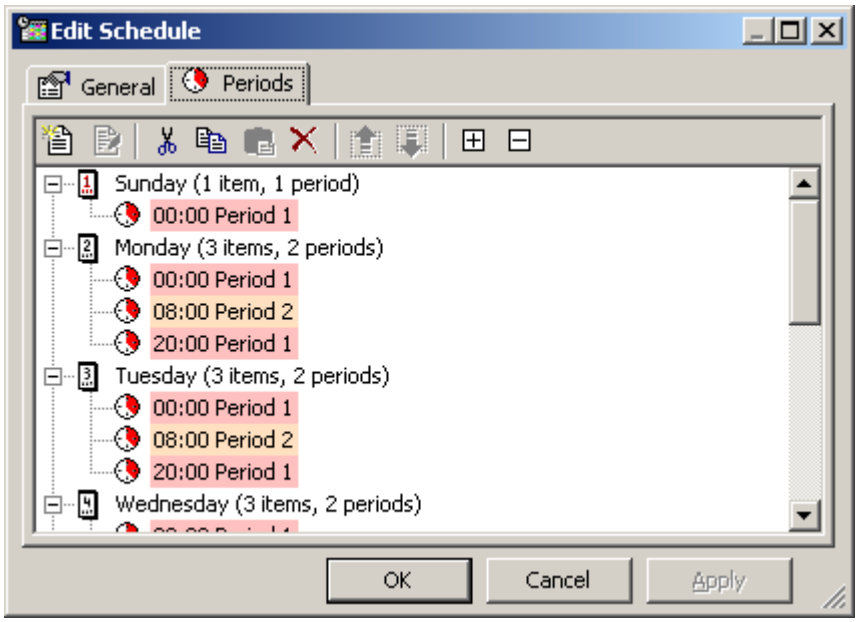
The **General** tab includes the following information.

Name An arbitrary name of the schedule. This name is used when connecting the schedule to a price plan on the **Price plan** tab.

Holiday Select the holiday group that should be linked to the current schedule. All holiday groups are displayed in, and can be selected from, the drop-down list. For more information on holiday groups, please refer to the **Holiday** chapter.

Description In the **Description** workspace any appropriate text concerning the current schedule can be typed.

Periods



On the **Period** tab, each day can be divided into time periods. It is possible to have up to five periods per day. Time periods can be specified for each day of the week and generally for holidays.

Each **Period** item includes the start time of the period and a period number from 1 to 5.

In the example, Monday's Period 1 starts 00:00 and stops 08:59:59. Period 2 starts 09:00 and stops 20:59:59. The remaining hours of the day is period 1 from 21:00 to 23:59:59. This setting enables the operator to use two different rates on Mondays. The last period for a day is valid also for the next day, until a new period is set.

The period settings are used in the rate plan settings on the **Price plan: Pricing** tab, where e.g. the Cost 1 field applies to Period 1, Cost 2 to Period 2, and so on.

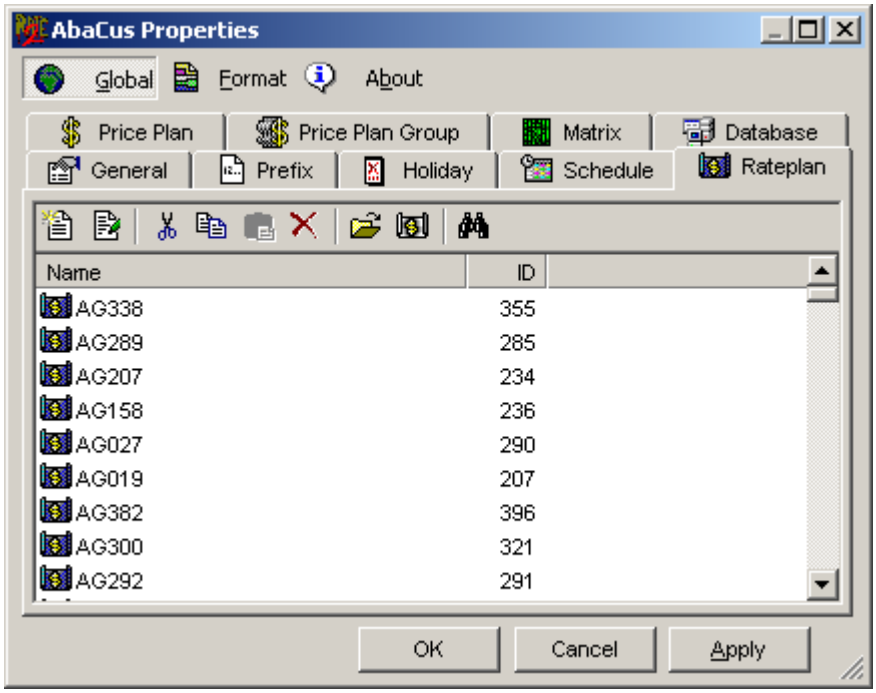
Rate Plan

Overview

A rate plan places the subscriber into a category of customers, e.g. "VIP customers". Each subscriber can have one rate plan which is stored in the billing system.

When AbaCus rates a call, the price plan is the basis for the rating. The price plans can have a number of rate plans connected to them, including pricing settings that differ from the price plan. A customer with a rate plan may be charged a special rate, and if this rate plan is included in the price plan, the rate plan settings overrule the price plan settings. E.g. there can be a price plan including standard prices for SMS messages. VIP-customers, however, have a lower rate, which is set in the VIP-customer rate plan that is then connected to the SMS price plan.

The **Rate plan** tab looks as follows.



The **Rate plan** tab has two columns, **Name** and **ID**.

Name The **Name** field contains the rate plan name. The names have to correspond exactly to the names in the input files, since AbaCus is using those values to find the rate plan.

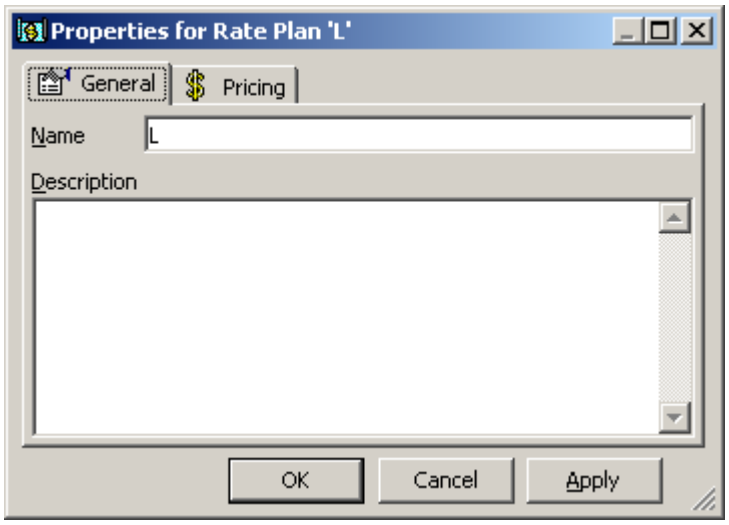
ID The **ID** number is set by AbaCus.

The **Rate plan** tab has a tool on the tool bar that only applies to this tab. This tool is described below.

Set as default
This tool is used for setting a rate plan as the default rate plan. Click the rate plan that should be set as default and click this symbol.

The default rate plan will always be added on top of the pricing tree on the Pricing tab when new price plans are created. The default rate plan pricing settings will be used also for the rate plans below the default rate plan in the pricing tree, unless new values are added to these items.

General



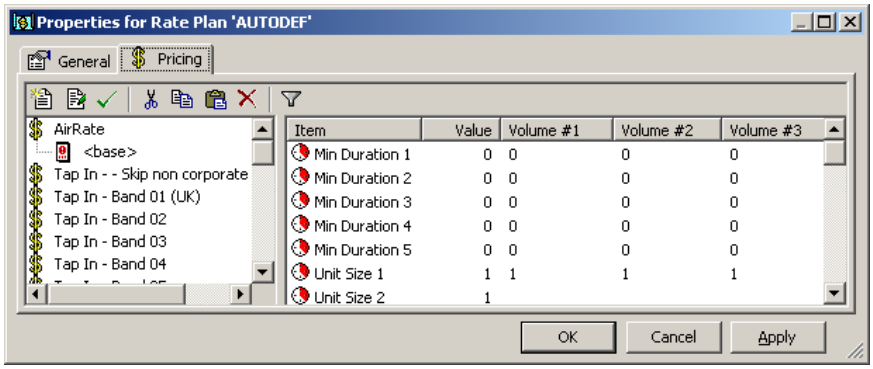
The **General** tab contains a comment about the current rate plan. The tab includes two text boxes.

Name The name of the rate plan.

Description A description of, or any appropriate information about, the rate plan.

Pricing

The **Pricing** tab looks as follows.



There are two workspaces on the **Pricing** tab.

The Price Plan List

The **Price Plan List** displays all price plans having been defined in AbaCus. Price plans that have been connected to the current rate plan are displayed first. Under each price plan, the default level of the price plan settings is displayed, enabling the user to see the pricing information applying to this price plan (see the next section).

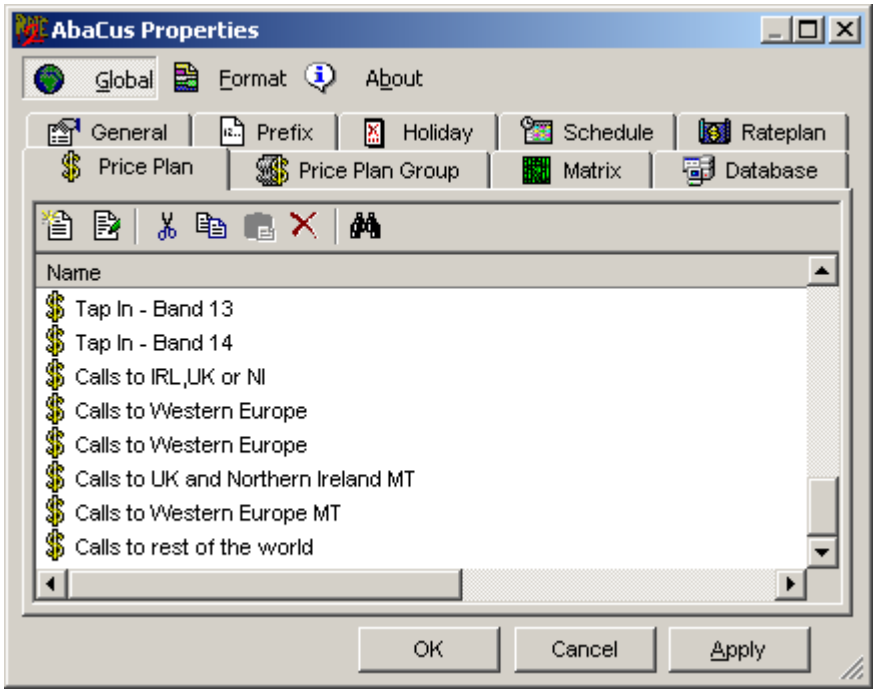
The Price Plan Details

The **Price Plan Details** contains the pricing details for the price plan that have been connected to the current rate plan. To see this information, click the <base> symbol below the price plan. A description of the pricing details can be found in the Price plan chapter.

Price Plan

The **Price Plan** tab is where the price plans are defined. Price plans contain details about the pricing. Prices can be set e.g. for airtime, fixed rates, and different times of days. The price plans can also be valid for different time periods.

Each price plan can also be connected to a number of rate plans, enabling AbaCus to use different rates for certain customers. When rate plans are present, these settings overrule the price plan settings. Please see the **Rate plan** chapter for further information on rate plans.



The Price Plan List

The price plan list displays all price plans that have been defined in AbaCus. The list has four columns.

Name The name of the price plan, set on the **General** tab when defining it.

ID This number is set by the AbaCus system.

