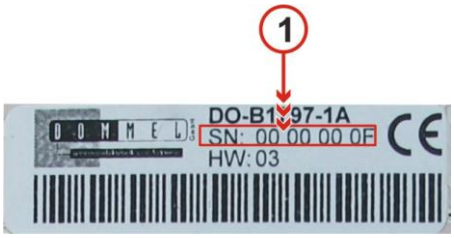
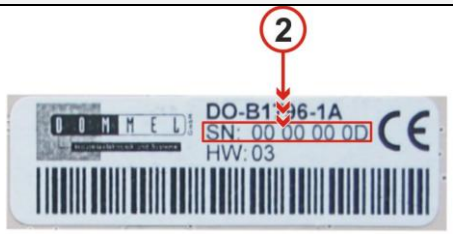
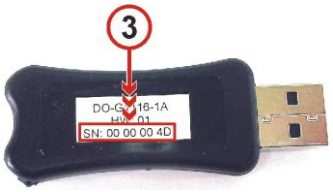
INSTRUCTION MANUAL

Monitoring system for atypical removal of products

1. Data sheet

	Serial no.
Serial no. of the central unit	**SN:**
The serial number (**1**) is listed on top of the sticker label on the back side of the board, directly after the word: “SN”	
	Serial no.
Serial no. of the expander module	**SN:**
The serial number (**2**) is listed on top of the sticker label on the back side of the board, directly after the word: “SN”	
	Serial no.
Serial no. of the USB-Stick	**SN:**
The serial number (**3**) is listed on the sticker label directly after the word: “SN”	
	Serial no.
Serial no. of the pager	**SN:**
After switching on the pager, the serial number is displayed for about two seconds.	
	Alarms
Factory-installed alarms:	There are pre-set alarms plus a self-learning feature to adjust alarm levels
	Location
Location of the antenna:	
	Location
Location of the central unit:	

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These operating instructions describe the functions and the handling of the monitoring system.

We tried to give a description as exactly as possible of the devices and of all the functions. We cannot guarantee the correctness and integrity of the contents of this document, even if we tried hard to do so. We would therefore be grateful at any time to let us have any suggestions for improvement or additional ideas.

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2. Introduction

Read the entire operating instructions carefully before commissioning the monitoring system and observe all operation and safety notices.
The instruction manual helps to familiarsize you with the functions of the monitoring system. It must be ensured, that all persons who have to operate the monitoring system can refer to the operating instructions at any time.

2.1 Symbols used

The following safety symbols are used in these operating instructions. These symbols are intended to call the reader's attention to the text of the adjoining safety instructions.

	This symbol indicates that people's life, health, safety and that the machine, materials or environment are at risk.
	This symbol indicates dangerous electrical voltage. Imminent danger to a person's life and health (serious injury or death)
	Electrostatic sensitive modules are identified by this symbol

3. Intended Use

The equipment cannot be sold to the general public, it is for commercial use only. The installation must be performed by licensed professionals only.
The equipment is designed to monitor atypical removal of products. The use is only permitted in closed rooms. Never use it in the open-air. The contact of electrostatic sensitive modules with moisture, for example contact with cleanser must be avoided absolutely. Any other use than described could lead to damage to this product and cause risk of short circuits, fire, electric shock, etc. The following safety instructions must be observed at all times. The operator of the equipment must especially ensure that the equipment is used only as intended.

4. Safety Instructions

- ❑ The warranty will be rendered null and void in the event of damage due to failure to comply with these operating instructions. The manufacturer doesn't accept liability for any consequential damage. The manufacturer also does not accept liability for damage to property or personal injury caused by improper handling or noncompliance with the safety instructions. The warranty will be rendered null and void in such cases.
- ❑ Make sure the system is put into operation correctly. More information about commissioning of the system see chapter 9.

	This monitoring system is not a toy and should be kept out of the reach of children. Children do not understand how dangerous electrical devices can be.

	Never open the AC-adapter and never touch the AC-adapter with wet hands! Unauthorized opening and inappropriate repair can lead to danger for the users of the device.The manufacturer does not take over any guarantee for arbitrary changes. **The warranty expires with the opening of the AC-adapter!**

	Remember to observe all ESD safety regulations when working and handling electronic components. Electronic components are sensitive to electrostatic charge. Discharge any electrostatic charge by touching the grounded housing before handling any electronic component. Ground you at a metallically earthed object, e.g. at a heater, before you touch the different components with the hands. Handle the components in such a manner, that contact with either the component pins or strip conductors are avoided. This will prevent discharge energy from reaching and damaging sensitive components

	Plug off immediately the AC-adapter and contact your distributor if metallic objects or liquids get in the components of the monitoring system

	The monitoring system may only be operated by the delivered AC-adapter. Only connect the AC-adapter to the outlets which correspond to the values specified on the type label.

	During installation of the monitoring system: Install the corresponding cables in such a way that nobody can step on it or trip over it.

Safety Instructions

	Never touch plug-in contacts of the components with sharp or metallic objects
	Handle the monitoring system carefully. The components of the monitoring system can be damaged by shocks, blows or by falling down.
	Please consider absolutely the instruction respective cleaning in chapter 10. Nonobservance of the cleansing tips may lead to destruction of the individual components. The manufacturer does not assume any liability here.

5. Technical data

Supply voltage:	12 V DC
Current input:	Expander module: about 40mA ….50mA Central unit: about 50…….960mA
Working temperature:	0….+70°C
Storage temperature:	0….+70 °C
General admissions:	EMC tests according to EN 300 220-2 and EN 301 489 Safety tests according to EN 60950-1 FCC and IC (according to EMC and Safety Standards) Note: This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference. Section 15.21 Information to user Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment Section 15.105(a) Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. **Canadian Compliance Statement** Complies with the Canadian ICES-003 Class A specifications. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada. This device complies with RSS 210 of Industry Canada. This Class A device meets all the requirements of the Canadian interference-causing equipment regulations. Cet appareil numérique de la Classe A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

6. Scope of delivery

	The delivery contains electrostatic sensitive components. Open the packaging at an electrostatically protected place, or contact a grounded metallic object e.g. heating element before unpacking.

Before the installation and commissioning, check whether all components are available:

- ❑ ***Central unit***

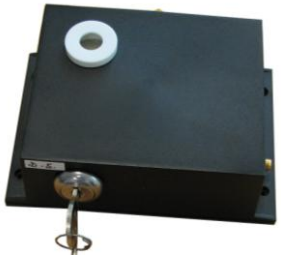


Figure 6-1

- ❑ ***Expander module***

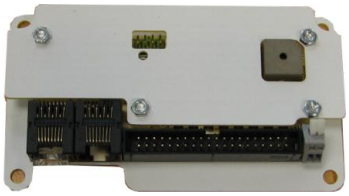


Figure 6-2

- ❑ ***Hub***

Figure 6-3

- ❑ ***Product pusher with connection cable***

Figure 6-4: Example of a product pusher

- ❑ ***USB-Stick (optional)***

Figure 6-5

- ❑ ***Buzzer***

Figure 6-6

- ❑ ***End piece***

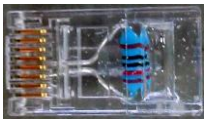


Figure 6-7

Scope of delivery

- ❑ ***AC-adapter of the central unit***

Figure 6-8

- ❑ ***Antenna***

Figure 6-9

- ❑ ***Patch cable and flat ribbon cable***

Figure 6-10

- ❑ ***CD with configuration soft-ware* IMCo PC Tool**

Figure 6-11

- ❑ ***Pager***

Figure 6-12

- ❑ ***AC-adapter of the pager***

Figure 6-13

Should damage in transit may have occurred or the contents be incomplete, please contact your competent distributor.

7. Description

7.1 Overview

The purpose of the system described here is for monitoring atypical removal of products. The following figure shows the different components of the monitoring system.

