



**Technical Manual**  
**Ex Scanner EX-DRAGON-M101**  
**EXOM-DRAGON**

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# **1 Important information**

## **1.1 General instructions**

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## 1.2 Safety instructions

- ⇒ These devices are only allowed to be installed and operated by trained and qualified personnel who have received suitable instruction in their use.
- ⇒ These devices represent state-of-art technology. They are only allowed to be connected to systems that have been approved by Pepperl+Fuchs GmbH.
- ⇒ Never open the devices yourself. They are only allowed to be opened by authorized Pepper+Fuchs GmbH personnel.  
**Pepperl+Fuchs GmbH is not liable for any resulting damages.**
- ⇒ The devices are not allowed to be modified or otherwise altered in any way.  
**Pepperl+Fuchs GmbH is not liable for any resulting damages.**
- ⇒ Please study the “*Technical Manual*” carefully prior to starting up the devices.
- ⇒ The most recent version of the “*Technical Manual*” is always valid. It is available on the Support page of our web site (Internet address: <http://www.extec.de>).
- ⇒ The operating voltage of the devices **must not exceed the limits** indicated in the “*Technical Manual*” under **Technical data**.  
In the event of failure to comply, **Pepperl+Fuchs GmbH is not liable for any resulting damages.**
- ⇒ The relevant **specifications for hazardous areas** (e.g. EN 60079, EN 50281 EN 50014 - 50039) and **accident prevention regulations** (e.g. UVV) must be observed.

The technical data specified for the hazardous area corresponds to the certified values for the European EEx approval. The user is responsible for ensuring that the devices are suitable for their intended application and for the prevailing ambient conditions. No warranty can be given by Pepperl+Fuchs GmbH in this connection.

Data subject to change without notice

## 1.3 Symbols used in this manual



**Warning:**

The indicated specifications may not be modified. Non-compliance may result in dangerous situations and damages.

**Caution:**

Careful installation: do not replace electrical fuses with fuses from different manufacturers. Non-compliance may result in dangerous situations and damages.

**Danger:**

The product may possibly be negatively impacted or damaged by foreign influences.



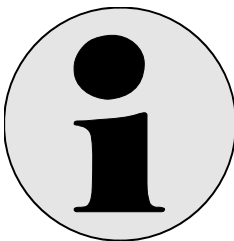
**Non-hazardous area:**

Assembly and installation only in **non-hazardous areas**.  
Power supply cables for the hazardous areas **zone 1** and **zone 2** only with cable type **DATL-A**.



**Danger:**  
Hazardous area

All safety regulations as well as **compliance certificates for hazardous areas** must be observed. In addition, all regulations (VDE) published by the respective authorities for the application of the devices in **hazardous areas** must be complied with at all times.



**Additional Info:**

Information and notices that must be observed **additionally**.



**Pressure load:**

Significant mechanical **pressure** or **impact loads** may result in damages.

no mechanical Force

## 2 Laser Safety Conditions:

Users of EX-Dragon-M101 handscanners must follow the respective safety regulations in conjunction with local specific regulations. General safety regulations are listed in the following paragraphs:

even though the level of energy is very low, the laser used in the EX-Dragon-M101 can damage the human eye provided it is exposed to the laser beam over a longer period of time.



### Warning

Never directly look into the reading window (laser beam) of a handscanner while the device is active.

A laser diode is used in the handscanner. Even though no biological effects are known that may be caused while looking into the laser beam for less than one minute, do not look into the laser beam directly. Also do not look into the reflection of the laser beam (mirror).

The laser beam can be viewed by the human eye and exits the reading window of the handscanner.

A warning label is attached to the handscanner describing the laser and laser category. The EX-Dragon-M101 device is a class 2 laser (according to IEC 825).

It is not necessary to open the handscanner for installation, application or maintenance. In addition only settings or actions described in this handbook may be carried out on the scanner.

When optical parts of the laser have been damaged rays of a higher intensity than class 3B may exit the device. The laser diode of the EX-Dragon-M101 is classified as 3B.

Labels cannot be attached to a laser diode. Hence the respective values are listed below:

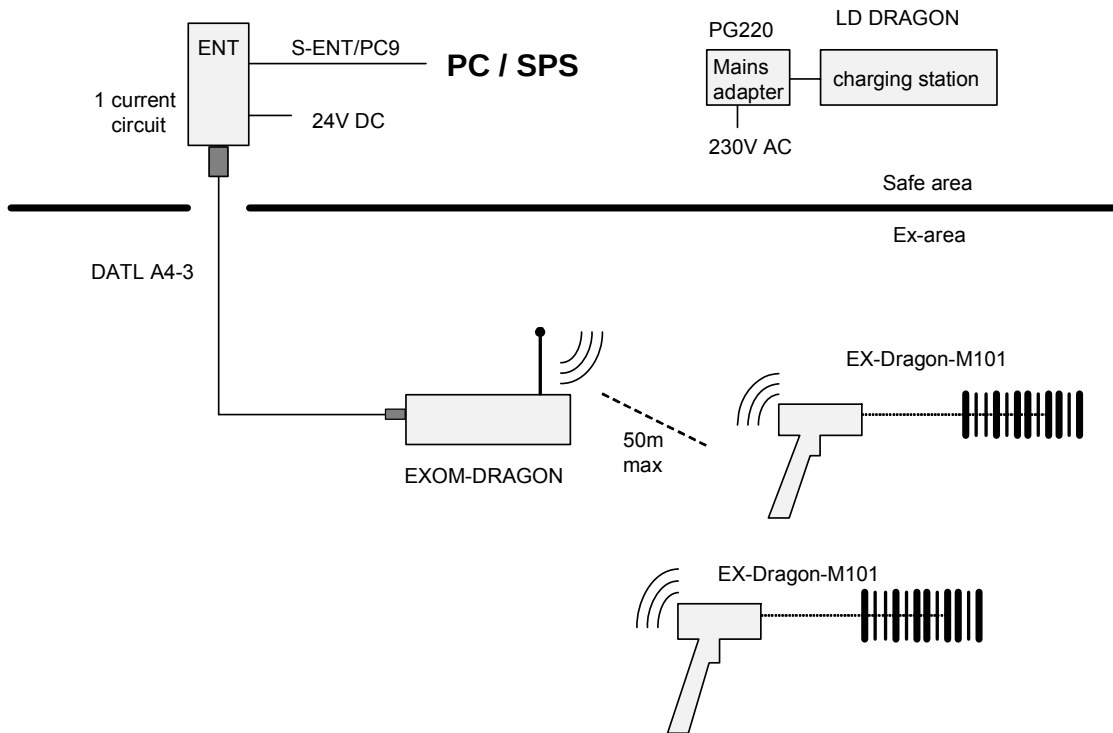


### Laser diode:

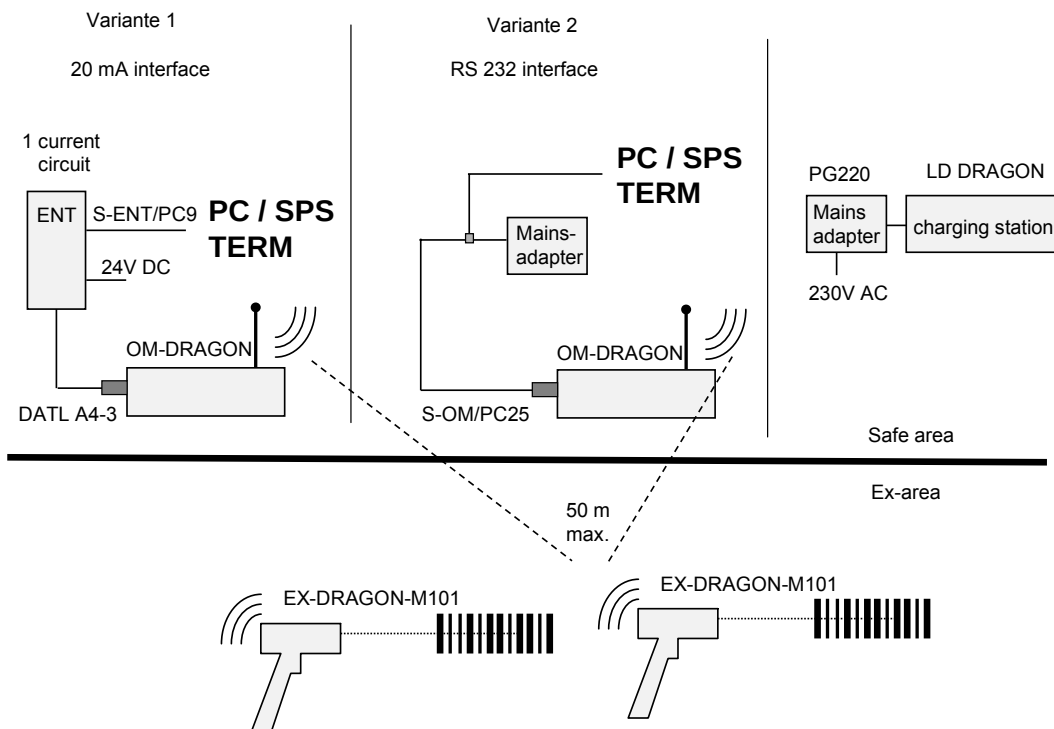
|                             |              |
|-----------------------------|--------------|
| Maximum output              | 1,4 mW       |
| Wave length                 | 630 - 680 nm |
| according to IEC 825 (1990) |              |

### 3 System Display in Hazardous Area

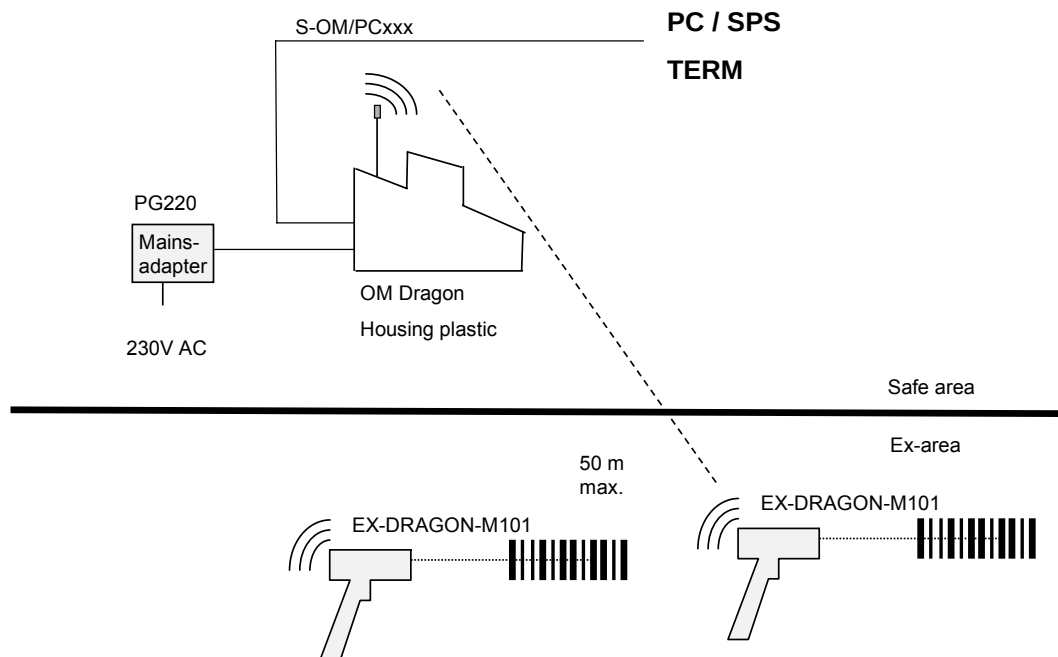
System with one receiver and multiple scanners connected via RS 232