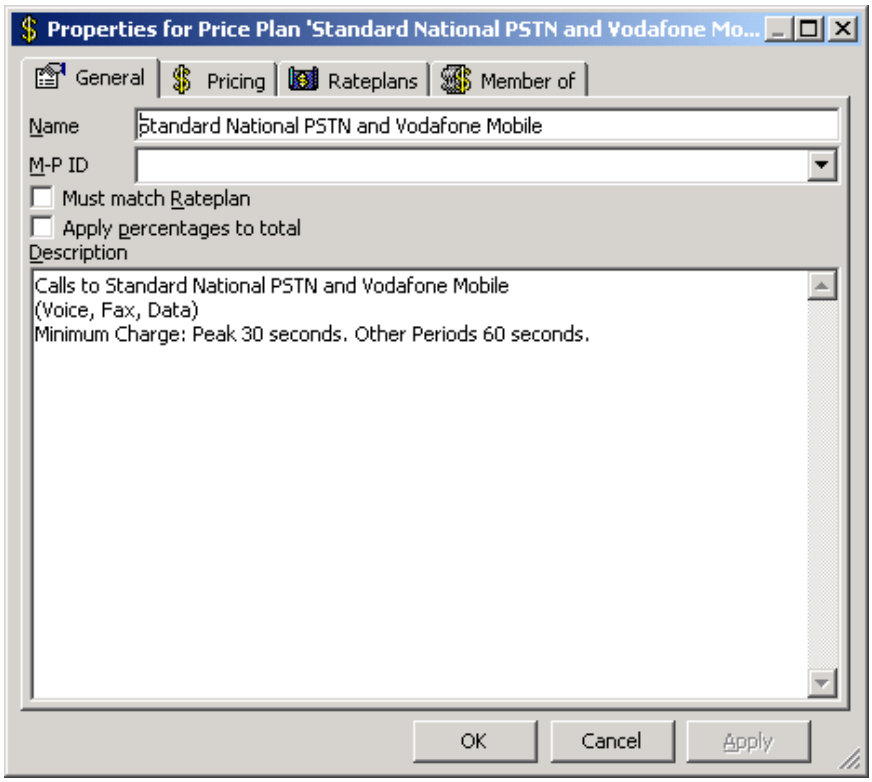
Changes The **Changes** field indicates the number of sub levels that have been added to a price plan.

Rate Plans The value in this column displays the number of rate plans a price plan has been connected to. To edit the price plan settings, double click a price plan item in the price plan list.

A new window displays, containing three tabs: **General**, **Pricing**, and **Rateplans**. These tabs are described in the following sections.

General

On the **General** tab, a price plan is named and described. This tab also contains two general pricing settings for each price plan.



The following parameters can be set.

Name — The price plan name is an arbitrary name for each price plan. This name will be displayed e.g. on the **Global: Matrix** tab when connecting price plans to the matrixes. The name can be changed at any time, and will then also be automatically updated e.g. in the matrixes.

Description — In this text box any comments can be typed about the current price plan.

M-P ID — To de defined.

Must match rate plan — This option is used in the rating process when AbaCus is checking the pricing details set on the **Price plan: Pricing** tab.

If a subscriber has a rate plan, the information belonging to the rate plan overrules the price plan settings. If no rate plan is connected to the price plan, or no rate plan matches the subscriber's rate plan, AbaCus can use default settings for the price plan connected to the root level of the price plan tree view. However, if this option is selected, and no rate plan matches, AbaCus will not set any prices in this stage but go on to the next step in the classification process.

Apply percentages to total

AbaCus can be set to add a percentage amount to an already calculated price. This can be used e.g. for adding taxes to a price. Sometimes a number of taxes should be added, which is normally done by using a sequence of price plans in the same matrix cell, where each extra price plan can add a new tax.

The **Apply percentages to total** option affects the result of percentage calculations performed in more than one step. If a price is set to 10 and two taxes, of 5% and 3% respectively, should be added, the following would be the results depending of how this option is set.

Option not selected

Price: 10 + (10 x 0,05) + (10 x 0,03) = 10,80

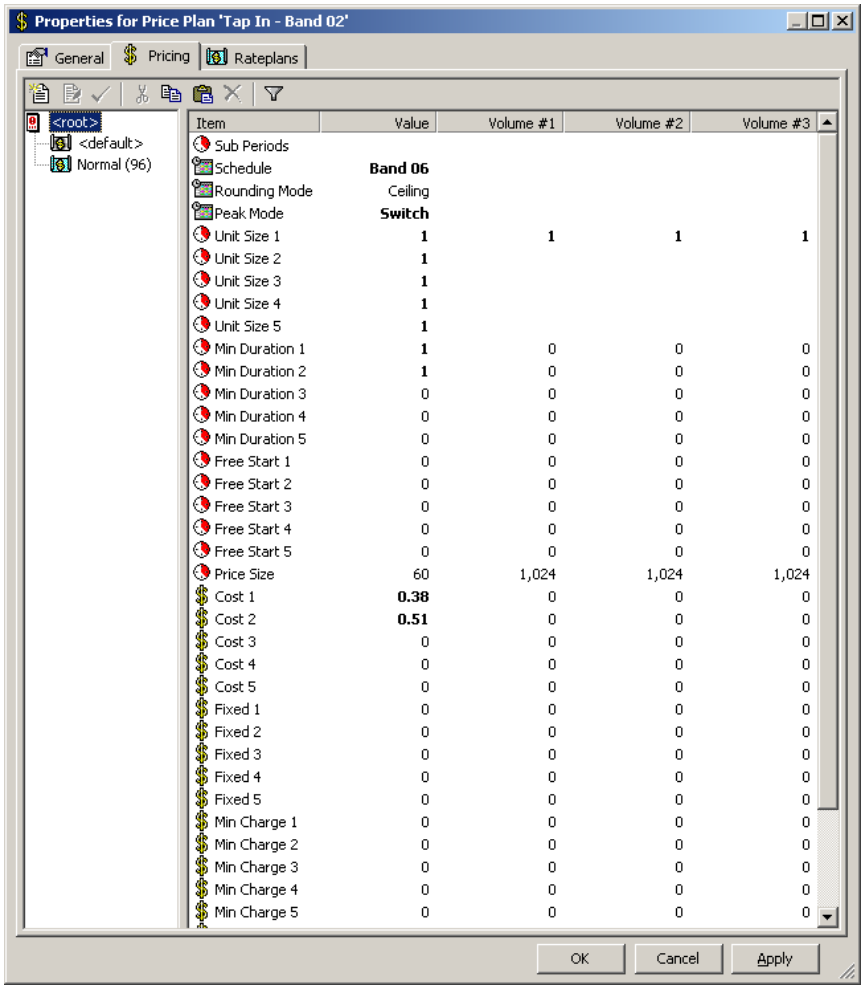
Option selected

Price: 10 x 1,05 x 1,03 = 10,815

When the option is selected, AbaCus uses the recalculated result for every calculation. If it's not selected, all taxes are calculated on the original price and the taxes are the added to the price.

Pricing

The **Pricing** tab consists of two areas: the price plan tree view and a price plan details matrix.



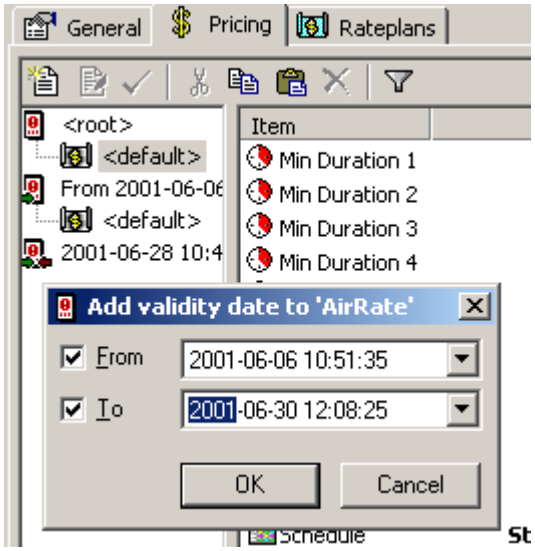
The Price Plan Tree View

To the left on the **Pricing** tab there is a tree view displaying different versions of the current price plan and, when occurring, the rate plans that have been connected to this price plan.

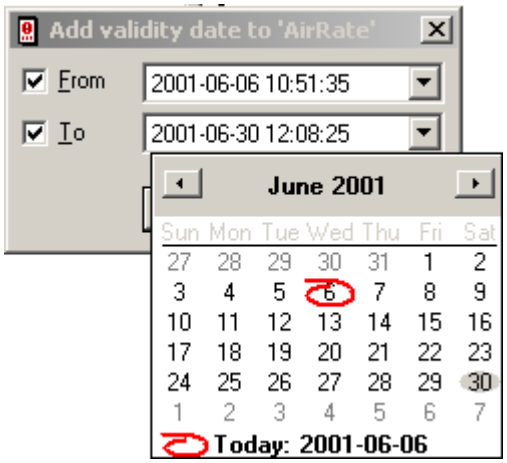
The price plan settings may differ over time, maybe because the prices should be lower during a campaign. Therefore different versions of the same price plan, based on the validity period, can be used. Added price plan inherits the values from the <root> item. When AbaCus is rating a call, the date of the called will be checked against the validity dates entered here.

If no price plan with a valid time period is present during the rating process, AbaCus will use the default values defined for the <root> price plan item.

When adding a validity date, the following dialog box appears.



Enter the validity period for this version of the price plan. The date and time can be typed or selected from the list displaying when clicking the arrows to the left of the date and time text boxes.



When a validity period has been added, it has to be activated before taking effect and before it is possible to edit the pricing details for this period. Then pricing details and connected rate plans are copied to the item from the root. The <root> item can also be activated if there is a need to make changes to it.

A price plan can be connected to one or more rate plans. In that case, the rate plans appears under the price plan symbol in the tree view. If a customer has a rate plan, AbaCus will check for this rate plan in this list when rating a call. If there is a match, the information belonging to the rate plan overrules the price plan settings. If there is no match, AbaCus can use the default settings for the price plan which are connected to the root level of the price plan tree view. However, if the **Price plan must match** option on the **Price plan: General** is

selected, no rating will be done in this stage but AbaCus will proceed to the next step in the classification.

Price Plan Details Matrix
The pricing details for a price plan or rate plan are displayed in the **Price Plan Details Matrix** on the right side of the **Pricing** tab.

The matrix consists of a number of predefined pricing items, used to enable an exact pricing of every call. All items are displayed in the **Item** column and they are described in detail below.

Each item has four values, containing the following information.

Value	**Value** displays item values concerning phone calls, e.g. seconds for call duration or a price for cost.
Volume #1	The **Volume #1** column contains the prices for GPRS uplink traffic.
Volume #2	The **Volume #2** column contains the prices for GPRS downlink traffic.
Volume #3	The **Volume #3** column contains the prices for GPRS volume traffic.

Below is a list of the pricing items and a description of the respective function.

Some items are numbered from one to five. The five levels are related to the five different time periods that can be set on the **General: Schedule** tab. Hence, level 1 of a pricing item is the price for time period 1 set there, and so on.

Sub Periods	The **Sub Periods** parameter makes it possible to divide each call into periods, based on the call duration. The purpose is to enable different pricing for different parts of a single call. The number of sub periods per call is unlimited. **Sub periods** apply to the **Cost** and **Unit Size** fields. The settings appear as numbered sub levels under each parameter. The sub periods are defined by entering a comma-separated list where each value represents the size of the sub period. The unit is number of units, as specified by the **Unit Size** parameter. To define sub periods for calls, set this parameter e.g. to 10,50,60. If the unit size is set to 1, this enables one rate for the first 10 seconds, as specified in **Cost** <n>, another rate up to one minute, as specified in **Cost** #<n>-1, a third rate for the second minute of the call, as specified in **Cost** #<n>-2, and a fourth rate for the

remainder of the call, as specified in **Cost** #<n>-3.

Item	Value	Volume #1
Sub Periods	**10,50,60**	
Schedule	**Band 06**	
Rounding Mode	Ceiling	
Peak Mode	**Switch**	
Unit Size 1	**10**	**1**
#1-1	10	1
#1-2	10	1
#1-3	**30**	1
Unit Size 2	**10**	
#2-1	10	
#2-2	10	
#2-3	**30**	

Schedule Schedule points out which schedule should be used for this price plan.

Rounding Mode This parameter applies to rounding of time units when the time period changes.

If the period (as set on the **Schedules** page) changes during a call, this parameter indicates when the price for the next period will start to apply in relation to the current time unit.

Ceiling: The time is rounded up to the end of the time unit. The new period rate will start to apply when the next time unit starts. The time unit in which the call is ended will be charged as a full unit. This is the default setting.

Floor: The time is rounded down and the new period rate applies from when the current unit started. The unit in which the call is ended will not be charged for.

Round: Round down (floor) if the remainder of the unit is less than unit size/2 when the period change occurs, round up (ceiling) otherwise.

Proportional: Round up (ceiling). For the unit in which the call is ended there will be no rounding, the exact number of seconds used will be charged.

Peak Mode This parameter applies to calls having been made over different time periods, i.e. if the period (as set on the **Schedules** page) changes during a call. For example a call that is started during peak hours and finished during off peak hours.