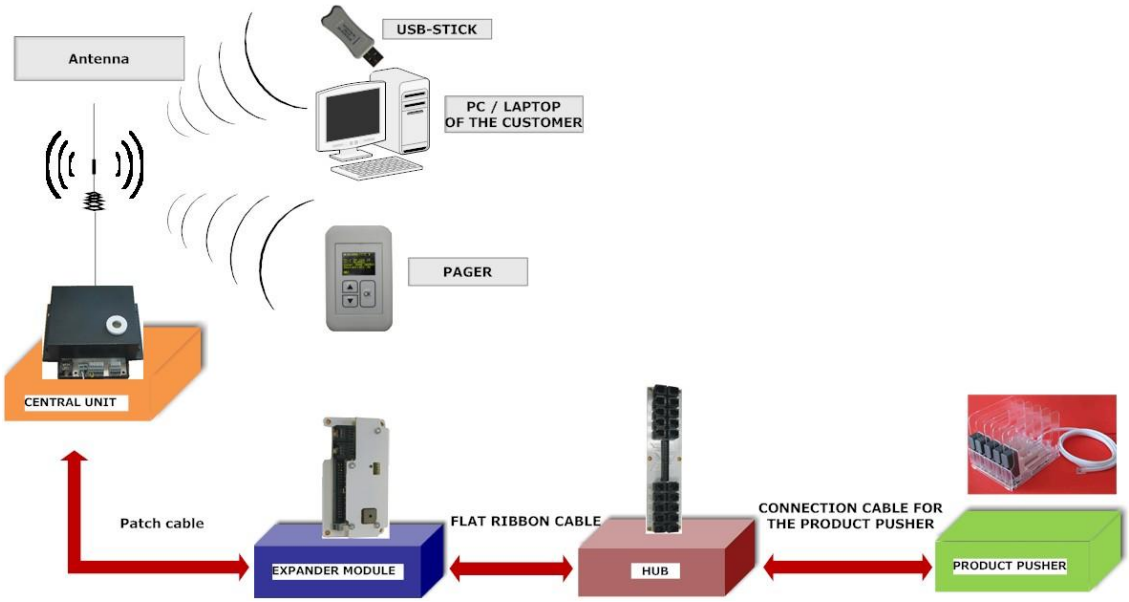


Figure 7-1

The components are connected via bus system (CAN bus). It is a safe CAN bus, i.e. if the system is working, a disconnection of any cable will cause an alarm. Informations concerning the installation and commissioning of the monitoring system see the following chapters.
The monitoring system can be extended easily. Informations concerning the extension of the system see ***chapter 12***. The system is extremely fail-safe.

The monitoring system can be configured with the help of the software (**IMCo PC Tool)** (see scope of supply) and a computer. With a USB-Stick, which is plugged into the USB socket of a computer, the configuration can be transferred to the monitoring system.
In the case of an alarm this is indicated on the display of the pager and if the **IMCo PC Tool -** Software is running, it will be indicated on the display of the computer.

8. Commissioning

8.1 Installing the monitoring system

8.1.1 Basic information

- Fasten all components like central unit, expander module(s) and hub(s) in such a way (e.g. behind or under the shop counter) that no people, except the service staff, have access
- Please mount the central unit close to 230V / 50Hz power connection or to 120V / 60Hz power connection.
- Select an adequate location for the antenna.

	Caution! **Electrostatic sensitive modules!**

8.2 Mounting the central unit and the expander module

	Caution! **Electrostatic sensitive modules!**

- Mount the central unit under the shop counter. Six holes are provided to mount the central unit.

Figure 8-1

- Mount the expander module alone or the expander module together with the hub.

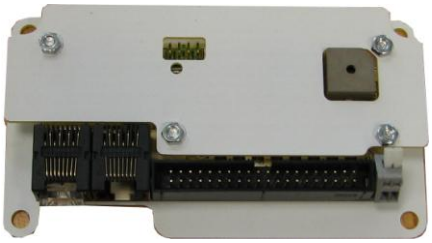


Figure 8-2

- Connect the buzzer (**A**) to the terminals (**B**) of the expander module.

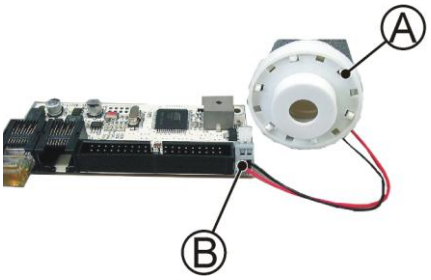


Figure 8-3

8.3 Cabling the monitoring system

	Connect the different components according to the rules as described in the following. Wrong connection can destroy the components.

	Caution! **Electrostatic sensitive modules!**

Connecting the antenna

- Install the cable of the antenna, insert the connector into the socket (**1**) of the central unit (**2**) and tighten the connector with the screw nut.

Please note!
Do not deform the pin in the centre of the connector when inserting it into the socket.

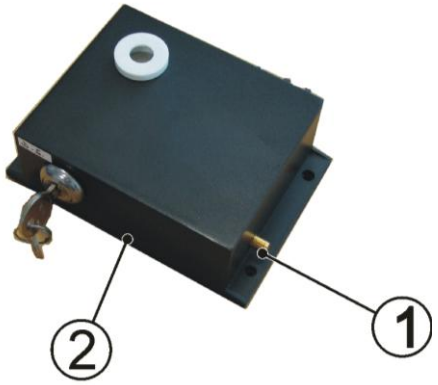
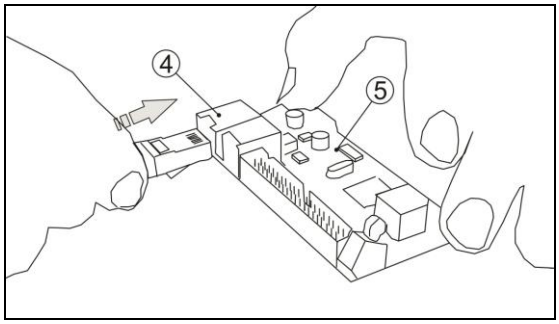


Figure 8-4

Connecting the central unit to the expander module

- Insert one end of the provided patch cable into the network connector (**4**) of the expander module (**5**), the other end of the patch cable into the network connector (**6**) of the central unit.



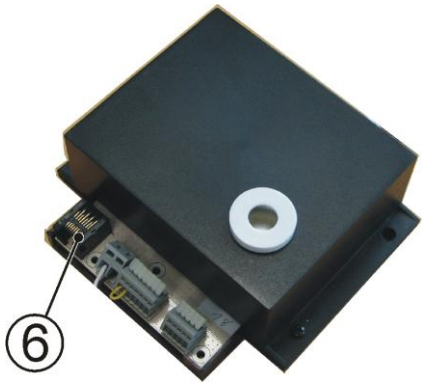


Figure 8-5

Connecting the expander module to the hub via flat ribbon cable.

- Insert one end of the flat ribbon cable into the connector (**7**) of the expander module (**5**) and the other end into the connector (**8**) of the hub (**9**).
  Please note!
  The noses (A) of the connectors of the flat ribbon cable must be inserted into the notches (B) of the connectors.
  Do not squeeze respectively deform the pins of the connectors when you insert the flat ribbon cable!

  Please note!
  If the system is working, a disconnection of any cable will cause an alarm at the main unit and the pager.

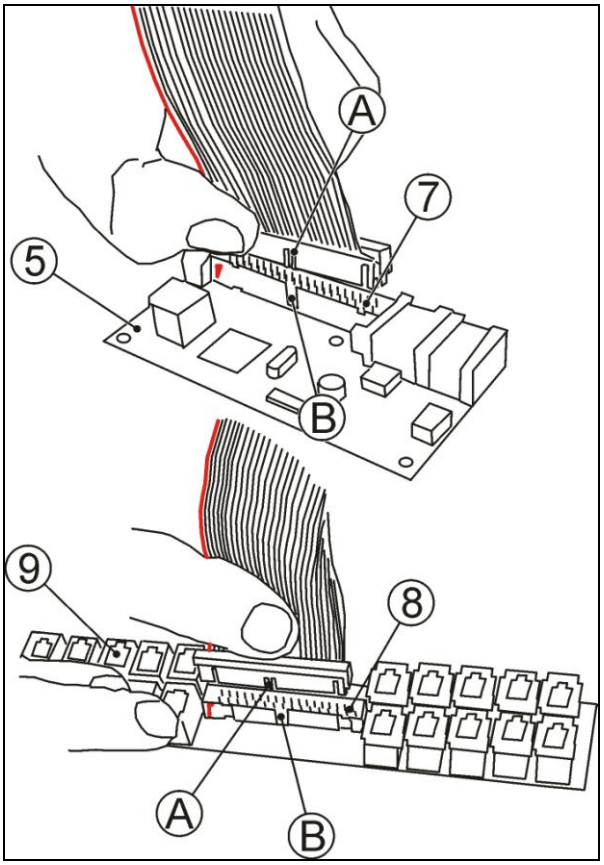


Figure 8-6

Connecting the hub to the product pusher.

- Plug in the connector of the connection cable (**10**) of the product pusher into the corresponding socket (**11**) of the hub (**9**).
  Please note, that the hub is labelled. Maybe you have to consider certain requirements, when inserting the connection cable of the product pusher.

  Please note!
  If the system is working, a disconnection of any cable will cause an alarm at the main unit and the pager.