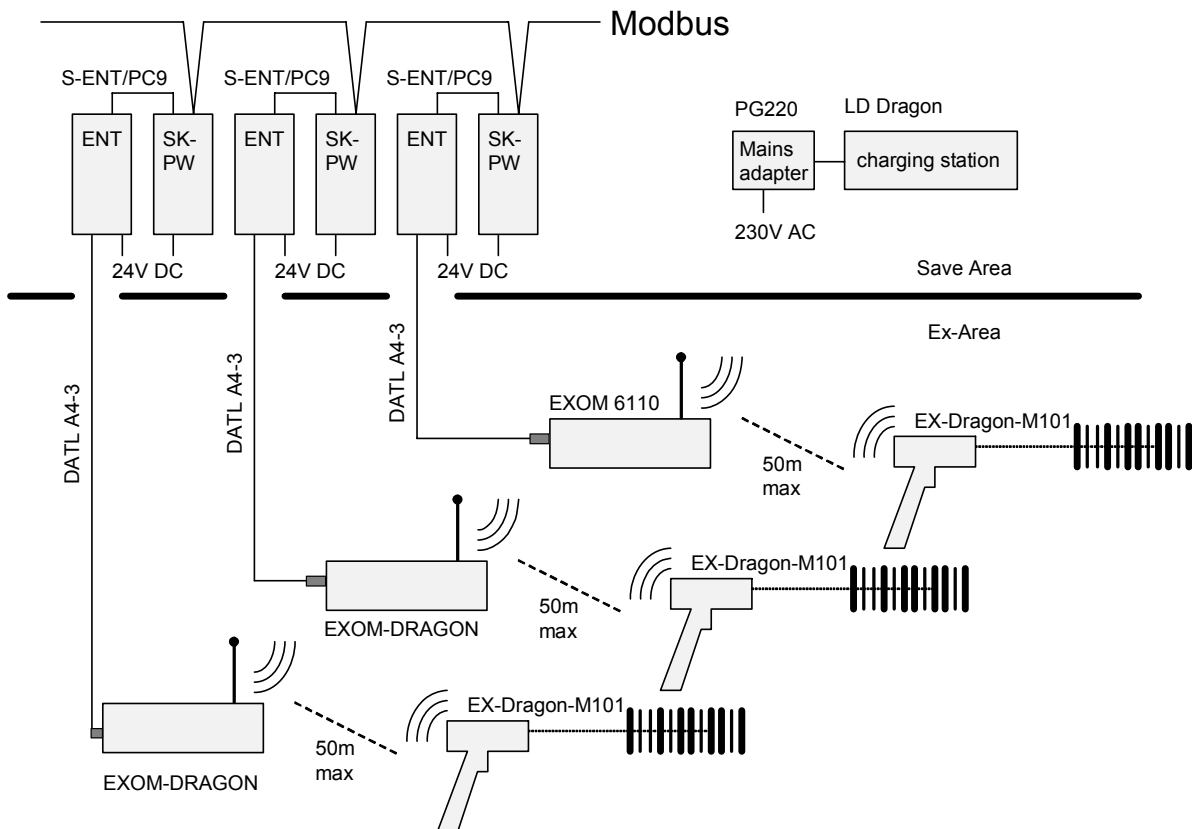
System with one receiver **OM-DRAGON** (IP 65 housing) in safe area and multiple scanner, connected via RS 232 interface.



System with one receiver OM-DRAGON (IP 40 housing) in safe area and multiple scanner, connected via RS 232 interface.



System with multiple receivers and multiple scanners connected via Modbus



## 4 Operation

### 4.1 Preparing the Hardware

This description for initial operation refers to those issues that must be considered with respect to the EX-DRAGON-M101. Information with respect to operation of the ENT-DC and the Host system can be found in the appropriate handbook.

For operation proceed as follows:

- Switch off system or machine.
- Make sure that the assembly area is non-hazardous during the initial operation in case voltages are wired or devices will be opened that are not intrinsically safe.
- Place the charging station LD DRAGON only in the save area.
- Connect the radio receiver EXOM-DRAGON to the ENT or the terminal TERMEX.
- Connect a protective ground wire to the radio receiver EXOM-DRAGON.



#### Warning

The protective ground wire connects to the housing. The housing must be grounded. The wire for connecting to ground must have a cross section of at least 4 mm<sup>2</sup> and should be as short as possible.

- Configure the radio scanner EX-DRAGON-M101 .
- Supply the system with 24 VDC.
- Switch on system or machine.
- Check functions of the entire system or machine respectively.



#### Warning

In case the EXOM-DRAGON has not been connected or configured correctly, malfunctioning of your system/machine is possible.

## 4.2 Special conditions for apparatus, category 3D (in zone 22)

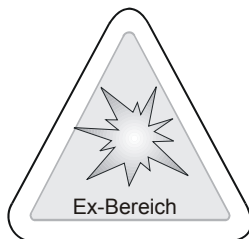
The housing is a direct component of the explosion protection. A visible damage of the housing waives the explosion prevention.

The maintenance plan of the plant should supervise that the housings of the products are not damaged.

The housing fulfills the requirements of the standard with low impact energy.

The plug connector to EXOM-Dragon-10 must be provided with a sign:

„Do not separate under voltage !“



### **Warning**

In ex-area (zone 22) plug the connector with disconnected power!

## 5 EX-DRAGON-M101 Radio Scanner

The Ex radio scanner EX-DRAGON-M101 can be used in hazardous areas zone 1, zone 2 and type -3D in zone 22. The scanner is able to read all standard code families. After a successful read a beep to indicate a good read is sent out for easy working. It is also possible to send back data to the scanner, where it can be shown on the integrated LCD display.

### The most important data in brief:

|                                                                                                              |                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protection type                                                                                              | EEx ib IIC T4 or EEx ib IIB T4<br>BVS 03 ATEX E282                                                                                                         |
| Classification in accordance with ATEX                                                                       | ⊕ II 2G EEx ib IIC T4<br>⊕ II 2G EEx ib IIB T4                                                                                                             |
| Declaration of conformity use in zone 22                                                                     | Ex-Dragon-M101-10-3D<br>⊕ II 3D X T 80 °C IP 53                                                                                                            |
| Display                                                                                                      | LCD display<br>4 lines / 12 characters per line                                                                                                            |
| Keyboard                                                                                                     | Membrane keyboard type:<br>3 keys:<br>"<" (arrow left)<br>">" (arrow right)<br>"=" (enter)                                                                 |
| Data transfer                                                                                                | radio transmission                                                                                                                                         |
| Connection to PC<br>Connection to PCEX<br>Connection to iPC<br>Connection to TERMEX<br>Connection to VisuNet | by ENT-DC via COM-port (DSub 9 pin), serial<br>via EXOM 20 mA interface<br>via EXOM 20 mA interface<br>via EXOM 5 mA interface<br>via EXOM 20 mA interface |
| Voltage supply                                                                                               | Scanner accumulator (up to 30000 scans)<br>Charging station LD DRAGON: 8...12V DC<br>(supplied by mains adapter)<br>Receiver EXOM DRAGON: by ENT-DC        |
| Degree of protection                                                                                         | IP 53                                                                                                                                                      |

## 6 Introduction

The Cordless Reading System is composed of one or more EX-DRAGON-M101 laser scanners, one or more EXOM-DRAGON cradles and one or more ENT-DC as barriers in the save area. The EX-DRAGON-M101 communicates with the EXOM-DRAGON cradle through low power radio. The cradle communicates by the ENT-DC with a serial port with the host system.

Optional element is the LD DRAGON battery charger.

Thank to its robustness, durability and reliability, the Cordless Reading System is the ideal solution in all **industrial** applications where large quantities of information need to be collected rapidly, easily and reliably in relatively harsh or dirty environments.

### 6.1 EX-DRAGON-M101 Laser Scanners

EX-DRAGON-M101 LASER SCANNERS are hand-held barcode readers with built-in decoder and radio.

The scanning system of the reader uses visible laser diode (VLD) technology and the high quality of internal parts guarantees constant reliability and superior performance.

#### 6.1.1 Description And Use

EX-DRAGON-M101 laser scanners automatically scan barcodes at a distance; simply aim and pull the trigger. Code scanning is performed along the scan line which must pass through the entire code.

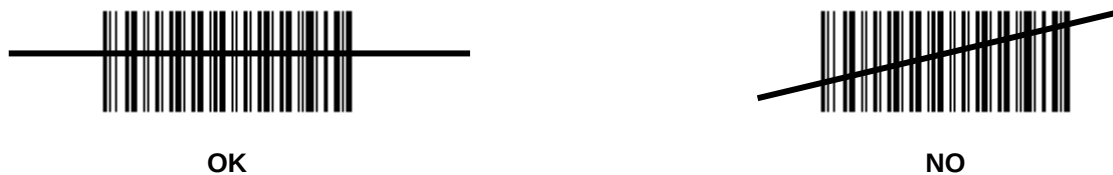


Figure 6.1 - Code reading example

Successful scanning is obtained by tilting the scanner with respect to the barcode to avoid direct reflections which impair the reading performance, see Figure 1.2.

