

Operating Manual

Status Display
With Integrated Service Console

For the Stationary Monitoring Device

DRC MCM XT



Issued by : **DEHN + SÖHNE GmbH + Co.KG.**
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Legal Notes

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Terms and definitions

Blitzductor®

Surge protection module manufactured by DEHN + SÖHNE

DEHNrecord DRC LC M3

DEHNrecord DRC LC M3 is a compact hand-held reader with integrated RFID technology for non-contact testing of surge protection modules (*Blitzductors®*).

DEHNrecord DRC MCM XT

DEHNrecord DRC MCM XT is a compact monitoring device with integrated RFID technology for stationary testing of surge protection modules (*Blitzductors®*).

HW

Hardware

LifeCheck®

Test for correct functioning of the surge protection modules during system operation without removing them.

Microsoft .NET- Framework® 2.0

Library basically independent from programming languages for developing and performing applications and services that are based on Microsoft **.NET** technology (e.g. PC application programs and so-called web services).

RFID

Radio Frequency Identification – Identification procedure per radio technology which allows for non-contact reading and saving of data.

RS485

Industrial 2-wire bus system for connecting external devices

SPD

Surge Protection Device – surge protection module

SW

Software

VB2005

Microsoft Visual Basic® 2005 – Programming language of Microsoft Windows operating system using the **.NET** technology.

Literature / References

- /1/** Operating manual for ***DEHNrecord DRC MCM XT***
 Issued by : DEHN + SÖHNE
- /2/** Operating manual for ***DEHNrecord DRC LC M3+***
 Issued by : DEHN + SÖHNE

1 Application

DEHNrecord DRC MCM XT is a compact monitoring device in an XT enclosure with integrated RFID technology (**R**adio **F**requency **I**dentification) for non-contact testing of surge protection modules. This device is marked with the LifeCheck® symbol.

LifeCheck® symbol:



The following surge protection modules are equipped with *LifeCheck*® technology:

- **Blitzductor**® CT; **Type: BCT MLC**
- **Blitzductor**® XT; **Type: BXT ML**

Only surge protection modules (SPDs) with integrated *LifeCheck*® function can be tested with *DEHNrecord DRC MCM XT* monitoring device!

SPDs with *LifeCheck*® symbol don't have to be removed for function testing. They can be tested during system operation (e.g. in the distribution cabinet).



Figure 1 : *DEHNrecord DRC MCM XT* stationary monitoring device

2 LifeCheck®

Protection modules with *LifeCheck*® symbol provide an additional circuit consisting of a combined RFID based transmission and monitoring unit. Thermal and electrical overloads of the surge protective device will be reliably detected and monitored.

3 DRC MCM XT Monitoring Device

Up to 10 surge protection modules can be assigned to one *DRC MCM XT* monitoring device¹¹. *DEHNrecord DRC MCM XT* checks the operating state of this "group" of protection modules permanently without contact. An integrated LED indicates the result, which is transmitted by remote signalling via a changeover contact. Both the LED indicator and remote signalling contact provide only a general information about the operating state of all protection modules assigned to the monitoring device ("All protection modules alright" or "Replacing of protection modules required").



Figure 2 : Stationary monitoring device with 10 *Blitzductors*®

As delivered, *Blitzductors*® XT and CT cannot be used with the *DRC MCM XT* monitoring device. Assignment of the *Blitzductors*® to the respective monitoring devices is effected by correspondingly programming of the RFID transponders in the *Blitzductors*®. When programming the transponder, a definite password each, containing bus address of the assigned monitoring device and current number of the respective *Blitzductor*® will be generated and stored in the transponder. During operation, the transponder then only reacts on enquiries containing its password. With the RS485 bus interface integrated into the device, up to 15 *DRC MCM XT* monitoring devices can be combined to one system. Within this system, one device will be configured as "master" and all others as "slaves". The "master" controls the monitoring of all *DRC MCM XT* devices connected to the same bus. For this purpose it

calls up continuously all "slaves", one after another (with ascending bus address) for testing the protection modules assigned to them.

In addition to the monitoring devices, a PC or laptop can also be connected to this RS485 bus by means of an adequate adapter (see *11*).

As far as the **"Status Display with integrated Service Console"** program has been installed on the PC or laptop, the following functions of this program can be applied:

- Status indication chart
 - of all *DRC MCM XT* monitoring devices connected at the RS485 bus
 - of all protection modules assigned to a *DRC MCM XT*
- Entering a system description (e.g. headlines, comments, SPD description with type designation and identification No. etc.)
- Saving and loading of system descriptions
- Logging of all state changes of an SPD in a file (log function)
- Printing of the actual system status e.g. as test report
- General testing of all protection modules assigned to a *DRC MCM XT*
- Single testing of a protection modules
- Determining the serial number of a protection module
- Programming the protection modules of a *DRC MCM XT*
- Reprogramming a protection module (to delivery status)
- Requesting the version number of the *DRC MCM XT* monitoring device
- Language switching (German / English integrated, any other user-defined language can be loaded as text file)

The program **"Status Display with Integrated Service Console"** has been designed primarily for the service staff of DEHN + SÖHNE or likewise trained staff.

Common users should apply *DEHNrecord DRC LC M3* for programming and administrating the *Blitzductors*® (see *12*).

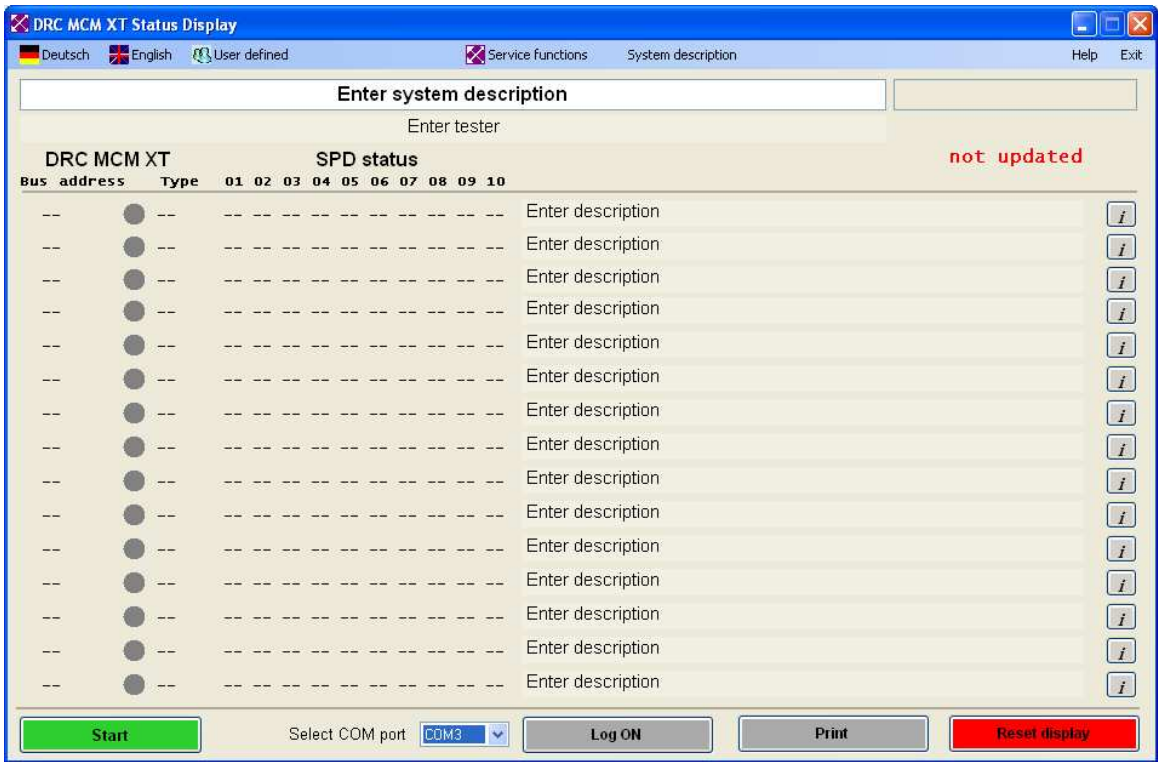


Figure 3 : *DRC MCM XT program Status Display with integrated Service Console*

4 Installation

For installing the programme, the following requirements have to be fulfilled.

4.1 System requirements

A common PC is required with a .NET Framework compatible Microsoft operating system such as

- Windows® 98
- Windows® ME
- Windows® 2000 with SP3
- Windows XP® with SP2
- Windows Vista® with SP1

Please note, that Windows® 95 and Windows® NT will not be supported.

The processor used in the PC should be at least a Pentium III processor, 700 MHz.

The graphic board must support min. 1024x768 pixels and 256 colours.

The minimum capacity of the central memory should be 256 MB. Furthermore, a CD drive and a RS485 interface adapter will be needed.

Installation will require approx. 8 MB fixed-disk storage (or approx. 100 MB if there is no .NET Framework® 2.0 installed yet).

.NET Framework® 2.0, on its part, requires Microsoft Software Installer (MSI) (min. 3.0 Version) as well as Microsoft Internet Explorer (min. 5.01 Version). If not already installed, the DEHN installation program will automatically initiate the download of Microsoft Software Installer and .NET Framework® 2.0 from the Microsoft website and install them on the PC.

This, however, requires access to the Internet to complete the installation procedure.

4.2 Installation procedure

To install the software, the CD delivered has to be put into a CD drive of the PC. The CD drive has then to be opened in Windows® Explorer and the installation procedure has to be started by double-clicking the "**install.bat**" file.

During the installation procedure, the system is checked in the first instance, if .NET-Framework® 2.0 has already been installed. If not, the program will be downloaded from the Microsoft website. Afterwards, the *DRC MCM XT* status display will be installed.

Note:

Before installing the program, the driver delivered together with the required RS485 interface adapter should be installed.

4.2.1 Installing the .NET-Framework® 2.0 environment

If not installed yet, Microsoft Software Installer and .NET Framework® 2.0 will be downloaded automatically from the Microsoft website and their installation will be initiated.

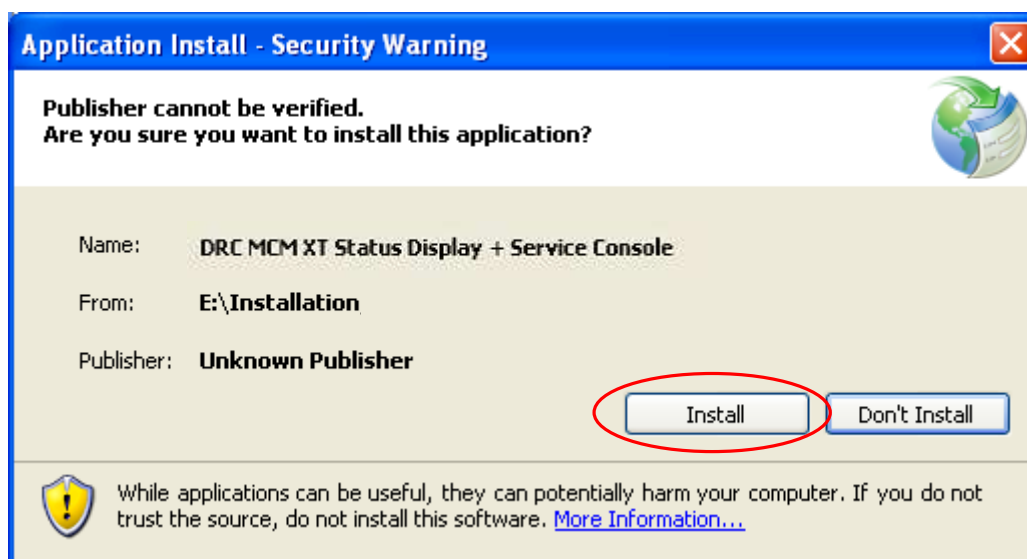
The duration of this procedure highly depends on the capacity of the central memory in the processor as well as the speed of the Internet access (download volume approx. 35 MB), however, at least approx. 5 minutes.

At the beginning of the download, Microsoft points out the terms of licence the user has to accept. After accepting the terms, the download will be started first and then the installation will be initiated.

After installing the software, the installation routine might request the user to reboot the system. After confirming this procedure, the system will be rebooted and the installation of the *DRC MCM XT status display* is then continued automatically.

4.2.2 Installing the *DRC MCM XT status display with integrated service console*

Finally, the *DRC MCM XT status display with integrated service console* is installed.



As soon as the window showing a security warning is opened, click the "Install" button to continue the procedure.

The application is installed and will be restarted automatically afterwards.

5 Operation of "Status Display with integrated Service Console"

When installing the program according to instructions, a new item "DEHN + SÖHNE GmbH + Co.KG." was created in the Windows® start menu under "Program". Clicking this item the program can be started.



The program consequentially consists of the two different function complexes

- *Status Display*

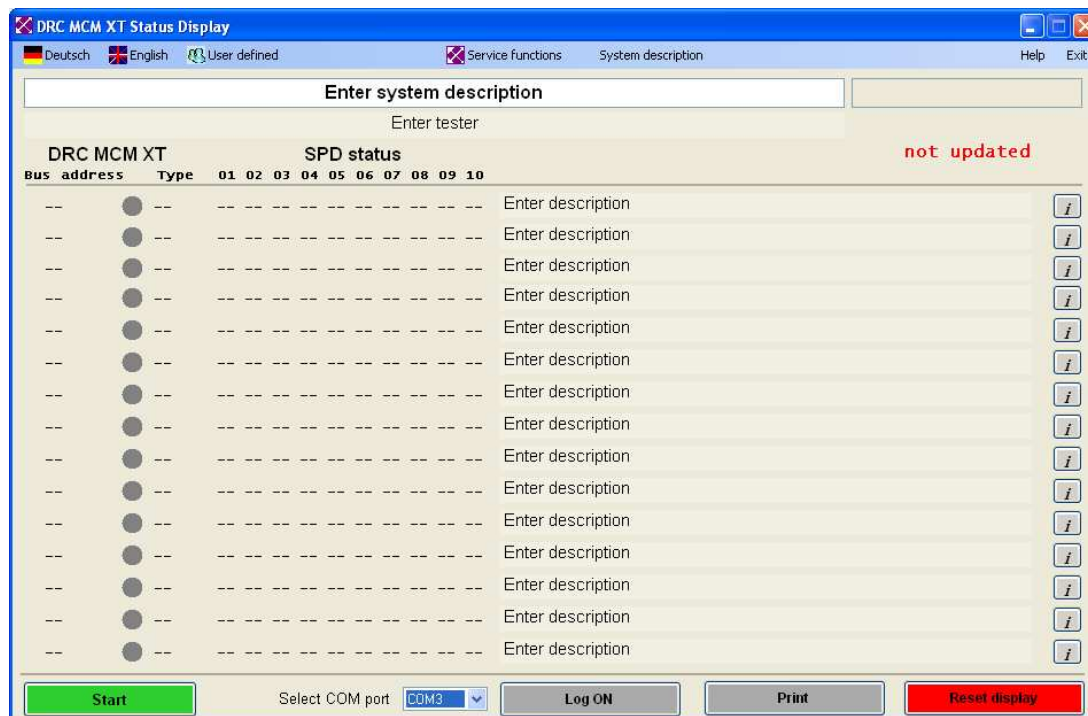
and

- *Service Console*

Status Display and *Service Console* have own user interfaces between which you can toggle.

6 Status Display

After starting the user interface of the *status display* opens and shows the following window.



In the "*Status Display*" mode the program is operated as passive subscriber at the RS485 bus $_{11}$ and is just monitoring the data communication of the *DRC MCM XT* monitoring devices -> "**monitoring mode**".