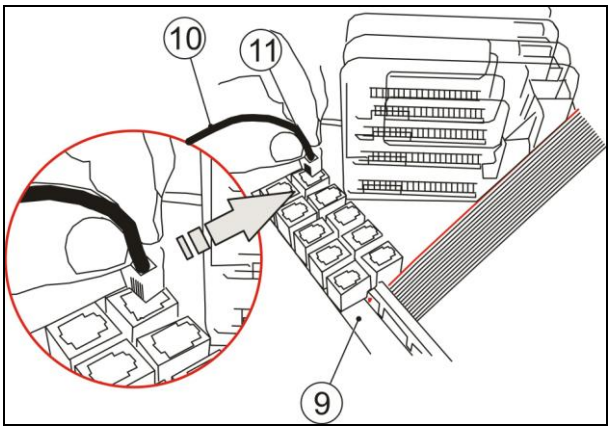


Figure 8-7

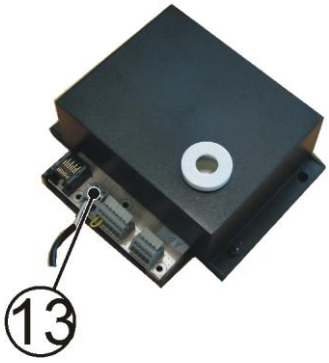


Figure 8-8

Connecting the central unit to 12V

- Connect both leads of the cable of the AC-adapter to the terminal strip (**13**).

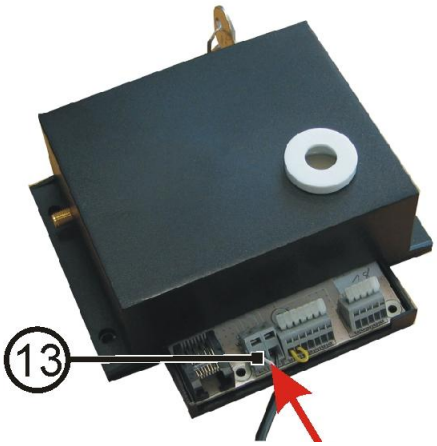


Figure 8-9

- Check the complete cabling.
- Plug in the AC-adapter into an electrical outlet 230V / 50Hz or 120V / 60Hz. A peeptone must sound.

Please note!
The main unit has to be powered-off in a specific routine, otherwise an alarm goes off.

8.4 Pager

The scope of supply contains a pager. With the help of the pager, occurring alarms are signalised visually and acoustically.

Following the description of the individual buttons of the pager.

The pager is switched on by pressing the button **OK**. The pager is switched off again by pressing the buttons (**2**) and (**3**) simultaneously.

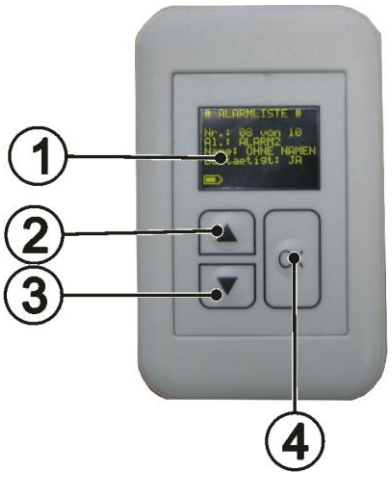


Figure 8-10

Position	Designation	Description	
1	**Display**	Occurring alarms with alarm number, alarm type, alarm name are signalized here. The status of the battery is also indicated on the display.	
2	**Arrow key up**	Scrolling backward in the alarm list	The pager is switched off by pressing the arrow key up and the arrow key down simultaneously.
3	**Arrow key down**	Scrolling forward in the alarm list	
4	**OK**	Switching on / switching off the pager	

8.5 Requirements

The following requirements for the installation of the software are necessary:

- ❑ Minimum: PC 1GHz Prozessor
- ❑ 500MB of memory
- ❑ Operating system: Windows 2000 ® or Windows XP ® or Windows Vista

8.6 Installation of the software IMCo PC Tool

- Switch on the system by connecting the AC-adapter to 230V / 50 Hz or to 120V / 60 Hz.
- Switch on the computer and insert the USB-Stick **(1**) into a free USB socket of the computer.

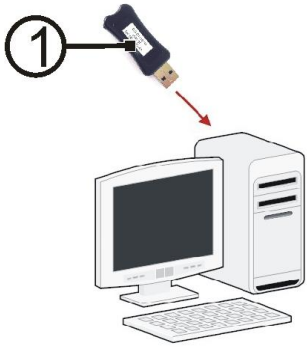


Figure 8-11

- Insert the enclosed CD in your CD / DVD drive

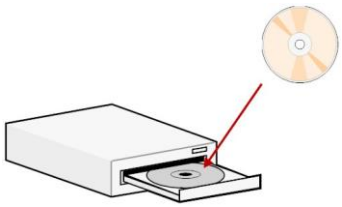


Figure 8-12

- Double-click the file **Setup.exe** in the subdirectory **\setup**

Figure 8-13

- As a result, the mask shown on the right, is displayed.
  Now click on the button
  Next >

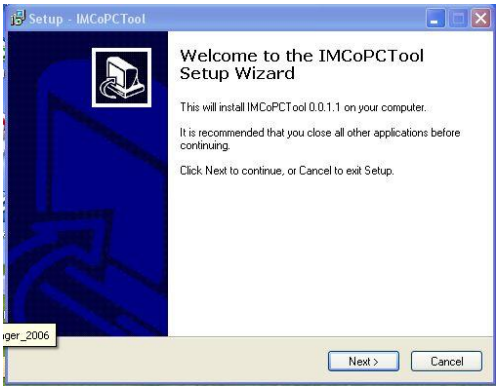


Figure 8-14

- Click on the option field **I accept the agreement**
- Click on the button **Next >**

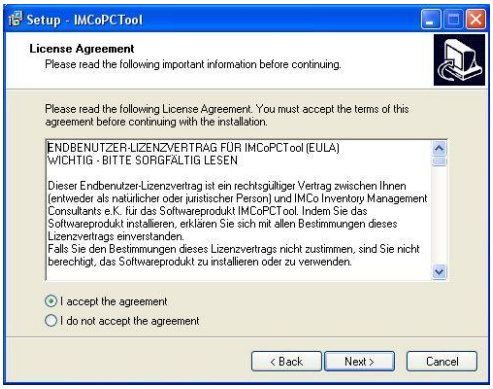


Figure 8-15

- Now you can accept the default path, or you enter a new path. Then click on the button **Next >**

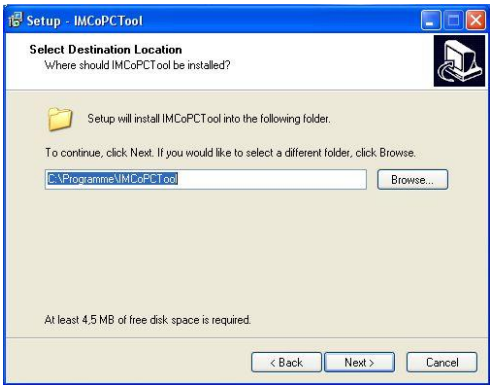


Figure 8-16

- Accept the settings of the Start Menu folder and click on the button **Next >**

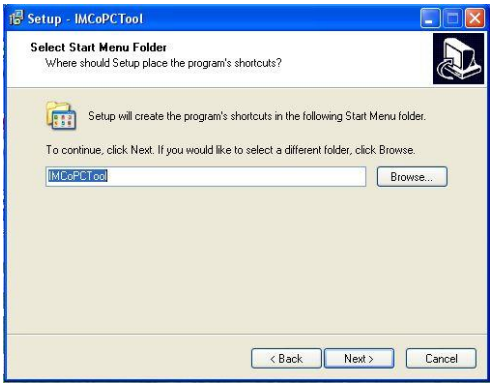


Figure 8-17

- Now click on the button **Install**

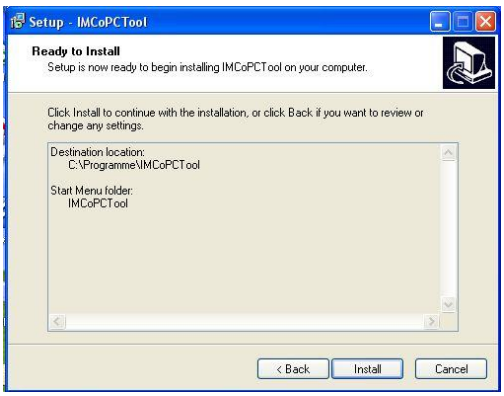


Figure 8-18

- After the the installation process, you have to click on the button **Finish.**

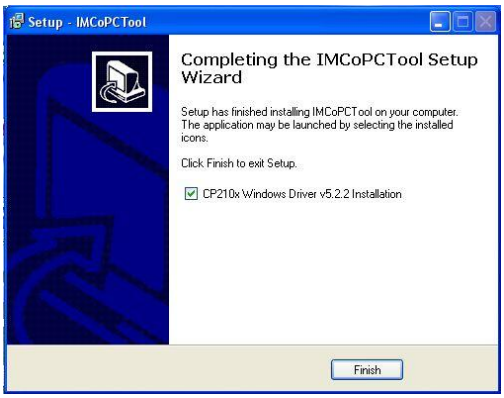


Figure 8-19

- The Windows driver for the USB-Stick must be still installed.
  Click in addition on the button **Install.**

Figure 8-20

- After finishing the installation, click on the button **OK**.
  The USB-Stick is identified.