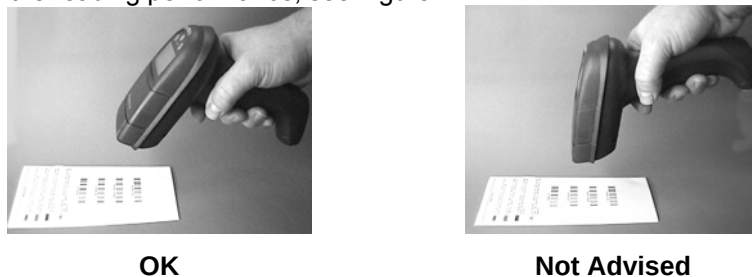
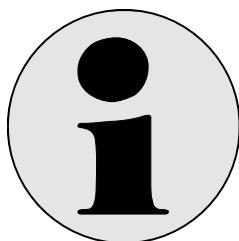


Figure 6.2 - Code reading position

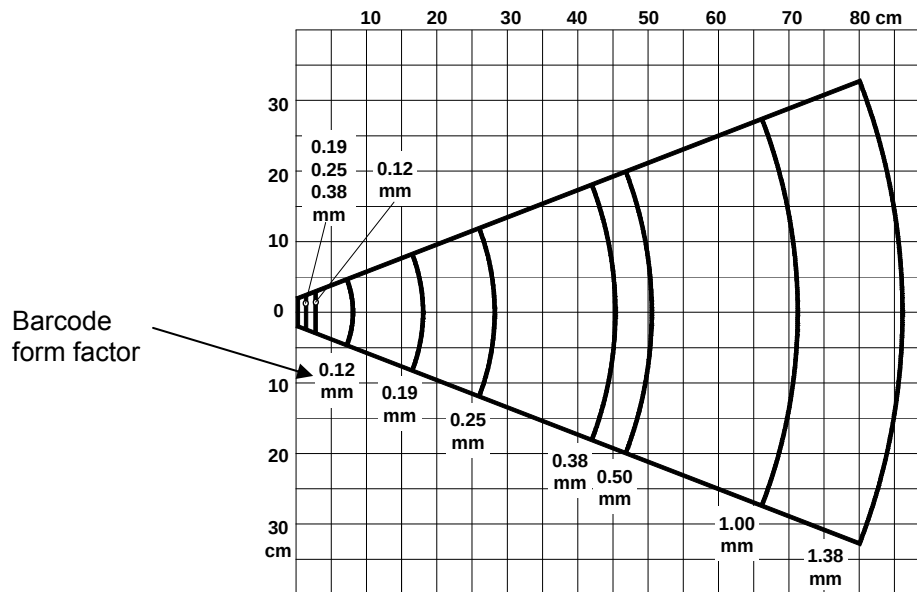
Adapt the reading distance to the code features and operating needs.



#### Note

During configuration keep the scanner close enough to the codes to assure the selection of the correct code.

## 6.1.2 Reading Diagram



## 6.1.3 EX-DRAGON-M101 Indicators

EX-Dragon-M101 readers have two LEDs and a beeper. They signal several operating conditions which are described in the tables below.

Power UP

| Beeper             | Meaning                                                                       |
|--------------------|-------------------------------------------------------------------------------|
| LLLL               | Parameters loading correctly                                                  |
| HHHH<br>Long tones | Parameters loading error, reading or writing error in the non-volatile memory |
| H L H L            | Hardware error in EEPROM                                                      |

CONFIGURATION

| Beeper | Meaning                                       |
|--------|-----------------------------------------------|
| HHHH   | Correct entry or exit from configuration mode |
| L°     | Good read of a command                        |
| LLL    | Command read error                            |

DATA ENTRY

| Red LED  | Green LED | Beeper         | Meaning           |
|----------|-----------|----------------|-------------------|
| ON       |           |                | Laser active      |
| Flashing |           | HHHH....       | Low battery       |
|          | Pulse     | L°             | Good read         |
|          | Pulse     | L°*            | Good transmission |
|          |           | H L Long tones | TX failure        |

BIND AND JOIN COMMANDS

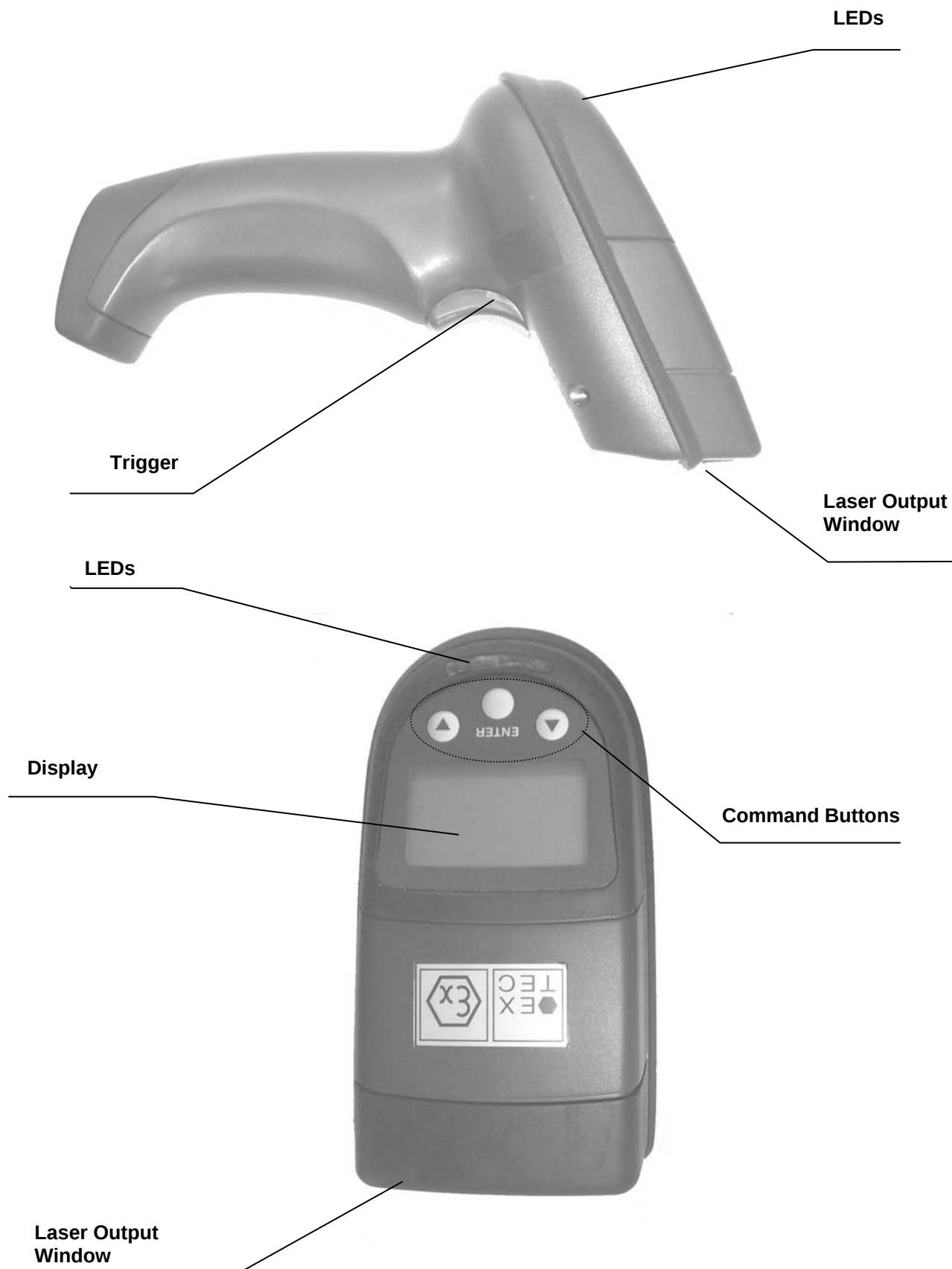
| Green LED | Beeper         | Meaning                                                |
|-----------|----------------|--------------------------------------------------------|
| ON        |                | Command accepted;<br>Gun ready to be inserte in cardle |
|           | L°             | Success                                                |
|           | H L long tones | Failure                                                |

° tone and intensity are user-configurable

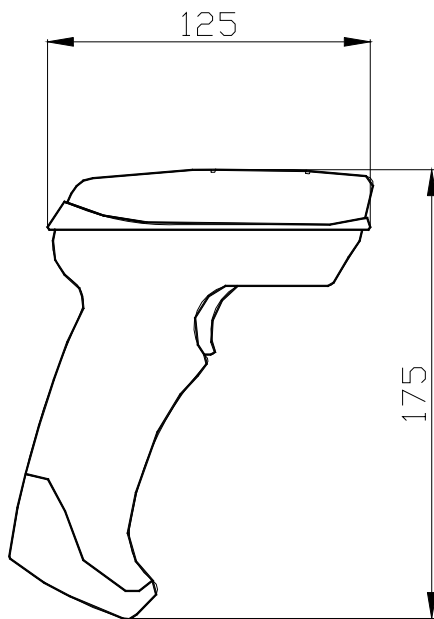
\* the good transmission beeper can be disabled.

H = high tone

L = low tone

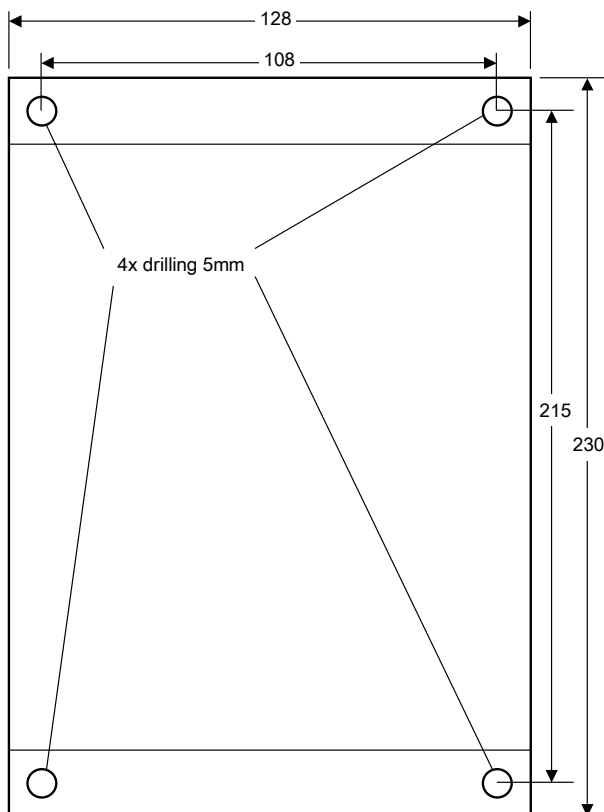
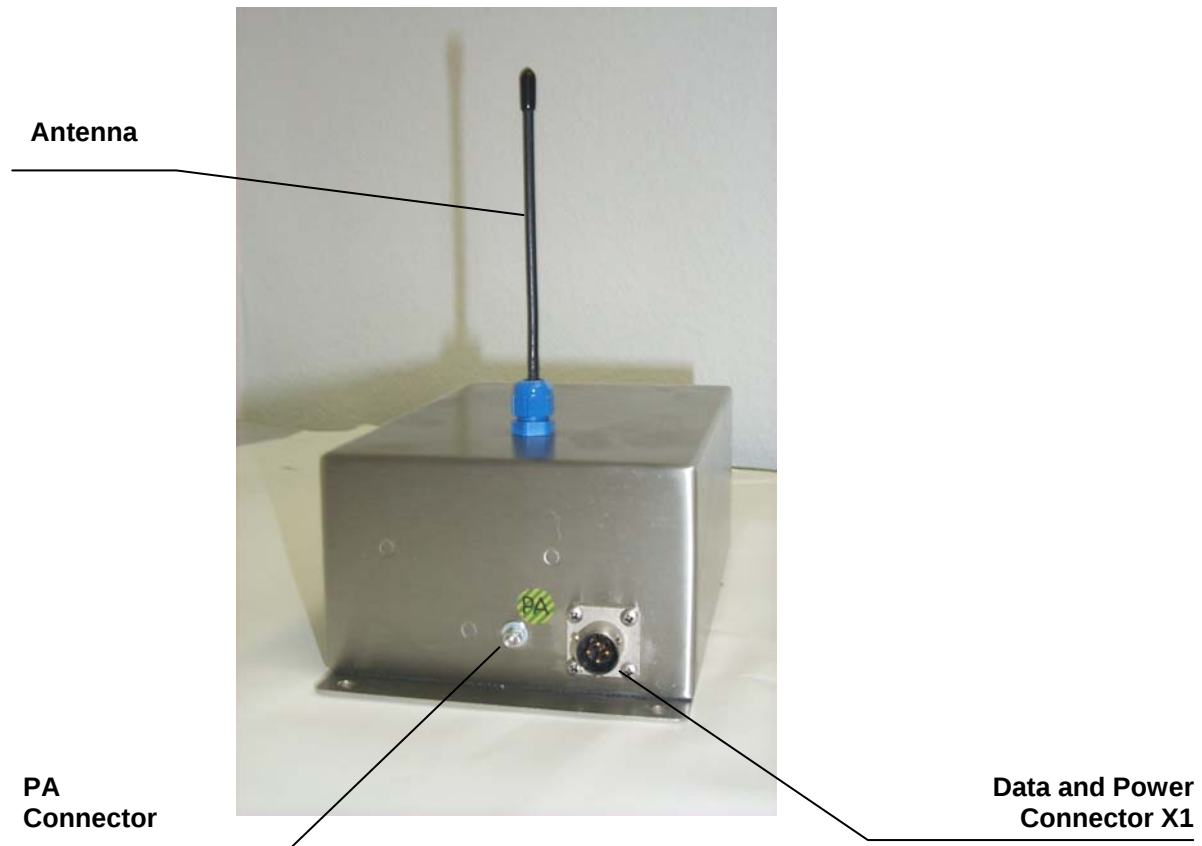