The *status display* comprises the following functions:

- Central settings for
 - language choice
 - communication settings for the RS485-Bus
- Entering a system description (e.g. headlines, comments, SPD description with type designation and identification no., etc.)
- Saving and loading of system descriptions
- Graphic operating state indication
 - of all *DRC MCM XT* monitoring devices connected to the RS485 bus
 - of all protection modules assigned to a *DRC MCM XT*
- Logging of all state changes of an SPD in a file (log function)
- Printing of the actual system state e.g. as test report

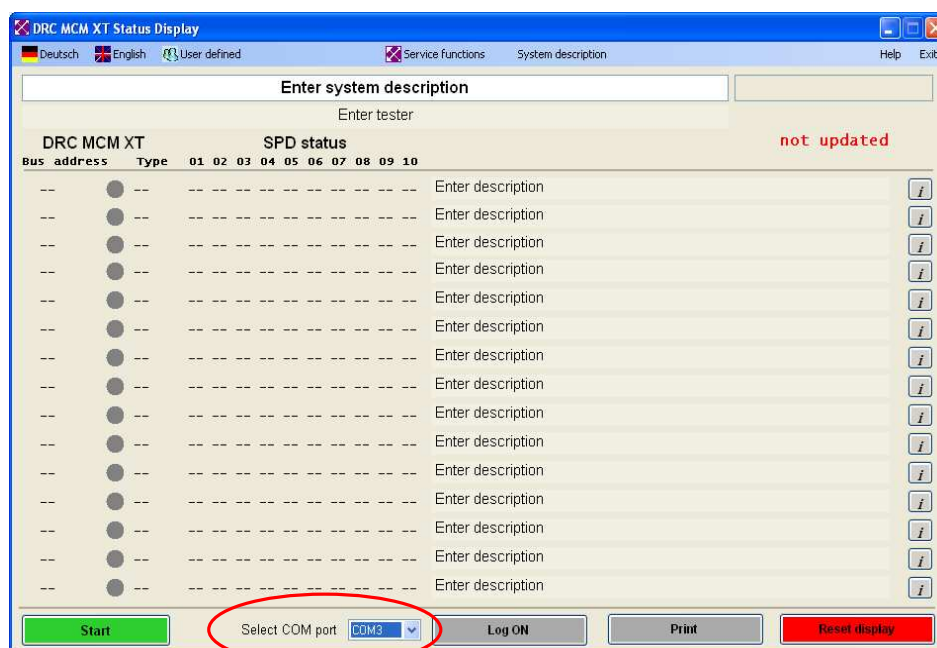
As soon as the program has started, the following settings have to be made.

6.1 Settings for the *Status Display*

Every time after starting the program, the communication interface has to be set first before using the program.

6.1.1 Setting the communication interface

In order to enable the program to determine the current state of the *DRC MCM XT* monitoring devices and the assigned surge protection modules for indication, the program has to listen in the data communication of the monitoring devices (via the RS485 bus) (thus the program is a passive bus subscriber). For this purpose, it has to be ensured under "**Select COM-Port**" that the correct communication port was selected for the RS485 interface adapter, as otherwise no connection can be established.



The same COM port as determined before in the system control has to be selected (refer also to 11).

It has to be really ensured that:

- the PC laptop is connected with the RS485 bus of **DRC MCM XT** via the installed RS485 interface adapter
- the monitoring devices are activated and started

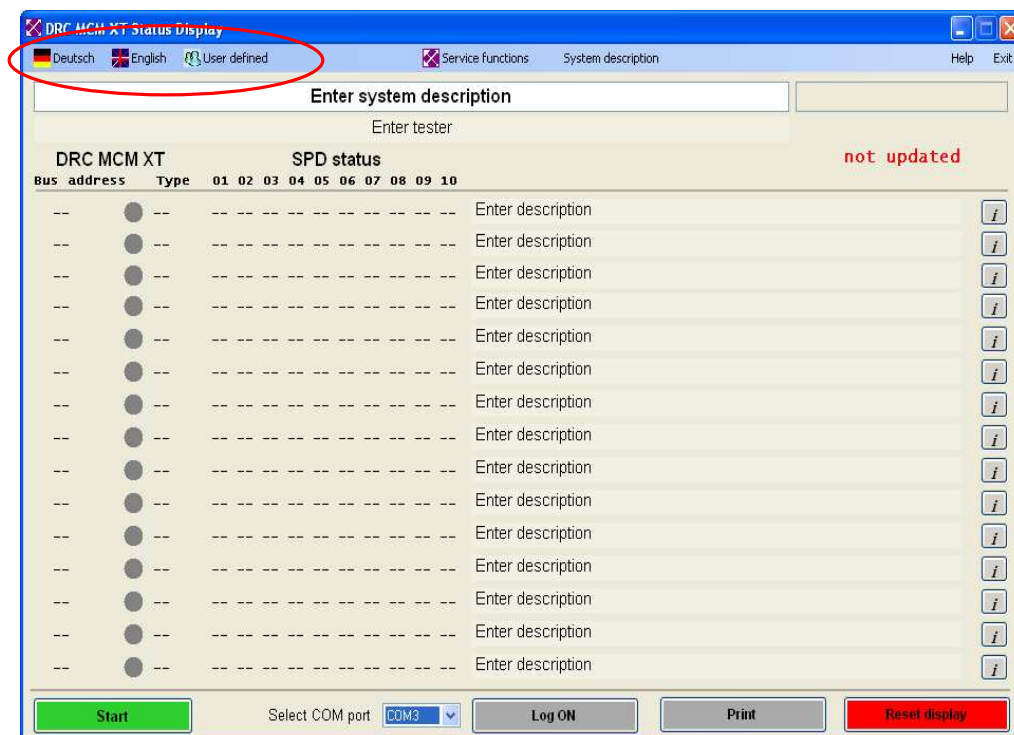
The RS485 interface adapter is automatically loaded and activated by Windows® as soon as the interface adapter is plugged in. The driver will also be deactivated with every switch-off or disconnection and deleted from memory. The interface can then no longer be addressed although it might still be indicated.

If the interface cannot be addressed any more despite of still being connected, plugging the interface adapter out and in again might often help. After a short period of time, the COM port can be set again under "**Select COM port**".

6.1.2 Language selection

The program contains texts in German and English. At the first starting, the program checks automatically which regional and language options are set in the Windows® system control. If the set language is not German, the program automatically selects "**English**" as preferred setting and starts in this language.

The preferred language can always be selected on the menu bar of the program.



Additionally any other language the user determines can be installed. For this purpose the user first has to extend a prefinished form file which includes all needed texts in English by the texts in the language he prefers.

The file "**user_defined_language.txt**" has the following structure:


```
[user defined texts]
DRC MCM XT Status Display=?1
DRC MCM XT Service Console=?2
Select COM port=?3
Please select COM port first=?4
bus address=?5
type=?6
SPD status=?7
Enter description=?8
Enter title=?9
.....
```

The texts in the wanted language will be entered after the English text as from the "?".

Example (French) :

Enter description = ?8 -> Enter description = **Entrer la désignation**

Entering is effected with a suitable text editor (e.g. MS Wordpad). All available character sets can be used for entering. The use of character sets *from "foreign local schemes"* (e.g. Chinese) follows the specifications of MS Windows® (see brief instruction 6.1.3).

The user provided language file can be selected and loaded after pressing the -  button. Switching to the corresponding language will be promptly.

Note :

In the form data file all foreign language texts are preoccupied with a "?" and a current number. If the loaded file remains unchanged the current number allows for determining the position of the respective text within the user surface.

6.1.3 Use of local schemata (locales) in MS Windows®

In the following a brief summary on the use of local schemata (locales) in MS Windows®. A detailed help file is available in MS Windows®.

Entering and display of foreign character sets

=====

A.) Settings in MS Windows®

- 1.) System control -> Select regional and language options
- 2.) Select register '*Language*'
- 3.) Additional language support -> Select as required
- 4.) Text services and entering languages -> Click... Details ->
 - a.) Under register '*Settings*' -> Installed services -> required input area schemes
 - b.) under register '*Extended*' -> Compatibility configuration -> Select '*Support extended text services in all programs*'

B.) Editing of the text file '*user_defined_language.txt*'

- 1.) Open data file (e.g. with Windows Editor or Wordpad)
- 2.) Select desired area scheme
- 3.) Enter texts in the desired language after the ' = '
- 4.) Save the data file
 - !!! Make sure that the file is saved as Unicode text document
 - a.) e.g. with Windows Editor :
 - use '*Save under*'
 - Type of file = '*Text files(*.txt)*'
 - Coding = Unicode
 - b.) e.g. with Windows Wordpad
 - use '*Save under*'
 - Type of file = Unicode text dokument

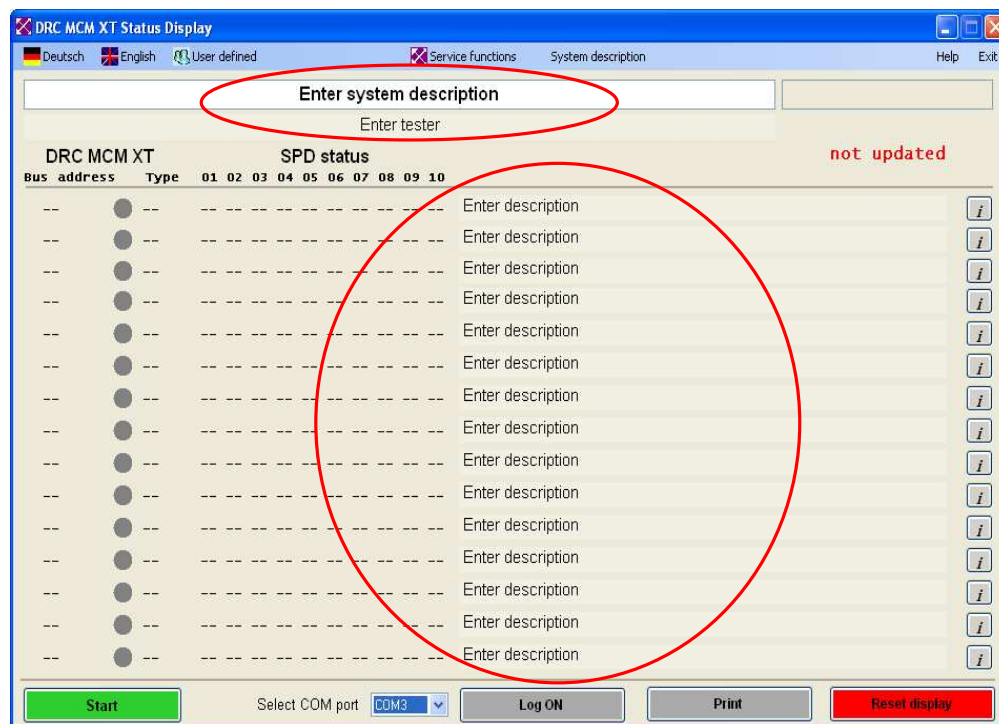
C.) Entering the system description/SPD description within the program

- 1.) Select the desired area scheme as under B.)
- 2.) Enter the texts
- 3.) Save data with menu level '*System description -> Save project*'

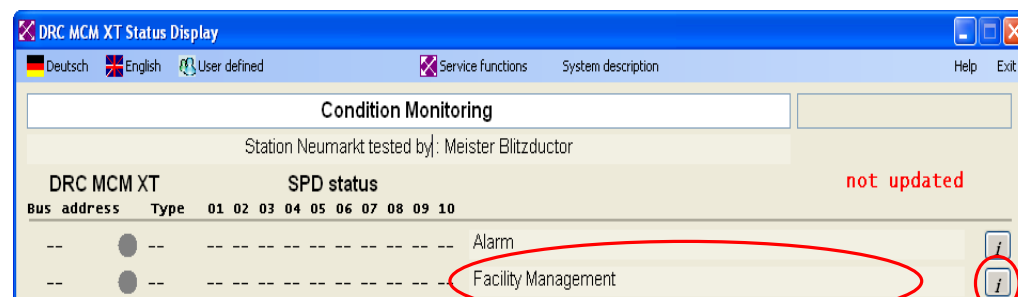
6.2 Entering the system description

In a next step texts according to the user's requirements can be entered in the provided fields (see also 6.1.3).

The monitored system, for example, can thus be clearly described (e.g. in the field provided for entering the title), the name of the person in charge and the assignment of the *Blitzductors*® can be determined. The texts are used both in the log and as a screen copy.



For each of the maximum 15 monitoring devices of a *DRC MCM XT* a short description (e.g. place of installation) can be entered in the operating surface. Double-clicking the short description or clicking one of the respective buttons on the right of the operating surface a window opens where the description of all SPDs assigned to this monitoring device can be entered.



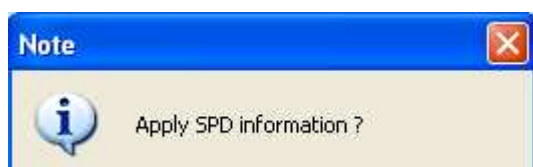
SPD information

Condition Monitoring

DRC MCM address Description

	SPD No.	SPD type	Ident No.	Terminal designation	Comment
	01	BXT ML 4BD	920342	R 21-AC	
▶	02	BXT ML 4BD	920342	R 21-AB	exchanged 17.07.2008
	03				
	04				
	05				
	06				
	07				
	08				
	09				
	10				

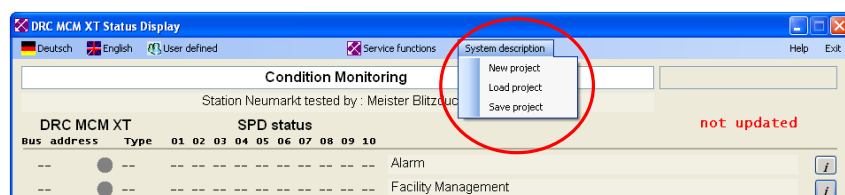
For safety reasons entering of texts is blocked per default. Clicking the button **"Modification approval"** texts can be entered again or changed. After release the button colour shows RED and the button signals **"Apply entries"**. After clicking the button **"Apply entries"** the texts are taken over into the program. This button also blocks the input automatically again. The texts saved in the program, however, are only saved in the respective file on saving the system description (see following section). Clicking the button **"Close"** quits the window SPD description. Before the window closes, as a precaution, the option of acceptance of the possibly changed texts is indicated again. Text changes not accepted, they are cancelled on closing of the window.



All text inputs can be filed on the PC in an arbitrary data file as system description (menu level **"System description"**).

Thus an own data file can be created, administrated and saved for each monitoring system (menu levels **"New project"** and **"Save project"**). At any time the system description can be read into the Status Display again (menu level **"Load project"**).

When creating a new project, the presets for the texts are reloaded.