Figure 8-21

9. Operation and description of the software

9.1 Starting the software IMCo PC Tool and configuring the monitoring system

9.1.1 General information

The monitoring system must be configured by the software **IMCo PC Tool** which is described on the following pages. Thereby a configuration can be transferred to the monitoring system.
The alarms are signalized optically and acoustically by the pager.

9.1.2 Starting the software IMCoPCTool

- Either click on the icon on the right, or alternatively click on **Start - Programs - IMCo PC Tool**

- As a result the following screen mask is displayed:

Figure 9-1

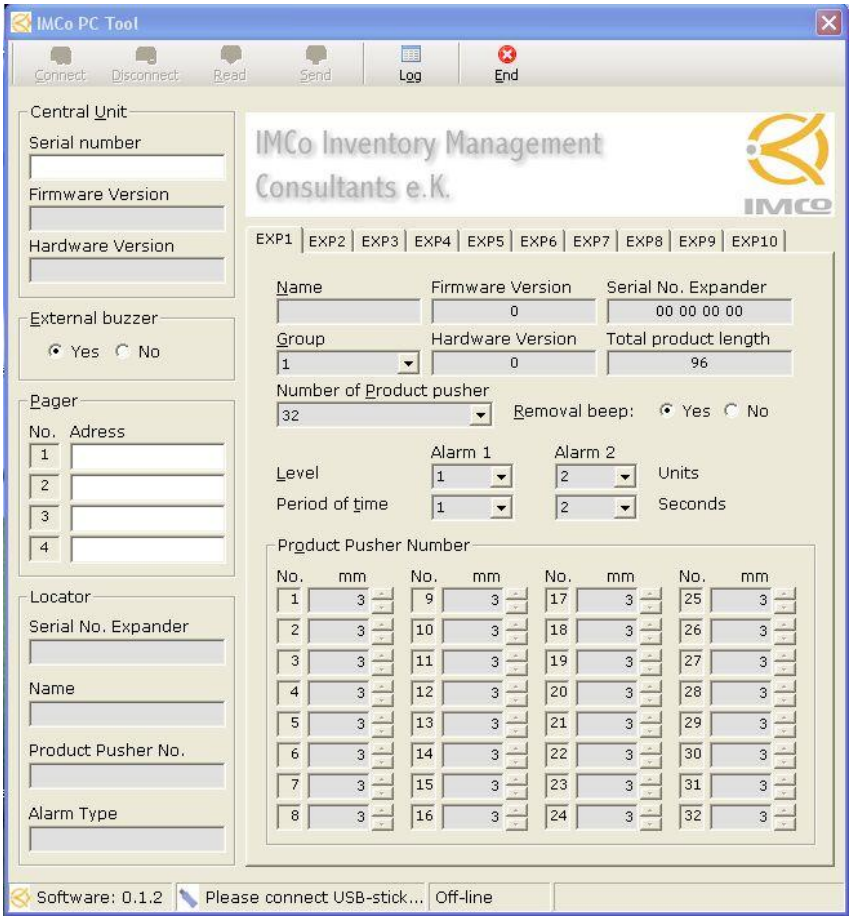


Figure 9-2

9.2 Adjusting basic settings

9.2.1 Setting up the connection to the central unit

- Click on the button (**4**) **Connect**
  → After a successful connection a loud signal sounds. The following message is indicated on the status display (**5**)
  Basis: connected Basis ok

  Please note!
  The minimum distance between PC/Laptop to the antenna must be one meter!

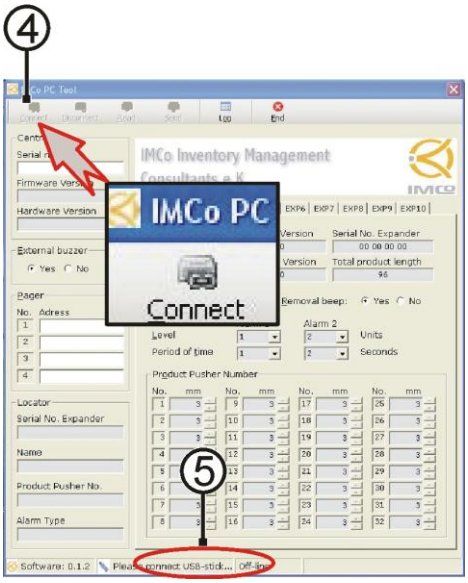


Figure 9-3

9.2.2 Integration of the connected components

- ❑ Click on the button (**6**) **Read**
  → An acoustic signal must sound again. All components and product pushers connected to the system must be detected. Already saved settings are read out and displayed.

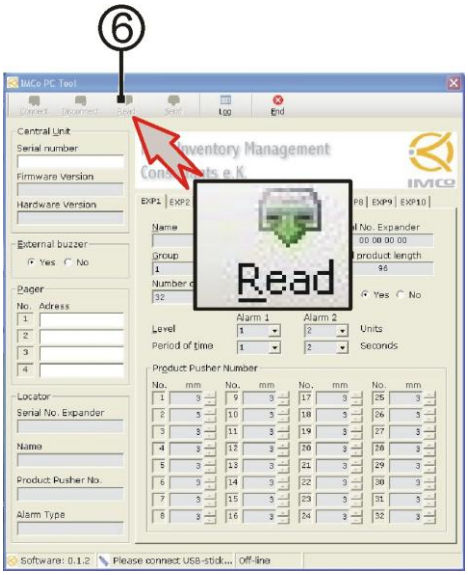


Figure 9-4

9.2.3 Configuration of the expander modules (EXP)

With the help of the tabs (**7**) the individual settings for every expander module (abbr. EXP) can be set. As far as necessary, the input mask **(8**) for every expander module can be edited.