### 6.1.5 EX-DRAGON-M101-10



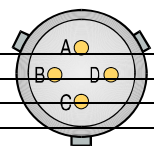
## 6.2 EXOM-DRAGON Cradle

The EXOM Dragon is a cradle with radio which allows wireless communication between one or more EX-Dragon-M101 series scanners and a Host computer.



### 6.2.1 Technical Data EXOM-DRAGON

|                                                  |     |
|--------------------------------------------------|-----|
| Protection:                                      |     |
| IP 65                                            |     |
| EEx ib IIC T4                                    |     |
| Classification in accordance with ATEX           |     |
| Ⓔ II 2G EEx ib IIC T4                            |     |
| Ⓔ II 2G EEx ib IIB T4                            |     |
| Declaration of conformity                        |     |
| Ⓔ II 3D IP65 T 80°C                              |     |
| Material / Dimensions:                           |     |
| W x D x H 128 x 230 x 82 mm<br>(without antenna) |     |
| Height antenna app. 130 mm                       |     |
| app. 1,2 kg                                      |     |
| stainless steel                                  |     |
| Fixing:                                          |     |
| 4 drills with 5 mm                               |     |
| PA Connector:                                    |     |
| threaded bolt M4                                 |     |
| Data and Power Connector (Supplied by ENT-DC):   |     |
| X1.A                                             | Tx  |
| X1.B                                             | Rx  |
| X1.C                                             | Us  |
| X1.D                                             | GND |
| max distance to ENT-DC 150m                      |     |
| max. distance to iPC-EX 50m                      |     |
| max. distance to PCEX 4xx 50m                    |     |
| Radio Frequency:                                 |     |
| 433,92 MHz < 10 mW                               |     |
| max Radio area 50 m                              |     |



## 6.3 LD DRAGON Charger

LD DRAGON Technical data

Protection:  
IP 40

Power supply (supplied by mains adapter):  
10 – 28 V DC max 8 Watt (while charging)

Material / Dimensions:  
L x W x H app. 190 x 115 x 100 mm  
(without scanner)  
app. 0,6 kg  
Polyester

**\*Do not use in the hazardous area !**

### 6.3.1 LD DRAGON Indicators

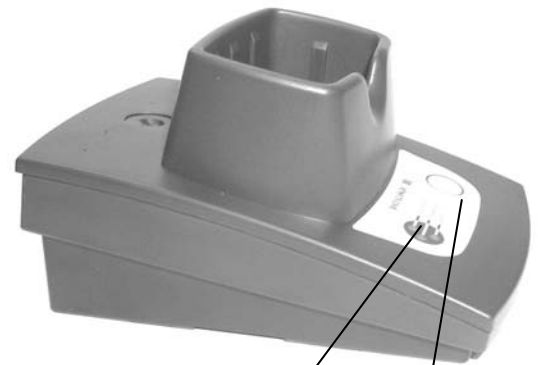
The LD DRAGON are equipped with three LEDs which signal the operating conditions described in the tables below.

#### CHARGE STATUS

| Red LED  | Green LED | Meaning                 |
|----------|-----------|-------------------------|
| ON       | OFF       | Charging                |
| OFF      | ON        | End of charge           |
| OFF      | OFF       | No battery inserted     |
| Flashing | OFF       | Discharging             |
| Flashing | Flashing  | Shorted or open battery |

#### POWER

| Yellow LED | Meaning                            |
|------------|------------------------------------|
| ON         | Power applied, no communication    |
| OFF        | Error in reading EEPROM parameters |



LEDs

Battery reconditioning  
button



Power  
Connector



Charging the EX-Scanner EX-DRAGON-M101 on the  
Non EX-Cradle the Host symbolise a defect accu.

Recovery:  
Switch off the autodetect of the Host and configure NiMh.

### **Configuration of the Host on NiMh**

By transmission of the following codes via terminal programm.

Convert of the NiMh on EXDLL-6110

\$+HT3\$-CR

Convert of the NiMh on EX-DRAGON-M101

\$+RB1\$-CR

## **6.4 PG12-10 Mains adapter\***

Mains adapter for Charger. For every charger one adapter is necessary.

### **6.4.1 PG12-10 Technical data**

Protection:

IP 40

Power supply:

100 - 240V AC

50/60 Hz 280 mA

Ouput:

12V DC 280mA

9,60VA max.

Housing:

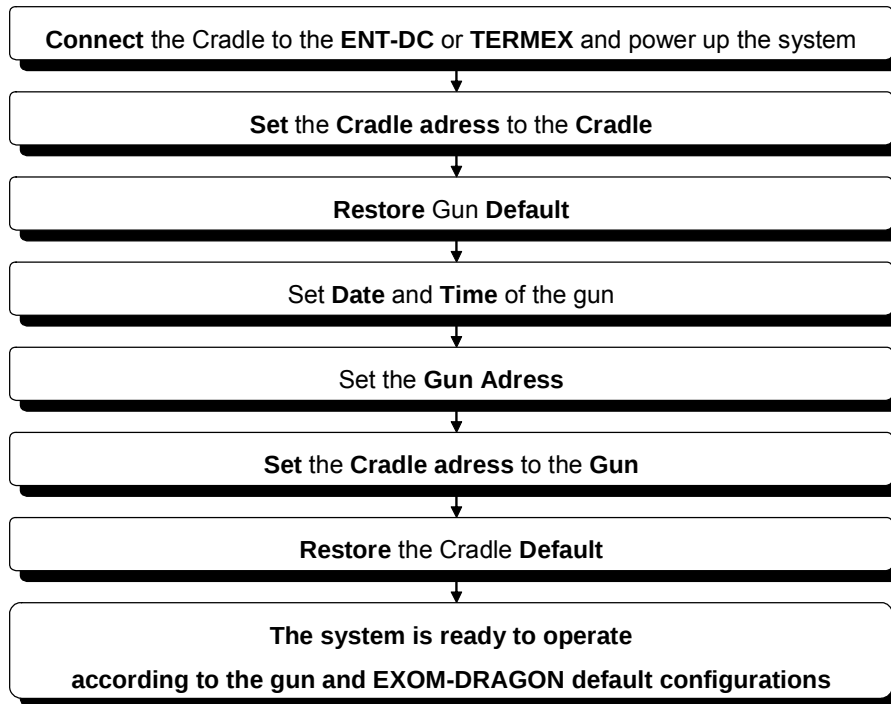
Desktop L x W x H app. 95 x 50 x 30 mm



**\*Do not use in the hazardous area !**

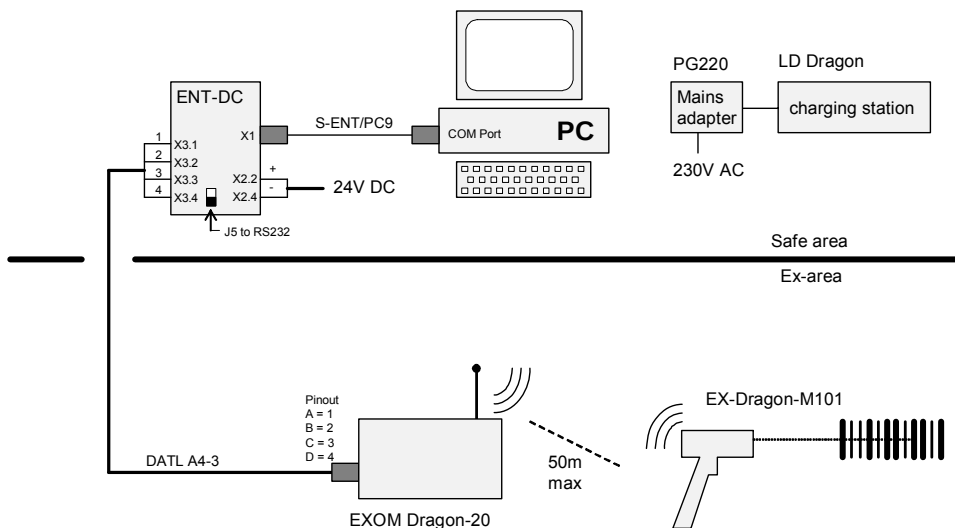
## 7 System Configuration

To start the system up, perform the operations represented in the flow-chart below, following the given sequence.