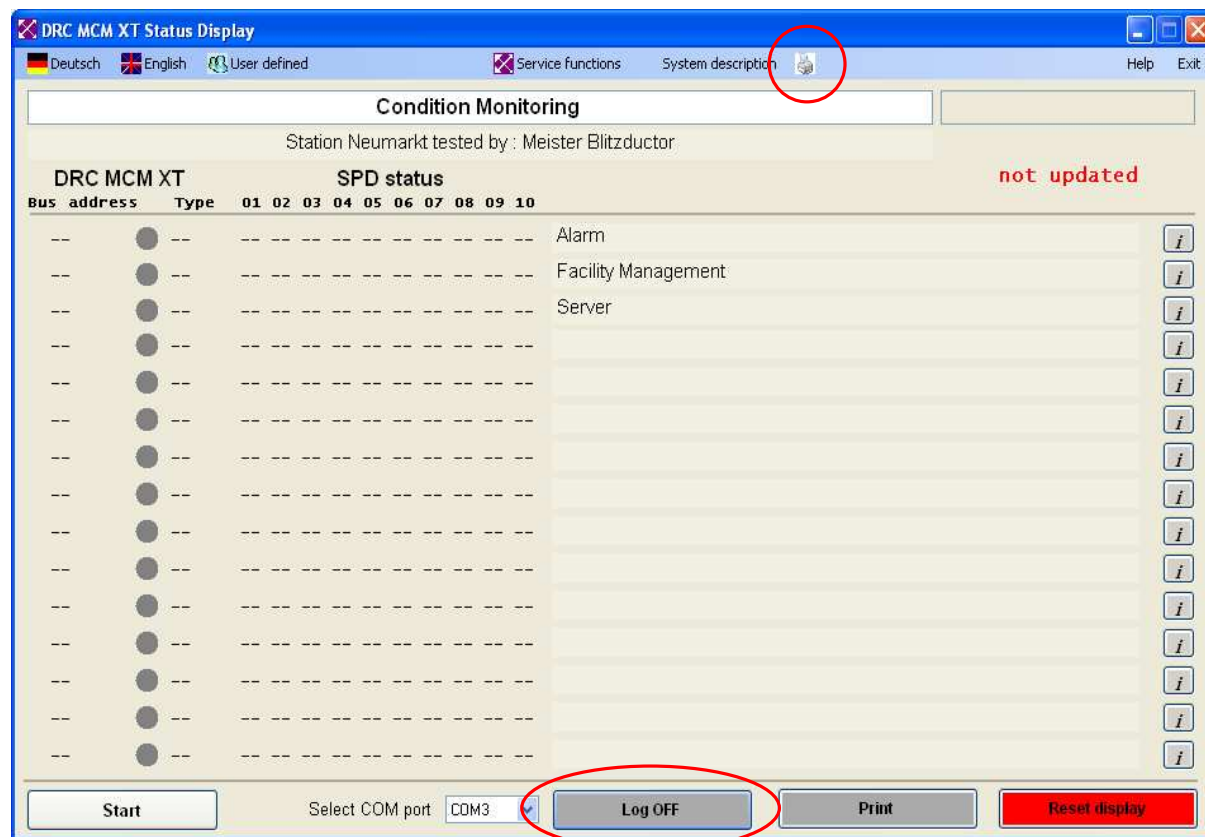
6.3 Loading the last program settings

Except for the first program start, both, the last-used language and the last-used system description are automatically loaded at any following program start.

6.4 Activating the log function

The Status Display allows for the logging of the status change of all *DRC MCM XT* monitoring devices or of the assigned SPDs in a file on the PC. After clicking the **"Log ON"** button any file can be selected where the **status changes** are stored in form of a clear text.

As soon as the logging is activated the button shifts to **"Log OFF"** and in the menu bar a printer is iconed.



After closing the log function or the status display, this text file can be opened and printed with the according program (e.g. Editor Notepad, Wordpad, MS Word etc.) (see also 6.9)

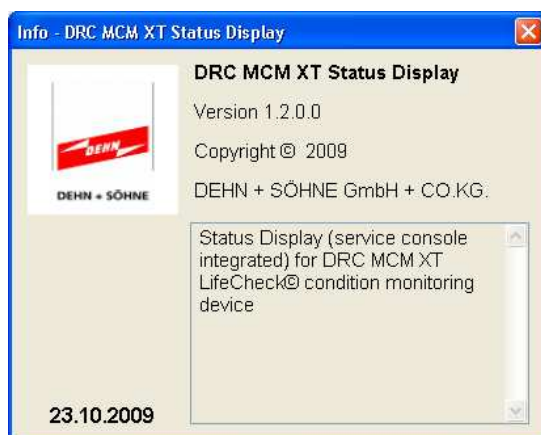
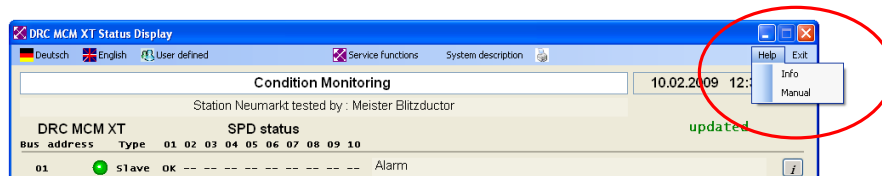
```
log-file started : 06.03.2008 - 14:40:35
Condition Monitoring Station Neumarkt
tested by : Mr. Blitzductor
06.03.2008 - 14:40:35 started with 01: OK OK OK OK -- -- -- --
06.03.2008 - 14:40:44 started with 02: OK OK -- -- -- -- --
06.03.2008 - 14:40:44 started with 03: OK OK -- -- -- -- --
06.03.2008 - 14:40:44 started with 04: -- -- -- -- -- -- --
06.03.2008 - 14:40:44 started with 05: -- -- -- -- -- -- --
06.03.2008 - 14:40:45 started with 06: -- -- -- -- -- -- --
```

Note:

If beside the SPD status changes also the initial state of the system shall be logged, it is absolutely necessary to activate logging before the first clicking of the **"Start"** button (see 6.7.1).

6.5 Help function

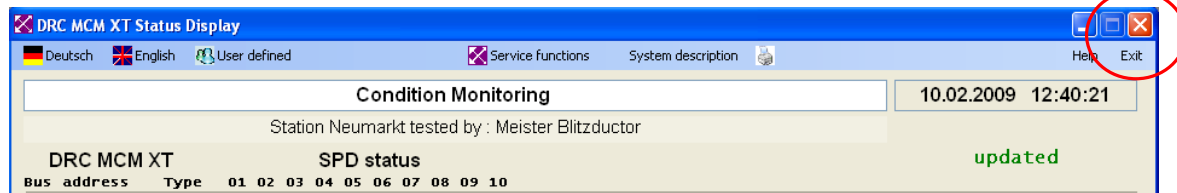
Clicking the **"Info"** button on the **"Help"** menu level opens a window showing information about the program version, date of issue and provider, or choosing the **"Manual"** button, this document can be opened as online operating manual.



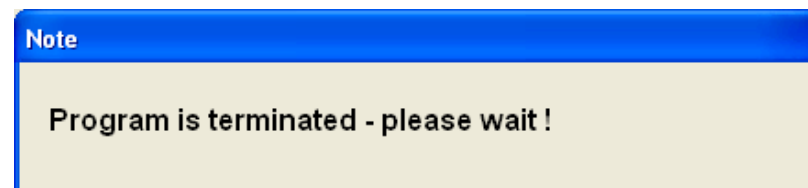
To be able to read the operating manual a reading program has to be installed on the PC which is capable of indicating pdf files with the file extension **".pdf"**, e.g. Adobe Acrobat Reader).

6.6 Exit program

The program is ended either by clicking the menu level **"Quit"** or the **"Exit"** button.



Whenever the program is closed the last-used system descriptions, the last-used language and the used COM part is saved, then the used RS485 bus interface is deactivated. As this process can take some time, a reference display window opens.



6.7 Status monitoring and status indication

Main task of the program is the graphical status display of

- all *DRC MCM XT* monitoring devices connected to the RS485 bus
- all protection modules assigned to a *DRC MCM XT*

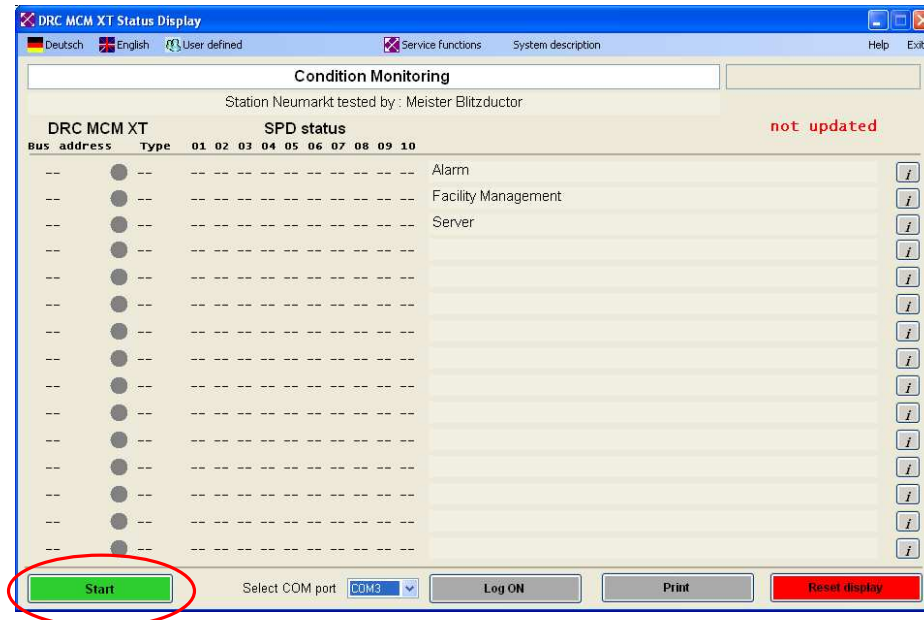
6.7.1 Starting status monitoring and status indication

If the PC is connected to the RS485 bus correctly, the status monitoring and status indication can be started for all *DRC MCM XT* devices connected to the bus and of all *Blitzductors*® assigned to them, by clicking the **"Start"** button.

After clicking the **"Start"** button the program can listen into the data communication of the *DRC MCM XT* monitoring devices at the RS485 bus (passive bus device) and uses the transmitted operating state reports for establishing a current operating state indication for all bus devices and protective devices assigned to them.

For this "**Monitoring**" operation it is necessary that

- exactly one monitoring device is active as "master" at the bus I/I
- all other monitoring devices work as "slave"



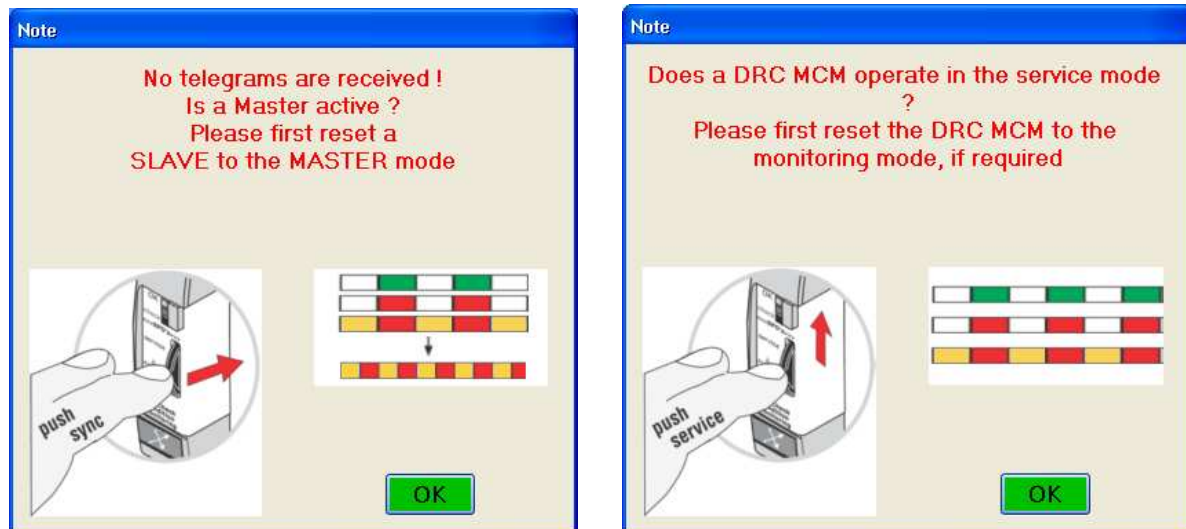
The user is responsible for the setting of the respectively required operating state.

During the background processing, the program is continuously monitoring,

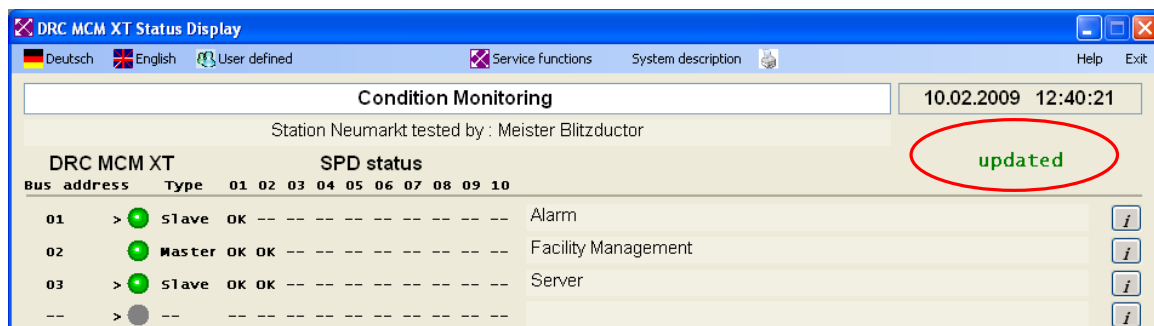
- that a "master" is active at the bus
- whether illegal telegrams for the "monitoring" operation are being received.

Whenever an illegal operating state will be detected, a display window opens informing the user about the possible reason and maybe requiring him to remedy the faulty system state.

The display window has to be confirmed by clicking the "OK" button. If the user does not confirm within approx. 1 minute, the display window closes automatically and the program will be continued.



Whenever receiving an operating state report the current PC time will be shown. As soon as the status of all monitoring devices connected to the bus are available, the status display changes its operating state indication from "**not updated**" to "**updated**" (see below).



6.7.2 Status display

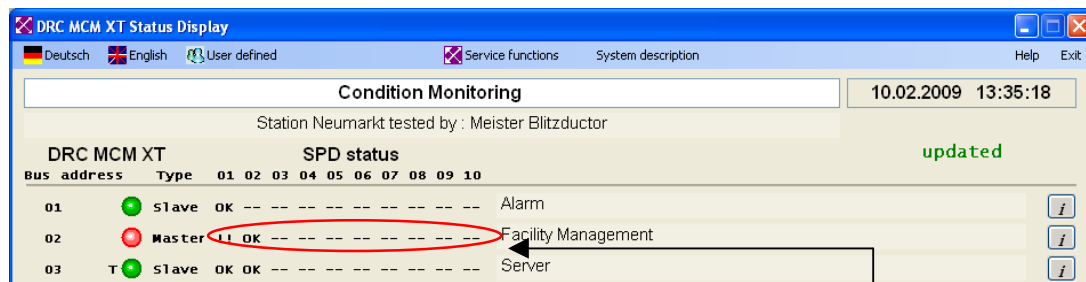
The status display indicates the own operating state of each correctly working *DRC MCM XT* and the operating state of the Blitzductors assigned to it.

6.7.2.1 Status of *DRC MCM XT* monitoring devices

The following information will be indicated for each monitoring device:

- Bus address (01 to max. 15)
- Current process (testing of *Blitzductors*® in process, status updating in process)
- Overall status of all assigned *Blitzductors*® (starting, all OK, to be replaced)

- Function as bus device (master or slave)



See 6.7.2.2.

- Function as bus device
- Overall status of all protective devices in this group
- all OK
 - one or more SPDs to be replaced
 - device in starting sequence (not yet testing)
- Current process:
- T = Testing of *protective devices*
 - > = Updating status
- Bus address/group no.