→ ***Description of the individual input fields see on the following pages***

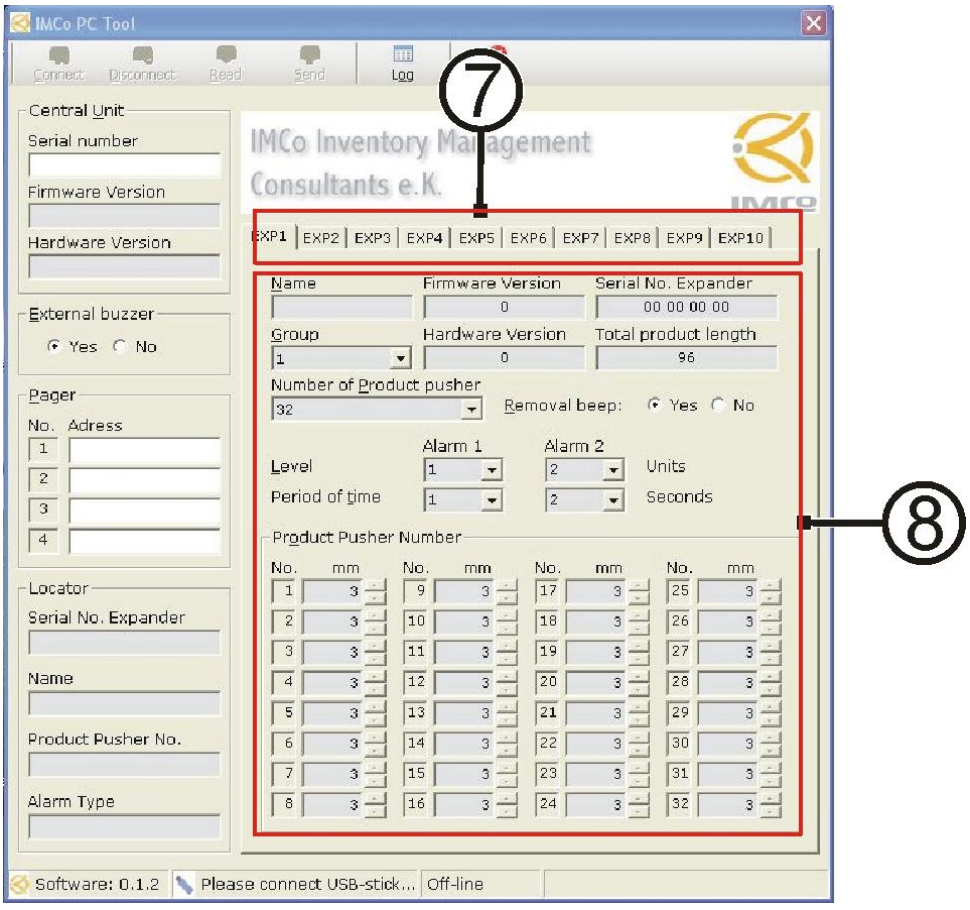


Figure: 9-5

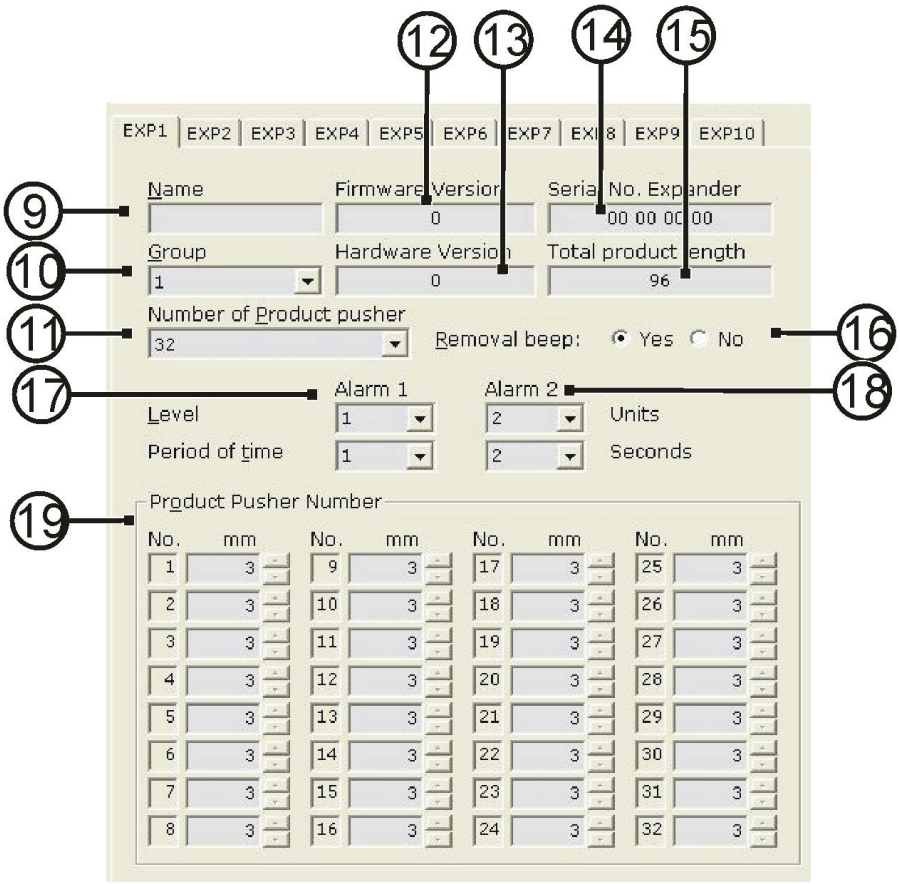


Figure: 9-6

Pos.	Name	Description
9	**Name**	Define a name for the place of the expander module for localising it as fast as possible
10	**Group**	Hereby, you can assign the expander module to defined groups.
11	**Number of Product pusher**	Depending on the selected expander module, the number of product pushers which are connected to the hub, can be selected here. **Example (see figure above): 32 product pushers connected to expander module 1.**
12	**Firmware Version**	No input box. The firmware version of the expander module is automatically displayed by pressing the button **Read.**
13	**Hardware Version**	No input box. The hardware version of the expander module is automatically displayed by pressing the button **Read**

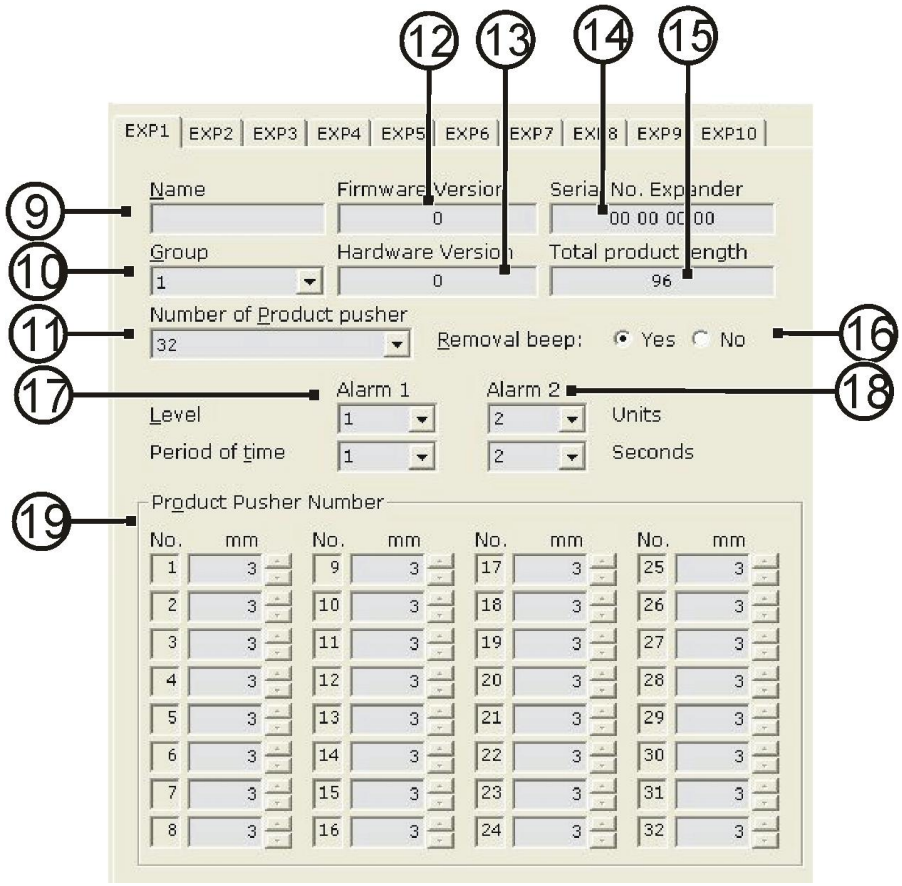


Figure 9-7

Pos.	Name	Description
14	**Serial number Expander**	No input field. The serial number of the expander module is displayed automatically after pressing the button **Read** .
15	**Total product length**	No input box. Sum of all values entered in the product pushers (**1**) - (**19**).
16	**Removal peep**	Please select here, whether a signal shall sound or not when removing a product from the product pusher.
17	**Alarm 1**	Set up the max. permissible number of products which may be removed from the product pusher within a certain period without activating an alarm.

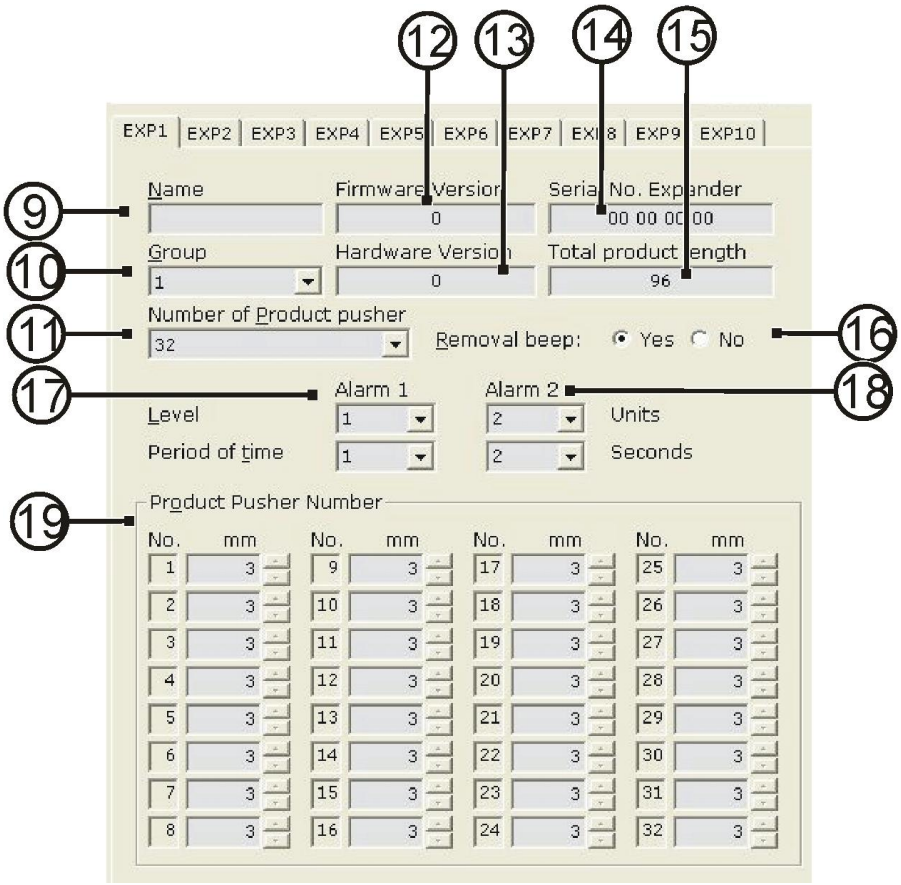


Figure 9-8

Pos.	Name	Description
18	**Alarm 2**	Set up the max. permissible number of products which may be removed from the product pusher within a certain period without activating an alarm.
19	**Product Pusher Number**	Depending on the product, you have to enter the distance in “mm” the product pusher is moved, when inserting or removing a product. **Please note!** Use a suitable product pusher for the corresponding product range.