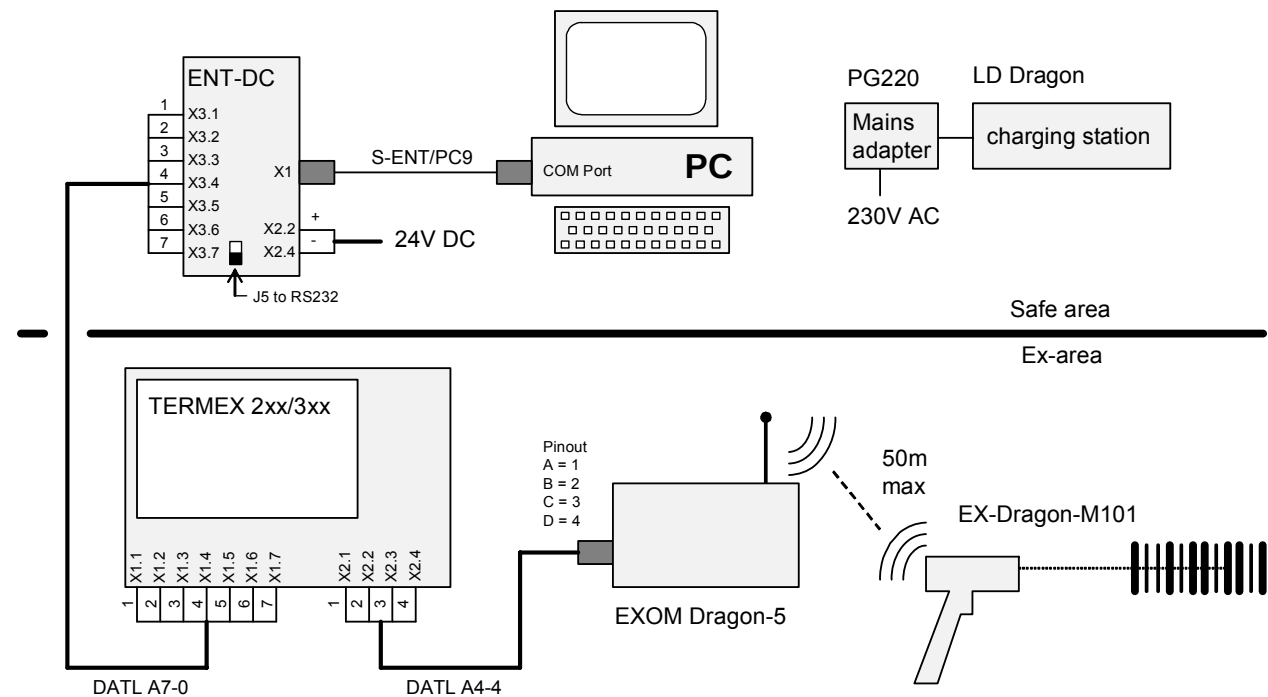
### 7.1 System Start-Up

#### 7.1.1 Connecting the Cradle to a Host (PC) system by ENT-DC



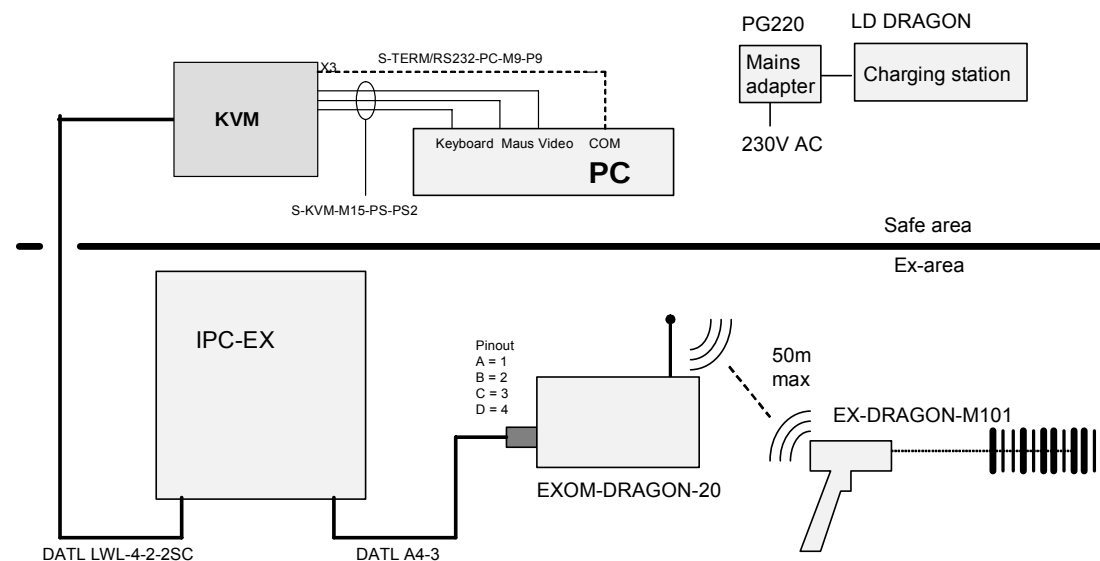
Start a terminal program like Hyperterminal or the Pepperl+Fuchs TermexSIO. Configure it for 9600 baud, even parity, 8 data bit, 1 stop bit.  
Go then to chapter 7.1.5.

## 7.1.2 Connecting the Cradle to a Host (PC) system by TERMEX 2xx / 3xx



With this application please contact the support.

## 7.1.3 Connecting the cradle to a Host (PC) system by iPC-EX

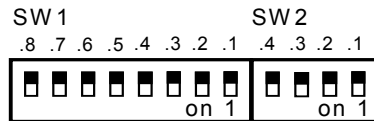


### Transmission of the barcode reader data to the PC

- 1.) Barcode reader data to PC keyboard interface
  - a) Please configure the EXOM-Dragon cradle to 1200 Baud, parity even , 8 data bit, 1 stop bit.
  - b.) Please check with any text program or Editor on the PC if barcode data arrive on the PC display.

2.) Barcode data via serial port (COMx)

a) DIP –switch configuration of SK-KVM to be noted (refer technical manual iPC-EX



DIP-Switch –settings of SW1 of SK-KVM:

SW1 .2 ON

SW1 .1 ON

9600/8/E/1

OFF

1200/8/E/1

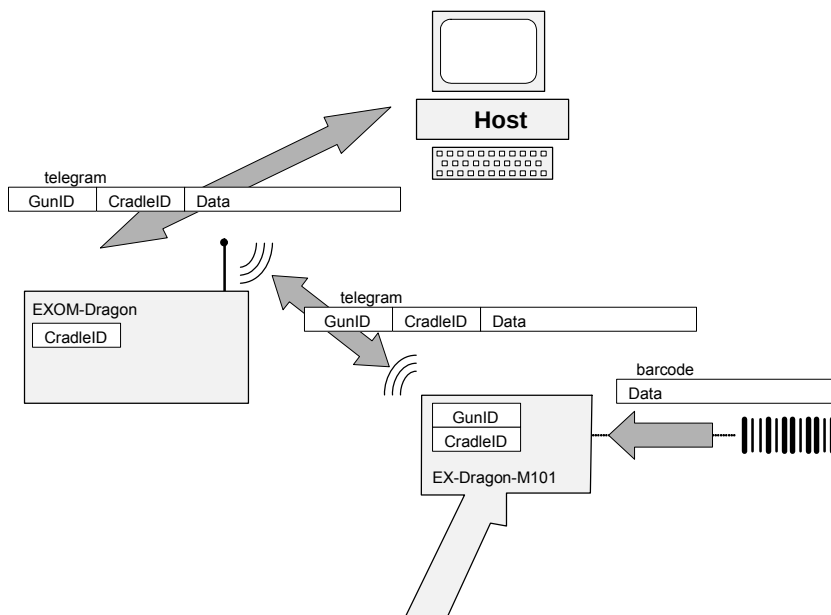
b) The EXOM-Dragon has to be configured according the baudrate set at the SK-KVM

c) Connect COM-Port of PC with SK-KVM X3 (serial PC) port with cable S-TERM/RS 232-PC-M9-P9.

d) Please start any terminal program (e.g.Hyperterminal) or P+Fs TermexSIO.

## 7.1.4 Schematic for scanner and cradle identification

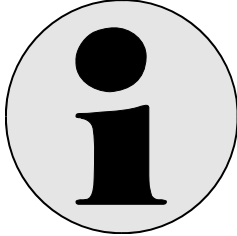
The scanner stores up the scanner ID and the cradle ID. So the scanner knows to which cradle it belongs. The cradle only knows its own ID. If the cradle detects a telegram with its ID in the header it accepts the telegram and transfers the data to the host system. For the transmission from the host to the scanner the host has to send a telegram with both IDs (cradle and scanner), to select the correct scanner.



## 7.1.5 Configuring the Cradle EXOM Dragon / Ex-Dragon-M101

### Configuring the Cradle EXOM Dragon

When the EXOM-DRAGON is connected and powered, configure it by sending the following telegrams to it in the given sequence and follow the instructions.



#### Note

Use any kind of terminal programm on the PC to send the ASCII sequence to the cradle.

Configure the Cradle with an identification number

1. **“\$+RCxxx\$-“ and  
”<CR>”**

xxxx is a variable for a 4 digit adress like 0005

ALL CRADLES USED IN THE SAME AREA MUST HAVE DIFFERENT ADDRESSES.

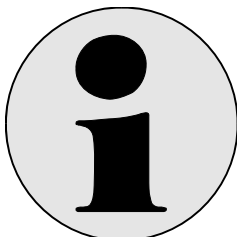


#### Warning

If the cradle is not configured with an adress gun, its address assumes a random value which can cause conflicts and malfunctions to other cradles within its range.

### Configuring the Radio Scanner Ex-Dragon-M101

When the Ex-Dragon-M101 is powered, configure it by reading the following codes in the given sequence and follow the instructions.



#### Note

Use the pages at the end of this Manual for the Numeric code selections.

**Restore EX-Dragon-M101 default**

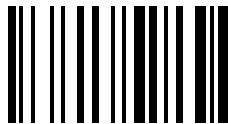
1.



\$+\$\*

**Enter configuration**

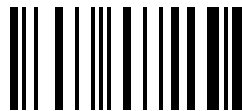
2.



\$+

**Set date**

3.



I Δ

+ six digits for Day, Month an Year  
(DDMMYY)

**Set Time**

4.



I B

+ four digits for Hours and Minutes  
(HHMM)

**Set radio adress**

5.



RAORF

+ four digits for radio adress  
(von 0000 bis 1999)

**Joint he scanner to the cradle**

6.



RS

+ four digits for the EXOM-adresse ( von 0000 bis 1999)

7.

**Exit and save configuration**



\$-

## 7.1.6 Configuring the Cradle EXOM-DRAGON by the gun

1.

**Cradle Default**



\$+RX0\$-

2.

**Enter configuration**



\$+

3.

**ENT Connection**

**9600 BAUD (\*)**



CD 6

**Terminal Connection**

**1200 BAUD**



CD 3

4.

**PARITY EVEN**



CC 1

5.