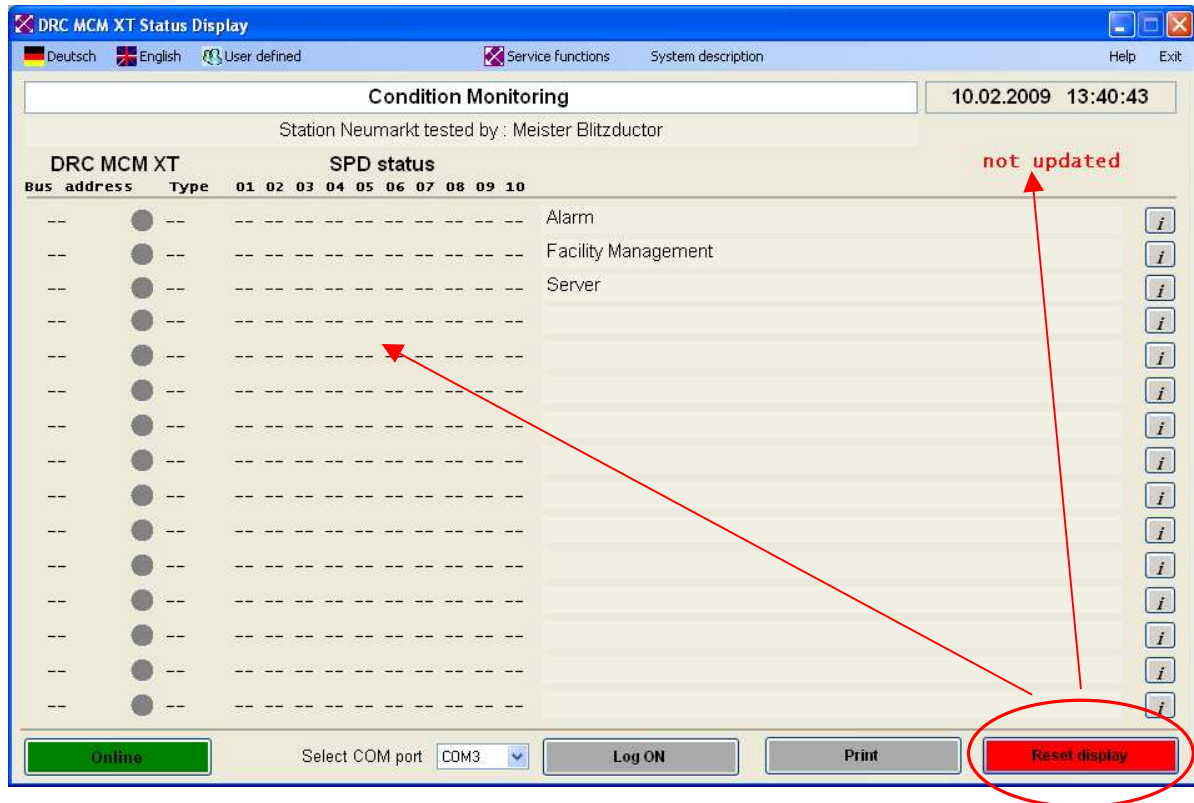
6.7.2.2 Status of the protective devices (*Blitzductors*®)

For each monitoring device the status of max. 10 assigned *Blitzductors* will be indicated as follows:

- OK** = *Blitzductor*® works correctly
- !!** = *Blitzductor*® has to be replaced
- = *Blitzductor*® not configured (no monitoring activated)

6.7.3 Resetting the operating state indication

Clicking the **"Reset display"** button, the *status display* will be reset and all existing operating states will be deleted (corresponds to the operating state before clicking the start button, status = undefined). A possibly activated logging (see 6.4) will not be affected.



This function can be used appropriately for monitoring and tracking the correct testing of all components.

Note:

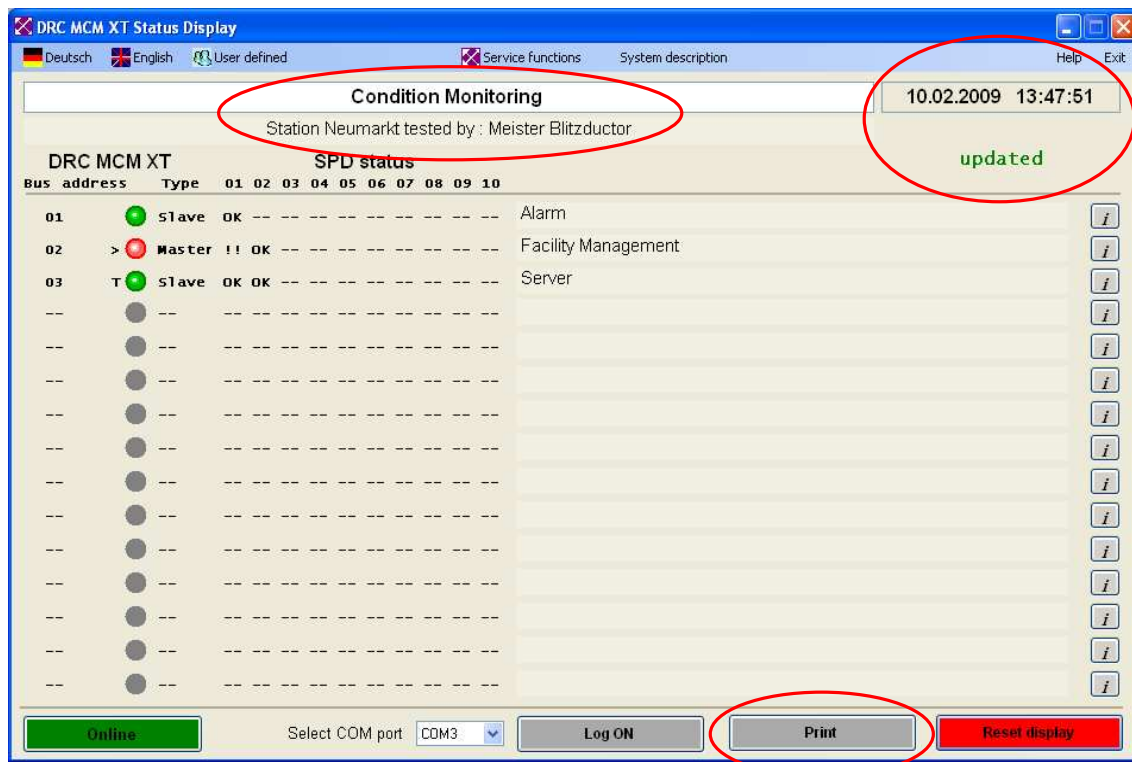
If the program doesn't receive a status telegram within a predefined period of time (approx. 2 minutes), in case of a bus failure, for example, all operating states will be automatically reset to **"undefined"** (- -).

6.8 Printing the current system status (test report)

Clicking the **"Print"** button, a window is opened for printing. Here, the printer can be selected for indicating the current operating state of the status display.

This function can be used for compiling a test report. For this purpose, the following requirements must be fulfilled:

- All operating states are updated (indicating **"updated"**)
- Current date and time are indicated
- System / installation site is clearly marked
- Name of the person in charge was filled in



6.9 Evaluating the log file

If the status log function was activated (**"Log ON"** button – see 6.4) the program stores all **status changes after starting the log function** in form of a clear text in the file selected for this purpose.

Note:

If beside the status changes also the the initial status of the installation shall be recorded, the logging has to be activated first, before operating the **"Start"** button (see 6.7.1).

After deactivating the logging or closing the status display, this file can be opened and printed by means of a compatible program (e.g. Editor Notepad, Wordpad, MS Word etc.).

It contains the following information:

```

SPDstatus.log - WordPad
Datei Bearbeiten Ansicht Einfügen Format ?

log-file started : 06.03.2008 - 14:40:35
Condition Monitoring Station Neumarkt
tested by : Mr. Blitzductor
06.03.2008 - 14:40:35 started with 01: OK OK OK OK -- -- -- --
06.03.2008 - 14:40:44 started with 02: OK OK -- -- -- -- --
06.03.2008 - 14:40:44 started with 03: OK OK -- -- -- -- --
06.03.2008 - 14:40:44 started with 04! -- -- -- -- -- -- --
06.03.2008 - 14:40:44 started with 05! -- -- -- -- -- -- --
06.03.2008 - 14:40:45 started with 06! -- -- -- -- -- -- --
06.03.2008 - 14:40:45 started with 07! -- -- -- -- -- -- --
06.03.2008 - 14:40:45 started with 08! -- -- -- -- -- -- --
06.03.2008 - 14:40:45 started with 09! -- -- -- -- -- -- --
06.03.2008 - 14:40:45 started with 10! -- -- -- -- -- -- --
06.03.2008 - 14:40:46 started with 12! -- -- -- -- -- -- --
06.03.2008 - 14:40:46 started with 13! -- -- -- -- -- -- --
06.03.2008 - 14:40:46 started with 14! -- -- -- -- -- -- --
06.03.2008 - 14:40:46 started with 15! -- -- -- -- -- -- --
06.03.2008 - 14:41:57 02: !! OK -- -- -- -- -- -- --
06.03.2008 - 14:42:33 01! -- -- -- -- -- -- -- Connection lost
  
```

Bus address

SPD Status

Operating status ! = SPD status not updated
: = SPD status updated

Text entered

In 1st line (head line – preferably system identifier / installation site)

In 2nd line (supplementary information – e.g. inspector)

Starting time (logging)

Status changes consisting of :

Bus address of *DRC MCM XT* + new operating state with date/time

Initial status when starting the logging

Note:

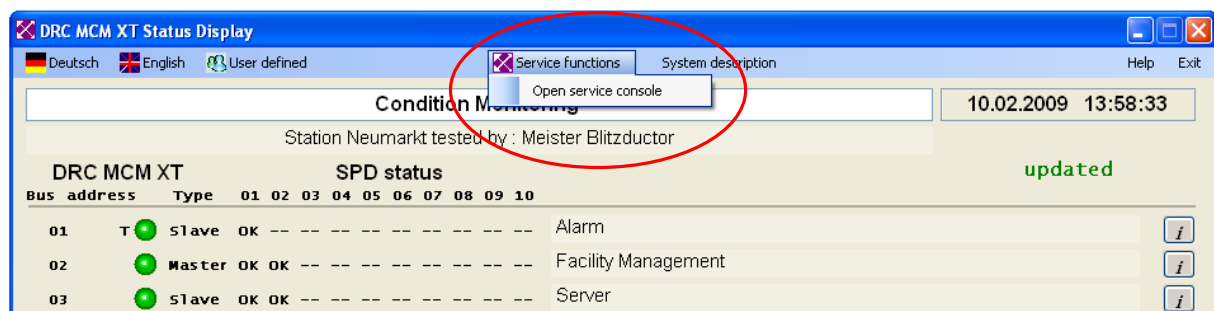
If logging was activated before the first clicking of the "**Start**" button, both, the status changes and the initial operating state of all *DRC MCM XT* devices was saved. These lines are marked with the additional text "**started with**".

If the connection to a *DRC MCM XT* device is interrupted, the status of all *Blitzductors*® assigned will be reset to "**undefined**" (- -).

If there is no updated test result available for a *DRC MCM XT* device (e.g. because a device is started or the connection was interrupted) the processing state will be marked with "!" (no updated test result available).

6.10 Changeover to Service Console

Clicking the menu level "**Service funktionen**" and "**Open service console**" you can change to the user surface of the functional complex "*Service Console*". Calling this user surface the *Status Display* will be closed and its functionality is no longer available.



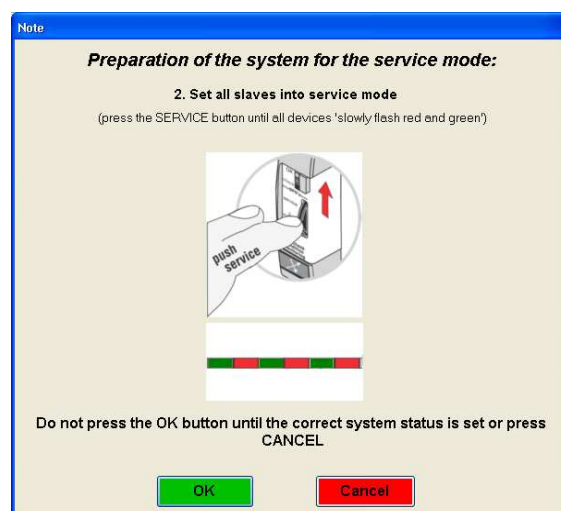
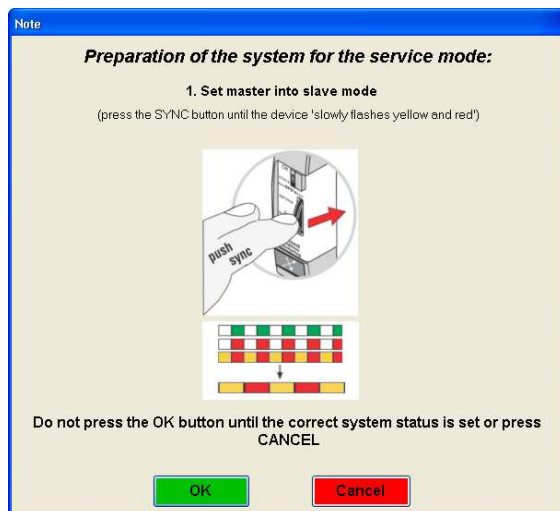
7 Service Console

In "**Service** mode" the PC as active bus device takes the "bus-master-function" and offers the following functionality on the *Service Console*:

- General testing of all protection modules assigned to a *DRC MCM XT*
- Single testing of a protection module
- Determining the current number of a protection module
- Programming of the protection modules of a *DRC MCM XT*
- Reprogramming of a protection module (to as-delivered state)
- Inquiring the version number of the *DRC MCM XT* monitoring device

To ensure that the user is setting the system into "Service mode" a window is opened where the user has to confirm that for the *service console* operation:

- *the DRC MCM XT, which was configured as 'master' has been reset to the 'slave mode'*
- *all DRC MCM XT devices have been set into the 'service mode'*



After confirmation by clicking of the "OK" button, the main window of the *DRC MCM XT Service Console* opens.

DRC MCM XT Service Console

Condition Monitoring

Select bus address Description

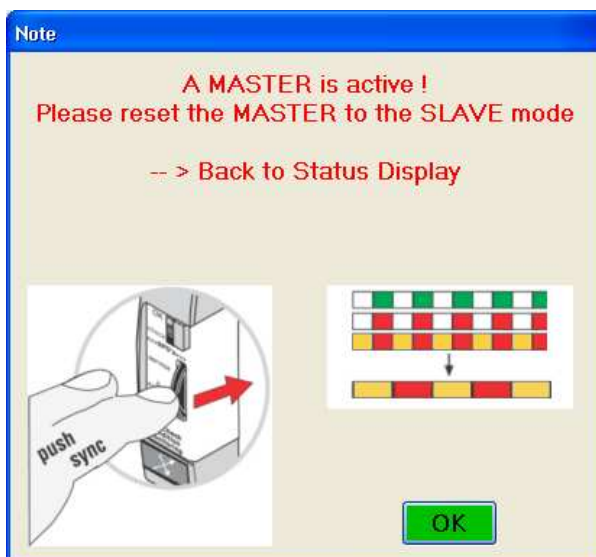
Select command Select SPD

Continue Cancel Exit

Send command

During the background processing, the program is continuously monitoring that no "master" is active at the bus.

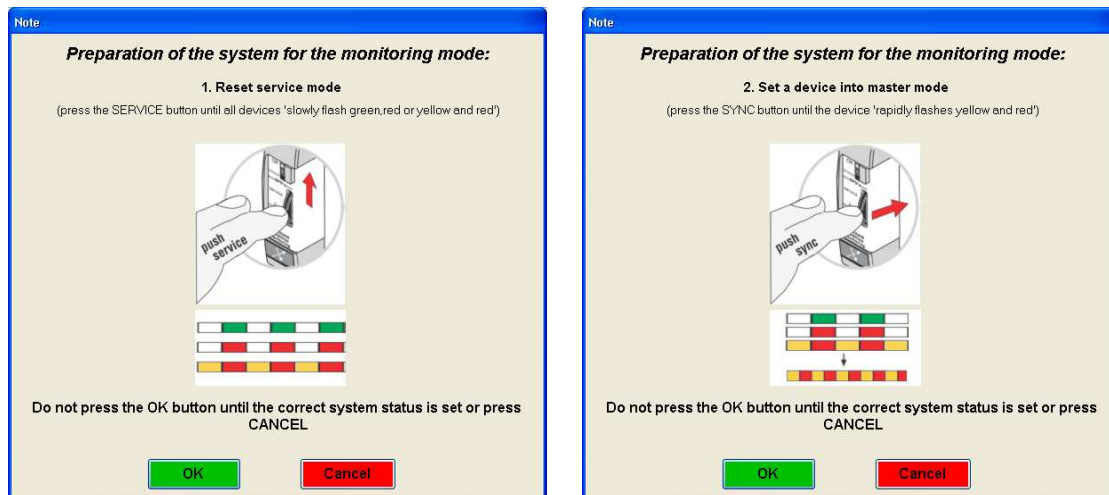
Whenever an active "master" is detected, a display window opens informing the user that the program will return to the *Status Display* in order to avoid faulty states.