There are five preset values for this parameter:

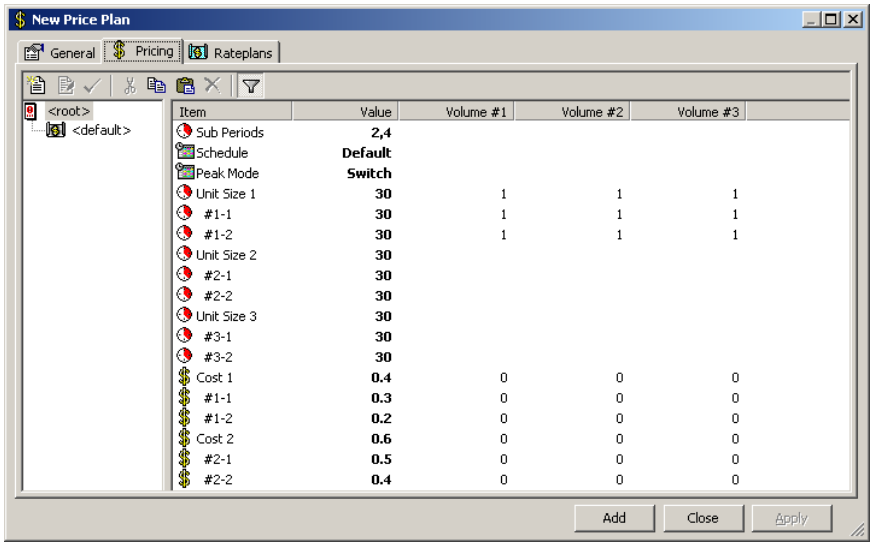
First: The call will be rated using the price valid for the

	first period of the call. **Last:** The call will be rated using the price valid for the last period of the call. **Cheapest:** The call will be rated using the price valid for the cheapest period of the call. **Most Expensive:** The call will be rated using the price valid for the most expensive period of the call. **Switch:** The call will be rated using all different prices valid for the respective periods during which the call was made.
Min Duration 1-5	Minimum duration is the minimum period of time, in seconds, for which a subscriber shall be charged.
Unit Size 1-5	Calls are rated per time unit. The time Unit Size is given in seconds. Different unit sizes can be specified for different time periods and sub periods.
Price Size	The price size defines the amount of time/volume the value in the corresponding **Cost** field represents. The price size is given in the unit used in the CDR. Example: If the specified cost is per minute, and call time in the CDR is given in seconds, the price Size should be set to 60.
Cost 1-5	A cost field contains the price for the item specified in the corresponding **Price Size** field.
Fixed 1-5	If a fixed cost should be applied for each call, this cost is specified here.
Free Start 1-5	A call will not be charged during the first number of seconds specified here.
Min Charge 1-5	If there should be a minimum charge for each call, the prize is specified here.
Percent 1-5	This field is intended mainly for adding tax to call costs. To add 5% to the cost, 0.05 should be entered here. Please, also read about the "Apply percentages to total" option in this chapter.

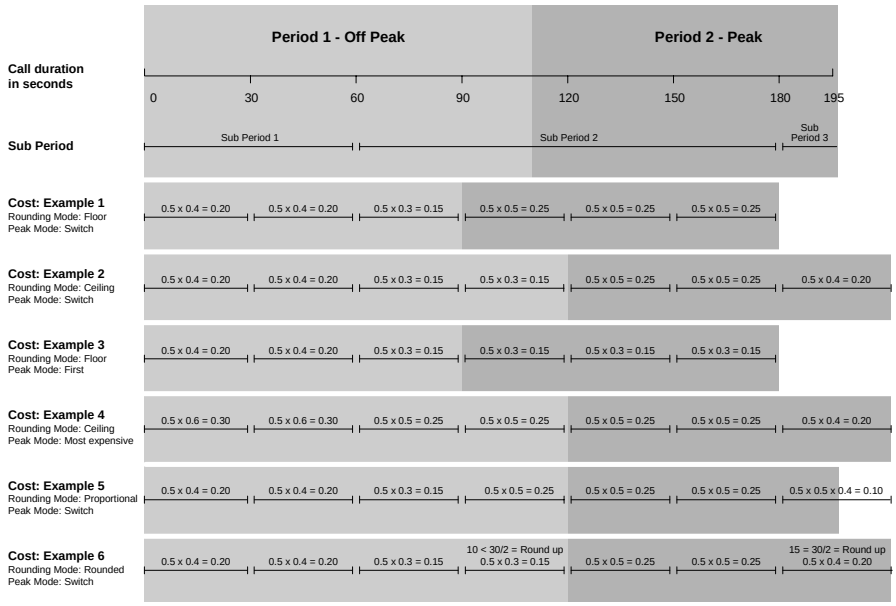
Pricing Examples

The picture and the diagram below show some examples of how the pricing settings affect the price. In particular, the **Rounding Mode** and **Peak Mode** parameters are described.

The first picture shows the pricing settings used in the diagram. Please note that the **Rounding Mode** and **Peak Mode** parameters are changed in each example in the diagram.



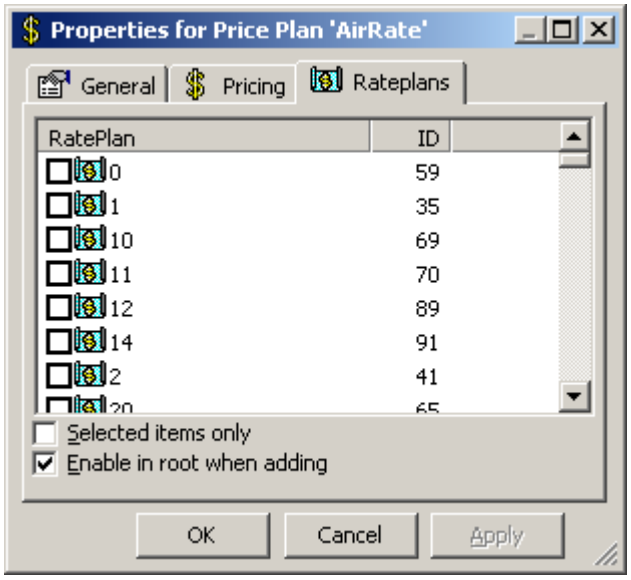
These pricing settings are used in the diagram below. The price size is set to 60.



*These are the different prices the above settings will generate for a call with duration 205 seconds, made across two different periods as set on the **Schedule** tab. Price calculations are Unit size (in relation to price size) x price.*

Rate Plans

The **Rateplans** tab displays a list of all rate plans having been defined on the **Global: Rateplan** tab. The purpose of this tab is to connect price plans to rate plans.

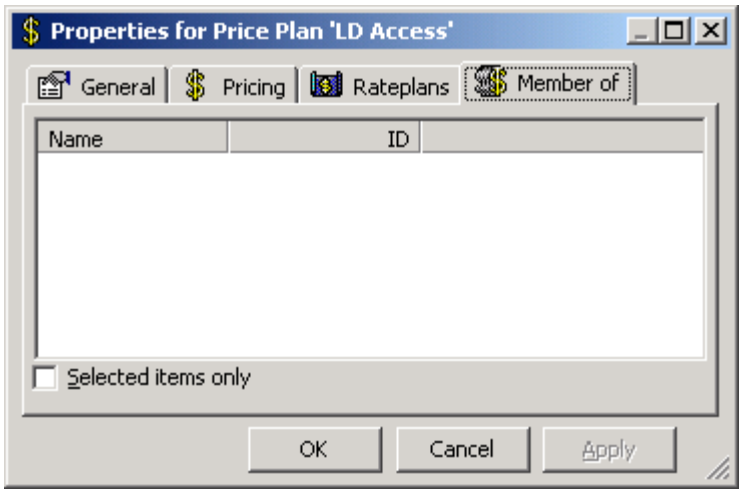


The **Rateplans** tab has two columns and two check box options.

RatePlan	This column shows all existing rate plans. Select the rate plan that should be connected to the current price plan.
ID	This is an identification number set by AbaCus.
Selected items only	When this option is selected, only the rate plans using the current price plan are displayed. When it is not selected, all price plans are displayed.
Enable in root when adding	If this option is selected when a rate plan is selected, the rate plan will be enabled in the root price plan root as can be seen on the **Pricing** tab. This means that this rate plan will automatically get the default pricing parameters as defined in the <default> price plan. If this option is not selected, the selected price plan will get no pricing parameters automatically.

Member Of

The **Member of** tab… To be defined.

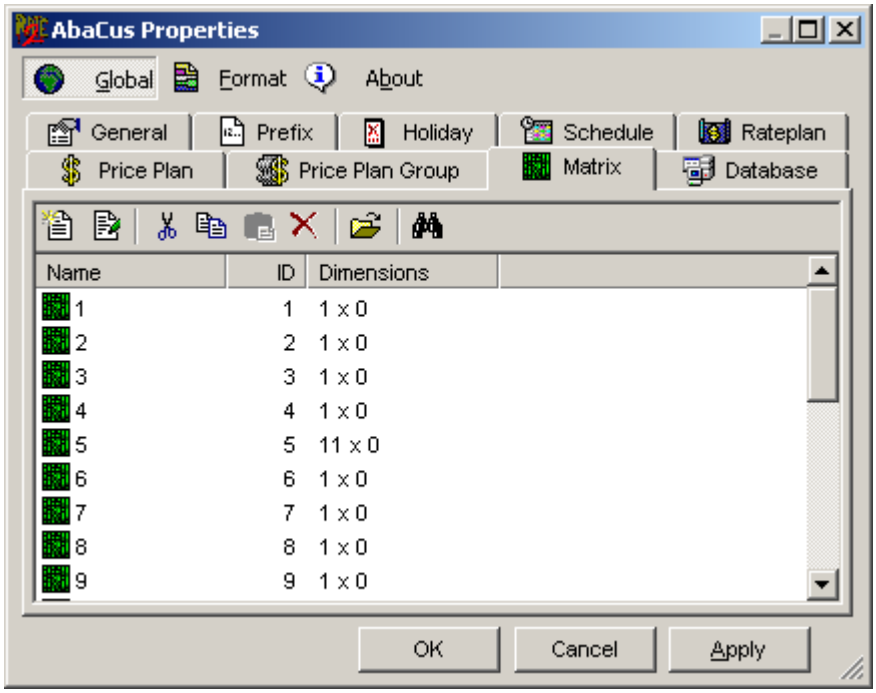


The **Member of** tab has two columns and one check box option.

Name	To be defined.
ID	This is an identification number set by AbaCus.
Selected items only	To be defined.

Matrix

The **Matrix** tab is used to set up criteria for which price plan that should be used when rating a call. Each matrix uses up to two parameters, one for each axis, that are matched to find the appropriate price plan. The **Format: Link Matrix** tab specifies where the data, setting the values to the two matrix parameters, can be found.



The Global settings **Matrix** tab includes the following information.

Name An arbitrary name of the defined matrix. This name is used when linking values to the matrix on the **Format: Link Matrix** tab and on the **Pricing** tab in the **Classification** settings.

ID This is a sequential identification number of the matrix set by AbaCus.

Dimensions A matrix can be defined using one dimension, one row with a number of columns, or two dimensions, with a number of rows and a number of columns. See the examples below.

The following example shows a 2 x 0 matrix with two value columns on the X-axis and no criteria on the Y-axis.

X-Criteria #1	X-Criteria #2
Price plan #1	Price plan #2

The following example shows a 2 x 1matrix with two value columns on the X-axis and one value on the Y-axis.

	X-criteria #1	X-criteria #2
Y-criteria #1	Price plan #1	Price plan #2

The following example shows a 2 x 2 matrix with two value columns on the X-axis and two value columns on the Y-axis.

	X-criteria #1	X-criteria #2
Y-criteria #1	Price plan #1	Price plan #2
Y-criteria #2	Price plan #3	Price plan #4

On each axis values set on the **Prefix** tab are used in the different columns and rows. By matching the criteria of the X-axis and the Y-axis to the variables from the call data record it is possible to define which price plan to use.

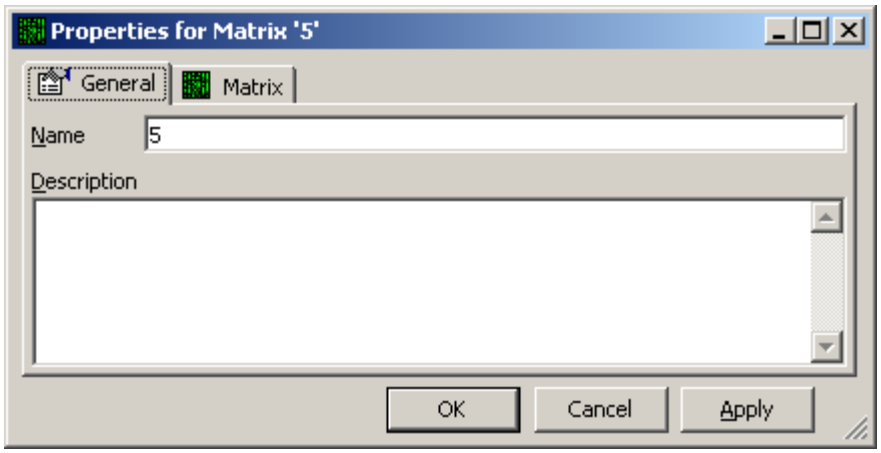
Matrix properties

The **Matrix properties window** consists of two tabs

- General tab
- Matrix tab

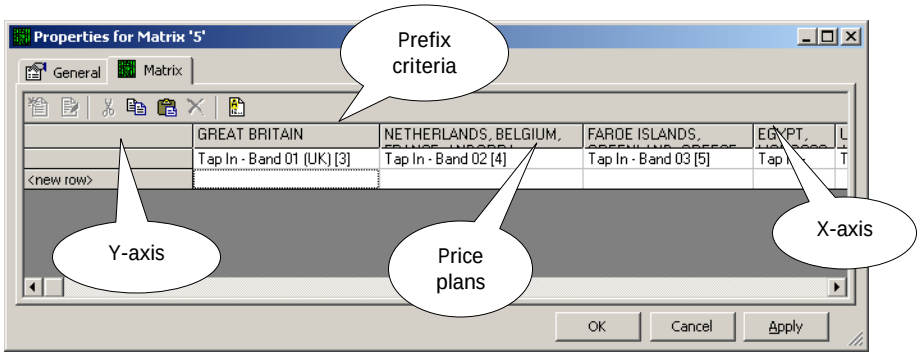
Each tab is described below.