**Exit and Save configuration**



\$-

## 7.1.7 Compatibility

### 7.1.7.1 Compatibility

#### Cradle EXOM 6110 / Scanner EX-Dragon-M101

If it is necessary to use the Ex-Dragon-M101 reader in EXOM 6110 applications, full radio protocol and software compatibility is provided by reading the following code:

Set EXOM 6110 compatibility



\$+B'Y1\$-

The reader will automatically be switches off and restarted and four high tones will be emitted.

At this point the Ex-Dragon-M101 reader is ready to be configured using the EXOM 6110 procedur.

Do not use the EXOM-Dragon configuration procedure.

To restore the EXOM-Dragon / Ex-Dragon-M101 standard configuration read the following code,  
Then follow the Ex-Dragon-M101 configuration procedure.

Restore EXOM-DRAGON standard configuration



\$+B'Y0\$-

### 7.1.7.2 Compatibility:

#### Cradle EXOM-DRAGON / Scanner: EXDLL-6110

To use a scanner EXDLL-6110 at a cradle EXOM-DRAGON the following code must be transfered to the cradle by a terminal program.

\$+RZ3\$-

Restore the EXOM-DRAGON in EXDL-6110 mode to EX-DRAGON-M101 mode:

\$+RZ0\$-

## 7.1.8 Configuring the Cradle EXOM 6110 / Ex-Dragon-M101

### Configurtation EXOM 6110 cradle

When the EXOM 6110 is connected and powered, configure it by sending the following telegrams to it in the given sequence and follow the instructions.



**Configure the Cradle with an identification number**

**“\$+HFxxx\$-“ and  
”<CR>”**



#### Note

Use any kind of terminal programm on the PC to send the ASCII sequence to the cradle.

xxx is a variable for a 3 digit adress like 005

ALL CRADLES USED IN THE SAME AREA MUST HAVE DIFFERENT ADDRESSES

#### Warning

If the cradle is not configured with an adress gun, its address assumes a random value which can cause conflicts and malfunctions to other cradles within its range.

### Configuring the Radio scanner Ex-DRAGON-M101

When the EX-Dragon-M101 is powered, configure it by reading the following codes in the given sequence and follow the instructions



#### Note

Use the pages at the end of this Manual for the Numeric code selections.

|    |                                                                                                                                                 |                                                                                                                                              |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | <p><b>Restore EX-Dragon-M101 default</b></p>  <p>\$+\$*</p>    | <p>Default parameter settings are listed in chap. 7.1.11</p>                                                                                 |
| 2. | <p><b>Enter configuration</b></p>  <p>\$+</p>                  |                                                                                                                                              |
| 3. | <p><b>Set Date</b></p>  <p>HE</p>                              | <p>+ six digits for Day, Month and Year (DDMMYY).</p>                                                                                        |
| 4. | <p><b>Set Time</b></p>  <p>HD</p>                             | <p>+ Four digits for Hours and Minutes (HHMM).</p>                                                                                           |
| 5. | <p><b>Set Gun Address</b></p>  <p>HF</p>                     | <p>+ Three digits for the EX-Dragon-M101 address (from 000 to 126).</p> <p>ALL GUNS USED IN THE SAME AREA MUST HAVE DIFFERENT ADDRESSES.</p> |
| 6. | <p><b>J<br/>oin the Scanner to the Cradle</b></p>  <p>HQ</p> | <p>+ Three digits for the EXOM address (from 000 to 126).</p> <p>THIS MUST BE THE ADDRESS YOU GAVE BEFORE TO THE CRADLE EXOM-DRAGON.</p>     |
| 7. | <p><b>Exit and Save configuration</b></p>  <p>\$-</p>        |                                                                                                                                              |

## 7.1.9 Configuring the Cradle EXOM-6110, EXOM-DRAGON by the gun

|    |                                                                                                                                                  |                                                                                                                                                     |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | <p><b>Cradle Default</b></p>  <p>\$+HX0\$-</p>                  |                                                                                                                                                     |
| 2. | <p><b>Enter configuration</b></p>  <p>\$+</p>                   |                                                                                                                                                     |
| 3. | <p><b>ENT Connection</b></p> <p>9600 BAUD (*)</p>  <p>CD 6</p> | <p><b>Terminal Connection</b></p> <p>1200 BAUD</p>  <p>CD 3</p> |
| 4. | <p><b>PARITY EVEN</b></p>  <p>CC 1</p>                        |                                                                                                                                                     |
| 5. | <p><b>Exit and Save configuration</b></p>  <p>\$-</p>         |                                                                                                                                                     |

### 7.1.10 Using multiple Guns with same Cradle

If you want to use several guns associated with the same cradle, you must join all guns with the same cradle address.

### 7.1.11 Gun Default Configuration (P+F initial state)

|                                 |                                 |
|---------------------------------|---------------------------------|
| <b>Data Format</b>              |                                 |
| *Header                         | <i>Head without character</i>   |
| *Terminator                     | <i>'0Dh' '0Ah' (CR LF)</i>      |
| Baudrate                        | <i>9600 (20 mA)</i>             |
| Parity                          | <i>1200 (5 mA)</i>              |
|                                 | <i>Even</i>                     |
| <b>Reading Parameters</b>       |                                 |
| Trigger type                    | <i>Hardware trigger</i>         |
| Trigger signal                  | <i>Trigger active level</i>     |
| Trigger off Timeout             | <i>10 sec.</i>                  |
| Flash Mode                      | <i>One 1 sec., off 0.6 sec.</i> |
| Reads per cycle                 | <i>1</i>                        |
| Safety time                     | <i>0,5 sec.</i>                 |
| Beeper intensity                | <i>high</i>                     |
| Beeper tone                     | <i>2</i>                        |
| <b>Decoding Parameters</b>      |                                 |
| Ink spread                      | <i>enabled</i>                  |
| Overflow control                | <i>enabled</i>                  |
| Interdigit control              | <i>enabled</i>                  |
| Puzzle Solver                   | <i>disabled</i>                 |
| Decoding Safety                 | <i>one read</i>                 |
| <b>Gun Operating Parameters</b> |                                 |
| Code identifier                 | <i>disabled</i>                 |
| Time stamping format            | <i>disabled</i>                 |
| Time stamping delimiter         | <i>None</i>                     |
| Field Adjustment                | <i>disabled</i>                 |
| Character Replacement           | <i>disabled.</i>                |
| * Gun address                   | <i>0001</i>                     |
| <b>Display parameters</b>       |                                 |
| Font size                       | <i>small</i>                    |
| Display timeout                 | <i>8 sec.</i>                   |
| Contrast                        | <i>Normal</i>                   |
| Backlight                       | <i>off</i>                      |
| Display mode                    | <i>Lokal echo</i>               |
| Key Pad                         | <i>disabled</i>                 |

\* The restore default command does not affect the selection made for this parameter.

### 7.1.12 Cradle Default Settings

|                                    |                            |
|------------------------------------|----------------------------|
| <b>RS232 Parameters</b>            |                            |
| Baud rate                          | 9600                       |
| Parity                             | <i>disabled</i>            |
| Data bits                          | 8                          |
| Stop bit                           | 1                          |
| Handshaking                        | <i>disabled</i>            |
| FIFO                               | <i>enabled</i>             |
| Inter-character delay              | <i>disabled</i>            |
| Rx timeout                         | 5 sec.                     |
| ACK/NACK Protocol                  | <i>disabled</i>            |
| <b>Cradle Operating Parameters</b> |                            |
| * Header                           | <i>none</i>                |
| *Terminator                        | <i>'0Dh' '0Ah' (CR LF)</i> |
| Address stamping                   | <i>disabled</i>            |
| Address delimiter                  | <i>Disabled</i>            |
| Code length Tx                     | <i>Not transmitted</i>     |
| * Cradle address                   | <i>0001</i>                |
| <b>Battery Parameter</b>           |                            |
| Battery type                       | <i>auto-detect</i>         |

\* The restore default command does not affect the selection made for these parameters.

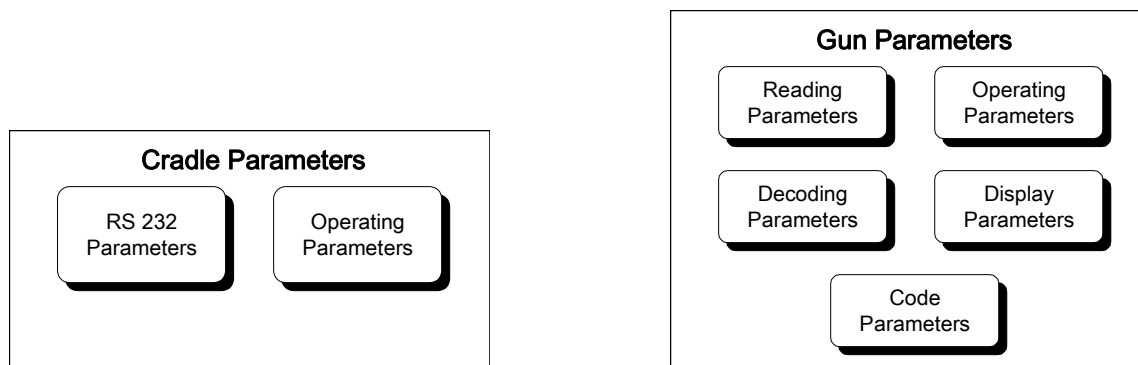
|                            |                                                                                    |
|----------------------------|------------------------------------------------------------------------------------|
| <b>Code selection</b>      |                                                                                    |
| EAN 8/EAN 13 / UPC A/UPC E | <i>Check digit transmission, no conversions</i>                                    |
| Interleaved 2/5            | <i>Check digit control and transmission, variable length code: 4-99 characters</i> |
| Standard Code 39           | <i>No check digit control, variable length code: 1-99 characters</i>               |
| Code 128                   | <i>Control without transmission of check digit, Add GS before code, disabledt</i>  |
| Code 93                    |                                                                                    |
| Codablock A-Familie        |                                                                                    |
| Codablock F-Familie        |                                                                                    |
| MSI, Plessey               |                                                                                    |
| Telepen, Delta IBM,        | <i>Disabled</i>                                                                    |
| Code 11, Code 16K,         |                                                                                    |
| Code 49, Codabar-Familie   |                                                                                    |

## 7.2 Changing System Configuration

The EX-Dragon-M101 and EXOM Dragon default parameters can be changed by following the procedure below.

1. Use the Hex-Numeric table (please refer to chapter 12 'Single Codes') if noted.
2. Go to the section of the group to modify.
3. Follow the procedure for that section.
4. The cradle must be powered and in the radio area, so that communication is possible.