After the display window has been confirmed by clicking the "OK" button, the *Service Console* will be closed and the *Status Display* opened again.

When closing the Service Console display windows will open, indicating stepwise that after finishing the tests with the *DRC MCM XT Service Console*:

- the 'service mode' has to be quit on all *DRC MCM XT* devices
- one of the *DRC MCM XT* devices has to be reset to the 'master mode'



After finally clicking the "OK" button, the *Service Console* closes and the *Status Display* opens.

7.1 Settings of the service console

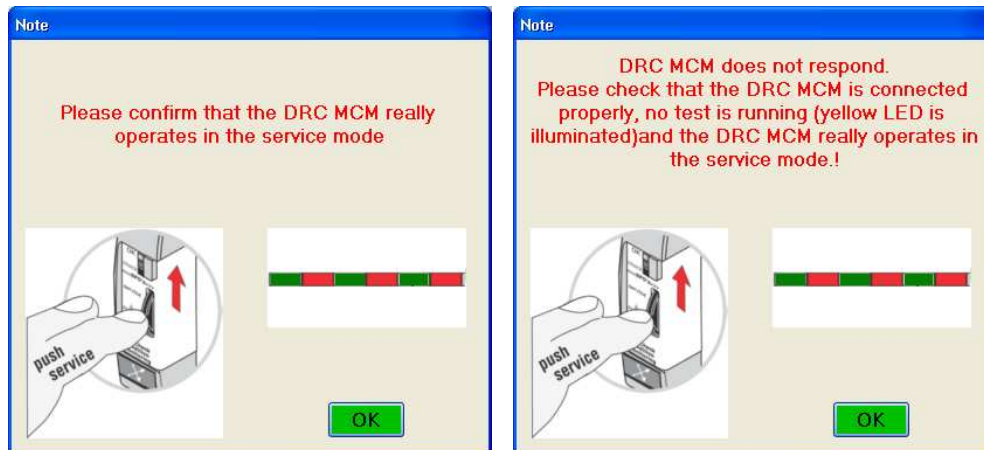
The settings of the language selection and the communication interface are automatically taken over by the status display. Additionally only the bus address of the monitoring device to be checked has to be set.

7.1.1 Setting of bus address of *DRC MCM XT* monitoring device

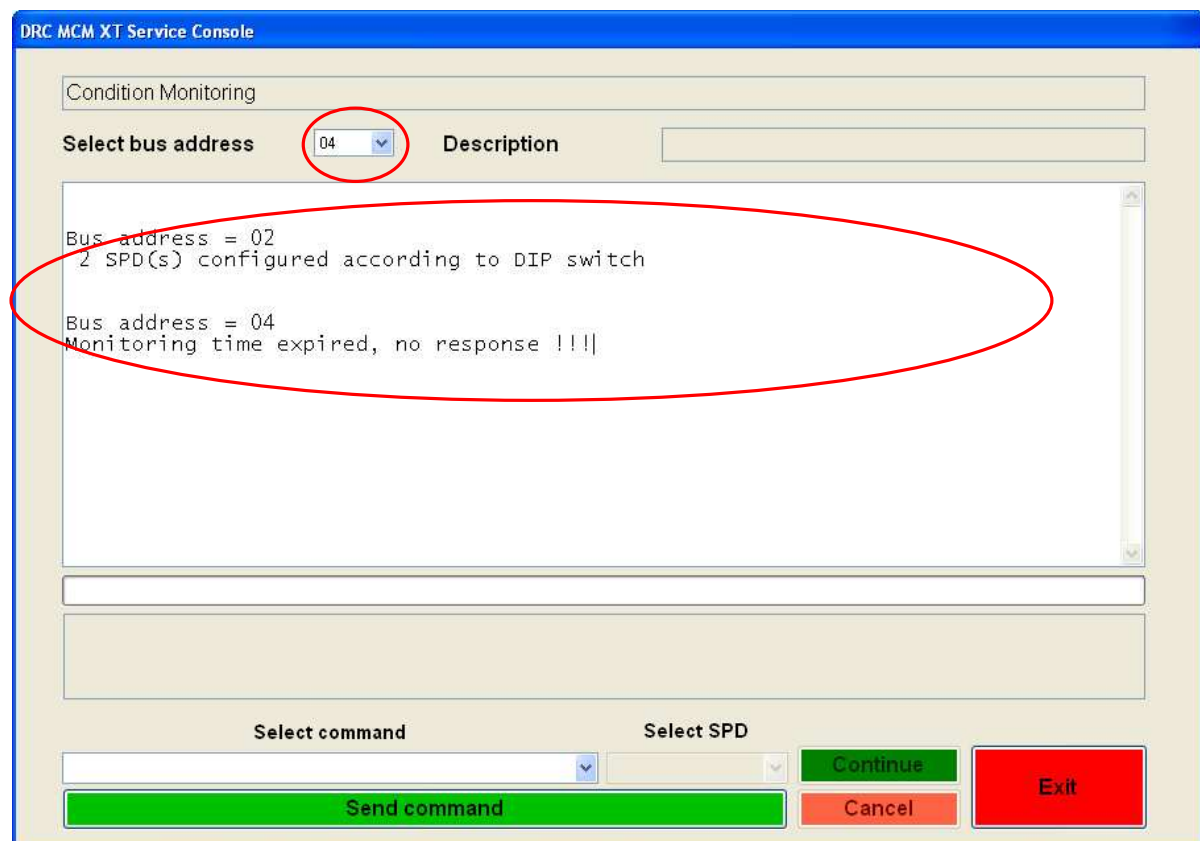
Monitoring devices can only be addressed via the set bus address (see 11/). Before communicating with a monitoring device and data exchange is possible

- its bus address has to be set by "**Select bus address**"
- the monitoring device has to be shifted to the "Service mode" (see 11/)

After each setting of a bus address, a display window opens requesting the user to confirm that the respective *DRC MCM XT* is in „service“ mode before the *DRC MCM XT* will be connected (see Fig. Page 32 top left).



Connection being successful the number of the *Blitzductors*[®] configured for this *DRC MCM XT* is indicated. In case of fault a warning is shown in the main window and an additional window displays possible reasons of fault (see top right figure).



7.2 General operating procedure

The general procedure of performing a test command will be described in the following. A detailed description of the available test commands can be taken from 7.3.

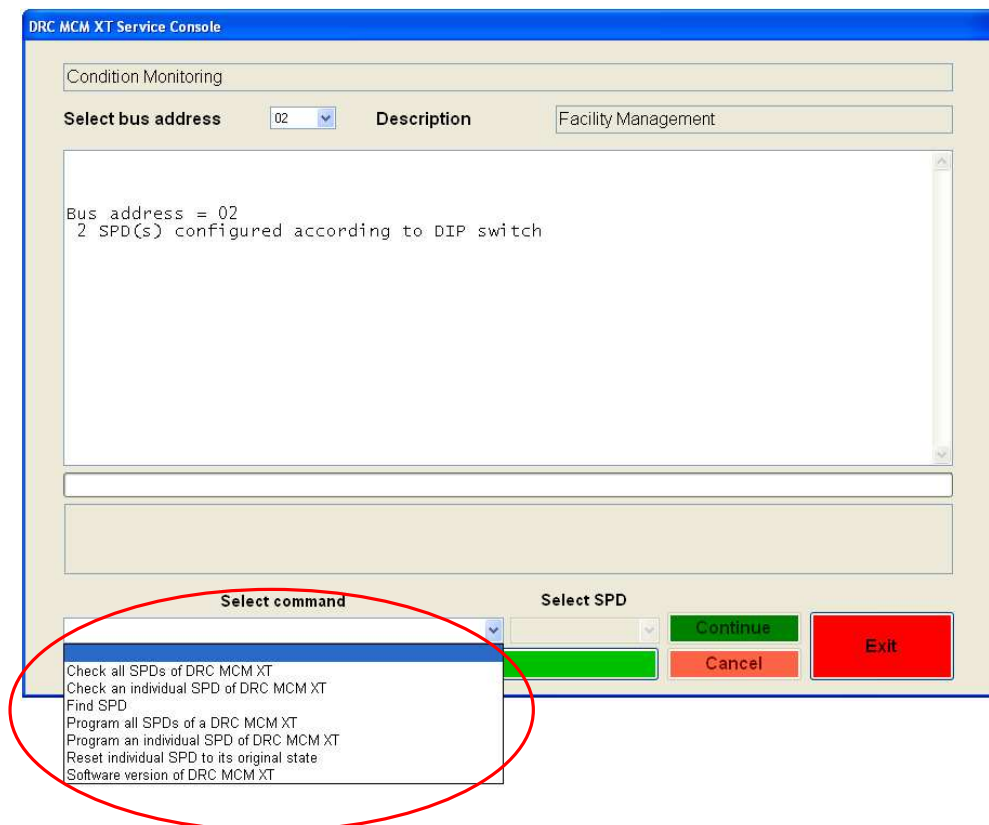
7.2.1 Requirements for testing

The following list states again the requirements for successfully performing a test command:

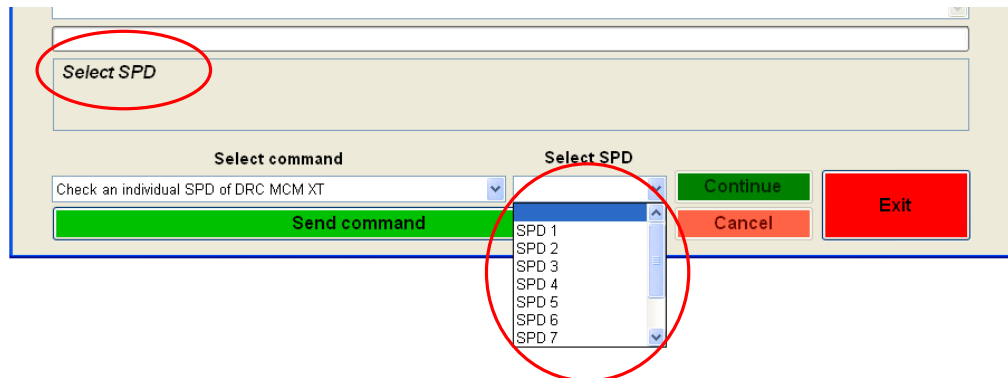
- Correct connection of the RS485 interface adapter between PC or laptop and RS485 bus system of the monitoring devices
- The correct COM port was selected for the RS485 interface adapter in the status display (see 6.1.1)
- All monitoring devices are in the "slave mode" (the PC or laptop assumes the "master" function)
- Monitoring devices to be tested are in the "service mode"
- The bus address of the respective monitoring device to be tested is set correctly (see 7.1.1)

7.2.2 Preparing and sending a command

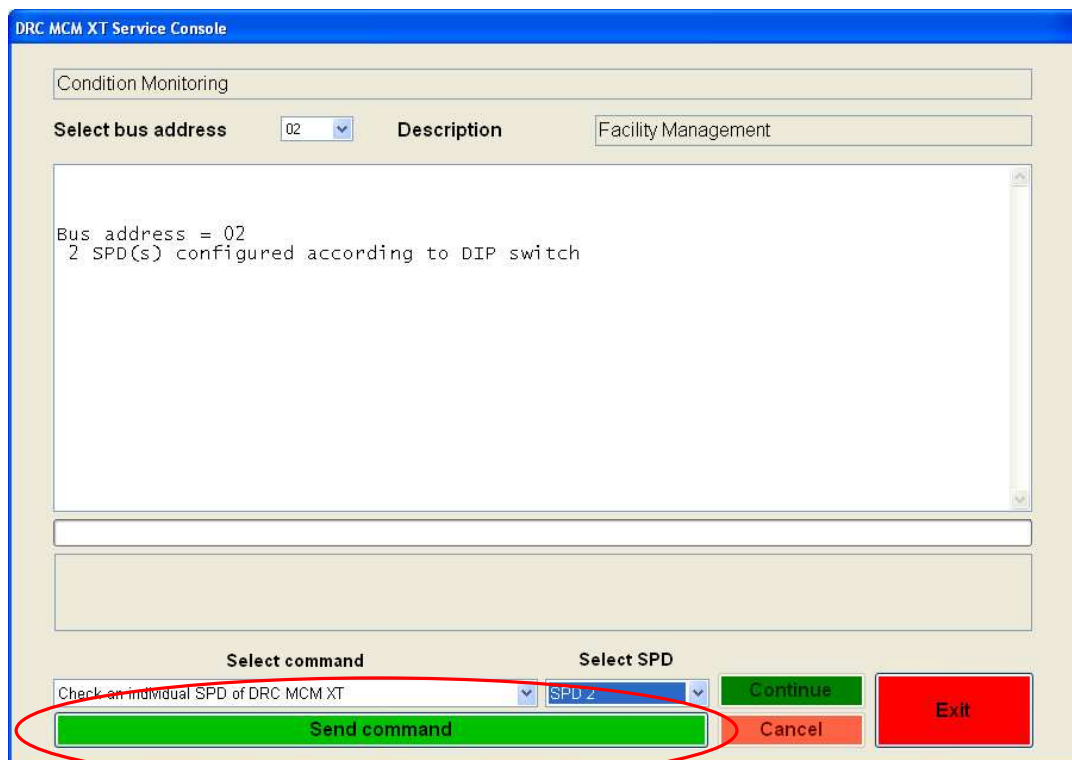
If all requirements are fulfilled, the requested test command can be selected in the next step.



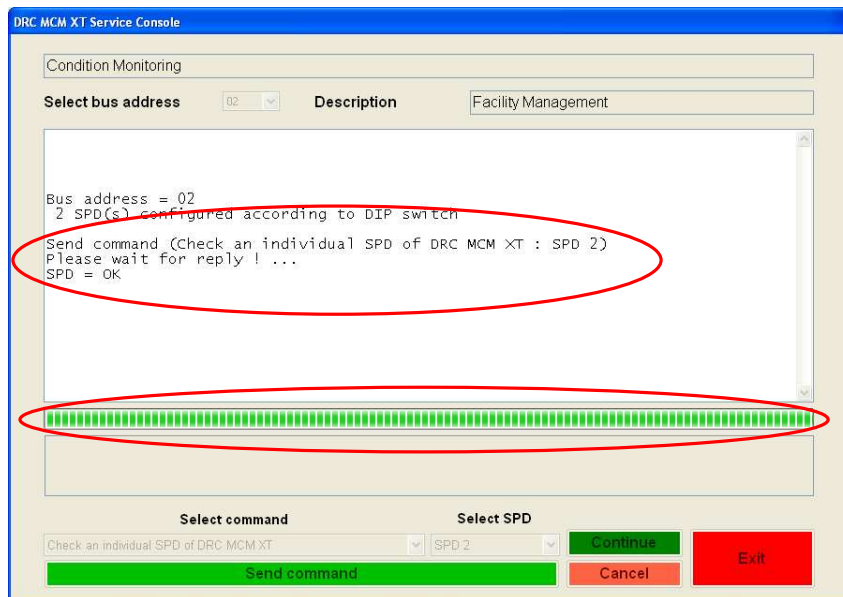
If the test command requires another parameter it will be specified in the index line. This parameter now can be selected accordingly.



Click the "**Send command**" button to perform the test command.