General
The **General** tab includes the name of the matrix and a description. In the **Description** workspace any appropriate text concerning the current matrix can be typed.



Matrix tab

On the **Matrix** tab you define the matrix by adding columns and rows, prefix criteria for each of them, and price plans inside the matrix. The rows and columns can be manually resized to fit the information of each axis.



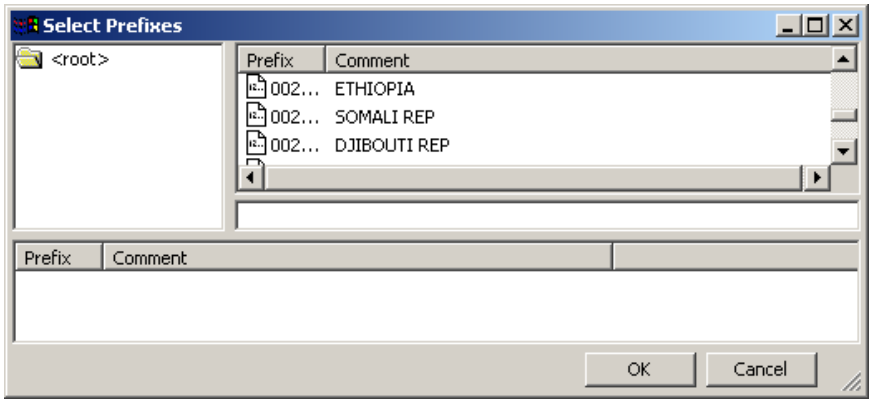
To add a new column or row, double click **<new column>** or **<new row>**, and the **Select prefix** window appears.

To add or edit an item in the prefix list, double click the selected row or column and the prefix criteria area and the **Select prefix** window appear.

To add or edit a price plan, double click the **Price plan** area for the selected prefix criteria, and the **Select Price plan** window appears.

Select prefixes

On the **Select Prefixes** window, prefixes set on the **Global: Prefixes** tab are connected to the matrix.



The **Select Prefixes** window consists of four different areas.

Prefix groups This view shows the prefix list logically grouped. The **Prefix groups** are defined and edited on the **Prefix** tab in **Global** settings.

Prefix list This is a list of prefixes for the selected prefix group. The prefixes are defined and edited on the **Prefix** tab in **Global** settings.

New prefixes From here is possible to manually add new prefixes to the **Added prefixes** list, prefixes not included in the **Prefix list**. Add a prefix by typing the prefix name and pressing the **Enter** button.

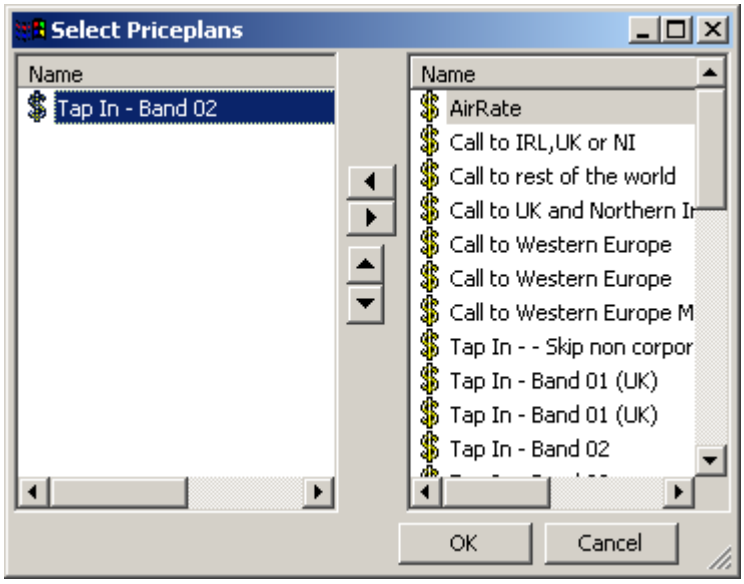
Added prefixes The prefixes that will act as criteria for finding the correct price plan are added to the **Added prefixes** list. The prefixes can be added from the **Prefix list** or manually from the **New prefixes** text box.

Select Priceplans

The **Select Priceplans** window is displayed when a price plan field in the matrix properties window is double-clicked. This window consists of two parts.

- Selected Priceplans
- Available Priceplans

Each part is described below.



Available Priceplans
The right area of the **Selected Priceplans** window consists of a list of all price plans defined in AbaCus. To select a price plan for the current matrix, and move it to the **Selected Priceplans** area, follow these steps:

1. Click the price plan you want to move.
2. Click the left arrow button.
3. The price plan appears in the **Selected Priceplans** area.

A price plan can also be moved by double clicking the item.

To cancel a selection, click the item in the **Selected Priceplans** area and click the right arrow button.

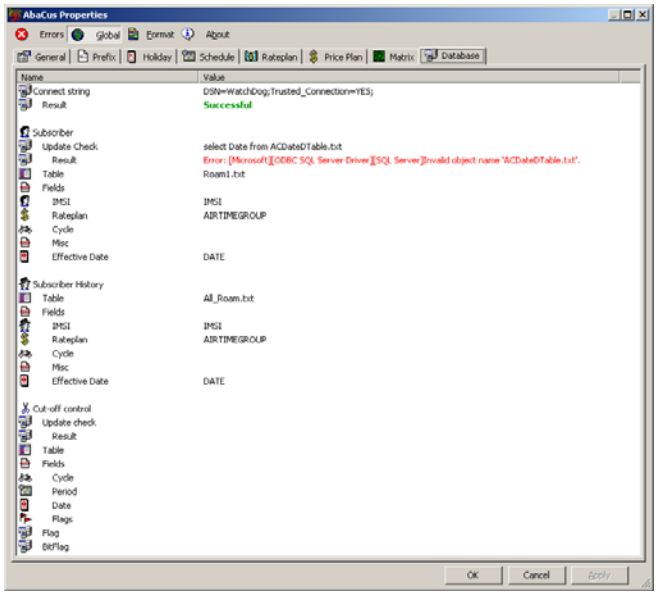
Selected Priceplans
The left part of the **Selected Priceplans** window consists of a list of the price plans having been selected for the current prefix criteria. A number of price plan can be selected, e.g. additional price plans can be used to add taxes after a price has been set. If many price plans have been selected, they will be used in the order as they appear in the list. To change the order of the price plans, click the item you want to move, and move it by clicking the up and down arrow buttons.

Database

Overview

To be able to rate data on a subscriber level, AbaCus may need additional information about each subscriber, information not included in the input files. This information is collected from an external database, e.g. the WatchDog subscriber database. The connection between AbaCus and this database is set up on the **Database** tab.

The **Database** tab looks as follows.



The **Database** tab workspace has two columns.

Name The values in this column are defined by the AbaCus system and cannot be modified. It is a list of the subscriber information needed by AbaCus when rating data on a subscriber level.

Value The values in this column are references to the external subscriber database, pointing out where the information that corresponds to each **Name** field can be found. To insert or change a setting, double-click the row you want to edit, and the **Value** field will change to edit mode. For some of the fields the value should be typed. For the other fields a drop-down list box displays containing the available alternatives. The values in this list are fetched from the external subscriber database and do not display until correct values are entered in the **Connect string** and **Subscriber: Table** fields.

The Fields

In this section all fields in the **Name** column are described.

Connect string This parameter sets up the data source with the user data source name (DSN). Syntax:

DSN=<data source name>

Result If the connection to the subscriber database is working, this value is set to 'Successful'. Otherwise the value is set to 'Error:<error message>'. AbaCus connects to the database once for every batch job.

Subscriber

The Subscriber values point out where to find the information that is current for a subscriber.

Update check In this field an SQL statement should be entered. The result is displayed in the Result field and is intended to indicate when the subscriber table was last updated. The SQL statement is executed once for every input file that is processed.

Result This field displays the result of the SQL statement entered in the Update check field.

Table Table contains the name of the subscriber table in the database. A value can be selected from a drop-down list. Click the Table item and a drop-down arrow appears to the right.

Note! If this value is changed, the settings on the Subscribers tab are updated and new values have to be added on that tab too.

Fields

IMSI IMSI number.

Rateplan Identity of the rate plan to use when rating the data.

Cycle Start and end dates for a customer's current billing cycle.

Misc User defined field. If any additional customer specific data is needed, use this entry.

Effective Date Start date when the current rate plan took effect.

Subscriber History

If AbaCus receives call information e.g. not concerning the current rate plan, additional information is required to make a correct rating. The Subscriber History entries points out where to find this information.

Table Table contains the name of the subscriber history table in the database.

Fields

IMSI IMSI number.

Rateplan Identity of the rate plan to use when rating the data.

Cycle Start and end dates for a customer's previous billing cycle.

Misc User defined field. If any additional customer specific data is needed, use this entry.

Effective Date Start date when this rate plan took effect.

Cut-off control

Cut-off control decides when the rating should move over to a new billing period. The cut-off control fields are used in the classification process when the Resolve Period command is used.

Update check In this field an SQL statements should be entered. The result is displayed in the Result field and should indicate when the cut-off control information was last updated. This function works as the corresponding function for the Subscriber table.

Result This field displays the result of the SQL statements entered in the Update check field. If the result is different from the previous result, a refresh of the values is performed.

Table Table contains the name of the update check table in the database.

Fields

Cycle The cycle ID.

Period An ID of a period, e.g. the number of a month.

Date Start date for the billing period.

Flags Tells if a billing period is open, clsoed, or active.

Flag

BitFlag

Chapter 4

Format Settings

Overview

Introduction

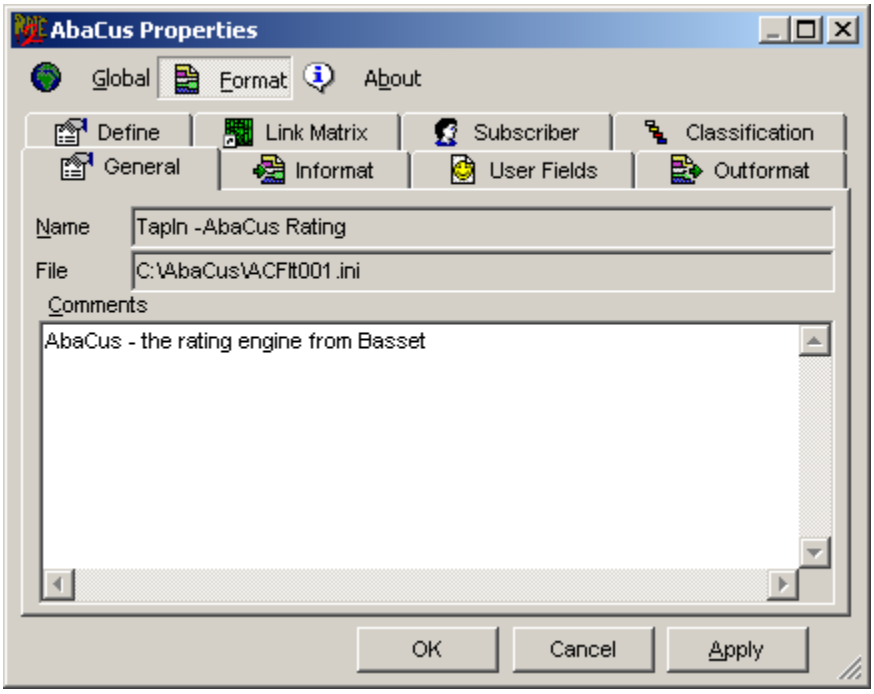
This chapter describes the settings that are specific to different files, having e.g. different file formats and requiring different classification rules. The **Format Settings** tabs display when the **Format** option is selected on the AbaCus Toolbar.

In this chapter

This chapter is organized as follows.

General

On the **General** tab you can make comments about the settings for each filter.



This tab includes two areas.