9.3 Sending the settings to the central unit

- If you have finished the settings as described before, save them by pressing the button **Send (18).**
  Several acoustic signals must sound. First one signal after the other and at the end a single signal must sound.

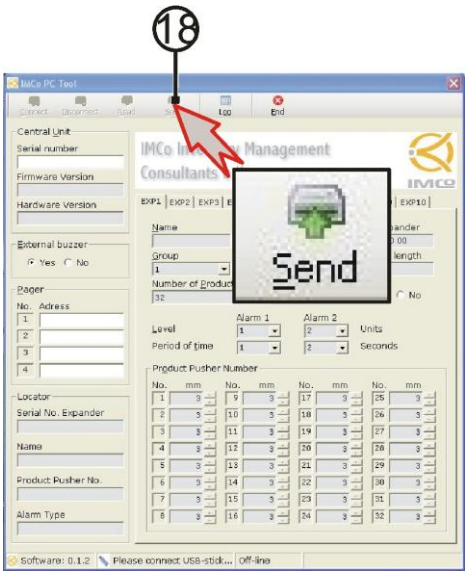


Figure 9-9

9.4 Filling of the system

- For filling the individual product pushers of the monitoring system the key-operated switch must be turned in position **0** (operating mode: Filling). After the filling, the key-operated switch must be turned in the position **1** (operating mode: Day) or position **2** (operating mode:Night). For this purpose please read the description of the different operating modes in **chapter 9.6**.

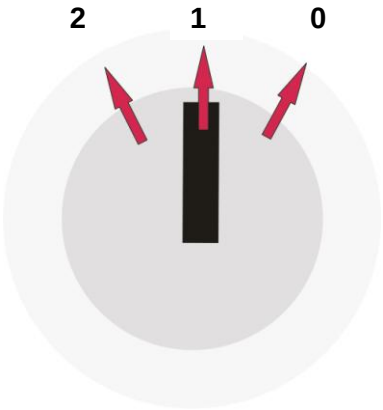


Figure 9-10

9.5 Alarm display

After an alarm is activated, this is displayed acoustically and visually by the software **IMCo PC Tool** in the display area **Locator** or by the pager.

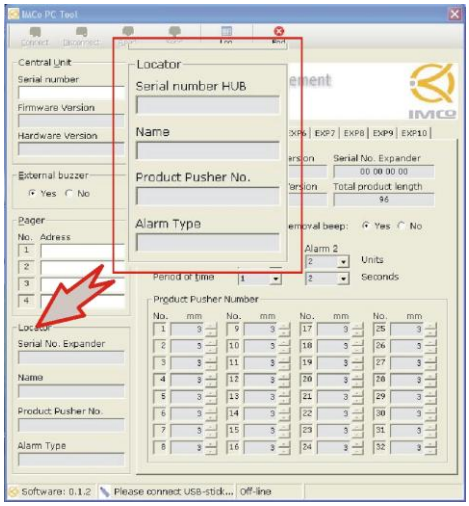


Figure 9-11

The following alarm types can be displayed in the field **Alarm Type**:

Alarm 1 or Alarm 2:
This message is indicated, if more than the specified number of products are removed from the product pushers

Removal: This message is indicated, if a product is removed from the product pusher.

The description of the different operating modes see on the following page.

9.6 Operating modes

With the help of the key-operated switch, the following three different operating modes can be selected:

Key-operated switch in position 1:
Operating mode: Day
The settings in the configuration menu (as described in chapter 9.2.4) for every expander module are valid. If there are removed more products than defined in the configuration menu, an alarm is activated.

Key-operated switch in position 2:
Operating mode: Night
When removing a product, an alarm tone sounds The message **Sabotage 3** is displayed.

Key-operated switch in position 0:
Mode of operation: Filling
This operating mode must be set when filling the product pushers. No alarms are activated here. After filling, the key-operated switch must be turned again in position 1 or 2

Please note!
If the key-operated switch is not turned back in position 1 or position 2 after 30 minutes, the system switches back automatically to the operating mode “Day”.

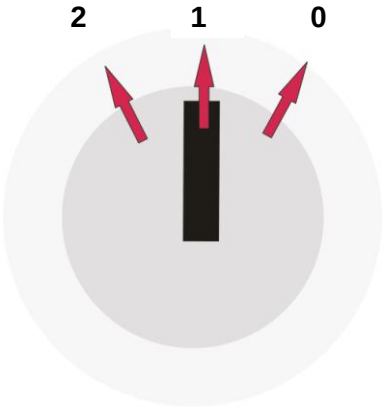


Figure 9-12

9.7 Structure of the log file

Note that the removals respectively alarms are recorded only then in the log file, if the software **IMCo PC Tool** is started and if there is a connection between PC and central unit.

With the help of the log file, alarms will be recorded. For viewing the log file, please press the button **Log** (**19**).

As a result the following mask is displayed:

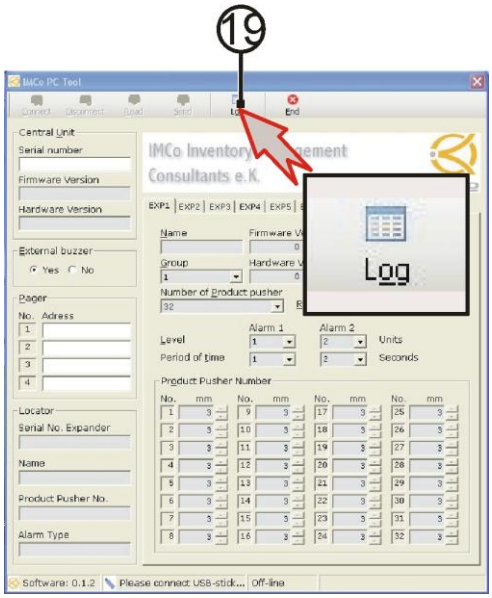


Figure 9-13

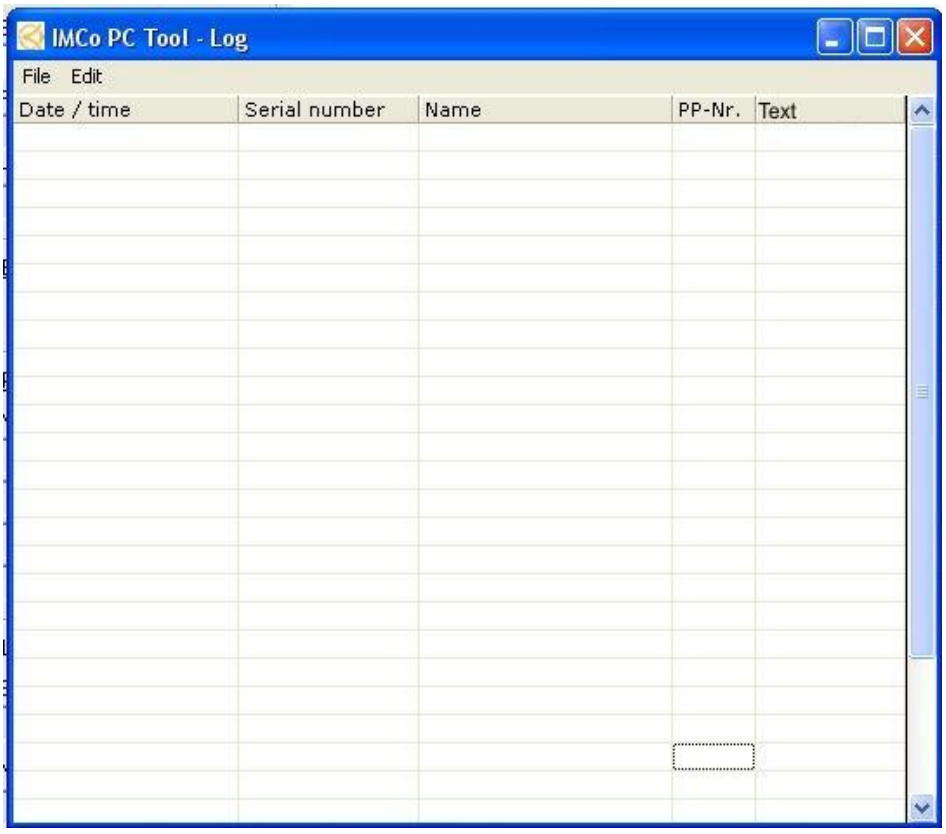


Figure 9-14

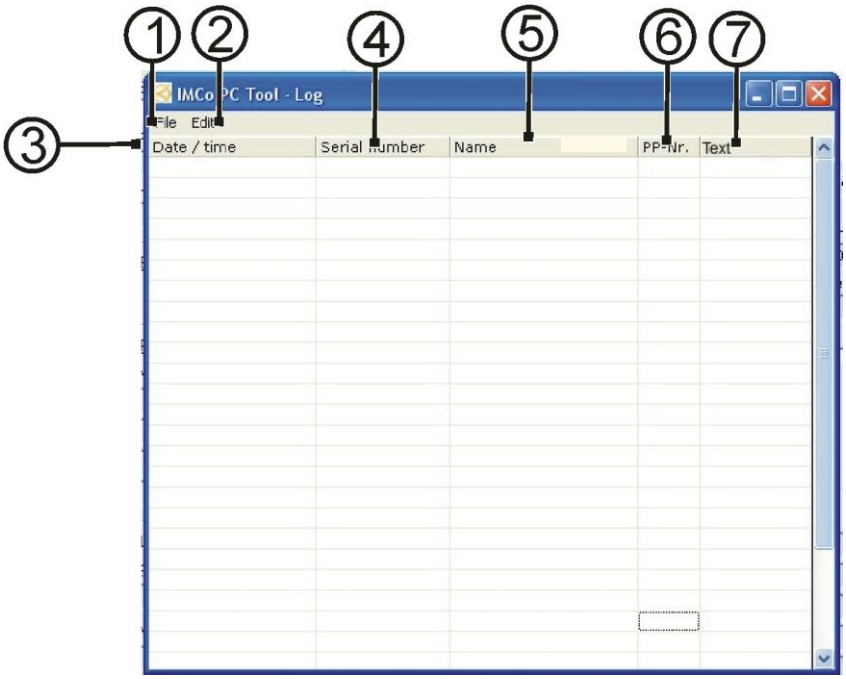


Figure 9-15

Pos.	Deesignation		Description
1	**File**		
		Export	Exporting the the data of the log file. Files with the following filename extension can be exported: **.txt** **.csv**
		Close	Closing the log file
2	**Edit**		
		Copy	Copies the selected text of the table in the clipboard
		Delete all	Deletes all data in the log file without previous warning
		Select all	Selects the complete text of the table
3		**Date / Time**	Chronological listing of the different alarms
4		**Serial number**	Serial number of the expander module
5		**Name**	Name of the expander module or group (sum of expander modules)
6		**PP-Nr.**	Number of the product pusher
7		**Text**	Listing of the alarms The following alarms can be indicated: → Alarm 1 → Alarm 2 → Removal → Sabotage 1 → Sabotage 3

9.8 Exit the software

Note that when exiting the software **IMCo PC Tool** all data in the log file get lost.
Should you need the data, you have to export the data before, or you have to copy and paste the data in another program by the clip-board.

- ❑ Press the button **End** to exit the software.

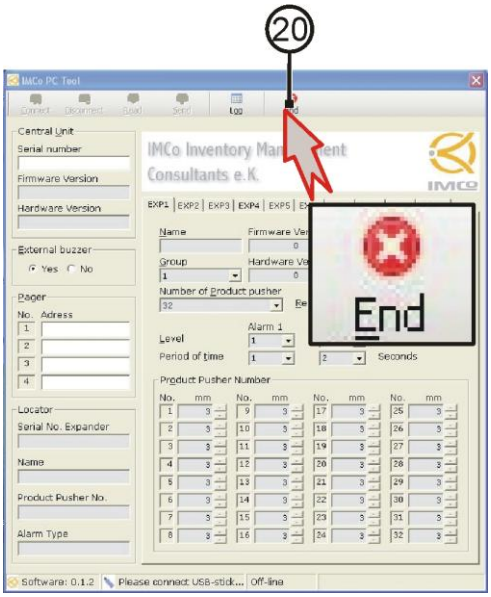


Figure 9-16

10. Cleaning

Before cleaning, please consider absolutely the following instructions!

	When cleaning, never touch the boards of the components of the monitoring system. For cleaning of the product pushers only use appopiate antistatic cloths. Never use swiffer! Swiffer can destroy the boards of the components, because they are electrostatic charged for removing dust particles. The warranty will be rendered null and avoid in event of damages due to failure to comply with the circumstances mentioned above.

	Do not pour cleanser into the product pusher and do not spray the cleanser into the components of the monitoring system. Liquids may never get inside of the product pushers, because through this the board material can be affected and destroyed. Short circuits and defects can be the consequence.

Before cleaning a product pusher, the key-operated switch must be rotated in position „**0**" (operating mode: Filling), because usually alarms could be activated during the cleansing process.

Clean the product pushers with a soft, dry antistatic cloth.
Stronger dirtying can be cleaned with a slightly moist antistatic cloth.
Solvents or cleansers are not permitted.