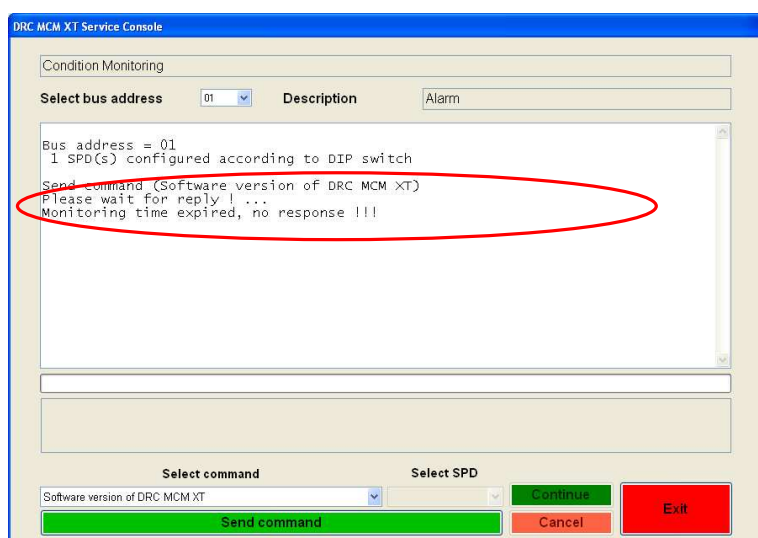
Performance of the test command and the test result will be shown in the main window of the *service console*.



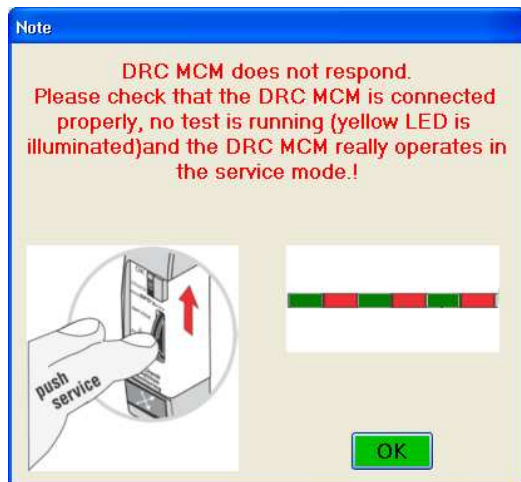
Note:

When executing the test command, a command specific maximum answer control time is started. The end of this control time is indicated as progress-bar notice directly under the main window of the service console. While carrying out the test command the service console is locked for any accepting of further commands. Only after arrival of the answer on *DRC MCM XT* monitoring device or in case of fault after expiration of the answer control time, this input blocking is released again.

Due to the internal program flow, test commands cannot be accepted by the monitoring devices any time (e.g. during the time-critical test of the RFID transponders, any accepting of test commands is blocked – yellow permanent light of LED at the *DRC MCM XT*). For this reason test commands without reaction possibly have to be repeated.



If there is no feedback on a test command, a display window shows possible reasons of fault, which the user has to confirm.



Tip:

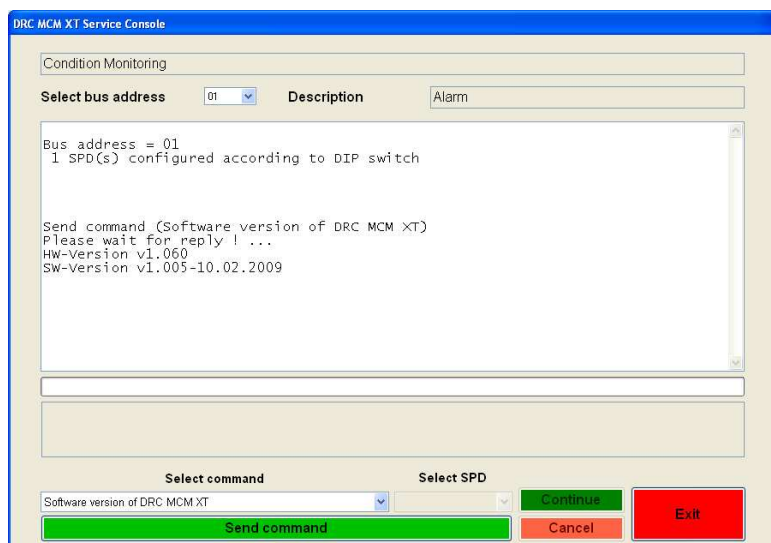
For the purpose of a test run documentation, the contents of the main window (includes all commands as well as the corresponding answers) can be copied after marking as usual in MS Windows®, and pasted into other documents such as MS Word® data files, for example.

7.3 Function of the service console

The following describes the available test commands with respect to the required input as well as output of the result.

7.3.1 Inquiring the version number of a *DRC MCM XT* monitoring device

Call of the test command "**Software version of *DRC MCM XT***" is performed without parameters by clicking the "**Send command**" button after selecting the command. The service console shows the hardware version number as well as the software version number and the date of issue.



With SW version v1.008 the DRC MCM XT allows for acknowledgement of the remote signalling contact (see 4.1). In the "Acknowledgement performed" state, the text **"FM acknowledged"** will be attached to the software version when reading out the version number.

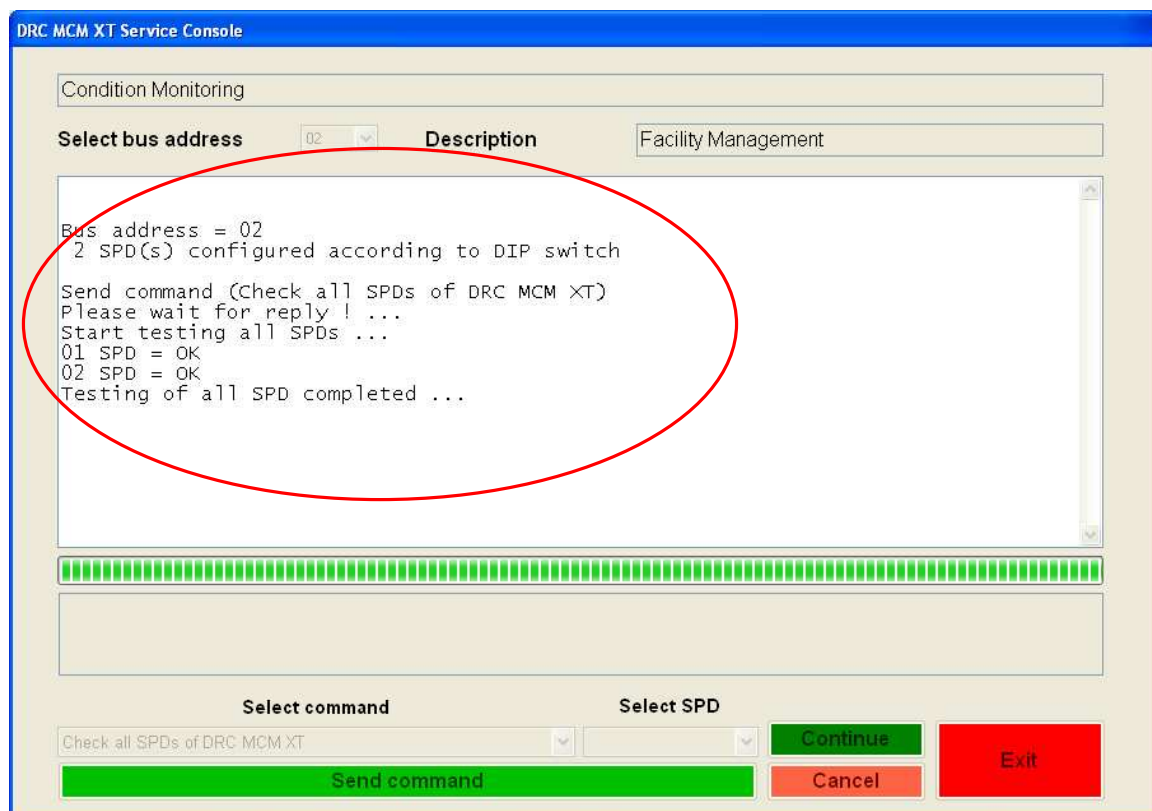
Example:

HW version v1.062

SW version v1.008-2009/10/12-**FM acknowledged**

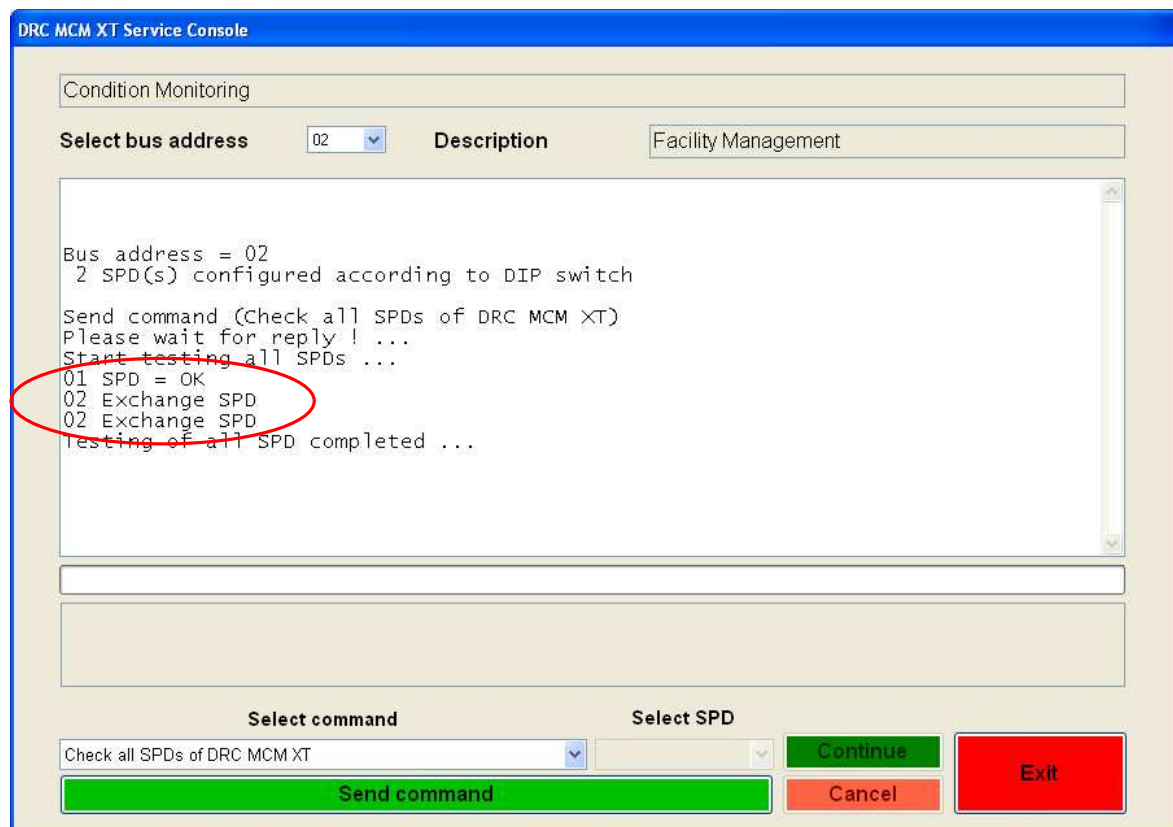
7.3.2 General test of all protection modules assigned to a *DRC MCM XT*

Call of the test command **"Check all SPDs of DRC MCM XT"** is performed without parameters by clicking the **"Send command"** button after selecting the command. The *service console* shows the test result for each of the assigned protection modules (quantity corresponding to the setting of the DIP switches at the *DRC MCM XT*)



The above figure shows that all protection modules work correctly.

The following figure, for example, shows that protection module No. 02 has to be replaced.

**Note:**

In order to exclude wrong results due to sporadic interferences of the RFID field, every protection module is tested several times. If all tests have a negative result, "**Exchange SPD**" will be displayed for the respective protection module. As soon as one of the tests provides a positive result, "**OK**" is indicated for the respective protection module.

Protection modules defined as faulty (in all tests), will be tested again in a second test cycle (see serial number 02 in the above figure). The result of the second test cycle then defines the operating state of the protection module.

7.3.3 Single test of a protection module

Call of the test command "**Check an individual SPD of DRC MCM XT**" is performed with parameter by clicking the "**Send command**" button after selecting the command. The serial number of the protection module to be tested has to be selected as parameter. Depending on the test result "**OK**" or "**Exchange**" is displayed for the assigned protection module.

The screenshot shows the 'DRC MCM XT Service Console' window. At the top, there's a 'Condition Monitoring' tab. Below it, 'Select bus address' is set to '02' and 'Description' is 'Facility Management'. A large text area displays the following log:

```

Bus address = 02
2 SPD(s) configured according to DIP switch

Send command (Check an individual SPD of DRC MCM XT : SPD 1)
Please wait for reply ! ...
SPD = OK

Send command (Check an individual SPD of DRC MCM XT : SPD 2)
Please wait for reply ! ...
Exchange SPD

```

Below the log, there are two dropdown menus: 'Select command' (set to 'Check an individual SPD of DRC MCM XT') and 'Select SPD' (set to 'SPD 2'). At the bottom, there are four buttons: 'Send command' (green), 'Continue' (green), 'Cancel' (red), and 'Exit' (red).

7.3.4 Determining the current number of a protection module

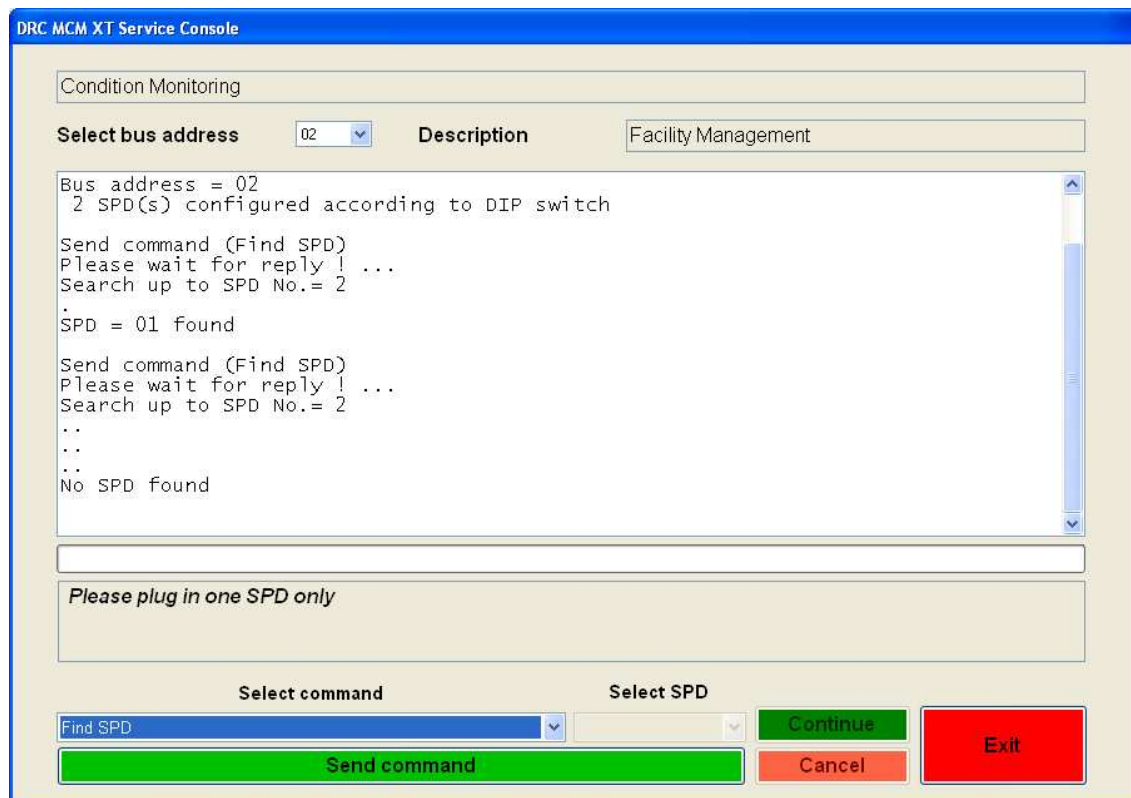
If neither the current SPD number of a *Blitzductor*[®] nor the current status is known, if necessary both of the information can be determined by means of test command **"Find SPD"**. The call is performed without parameters by clicking the **"Send command"** button after selecting the command.