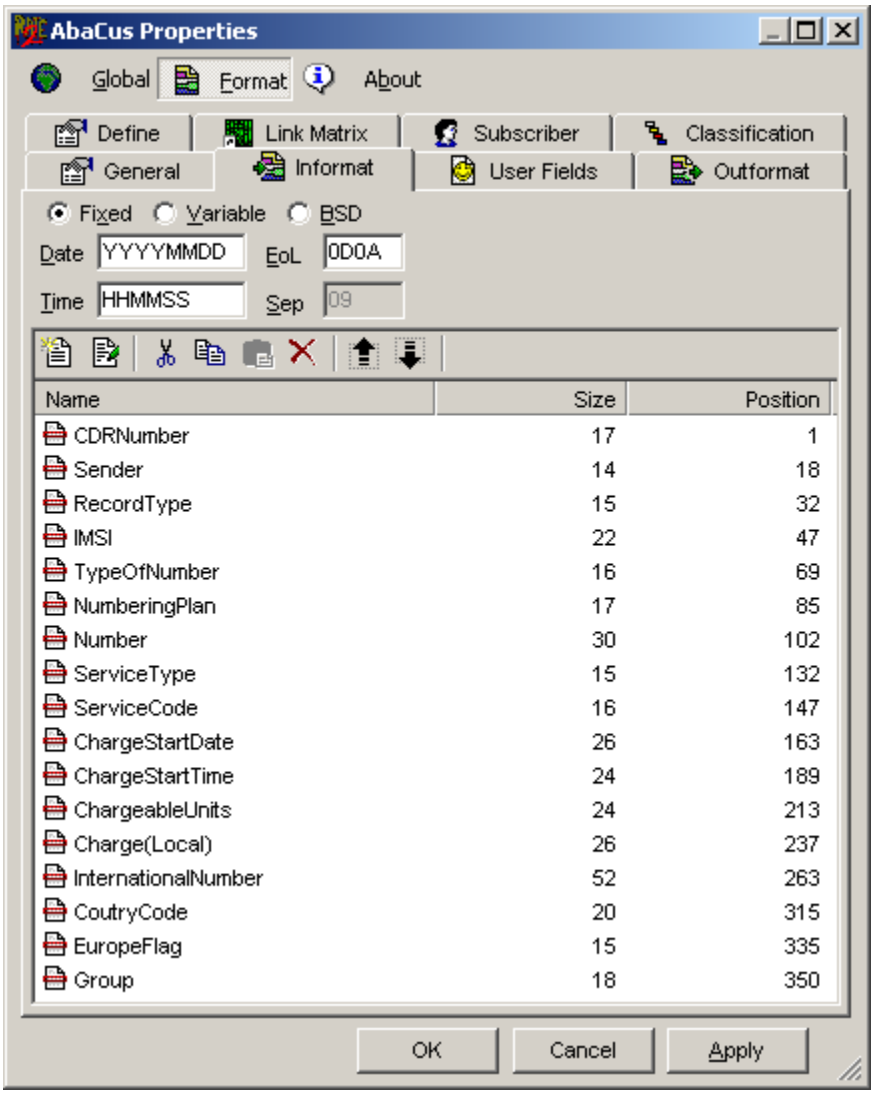
Name The Name text box contains the name of the current filter.

Comments In the Comments workspace any appropriate text concerning the current filter can be typed.

Informat

The format of the files that are sent to AbaCus for rating, the input files, is specified on the **Informat** tab. The field names specified here are later used in the rating process.

The **Informat** tab looks as follows.



The **Informat** tab consists of two parts.

- General input file settings
- The Informat Specification Workspace

General Input File Settings

This area includes the following parameters.

Fixed Select the Fixed option if the input file has fixed field lengths. When Fixed is selected, a value also can be entered in the EoL text box.

Variable Select this option if the input file has variable field lengths. When **Variable** is selected, values also have to be entered in the **EoL** and the **Sep** text boxes.

BSD The **BSD** (Basset super duper) option is used if the input file is organized with each record starting with an index giving the number of fields and then the lengths of each field. When **BSD** is selected, a value also can be entered in the **EoL** text box.

EoL The **EoL** (end of line) text box contains the value that ends each record in the input file. The value should be in Hex format.

Sep The value in the **Sep** (separator) text box contains the characters that separate each field in the input file. This value only applies to files with variable field lengths. The value should be in Hex format.

Date Date defines the format of date fields in the input file.

Time Time defines the format of time fields in the input file.

The Informat Specification Workspace

The **Informat Specification Workspace** contains a list of the fields in the input file. The following information is required.

Name Arbitrary name of the field. The name is entered when a new field is added and can be changed at any time. The name is used for example when the output file format is defined.

Size The length of the field in the input file. If the **Variable** or **BSD** options are used, this defines the maximum length of a field. 0 (zero) represents unlimited length.

Position This value has different meanings depending on whether the input file has fixed or variable field lengths. If the file has fixed field lengths, position means the starting

position for this field in each input file record. If the file has variable field lengths, position is a sequence number. In this case, position = 5 means that this field is the fifth field in each input file record.

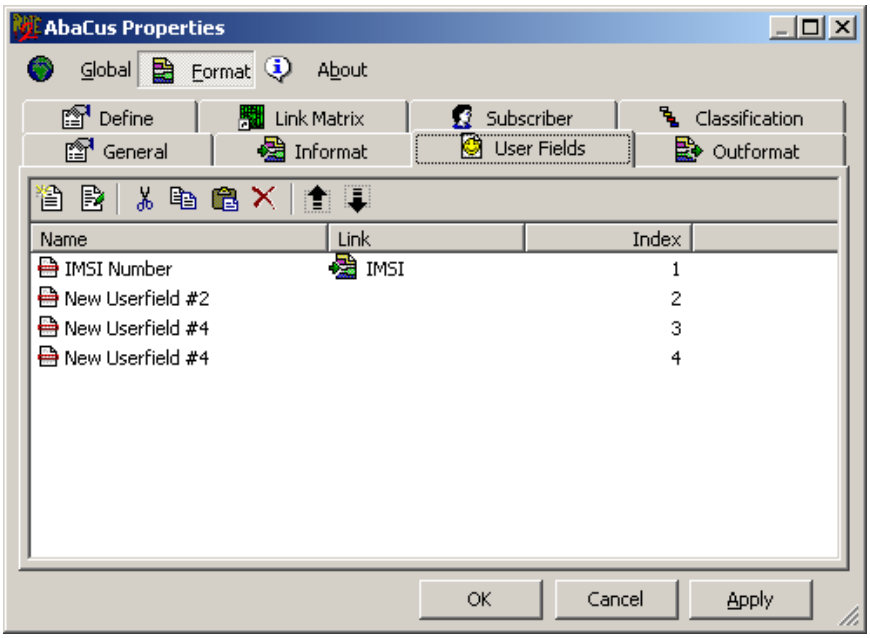
Update the Informat Settings

To change the input file format settings, the **Tab Toolbar** is used. Please see **Application Overview/Graphical User Interface (GUI) overview** for further information.

User Fields

Sometimes it can be useful to define new fields. E.g. if two values from two different fields should be concatenated a new field can be defined for this purpose, enabling the concatenation to be done without overwriting any of the old fields. These fields can as well be used for settings constant values, used for all records in a file or for all file being rated.

This kind of settings can be made on the **User Fields** tab. This tab looks as follows.



The **User Fields** tab contains three columns.

Name This field contains the name of the field. The name is used when referring to the field, e.g. in the classification.

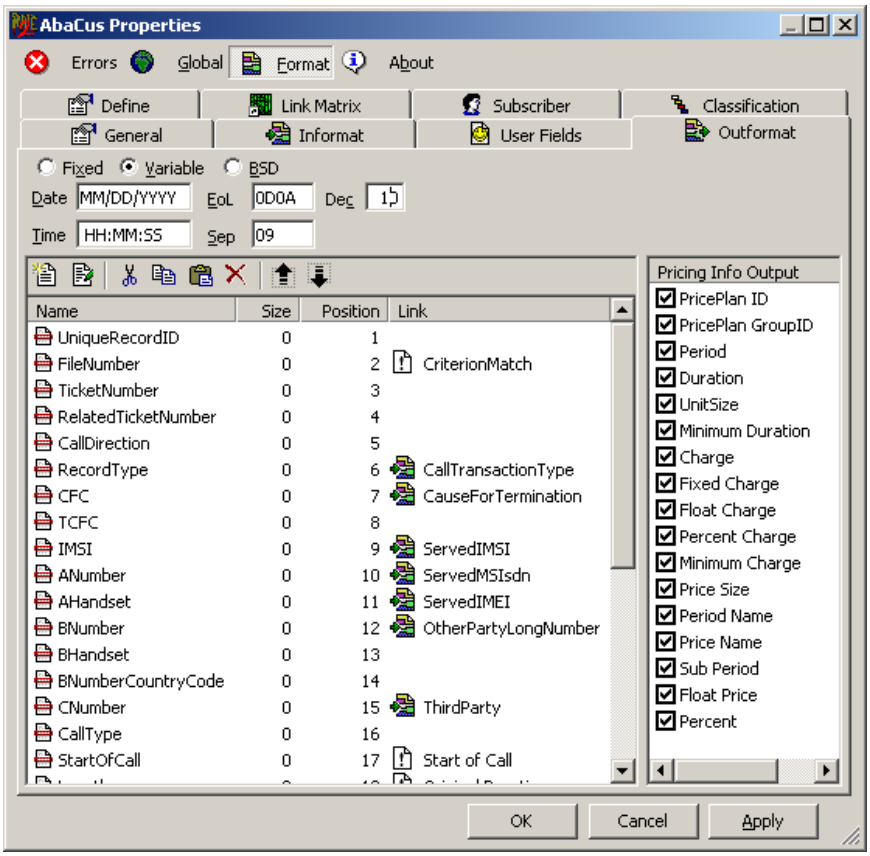
Link This field contains the input file field that will set the value to the user field. The input file fields can be selected from a drop-down list box that appears when the drop-down arrow is clicked. If you want the user field to have a constant value, leave the **Link** field empty and set a value on the **Classification: Modify** tab.

Index This number is set by the AbaCus system and is mainly for internal use.

Outformat

The format of the output files that are generated by AbaCus is specified on the **Outformat** tab.

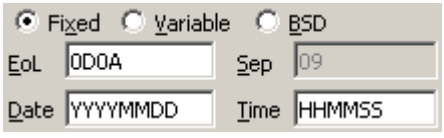
The **Outformat** tab looks as follows.



The **Outformat** tab consists of three areas.

- General input file settings
- The Outformat Specification Workspace
- Pricing Info Output

General Input File Settings



This area includes the following parameters.

Fixed Select this option if the output file should have fixed field lengths. When **Fixed** is selected, a value also can be

entered in the **EoL** text box. The **EoL** text box is described below.

Variable Select this option if the output file should have variable field lengths. When **Variable** is selected, values also have to be entered in the **EoL** and the **Sep** text boxes. These text boxes are described below.

BSD The **BSD** (Basset super duper) option is used if the output file should be organized with each record starting with an index giving the number of fields and then the lengths of each field. When **BSD** is selected, a value also can be entered in the **EoL** text box.

EoL The **EoL** (end of line) text box contains the value that will end each record in the output file. The value should be in Hex format.

Sep The value in the **Sep** (separator) text box contains the characters that separate each field in the output file. This value only applies to files supposed to have variable field lengths. The value should be in Hex format.

Date Date defines the format date fields should have in the output file.

Time Time defines the format time fields should have in the output file.

Pricing Info Output

This area applies to the special field **Volume Pricing Info #1-4**. If that field is used in the output format, this list offers the possibility to select the contents of it. The selected field's values will be written as a list in the **Volume Pricing Info** fields in the output file.

The Outformat Specification Workspace

The **Outformat Specification Workspace** contains a list of the fields in the output file. The following information is required to define a output file.

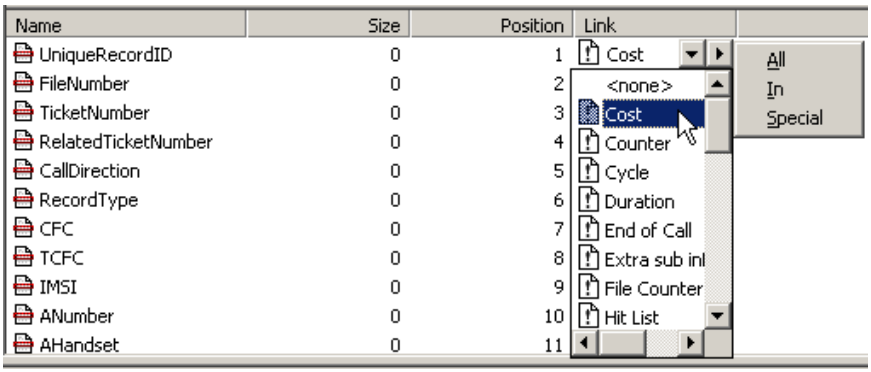
Name Arbitrary name of the field. The name is entered when a new field is added and can be changed at any time.