System parameters are grouped according to the following figure:





## 7.2.1 Cradle Parameters EXOM-DRAGON and OM-DRAGON

| PARAMETER             | DEFAULT  |
|-----------------------|----------|
| Baud-Rate             | 9600     |
| Parity                | disabled |
| Datenbits             | 8        |
| Stopbit               | 1        |
| Handshaking           | disabled |
| FIFO                  | enabled  |
| Inter-character Delay | disabled |
| Rx Timeout            | 5 sec    |
| ACK/NACK Protocol     | disabled |

### To change the default values:

1. Read the „Enter Configuration“ code once
2. Read the configuration codes from the desired groups  

Choose only one code from each selected group

Follow the procedure given fort his code group
3. Read the “Exit and Save Configuration“ code once.

### Baud-Rate

150 BAUD



600 BAUD



2400 BAUD



9600 BAUD (\*)



38400 BAUD



300 BAUD



1200 BAUD



4800 BAUD



19200 BAUD



Parity

PARITY DISABLED (\*)



PARITY EVEN



PARITY ODD



Data Bits

7 DATA BITS



8 DATA BITS (\*)



9 DATA BITS



Stop Bit

1 STOP BIT (\*)



2 STOP BITS



Handshake

Transmission without HANDSHAKE (\*)



TRANSMISSION-HANDSHAKE RTS/DTR



TRANSMISSION HANDSHAKE XON/XOFF



TRANSMISSION HANDSHAKE RTA always on



See also chapter 8.1.1

FIFO

FIFO ENABLED (\*)



FIFO DISABLED



See also chapter 8.1.3



Inter-Character Delay

Inter-Character Delay  
(delay between cahacters transmitted to host)



RX Timeout

RX TIMEOUT  
(Timeout control in reception from host)



ACK/NACK Protocol

disabled (\*)



See also chapter 8.1.2

Read 2 numbers from the table where:

00 = Delay disabled (\*)  
01-99 = Delay from 1 bis 99  
Milliseconds

Read 2 numbers from the table where:

00 = TIMEOUT disabled  
01-99 = TIMEOUT from 0,1 bis 9,9 seconds  
Default 5 sec (\*)

enabled



## 7.2.2 Data Format

| PARAMETER                  | DEFAULT         |
|----------------------------|-----------------|
| Code Identifier            | disabled        |
| Custom code identifier     | disabled        |
| Header                     | non             |
| Terminator                 | non             |
| Field Adjustment           | disabled        |
| Field Adjustment character | disabled        |
| Code Length Tx             | Not transmitted |
| Character Replacement      | disabled        |
| Adress Stamping            | disabled        |
| Adress Delimiter           | disabled        |
| Time Stamping              | disabledt       |
| Time Delimiter             | disabled        |

### To change the default values:

1. Read the "Enter Configuration" code once
2. Read the configuration codes from the desired groups  

Choose only one code from each selected group

Follow the procedure given for this code group
3. Read the "Exit and Save Configuration" code once



| Code Identifier Table |              |                    |        |
|-----------------------|--------------|--------------------|--------|
| Code                  | AIM Standard | Datalogic Standard | Custom |
| 2/5 interleaved       | ] I y        | N                  |        |
| 2/5 interleaved       | ] X y        | P                  |        |
| 2/5 normal 5 bars     | ] S y        | O                  |        |
| 2/5 matrix 3 bars     | ] X y        | Q                  |        |
| EAN 8                 | ] E 4        | A                  |        |
| EAN 13                | ] E 0        | B                  |        |
| UPC A                 | ] X y        | C                  |        |
| UPC E                 | ] X y        | D                  |        |
| EAN 8 mit 2 ADD on    | ] E 5        | J                  |        |
| EAN 8 mit 5 ADD on    | ] E 6        | K                  |        |
| EAN 13 mit 2 ADD on   | ] E 1        | L                  |        |
| EAN 13 mit 5 ADD on   | ] E 2        | M                  |        |
| UPC A mit 2 ADD on    | ] X y        | F                  |        |
| UPC A mit 5 ADD on    | ] X y        | G                  |        |
| UPC E mit 2 ADD on    | ] X y        | H                  |        |
| UPC E mit 5 ADD on    | ] X y        | I                  |        |
| Code 39               | ] A y        | V                  |        |
| Code 39 Full ASCII    | ] A y        | W                  |        |
| CODABAR               | ] F y        | R                  |        |
| ABC CODABAR           | ] X y        | S                  |        |
| Code 128              | ] C y        | T                  |        |
| EAN 128               | ] C y        | k                  |        |
| ISBT 128              | ] C 4        | f                  |        |
| Code 93               | ] G y        | U                  |        |
| CIP/39                | ] X y        | Y                  |        |
| CIP/HR                | ] X y        | e                  |        |
| Code 32               | ] X y        | X                  |        |
| Codablock-A           | ] O 6        | n                  |        |
| Codablock-F Std       | ] O 4        | l                  |        |
| Codablock-F EAN       | ] O 5        | m                  |        |
| MSI                   | ] M y        | Z                  |        |
| Plessey Standard      | ] P 0        | a                  |        |
| Plessey Anker         | ] P 1        | o                  |        |
| Telepen               | ] X 0        | d                  |        |
| Delta IBM             | ] X 0        | c                  |        |
| Code 11               | ] H y        | b                  |        |
| Code 16K              | ] K 0        | p                  |        |
| Code 49               | ] T y        | q                  |        |
| PDF417                | ] L 0        | r                  |        |

**Reference:**

AIM standard identifiers are not defined for all codes: the X identifier is assigned to the code for which the standard is not defined. The y value depends on the selected options (check digit tested or not, check digit tx or not etc.)

Custom Code Identifiers default to Datalogic Standard

When customizing the Datalogic Standard code identifiers, 1 or 2 identifier characters can be defined for each code type. If only 1 identifier character is required, the second character must be selected as FF (disabled).

The code identifier can be singly disabled for any code by simply selecting FF as the first identifier character.

Write in the custom character identifiers in the table above for your records.

Code Identifier

Disabled (\*)



Datalogic standard



AIM standard



Custom



Custom code Identifier



- 1.) Read the above code
- 2.) Select the code type from the code table.
- 3.) You can define 1 or 2 identifier character for each code type. If only 1 identifier character is required the 2. character must be selected as FF. Read the hexadecimal value corresponding to the character you want to define as identifier for the code selected . valid characters are in the range 00-FE

Example: To define Code 39 Identifier = @

Read:



+ Code 39 + 40 + FF



No header (\*)



2 character header



4 character header



6 character header



8 character header



One character header



3 character header



5 character header



7 character header

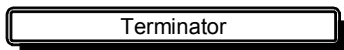


After selecting one of the desired Header codes, read the character(s) from the HEX table.  
Vailed characters for all readers are in the range 00-FE.

Example: 4 character header



+ 41 + 42 + 43 + 44 = header ABCD



No terminator (\*)



2 character terminator



1 character terminator



3 character terminator



4 character terminator



5 character terminator



6 character terminator



7 character terminator



8 character terminator



After selecting one of the desired terminator codes, read the character from the HEX table.

Example:

4 character terminator



+ 41 + 42 + 43 + 44 = Terminator ABCD

Field Adjustment

disabled (\*)



## Define the field adjustment

1.)

enable



2.) Select the code type from the Code Identifier Table page 33 or in Appendix 14.

3.) Select the type of adjustment to perform:

right addition



left addition



right deletion



left deletion





4.) Read a number in the range 01 -32 from the HEX/Numeric Table to define how many characters to add or delete.

Example:

Field adjustment aktiviert + Code 39 + right addition + **04**



Field Adj. character

1.)



2.) Read the field adjustment character code

Valid characters for all readers are in the range: 00-FE

Example:

To define the field adjustment character = A:



+ **41**

Code Length Tx

not transmitted (\*)



transmitted in variable-digit format



transmitted in fixed 4-digit format



Character Replacement

disabled character replacement (\*)



This parameter allows up to three characters to be replaced from the barcode read. These substitutions are stored in memory. To define each character replacement

1.) Read one of the following character replacement codes:

first character replacement



second character replacement



third character replacement



2.) From the Code Identifier see at page 37 or in Appendix 15, read the code identifier for the desired code family.

0=character replacement will be effective for all code families.

3.) Read 2 characters corresponding to the HEX value which identifies the new character to be replaced. Valid values for all readers are in the range 00-FE

FF=The character to be replaced will be substituted with no character, that is, it will be removed from the code.

**Example:**

First character replacement: Substitution in Code 39 barcodes of all occurrences of the **0** character with the **1** character..

| First character replacement | + | Code 39 | + | ASCII character<br>Corresponding to the<br>HEX-value 0 | + | ASCII character<br>corresp. to the<br>HEX-value 1 |
|-----------------------------|---|---------|---|--------------------------------------------------------|---|---------------------------------------------------|
|                             |   |         |   | <b>30</b>                                              |   | <b>31</b>                                         |

For Code 39 codes containing the string „0123“ the contents transmitted will be „1123“

**Example 2:**

2 Second character replacement: Substitution in Code 39 barcodes of all occurrences of the A character with the B character.

| Second character replacement | + | Code 39 | + | ASCII character<br>Corresponding to the<br>HEX-value A | + | ASCII character<br>corresp. to the<br>HEX-value B |
|------------------------------|---|---------|---|--------------------------------------------------------|---|---------------------------------------------------|
|                              |   |         |   | <b>41</b>                                              |   | <b>42</b>                                         |

For Code 39 codes containing the string „ABCD“ the contents transmitted will be „BBCD“.



Address Stamping

Disable reader address stamping (\*)



Enable reader addresss stamping



Disabled cradle address stamping (\*)



Enable cradle address stamping



Address Delimiter

Disable reader address delimiter (\*)



Enable reader address delimiter and select character



Read 2 HEX characters in the range 00-FE

Disable cradle address delimiter



Enable cradle address delimiter and select character



Read 2 HEX characters in the range 00-FE

Time Stamping

Disable (\*)



Hour/minutes/seconds/month/day/year



hhmmssmddy

Hour/minutes/seconds/day/month/year



hhmmssddmmyy

Hour/minutes/seconds



hhmmss

month/day/year



mmddy

day/month/year



ddmmyy

Time Delimiter

Disabled (\*)



Select delimiter



Read 2 HEX characters in the range 00-FE

## 7.2.3 Power Save



| PARAMETER           | DEFAULT  |
|---------------------|----------|
| Sleep State         | disabled |
| Enter Sleep Timeout |          |

**To change the default values:**

1. Read the "Enter Configuration" code once
2. Read the configuration codes from the desired groups
  -  Choose only one code from each selected group
  -  Follow the procedure given for this code group
3. Read the "Exit and Save configuration" code once.

Sleep State

disabled (\*)



enabled



Enter Sleep timeout (100 ms)



**Read 2 numbers in the range 00-99:**

00 = Enter sleep state immediately

01-99 = corresponds to a max. 9.9 sec. Delay before entering the sleep state.