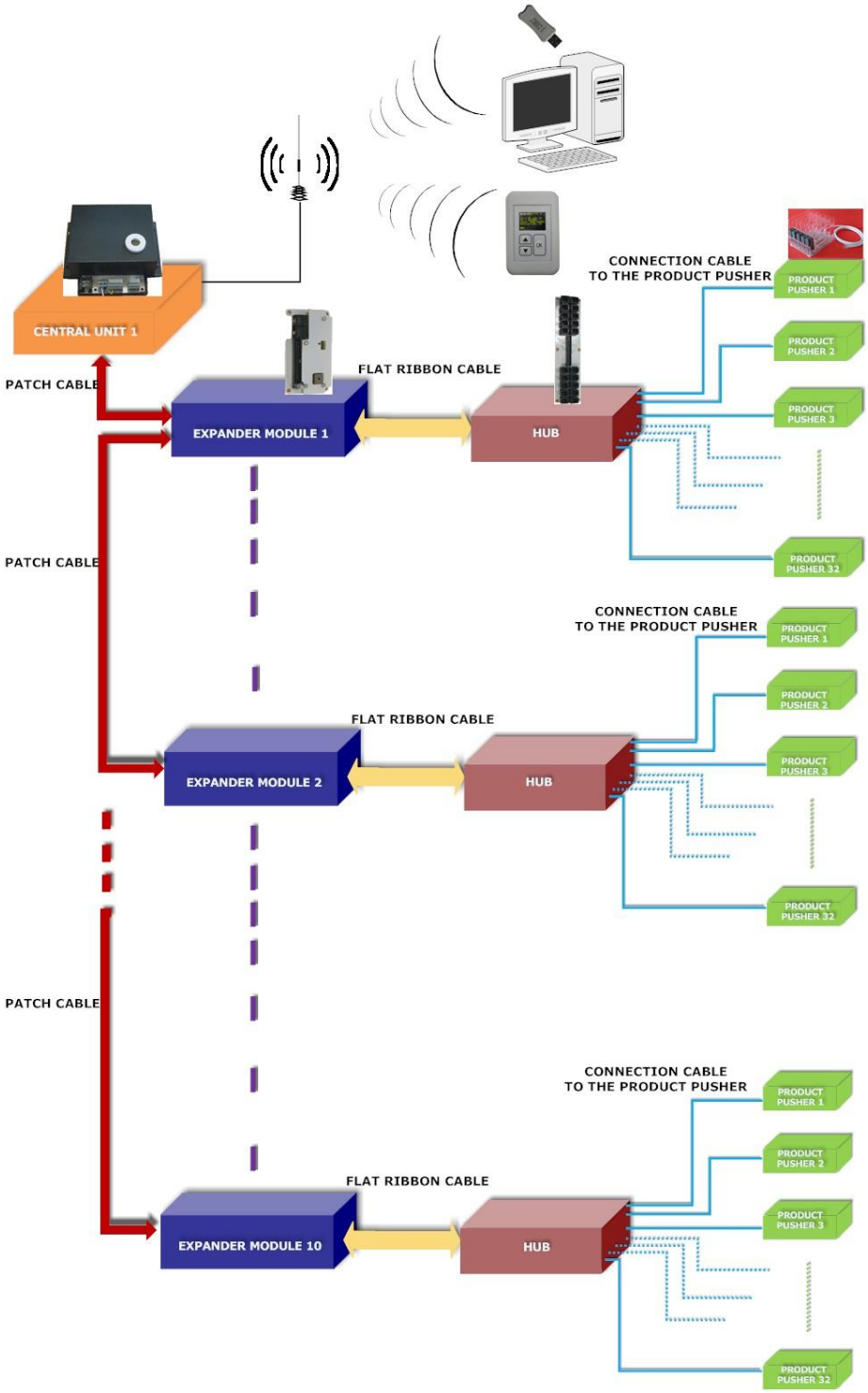
11. Trouble shooting

Problem	***Cause of malfunction with elimination of error***
Software **IMCo PC Tool** cannot be installed	You have no administrator's rights. • Get in contact with your system administrator
USB-Stick is not identified	• Get in contact with your system administrator
No connection of the pager to the central unit	Minimum distance is below the specified limit • Generate the minimum distance of one meter between the USB-Stick and the antenna Too far distance between USB-Stick and antenna • Reduce the distance between USB-Stick and antenna Serial number is not correct • Check the serial number of the expander module Antenna is not inserted in the central unit • Plug in the antenna AC-adapter of the monitoring system is not plugged in • Plug in the AC-adapter
Lamps do not light up, neither at the central unit, nor at the expander module	AC-adapter of the monitoring system is not plugged in • Plug in the AC-adapter
Lamps light up at the central unit, but not at the expander module	No connection between central unit and expander module • Check if the central unit is connected to the expander module by the patch cable.
Lamps light up at the central unit, but not at the expander module. Additionally a loud signal sounds.	Patch cable not inserted. • Insert the patch cable Possibly sabotage
No expander module is identified	Central unit not connected to the expander module • Check if the central unit is connected to the expander module by the patch cable.

12. Extension of the monitoring system

12.1 General information

The monitoring system can be extended by additional expander modules and hubs up to 10 expander modules and with it up to 320 product pushers (see the following figure) For the extension of the monitoring system special modifications are necessary (description see on the following pages).



12.2 Extending the monitoring system by expander modules

- Localize the position of that expander module, which is connected at the end of the CAN-bus system.

Tip:
In the menu mask of the software **IMCo PC Tool** the expander modules are listed in an ascending order. Here you can identify the name of the expander module which is connected at the end of the CAN-bus. It is about the last listed expander module with the name field which is not grey shaded.

	The monitoring system must be switched off before connecting or disconnecting new components.

	Electrostatic sensitive components or modules must not get in contact with materials which are chargeable Any person not conductively linked to the ambient electrical potential can be electrostatic charged. The following rules for working with electrostatic sensitive components or modules must be obeserved: ○ Ensure that persons, the work area, and packaging have proper grounding when working with electrostatic sensitive modules. This avoids static charging. ○ Avoid any contact with electrostatic sensitive modules unless it is inevitable. ○ Handle the components in such a manner, that contact with either the component pins or strip conductors are avoided. This will prevent discharge energy from reaching and damaging sensitive components. Before to do so, touch grounded metallic objects.

Removing the LAN-connector (end piece)

- Remove (see figure on the right) the LAN-connector (**1**) of the expander module connected at the end of the CAN-bus.

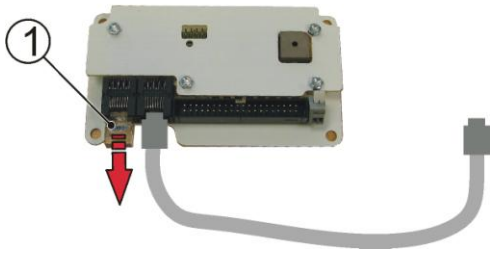


Figure 12-1

Inserting the LAN-connector (end piece)

- If the new expander module shall be connected at the end of the bus system, insert the LAN-connector if there is not inserted one until now.

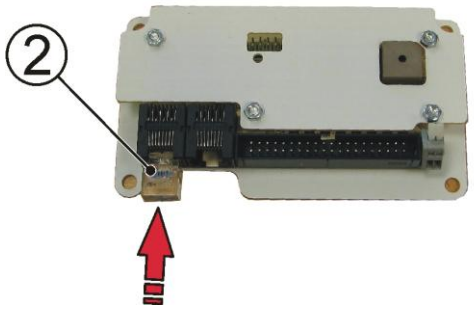


Figure 12-2

Connecting the expander modules

- Plug in one end of the provided patch cable in one of the free jacks, e.g. (**3**) of the expander module. Plug in the other end of the patch cable in one of the jacks, e.g. (**4**) of the following expander module.

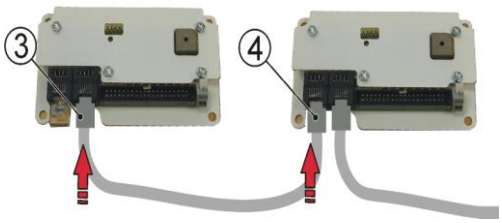


Figure 12-3

Connecting the expander module to the hub by flat ribbon cable

- Insert one end of the flat ribbon cable into the connector **(7**) of the expander module (**5**) and the other end into the connector **(8**) of the hub (**9**).
  Please note!
  The noses (A) of the connectors of the flat ribbon cable must be inserted into the notches (B) of the connectors.
  Do not squeeze respectively deform the pins of the connectors when inserting the flat ribbon cable!

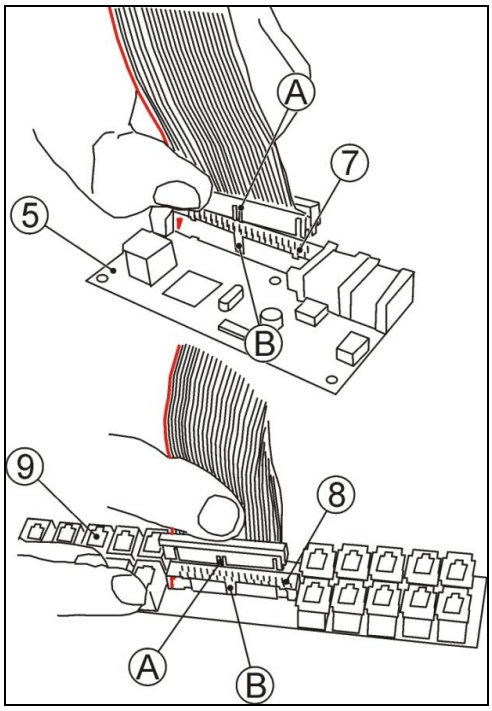
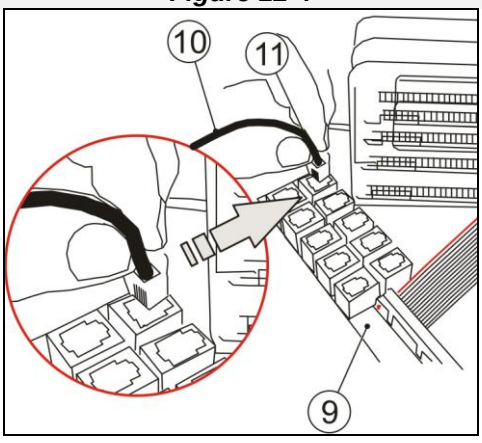


Figure 12-4

Connecting the hub to the product pusher

Plug in the connector of the connecting cable of the product pusher in a free jack of the hub.
Please note, that the hub is labelled. Maybe you have to consider certain requirements, when inserting the connection cable of the product pusher.



- ❑ Start the software **IMCo PC Tool**

Figure 12-5

- ❑ Press the button **Connect**

Figure 12-6

- ❑ Press the button **Read**.

Figure 12-7

- ❑ Check the software settings of every expander module and configure the alarms
  (Description see chapter 9.2.4)

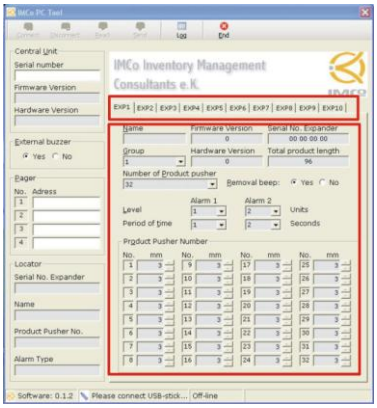
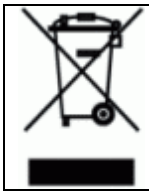


Figure 12-8

- ❑ Save now your settings by pressing the button **Send**
  Now the setting up of the monitoring system is complete.

Figure 12-9

13. Disposal

	*If parts of the monitoring system have become unuseable, dispose it in accordance with the current statutory regulations.*

You thus fulfil your statutory obligations and make your contribution to the protection of the environment.