Size The length the field will have in the output file. If the **Variable** or **BSD** options are used, this defines the maximum length of a field. 0 (zero) represents unlimited length.

Position This value has different meanings depending on whether the output file will have fixed or variable field lengths. If

the file will have fixed field lengths, position means the starting position for this field in each output file record. If the file will have variable field lengths, position is a sequence number. In this case, position = 5 means that this field will be the fifth field in each output file record.

Link This column is used to set values to the output file fields. The available source fields are displayed in a drop-down list box. Double-click a field item and the list box displays.



The drop-down list displays all available source fields. Click the left arrow ▾ to open the list. The source fields can be of two kinds, input file fields and AbaCus special fields.

Items with this symbol are fields from the input file, as defined on the **Informat** tab.

Items with this symbol are AbaCus special fields, which values are set during the rating process.

Items with this symbol are User fields.

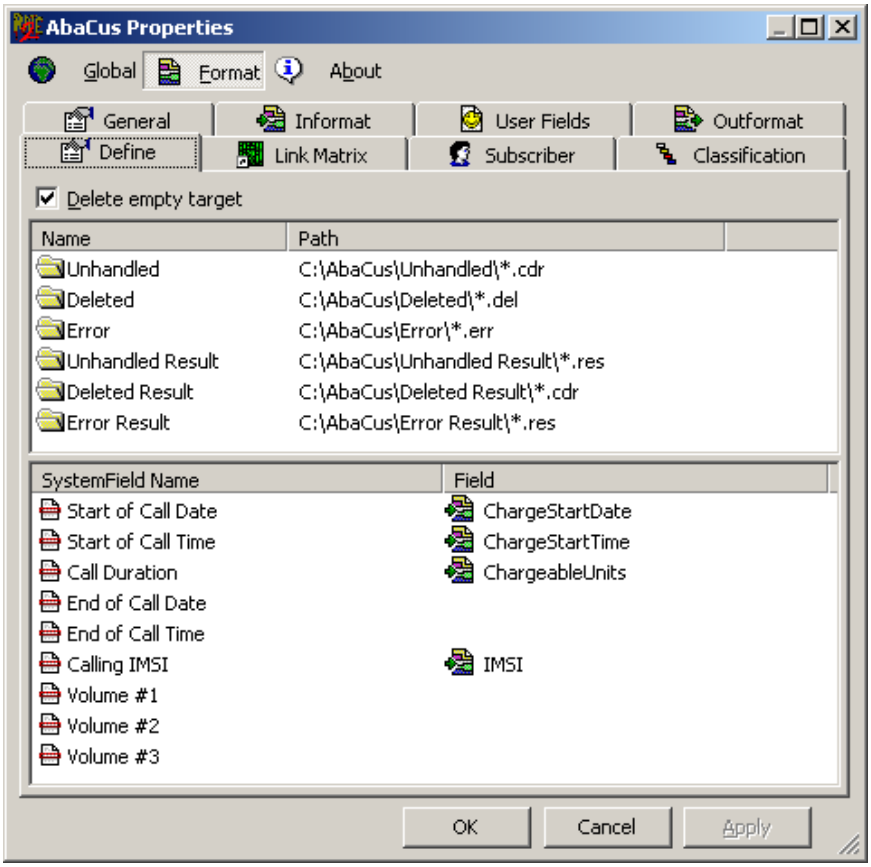
It is possible to limit the contents of the source field drop-down list by using the pop-up menu to the right of the list. Click the right arrow ▸ to open the menu. Click **None** to erase the value of the **Link** field. Click **All** to display all available source fields in the source field drop-down list. Click **In** to display fields only from the input file or **Special** to display only the AbaCus special fields.

Update the Outformat Settings

To change the outformat settings, the **Tab Toolbar** is used. Please see **Application Overview/Graphical User Interface (GUI) overview** for further information.

Define

On the **Define** tab file paths to input and output source catalogues, and mapping of AbaCus system fields, are specified.



The **Define** tab is divided in two different areas.

- File paths, defining where to find the files used in the rating process.
- System fields, defining how to set values to the AbaCus system fields that are used in the rating process.

Each part is described below.

File Paths

If AbaCus finds records that cannot be fully handled, the records are put aside and stored in some designated files. This is where to define where these files should be stored.

The data is stored both in the original input format, but also in the output record format.

Delete empty target

If the **Delete empty target** option is selected, output files created during the rating process that are empty when the process is done will be deleted.

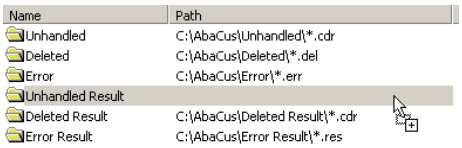
The file paths describe all input and output source catalogues used by AbaCus, apart from the input and output files catalogues. Settings concerning these catalogues are made in Decode32.

The **File Paths** list box has two columns. The **Name** fields define the names of the file paths and in the **Path** fields the file paths to the catalogues containing the files are defined. Each file path can be defined by using standard Windows wildcards.

Browse for a path or file
When a file path is selected, three buttons are visible. Each button opens up the folder/file browser but in different modes.

The first button opens the file browser in folder mode. From here it is possible to browse for folders and add a new folder. The second button opens the Windows file browser. From here it is possible to browse for a folder or a file. The third button opens a window for the selected file path.

It is also possible to enter the file path and file name into the path field automatically by a drag-and-drop operation.



The file paths
Not rated records can be stored in some different locations, depending on the reason they weren't rated. Each record is stored in two places, in one file using the input record format and one using the output record format.

Below the file paths to the different locations are described.

The following folders are used to store records with the input file format.

Unhandled The unhandled file path defines where AbaCus should put files containing records that have

not been rated.

Deleted The deleted file path defines where AbaCus should put files containing the records that have been deleted in the classification.

Error The error file path defines where AbaCus should put files containing records that for some reason have generated errors while AbaCus has performed the Resolve date/time, Resolve rateplan and Resolve period actions.

The following folders are used to store records with the output file format. Since the rating hasn't been finished when these folders are used, these records are not complete. AbaCus stores as much information as is at hand when an error occurs.

Unhandled result The unhandled file path defines where AbaCus should put files containing records that have not been rated.

Deleted result The deleted file path defines where AbaCus should put files containing the records that have been deleted in the classification.

Error result The error file path defines where AbaCus should put files containing records that for some reason have generated errors while AbaCus has performed the Resolve date/time, Resolve rateplan and Resolve period actions.

System fields

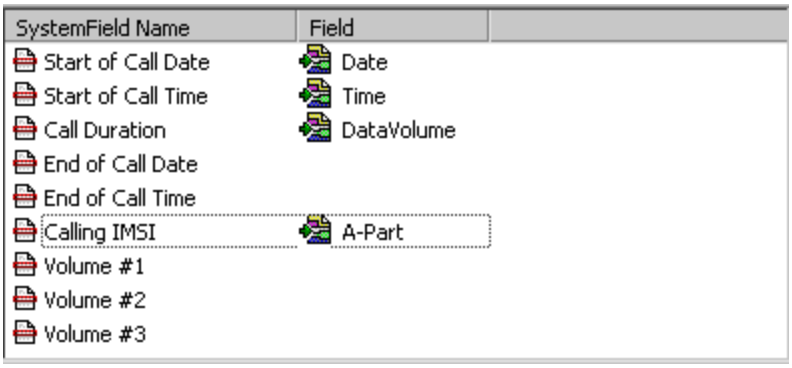
System fields are internal AbaCus fields that are used during the rating and classification process. On the system field window, the system fields are mapped from the appropriate fields in the input file.

The system field list includes two columns.

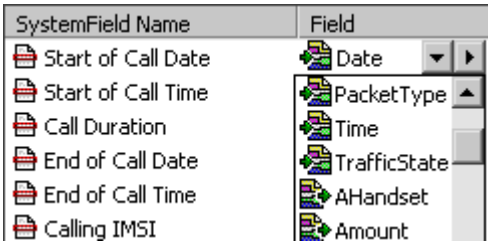
SystemField Name The name of the system field. Each system field is described below.

Field The field in the input or output file containing the value that should be copied to the system field.

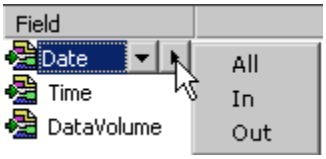
Field



The **Field** values can be selected from a drop-down list. Double-click the system field to enter a **Field** value, and a drop-down arrow appears. Click the arrow to open the list.



It is possible to filter the list of available input and output file fields. Click the second arrow. The menu includes three different options.



All Show all source and target fields.

In Show only source fields.

Out Show only target fields.

Below all system fields are described.

Start of Call Date The date the current call started.

Start of Call Time The time the current call started.

Call Duration The length of the call.

End of Call Date The date the current call ended.

End of Call Time The time the current call ended.

Calling IMSI The IMSI number that generated the call.

PartialFlag This field can contain the following values.

	0: Not a partial 1: First record 2: Intermediate record 3: Last record
PartialID	This field contains a unique identifier used to check the record's pertinent information in the partial cache.
Volume #1	The volume of the data sent, e.g. concerning uplink or downlink traffic, or total volume. This field applies to GPRS traffic.
Volume #2	The volume of the data sent, e.g. concerning uplink or downlink traffic, or total volume. This field applies to GPRS traffic
Volume #3	The volume of the data sent, e.g. concerning uplink or downlink traffic, or total volume. This field applies to GPRS traffic.

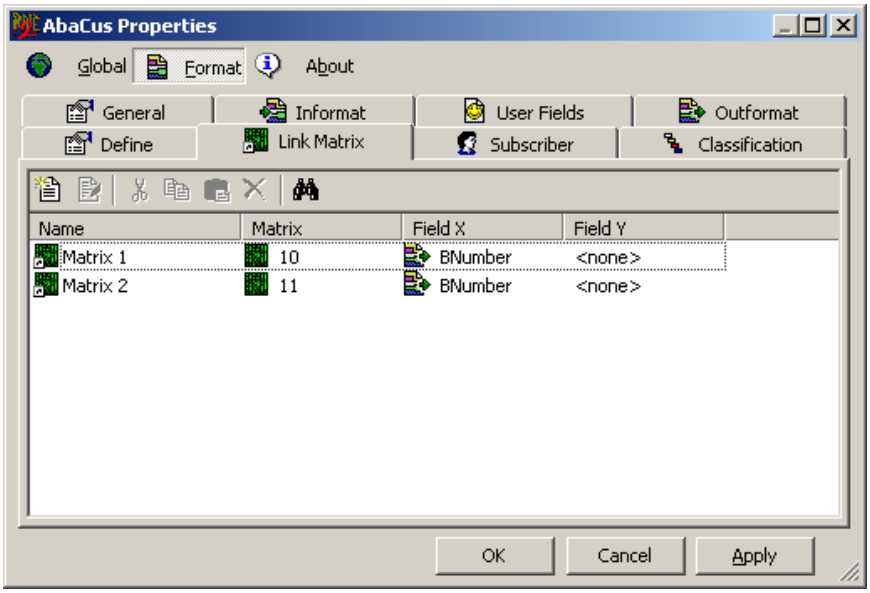
When setting values to the Start of Call Date, End of Call Date and Call Duration fields, it is not relevant to set all of them. The following combinations are useful.

Start of Call Date	&	Call Duration
End of Call Date	&	Call Duration
Start of Call Date	&	End of Call Date

Link Matrix

The **Link Matrix** tab is used to link information to the existing pricing matrixes defined under **Global settings**. The settings made here provide the values deciding which price plan that will be used when rating each record.

For each record that is rated, the values of the fields defined here are compared to the matrix criteria. The fields that are used can be either input file fields, output file fields, or AbaCus special fields.



The **Link Matrix** screen includes the following information.

Name An arbitrary name of the current matrix link.

Matrix Choose a predefined matrix from the list box. This list consists of the matrixes defined on the **Global: Matrix** tab.

Field X Choose the field that holds the value that will work as input value for the X-axis on the selected matrix. It is possible to choose from Input file fields, Output file fields, User fields and AbaCus Special fields.

Field Y Choose the field that holds the value that will work as input value for the Y-axis on the selected matrix. It is possible to choose from Input file fields, Output file fields, User fields and AbaCus Special fields.

Subscriber

Some installations of AbaCus are connected to a subscriber database belonging to an external application, e.g. WatchDog. This connection is set up on the **Database** tab.

As call or data records are rated, AbaCus in these cases continuously collects information about each subscriber, e.g. rate plans, from this database. If AbaCus receives data concerning a customer not present in the database, AbaCus can be set to update it with the information that is on hand. The **Subscribers** tab is used for this purpose, linking the AbaCus information to the corresponding fields in the external subscriber database.

The subscriber table is defined in the **Subscribers** – **Table** field on the **Database** tab. The **Subscriber** tab is automatically filled with information when the table is added. Note! If the table reference is changed on the **Database** tab, these settings are updated and new values have to be added. Please see the Database chapter for more information.