Search starts with the current SPD number 01 and ends as soon as a *Blitzductor*[®] was found, latest, however, as soon as all according to configuration capacity existing *Blitzductors*[®] were called.

Depending on the test result, either the current number of the found and functioning *Blitzductors*[®] will be displayed by **"SPD = xx found"** or, if no functioning *Blitzductor*[®] was perceived, the *service console* only displays **"no SPD found"**.

Note:

When determining a protection module there may be no other protection module within a circle of approx. 25 cm around the *DRC MCM XT*, as otherwise the protection module can not be clearly identified.

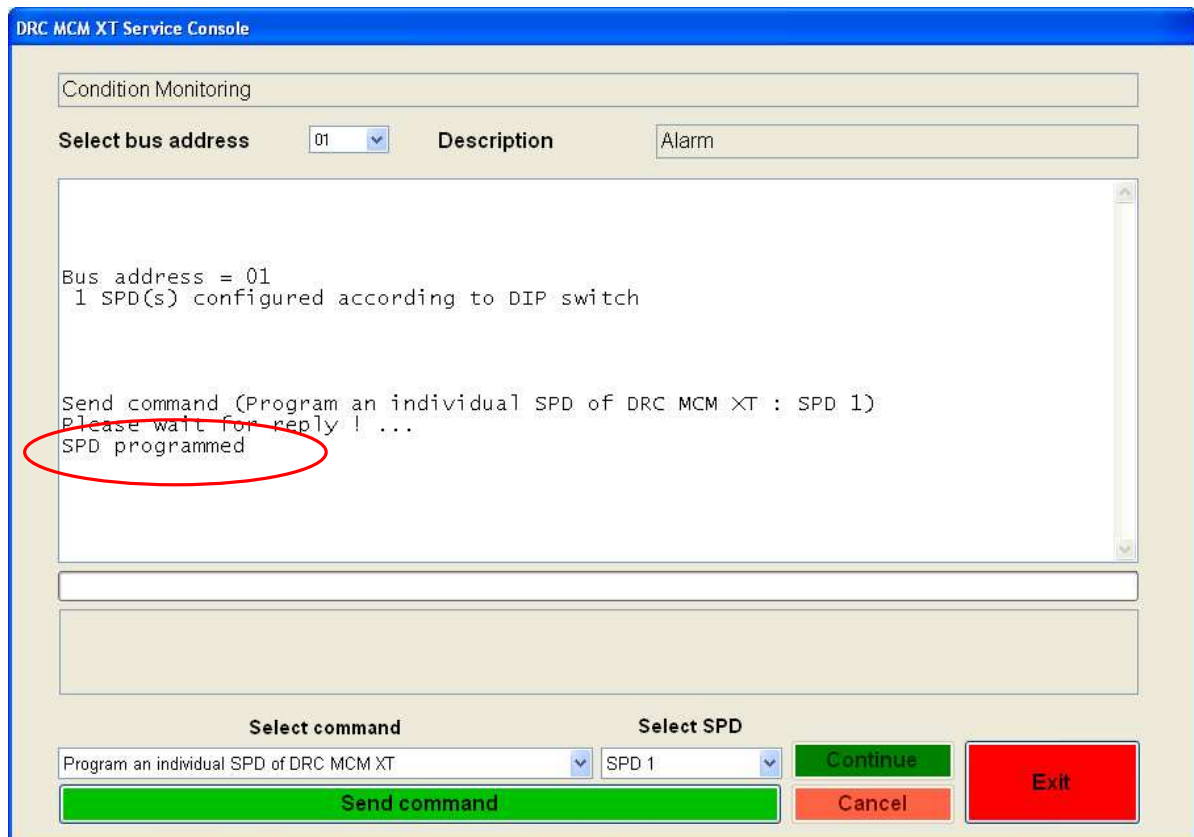


7.3.5 Programming a protection module

In as-delivered status *Blitzductors*[®] XT and CT cannot be used with one *DRC MCM XT* at the same time. The *Blitzductors*[®] will be assigned to the respective monitoring device by correspondingly programming of the RFID transponders in the *Blitzductor*[®]. When programming them, a definite password for each transponder containing the bus address of the assigned monitoring device and the serial number of the respective *Blitzductor*[®], is generated and stored in the transponder. During operation, the transponder then reacts only upon inquiries containing its password.

The *Blitzductors*[®] are programmed by means of the test command "**Program an individual SPD of DRC MCM XT**". The call is performed with parameters by clicking the "**Send command**" button after selecting the command. The parameter to be selected is the serial number of the protection module to be programmed.

Depending on the result of the test following the programming, either "**SPD programmed**" or in case of fault "**Programming failed**" will be displayed on the *service console*.



If programming was successful an additional window opens which requests for input of the SPD labelling (which contains the now valid bus address and the current SPD number).

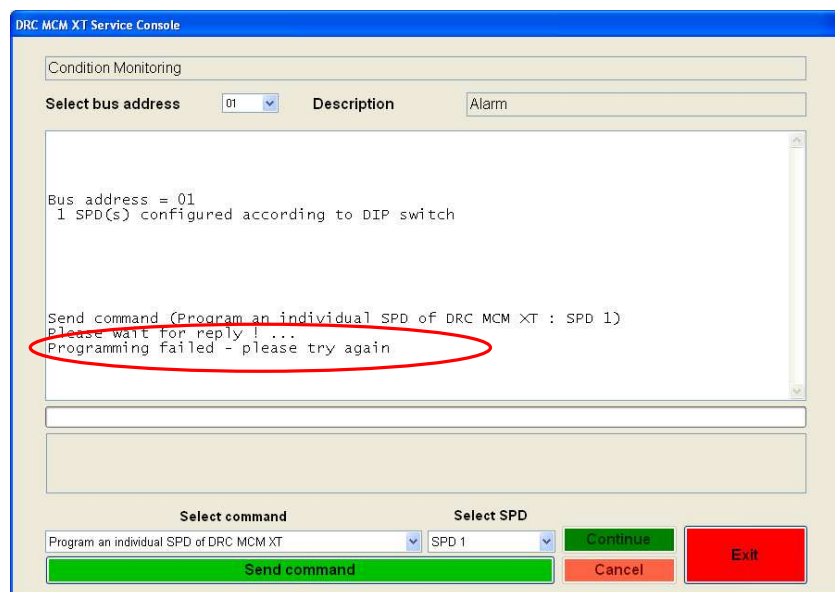
By marking the check box ("Do not show this window again") the reference display window will not be opened any more before the program is stated again.



Programming can fail due to the sporadic influence or interference of the RFID field during the procedure of programming. Another trial, however, can be successful.

Note:

When programming a protection module, there may be no other protection module within a circle of approx. 25 cm around the *DRC MCM XT* monitoring device.

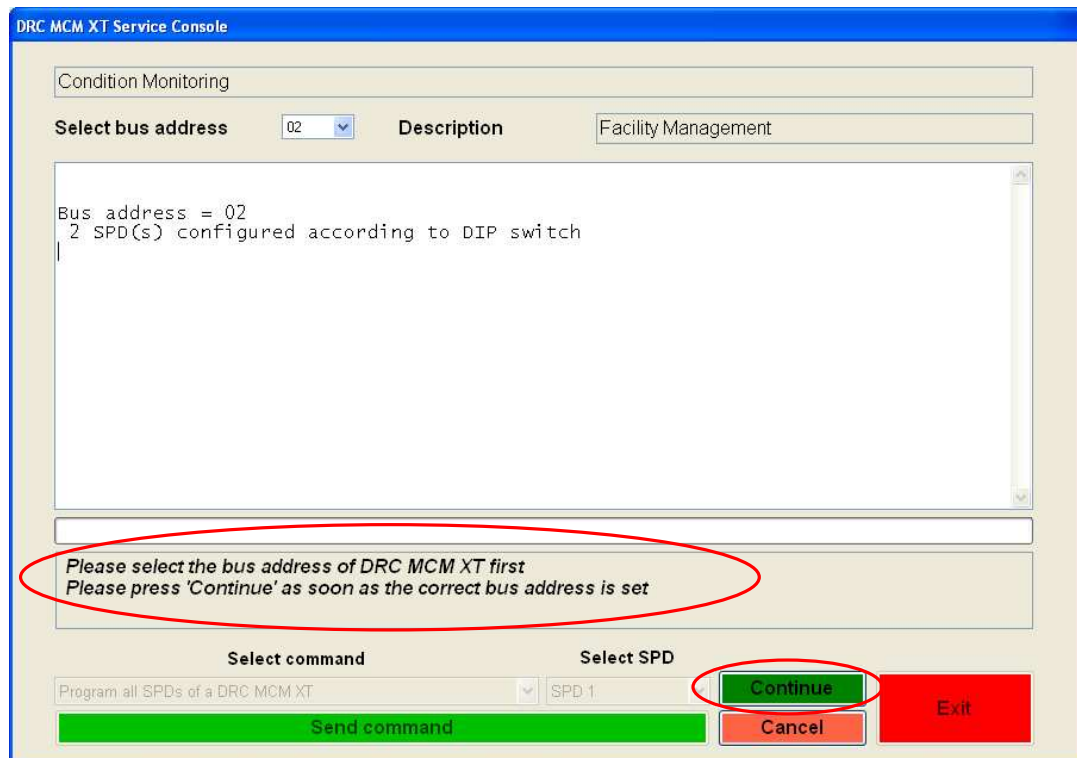


7.3.6 Programming all protection modules of a *DRC MCM XT*

This test command as a kind of 'batch mode' with user prompting allows to program all protection modules assigned to a *DRC MCM XT* monitoring device in one pass. This command thus provides only one flow frame for the test **command "Program an individual SPD of *DRC MCM XT*"** already known from 7.3.5.

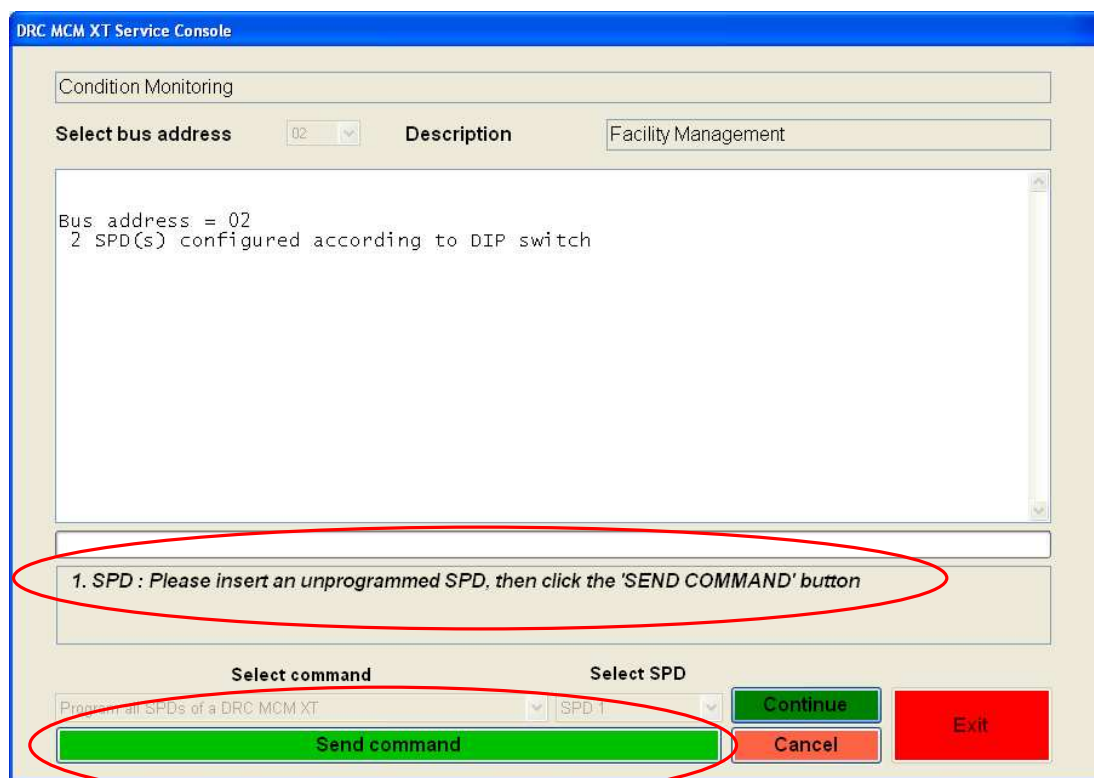
By indicating notes for further proceeding, the user is led step by step in the programming of all protection modules assigned to a *DRC MCM XT*. Clicking of the **"Continue"** button, programming of the next protection module is started or the process is stopped by clicking the **"Cancel"** button. The following describes the different steps by means of the corresponding screenshots.

Call of the test command **"Program all SPDs of a *DRC MCM XT*"** is performed without parameters after selecting the command.

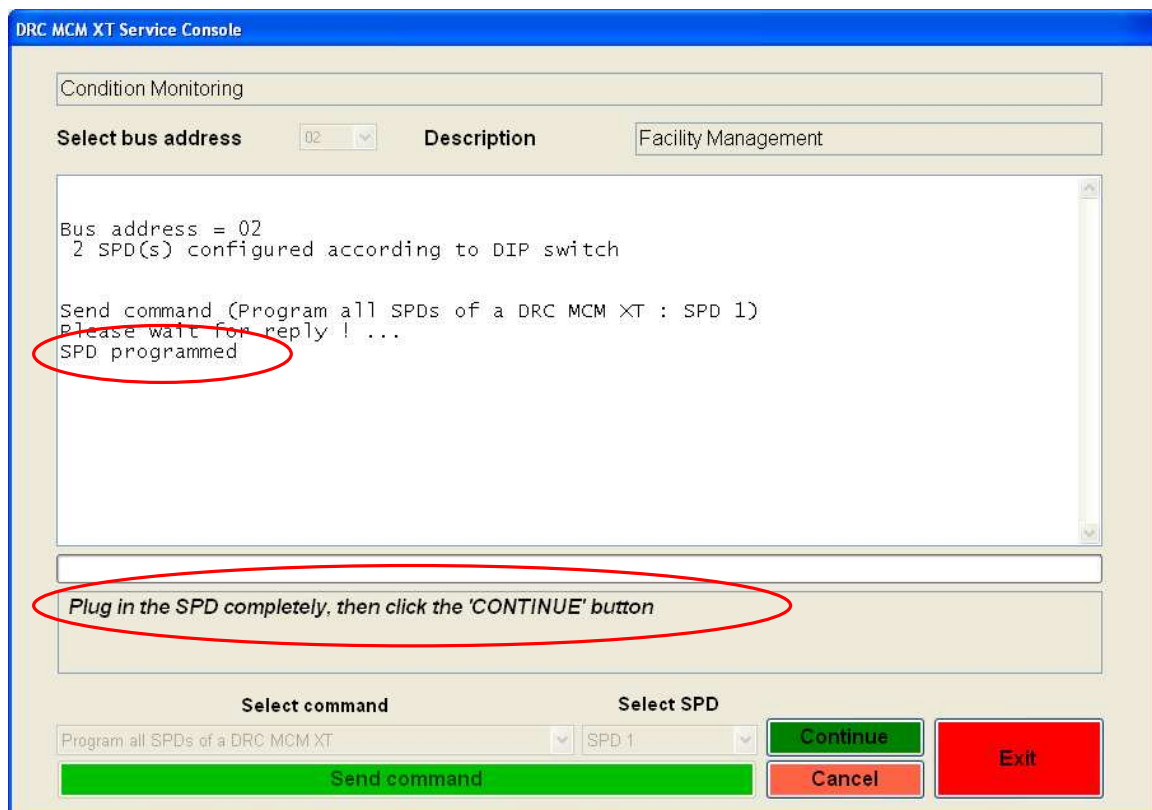
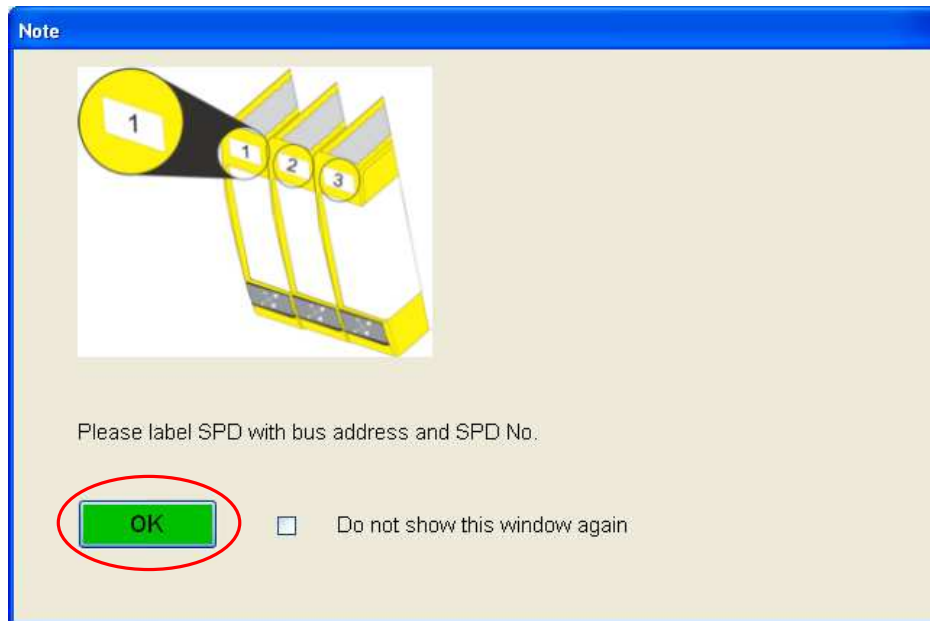


After setting the bus address of the requested *DRC MCM XT* monitoring device you will be asked to click the **"Continue"** button.