The **Subscribers** tab includes the following information.

Field The Field column includes all available fields in the external subscriber table. This column is updated automatically by AbaCus.

Type The Type column displays each field's data type written in the format that the database is using. For example, if an SQL Server is used as database, the format for a 50 characters long text field is char(50).

Link The Link column is where the information being at hand in AbaCus is linked to the corresponding fields in the external subscriber table. The value in the selected Link field will then be automatically added for each new customer. It is possible to add the following information:

- Constants
- Input file fields
- Output file fields
- User fields
- AbaCus special fields

Follow these steps to add a constant value to the **Subscriber** table.

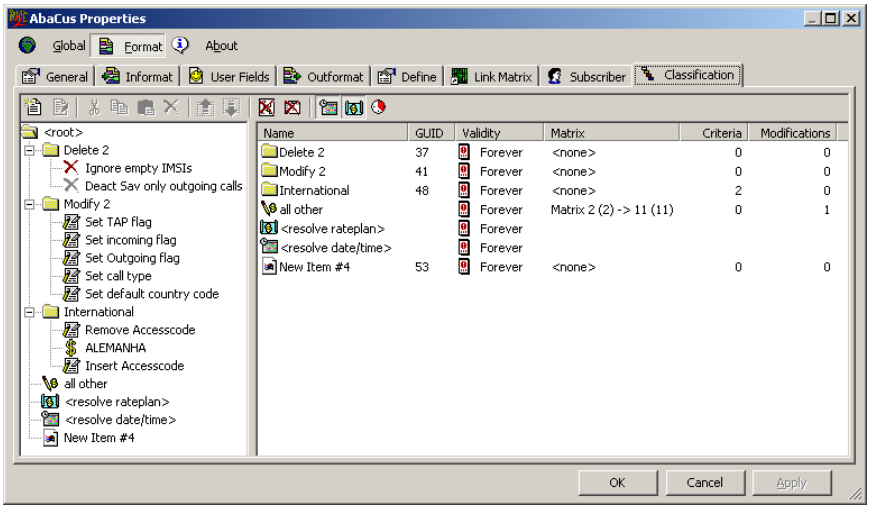
1. Double click the **Field** item for which the value should be added.

2. Click the arrow button that appeared to the right of the **Field** item.

3. Select **Constant** from the menu.
4. Type a value in the **Link** column.

Classification

On the **Classification** tab the classification and pricing process is defined. All steps in the pricing process are set up as a workflow in a tree view. The steps include tasks such as deletion of data not to be rated, resolving of rate plans, modifying or adding values, and setting prices on the basis of chosen parameters, matrixes and price plans. AbaCus starts from the top and goes through the steps to the bottom of the tree, unless conditions are set interrupting the pricing process for the current record.



The **Classification** tab is divided into two different parts.

- The classification tree view
- The classification items view

Each part is described below.

The classification tree view
In the classification tree view, all classification items should be grouped into a logical and sequential order. AbaCus goes through the classification items from the top to the bottom. However, if the classification item is of the Delete type the process concerning the current record is interrupted.

The classification items view
Classification items are used to modify values, set prices and delete records. Each item type is described below.

Modify item
Modify item is used to change the values of input file fields, output file fields, AbaCus special fields, and AbaCus user fields. When modifying an item, rules have to be set on the Criteria tab and the Pricing tab can not

contain a matrix.

Modify & Price item
A modify item that includes pricing settings get this symbol instead of the symbol above.

Price item
A price item is created by specifying a matrix on the Pricing tab. A price item can also include modifications.

Delete record (Filter)
If the criteria for the specified classification item is true, AbaCus deletes the record, quits the sequential handling of the classification items and continues with the next record.

Only the General tab, Criteria tab and the Validity tab are visible when a classification item is set to Delete record (Filter).

Delete items are created by selecting the Delete record (Filter) check box on the Classification: General tab.

Parent item
Parent items are used to organize the classifications items.

Hide Treeview
By clicking the Hide Treeview button, the classification tree view area is closed or opened.

Hide Listview
By clicking the Hide Listview button, the classification items view area is closed or opened.

There are three special classification items that are used to resolve information from the subscriber database. When they are added, they always appear on the bottom of the classification items list. Move them into the appropriate position by using the arrow buttons.

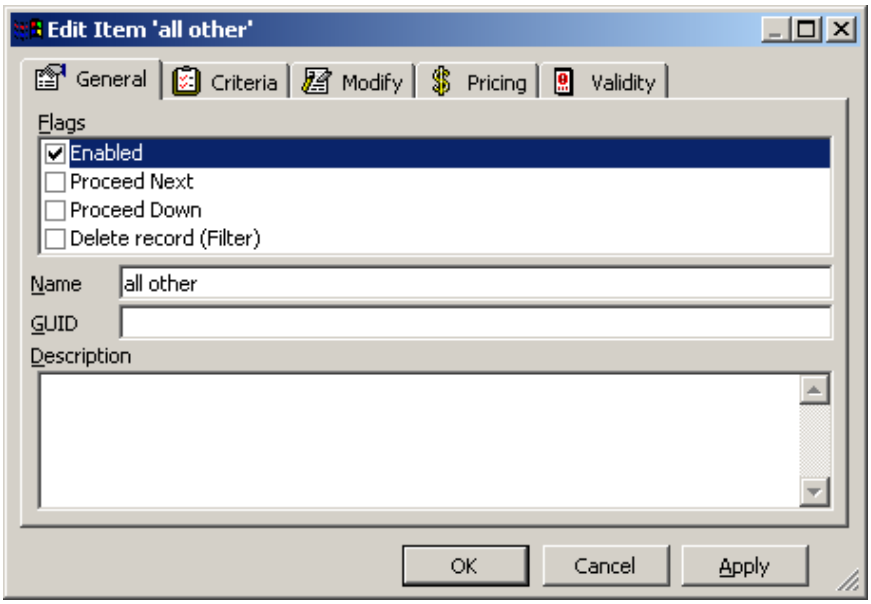
<Resolve Rate Plan>
AbaCus reads the rate plan for the current subscriber from the AbaCus internal cache. If the subscriber doesn't exist in the subscriber database, AbaCus updates the database with the information available.

<Resolve Date/Time>
AbaCus calculates the start of a call, end of a call or the duration of a call depending on the information that has been linked to the AbaCus special fields on the **Define** tab. This item also resolves partial-related system fields.

<Resolve Period>
AbaCus reads the cut-off control data from the AbaCus internal cache.

Classification Item Properties

The Classification item properties window consists of a number of tabs, varying depending on the classification type. If the classification item is set to Modify or Pricing, all five tabs are visible. If the classification item is set to Delete record (filter), only three tabs are visible. If the classification item is a resolve item, only one tab is visible.



The following tabs are available on the **Edit Item** window.

- General
- Criteria
- Modify
- Pricing
- Validity

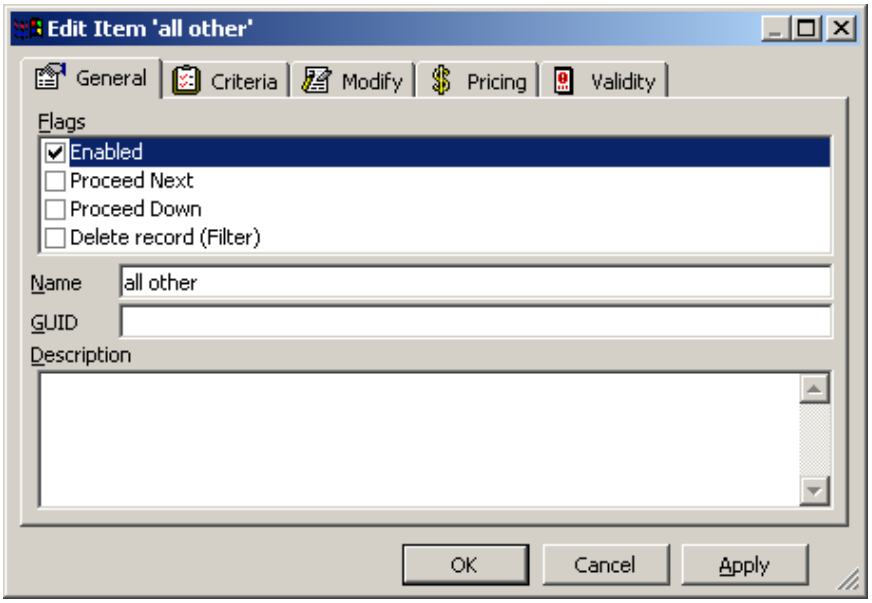
Each tab is described below.

General

The **General** tab includes general information about the classification item and flags concerning the function of each item.

- Flags
- Name
- GUID
- Description

Each part is described below.



Flags
Four different flags can be set for a classification item.

Enabled Set the classification item on or off by selecting the **Enabled** check box. If the check box is not selected, the settings in this classification will have no effect on the rating process.

Proceed next The **Proceed next** applies to pricing items. If a price has been set, AbaCus normally skips possible following pricing steps in the classification sequence. If these steps should be executed, this option has to be selected.

For items other than pricing and delete, AbaCus by default executes the following item in the classification sequence.

Proceed down When this option is selected, AbaCus skips the following items in the current folder if the criteria in an item correspond to the current record.

Delete record (Filter) If the **Delete record (Filter)** check box is selected, the current record will be deleted if the criteria set on the **Criteria** tab is true. The sequential execution of the classification items in the **Classification tree view** is also stopped and AbaCus starts to classify and rate the next record in the input file.

The **Delete record (Filter)** check box is not

visible if any of the following criteria is true.

- The current item has sub items (children) defined.
- The current item has a modifier set.
- The current item has a matrix defined.

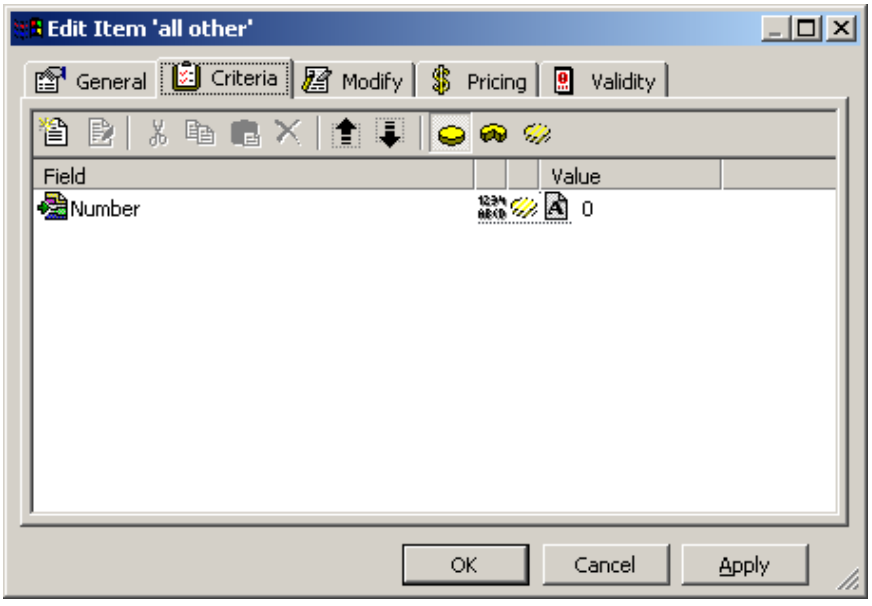
Name
Name is a descriptive name for the current classification item seen on the **Classification** tab.

GUID
GUID is a unique identification number for each item used when debugging the rating and classification process. The debug process is described in a separate chapter.

Description
In the **Description** workspace any appropriate text concerning the current classification item can be typed.

Criteria

The **Criteria** tab is used to set criteria for when the **Modify**, **Delete records (filter)** and the **Matrix** functions should be executed. If no criteria are set for an item, it will always be executed.



The **Criteria** tab includes the following information.

Field
Field contains the name of the field to use for this criterion. The value can be selected from a drop-down list containing all input file

fields, output file fields, AbaCus special fields, and User fields. To see the list, double-click an existing **Field** item, or click the **Add** button to create a new item, and the drop-down list button appears. Click the button and the list is displayed.

Field type
The field can be of two types, character or bit. Click on the field type symbol to change the field type.

Character field
The field is of data type character (char() or varchar() in SQL Server).

Bit field
The field is of data type bit.

Match
This entry defines how the **Field** parameter should match the **Value** parameter.

Match All
Field must match all parameters entered for Value.

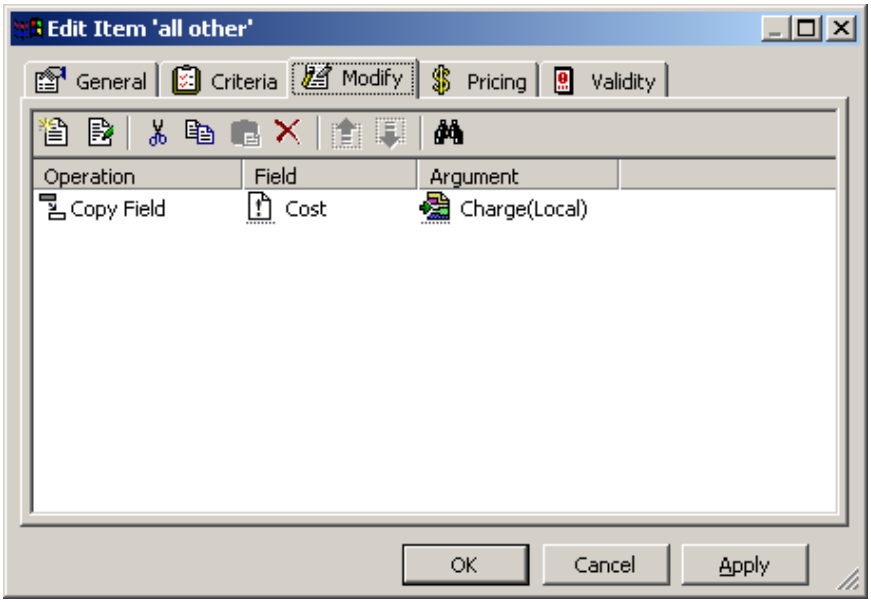
Match Some
Field must match at least one of the parameters entered for Value.

Match None
Field must match none of the parameters entered for Value.

Value
Value contains the value, or values, the **Field** parameter should be matched against. The value can be typed as a constant or selected from a drop-down list in the same manner as when setting the **Field** value.

Modify

The **Modify** tab is used to change or set values to any of the fields used in the classification process. A modify item can also contain pricing. In that case the value is set only if a price is found for the current record.



Operation

The **Operation** tab defines in which way a field should be modified. There are three columns on the tab: Operation, Field, and Argument. Values to the respective columns can be selected from drop-down lists.

The following options are present.

Exchange field

Exchange field swaps the values between the fields entered in the **Field** column and the **Argument** column.

Operation	Field	Argument
Exchange Fields	Prefix X	Prefix Y

AbaCus moves the value in Prefix X to Prefix Y and vice versa.

Copy field

Copy field copies the value from the field entered in the **Argument** column to the field entered in the **Field** column.

Operation	Field	Argument
Copy Field	CallDuration	Length

AbaCus *copies the value from the Length field in the output file to the CallDuration field in the input file.*

Set value

Set value sets the value of the field specified in the **Field** column to the value entered in the **Argument** column.

Operation	Field	Argument
Set Value	CallDuration	12

AbaCus sets the value in the CallDuration field to 12.

Set bit

Set bit adds the binary value entered in the **Argument** column to a binary field specified in the **Field** column.

Operation	Field	Argument
Set Bit	ClassificationBitmap	2

AbaCus adds 2 to the binary ClassificationBitmap field.

Clear bit

Clear bit deletes the binary value of the binary field specified in the **Field** column. No entry is needed in the **Argument** column.

Operation	Field	Argument
Set Bit	ClassificationBitmap	

AbaCus deletes the value in the ClassificationBitmap field.

Merge field

Merge field concatenates the value of the field entered in the **Field** column with the value of the field entered in the **Argument** column. The result is stored in the **Field** field.

E.g., field A = 12 and field B = 10. The result is field A = 1210 and B = 10.

Operation	Field	Argument
Merge Field	Year	Month
Merge Field	Year	Day

This operation concatenates the value in the Month field to the Year field. The second step adds the Day field to the Year field already including Month. The result is the Year field including YearMonthDay as one value.

Merge value

Merge value concatenates the value of the field entered in the **Field** column with the value typed in the **Argument** column. The result is stored in the **Field** field.

E.g. field A = 10 and the **Argument** value is 5, the result is A = 105.

Operation	Field	Argument
Merge Value	Misc1	10

AbaCus concatenates the value in the Misc1 field with the value 10.

Replace section

Replace section replaces a selected part of the value of the field specified in the **Field** column using the entry in the **Argument** column. The **Argument** column should contain <start value>,<length>,<value>.

Operation	Field	Argument
Replace Section	BHandset	3,2,00

The value of the Bhandset field is 123456789. AbaCus replaces 2 characters starting in position 3, with 00. The result is 120056789.

Multiply

Multiply multiplies the numeric value of the field specified in the **Field** column by the value entered in the **Argument** column.

Operation	Field	Argument
Multiply	Cost	4

AbaCus multiplies Cost by 4.

Date Add

Date add adds a value specified in the **Arguments** column to the value of the date field specified in the **Field** column. The entry in the **Argument** column should contain <part of date>,<value>, where Y=year, M=month, D=day, H=hour, N=minute, S=second.

Operation	Field	Argument
Date Add	End of Call	M,4

AbaCus adds 4 months to the value of the date field EndofCall.

HexToDec

HextToDec converts the value of the numeric field entered in the **Field** from hexadecimal format to decimal format.

Operation	Field	Argument
HexToDec	Number	

AbaCus converts the value in the Number field to decimal format.

Replace string

Replace searches for a string in the **Field** field and replaces it with another value. The values are specified in the **Argument** column.

Operation	Field	Argument
Replace String	Number	070,+4670

AbaCus searches for 070 in the Number field and replaces the value with +4670.

Copy source record to file

Copy source field to file copies the input record to the file that has been specified. This can be useful if the records are needed for other purposes than rating. Wildcards are allowed in the file name.

Add value

Add value adds the value specified in the **Arguments** column to the value of the numeric field specified in the **Field** column.

AbaCus adds 10 to the value of the Cost field.

Add field

Add field adds the value of the numeric field specified in the **Arguments** column to the value of the numeric field specified in the **Field** column.

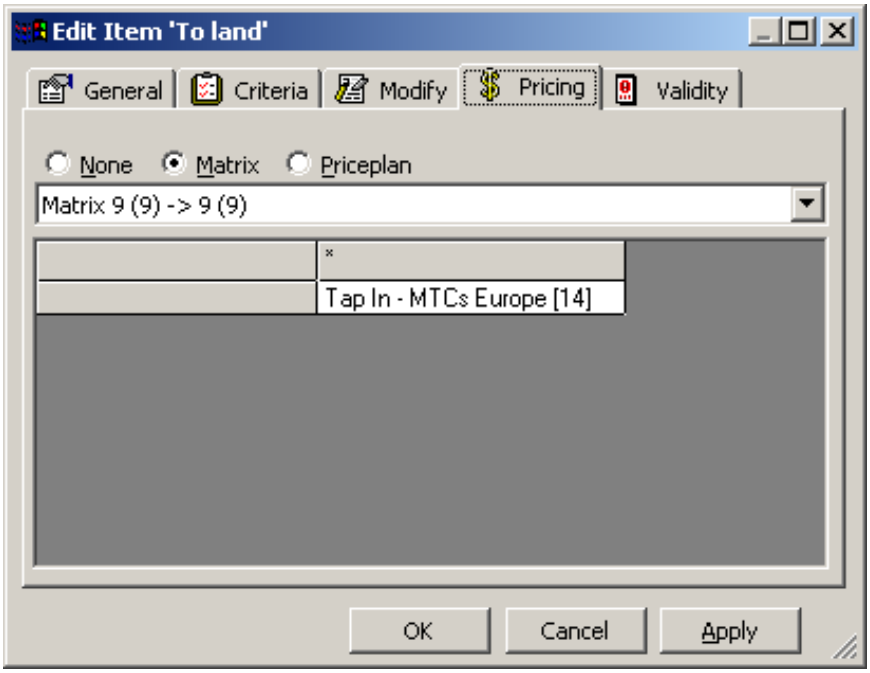
AbaCus adds the value of VolumeCost#0 to the value of the Cost field.

Field
The entry in the Field column is the name of the field the operation concerns. The Field value can be selected from a drop-down menu and can be either from the input file, the output file, an AbaCus system field or a User field.

Argument
The entry in the **Argument** column differs depending on the operation. Please see the **Operation** section for details.

Pricing

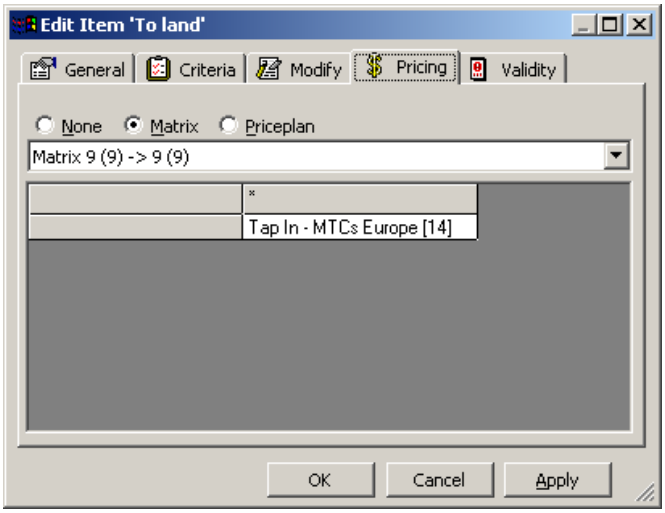
The **Pricing** tab is where the connections to the matrixes are set. Connections can also be set directly to price plans. The tab consists of three areas: connection option buttons, a matrix drop-down list and a matrix window displaying the details of the selected matrix.



The Connection Option Buttons
Each classification item can be connected to a matrix or directly to a price plan. The connection option buttons decides which. The following options are available.

None Select this option if the classification item not is a pricing item.

Matrix Select this option if the classification item should be connected to a matrix. If this option is selected, the following information is displayed.



The Matrix drop-down list
Click the drop-down button and a list is displayed. The list contains the matrixes defined on the **Matrix** tab.

To connect the current pricing item to a matrix, select a matrix in the list.

The Matrix Window
The details about the selected matrix are displayed here.

Priceplan Select this option if the classification item should be connected to a price plan. If this option is selected, the following information is displayed.

Selected
This area displays which price plans that have been selected for this classification item.

Available
This is a list of the price plans that are available. The price plans are defined on the **Global: Price Plan** tab.

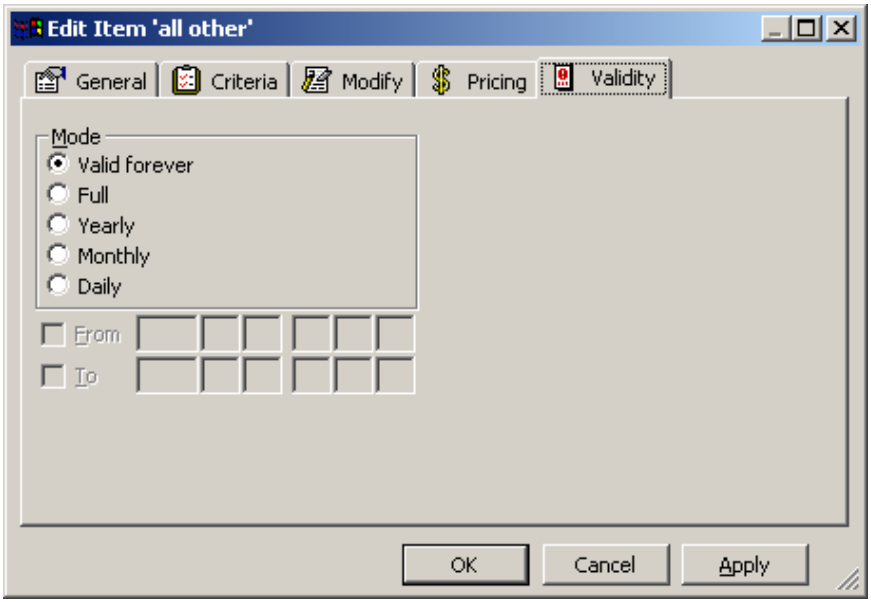
The arrows


Use these arrows to move the price plan items to and from the Selected area.


Use these arrows to change the order of the selected price plans.

Validity

Each classification item can be set to be valid only for a limited period of time or forever. This is made on the **Validity** tab. This tab looks as follows.



The **Validity** tab has two areas, one for mode settings and one for date settings. The mode area has five options. Select any of them by clicking the appropriate radio button. The purpose of the different options, and the date settings, are described below.

Option	Description	Date
Valid forever	The classification item is always valid.	No date is required.
Full	The classification item is valid during the period of time set in the date fields.	Enter a single period of time when the classification should be valid.
Yearly	The classification item is valid every year during the period of time set in the date fields.	Enter a period of time, shorter than and within a year, when the classification should be valid.
Monthly	The classification item is valid monthly during the period of time set in the date fields.	Enter a period of time, shorter than and within a month, when the classification should be valid.
Daily	The classification item is valid every day during the period of time set in the date fields.	Enter a period of time, shorter than and within a day, when the classification should be valid.