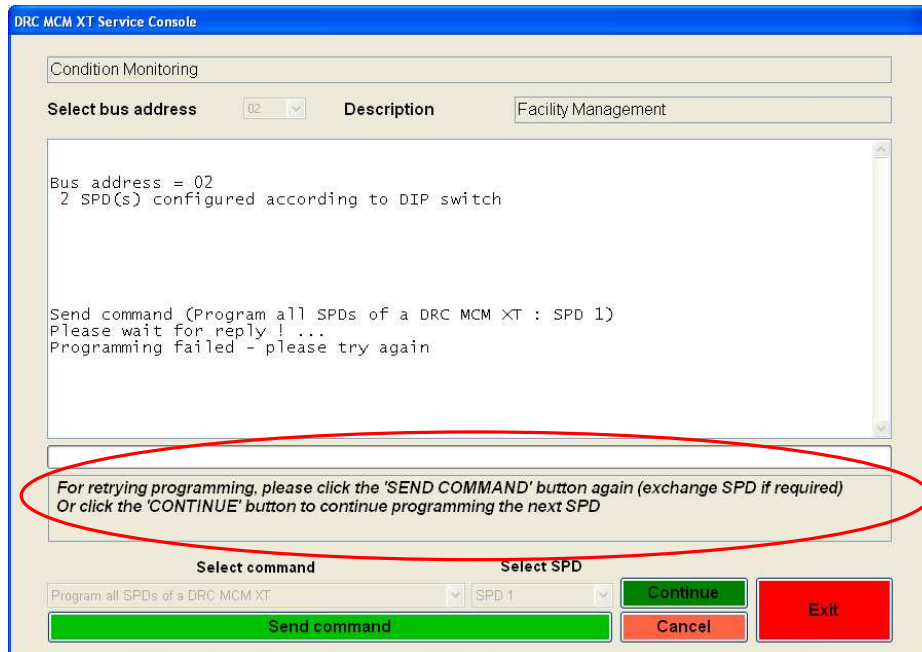
Clicking the **"Continue"** button the number of the SPD to be programmed next will be set, and you will be asked to place an "unprogrammed" SPD and to start the programming process by clicking the **"Send command"** button.



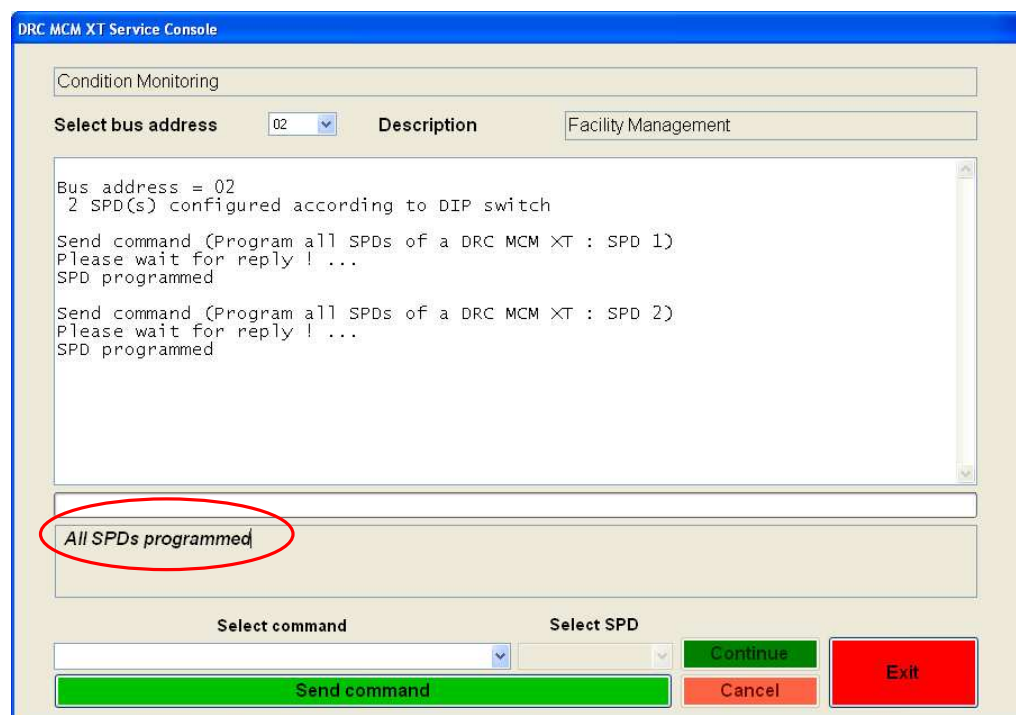
After successful programming (as described in 7.3.5) a reference display window opens requesting to completely snap on the SPD and to label it at once. By clicking the "**Continue**" button the same procedure can be started with the next SPD.



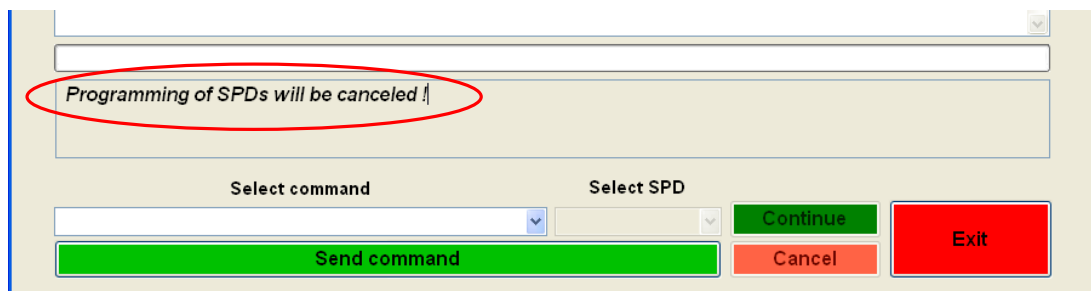
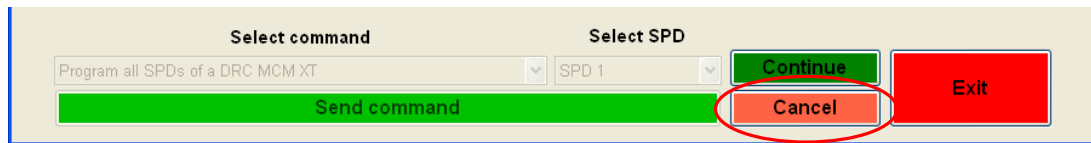
In case of incorrect programming the process for the same "SPD number" can just be repeated by clicking the "**Send command**" button as often as necessary. Preferably the same SPD first should be used again and only if this attempt fails a new SPD shall be inserted.



As soon as all protection modules are programmed another clicking of the "**Continue**" button finishes the programming process displaying

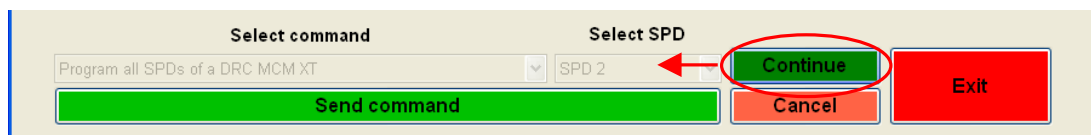


The user of course can abort the process by clicking the "**Cancel**" button.



Tip:

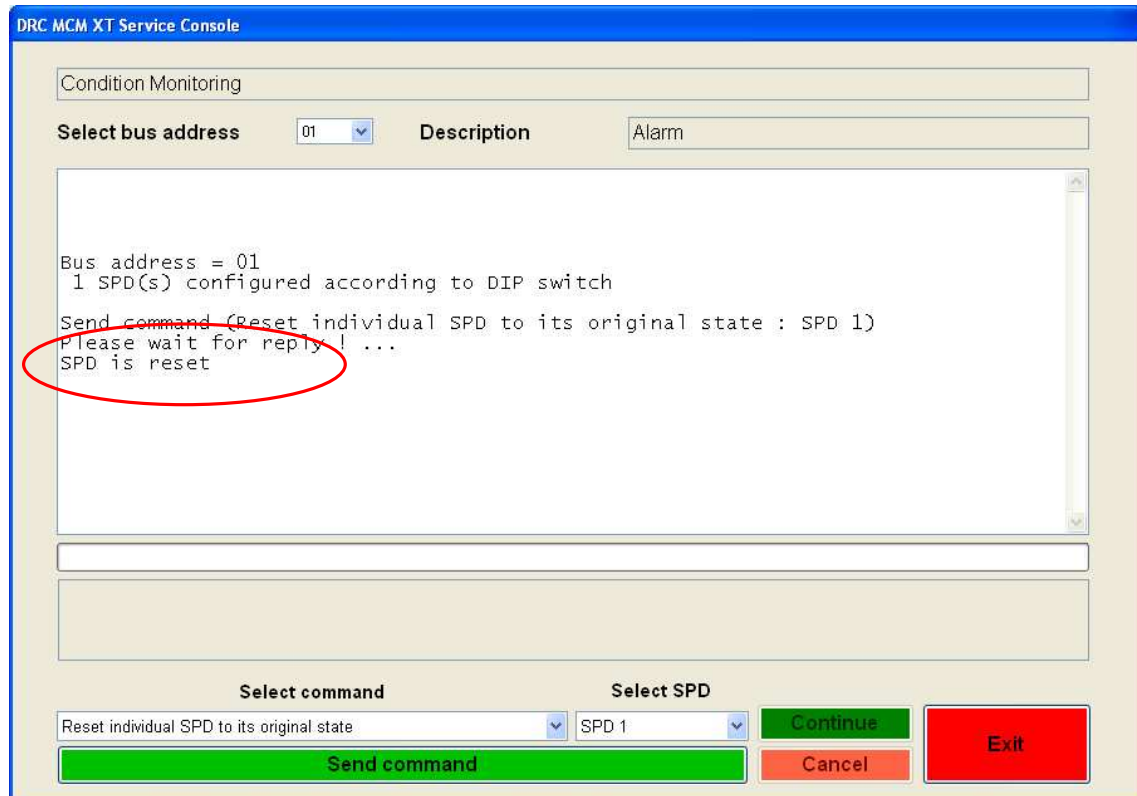
Every clicking of the "**Continue**" button increases the current number for the next protection module to be programmed. Thus during the programming procedure you can jump to the next SPD number by clicking the "**Continue**" button.



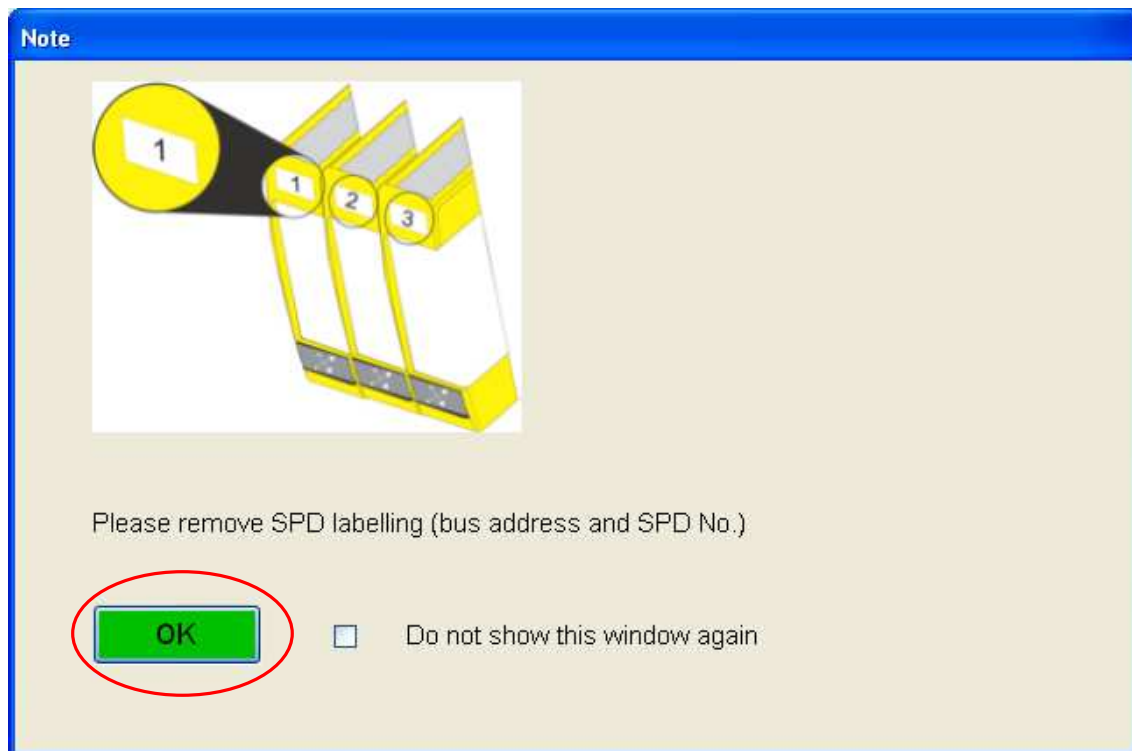
7.3.7 Resetting a protection module

The test command "**Reset individual SPD to its original state**" allows to reset *Blitzductors*® already assigned to a *DRC MCM XT* monitoring device into the as-delivered status (reprogramming).

The device is called by entering parameters and clicking the "**Send command**" button after selecting the command. The parameter to be selected is the current number of the protection module to be reset. Depending on the result of the test following the resetting process, the service console either shows "**SPD is reset**" or in case of failure "**Reset failed**".



If the resetting process was successful, a reference display window opens, requesting to remove the 'old' SPD labelling (which includes the no longer valid bus address and the previous running SPD number).



In case of a resetting failure, a further attempt should be made as probably the RFID field was sporadically interfered.

DRC MCM XT Service Console

Condition Monitoring

Select bus address: 01 Description: Alarm

Bus address = 01
1 SPD(s) configured according to DIP switch

Send command (Reset individual SPD to its original state : SPD 1)
Please wait for reply ! ...
Reset failed

Select command: Reset individual SPD to its original state Select SPD: SPD 1

Continue Cancel Exit

Send command

Notes

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