## 7.2.4 Reading Parameters

| PARAMETER           | DEFAULT              |
|---------------------|----------------------|
| Trigger Type        | Hardware trigger     |
| Trigger Signal      | Trigger active level |
| Trigger off Timeout | 10 sec.              |
| Flash Mode          | On 1 sec, off 0,6sec |
| Reads per cycle     | 1                    |
| Safety Time         | 0,5 sec.             |
| Beeper intensity    | High intensity       |
| Beeper Tone         | 2                    |

To change the default values:

1. Read the "Enter Configuration" code once.
2. Read the configuration codes from the desired group.  

Choose only one code from each selected group.

Follow the procedure given for this code group.
3. Read the "Exit and Save Configuration" code once.

Trigger Type

software trigger



hardware trigger (\*)



Trigger Signal

Trigger active level (\*)



Trigger active pulse



See also chapter 8.4.1

Trigger off Timeout

Trigger off timeout (\*)



See also chapter 8.4.2

**Read 2 numbers in the range 00-99:**

00 = disables the trigger-off timeout  
01-99 = Corresponds to a max 99 sec. Delay after the trigger press to allow the reader to turn off automatically.



Flash Mode

Flash on



Flash off



Read 2 numbers in the range 01 – 99

01 to 99 = from 0.1 to 9.9 seconds

Default: Flash on = 1 sec. Flash off = 0,6 sec.

Reads per Cycle

One read per cycle (\*)



See also chapter 8.4.3

Multiple read per cycle



Safety time

Safety time



Limits **same** code consecutive reading.

Default = 0,5 sec.

See also chapter 8.4.4

**Read 2 numbers in the range 00-99:**

00 = no same code consecutive reading until reader is removed ( no decoding) for at least 400 ms.

01 bis 99 = Timeout from 0.1 to 9,9 seconds, before a consecutive read on same code.

**Beeper Intensity**

Very low intensity



Medium intensity



**Beeper Tone**

Ton 1



Ton 3



Low intensity



High intensity (\*)



Ton 2 (\*)



Ton 4



## 7.2.5 Radio Parameter

| PARAMETER                        | DEFAULT       |
|----------------------------------|---------------|
| Radio Protocol Timeout           | 2 sec.        |
| Power-off Timeout                | After 4 hours |
| Beeper control f. radio response | normal        |
| Transmission Mode                | One way       |
| Single store                     | disabled      |
| Batch Mode                       | disabled      |

**To change the default:**

1. Read the „Enter configuration“ code once
2. Read the configuration codes from the desired groups  
 Choose only one code from each selected group.
3. Read the „Exit and Save Configuration“ code once.



Radio Protocol Timeout



Read 2 numbers from the table where  
02-19 = Timeout from 2 to 19 seconds  
Default = 2 sec.

Power off Timeout



Default after 4 hours

Read 2 numbers in the range 00 – 99.

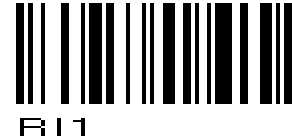
00 = Power off disabled, reader always ready  
01-99 = corresponds to a max. 99 hour delay before power-off.

Transmission Mode

One-way (\*)



two-way



See also chapter 8.6.3

Beeper control f. radio response

normal (\*)



only good decode



only good reception



off



See also chapter 8.6.4

Single Store

disabled (\*)



2 attempt



4 attempt



6 attempt



8 attempt



1 attempt



3 attempt



5 attempt



7 attempt



9 attempt



See also chapter 8.6.5

Batch Mode

batch disabled (\*)



enable automaitc batch in RAM



enable automatic batch in EEPROM



enable normal batch in RAM



enable normal batch in EEPROM





The following batch management parameters are complete commands and do not require reading the „enter configuration / exit and save configuration“ Codes.

start normal batch transmission



delete batch data



## 7.2.6 Decoding Parameter

| PARAMETER          | DEFAULT  |
|--------------------|----------|
| Ink-Spread         | enabled  |
| Overflow Control   | enabled  |
| Interdigit Control | enabled  |
| Puzzle Solver      | disabled |
| Decoding Safety    | One read |

To change the default values:

1. Read the “Enter configuration” code once.
2. Read the configuration code from the desired groups  
 Chooss only one code from each selected grooup.
3. Read the “Exit and Save configuration” code once.



### Attention

Before changing these parameter values read the descriptions in chap.8.5

**Ink Spread**

disabled



Enabled (\*)



**Overflow Control**

disabled



Enabled (\*)



**Interdigit Control**

disabled



Enabled (\*)



**Puzzle Solver**

disabled (\*)



enabled



**Decoding Safety**

one read (\*)



two read



three reads



four reads





## 7.2.7 Display Parameters

| PARAMETER           | DEFAULT    |
|---------------------|------------|
| Font Size           | small      |
| Display-off-Timeout | 8 sec      |
| Contrast Display    | normal     |
| Backlight           | off        |
| Modus Display       | lokal echo |
| Key Pad             | disabled   |

### To change the default values:

1. Read the "Enter Configuration" code once.
2. Read the configuration codes from the desired groups  

Choose only one code from each selected group.

Follow the procedure given for this code group.
3. Read the "Exit and Save Configuration" code once.

Date



IAxxxxxx

day / month / year

Time



IBxxxx

hour / minutes

Font Size

small



medium



large



Display-Off Timeout



Read 2 numbers in the range

00 to 99 (sec.) ein.

00 = disables display timeout (always on)

01 to 99 = timeout from 1 to 99 seconds

Default after 8 sec.

### Contrast Display

lighter



darker



Read the code until the desired contrast is reached.

### Backlight

off (\*)



on



### Modus Display

normal



Clear display after decode



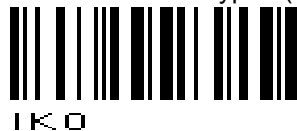
Lokal echo (\*)



See also chapter 8.7.1

### Keypad

disabled reader keypad (\*)



enable reader keypad and select characters



Read 3 HEX characters in the range 00-FE  
Corresponding to the left, center and right  
keys respectively  
FF=KeyID deaktiviert



## 7.2.8 Code selection

| PARAMETER          | DEFAULT                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------|
| EAN/UPC - Family   | <b>EAN 8/EAN 13 / UPC A/UPC E</b><br>check digit control<br>no conversion                                    |
| 2/5 - Family       | <b>Interleaved 2/5</b><br>check digit control and<br>transmission<br>variable Codelength: 4 55<br>characters |
| Code 39 - Family   | <b>Standard Code 39</b><br>no check digit control<br>variable Codelength: 1-99<br>characters                 |
| Code 128 - Family  | Check digit control without<br>transmission<br>Add GS before Code<br>disabled                                |
| Code 93            | <b>disabled</b>                                                                                              |
| Codablock A-Family | <b>disabled</b>                                                                                              |
| Codablock F-Family | <b>disabled</b>                                                                                              |
| MSI                | <b>disable</b>                                                                                               |
| Plessey            | <b>disable</b>                                                                                               |
| Telepen            | <b>disable</b>                                                                                               |
| Delta IBM          | <b>disabl</b>                                                                                                |
| Code 11            | <b>disable</b>                                                                                               |
| Code 16K           | <b>disable</b>                                                                                               |
| Code 49            | <b>disable</b>                                                                                               |
| Codabar-Family     | <b>disable</b>                                                                                               |

### To change the default values:

**1.** Read the "Enter configuration" code once.

**2.** Read the configuration codes from the disired groups



Choose only one from each selected group.



Follow the procedure given for this group

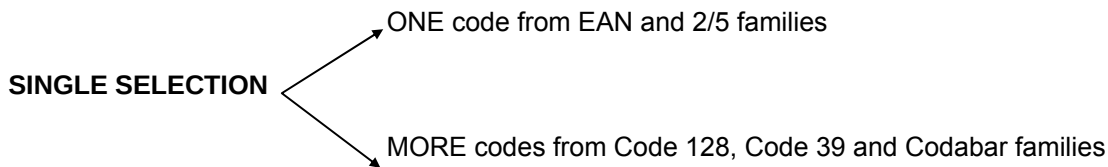
**3.** Read the "Exit and Save Configuration" code once.

Disabled all code families



**Note**

The reader allows up to 5 code selections. This does not limit the number of CODES enabled to 5, as it depends on the code family:



**Example**

5 code selections:

1. **2/5 Interleaved**
2. **2/5 Industrial**
3. Code 128 + EAN 128
4. Code 39 Full ASCII + Code 32
5. **UPC A/UPC E**

In this section all **SINGLE** code selections are **underlined and in bold.**



**EAN/UPC Family**

disables the family



**EAN 8**



**UPC A**



**EAN 8/EAN 13/UPC A/UPC E**  
**with and without ADD ON**



**WITHOUT ADD ON**

**EAN 8/EAN 13/UPC A/UPC E**



**EAN 8/EAN 13**



**UPC A /UPC E**



Read a single code or combination code selection

**EAN 13**



**UPC E**



**WITH ADD ON**

**EAN 8/EAN 13/UPC A/UPC E**



**EAN 8/EAN 13**



**UPC A /UPC E**



## **EAN/UPC CHECK DIGIT TX SELECTIONS**

For each code type in this family you can choose to transmit the check digit or not

**EAN 8**



AA G

**EAN 13**



AA H

**UPC A**



AA I

**UPC E**



AA J

**check digit transmission**



1

**no check digit transmission**



0

## **CONVERSION OPTIONS**

**UPC E to UPC A conversion**



AA A

**UPC A to EAN 13 conversion**



AA C

**UPC E to EAN 13 conversion**



AA B

**EAN 8 to EAN 13 conversion**



AA D



## ISBN Conversion Codes

enable ISBN



enable ISSN



enable ISBN and ISSN



disable ISBN and ISSN



2/5 Family

disables the family



① Read the desired family code

② Read a check digit selection

### Interleaved 2/5



### Normal 2/5 (5 Bars)



### Industrial 2/5 (IATA)



### Matrix 2/5 (3 Bars)



no check digit control



check digit control and transmission



check digit control without transmission



The pharmaceutical code below is part of the 2/5 family but has no check digit nor code length selections.

### Code CIP/HR



French pharmaceutical code

③ Read 4 numbers for the code length where:

**First 2 digits** = minimum code length.

**Second 2 digits** = maximum code length.

The maximum code length is 55 characters.

The minimum code length must always be less than or equal to the maximum.

Examples:

0155 = variable from 1 to 55 digits in the code.

1010 = 10 digit code length only.

Code 39 Family

disables the family



AB 0

① Read the desired family code

**Standard Code 39**



AB 1

② Read a check digit selection

**CHECK DIGIT TABLE**

no check digit control



1

check digit control and transmission



2

**Full ASCII Code 39**



AB 2

check digit control without transmission



3

**CODE LENGTH (optional)**

The code length selection is valid for the entire Code 39 family.

set code length



AB \*

Read **4** numbers for the code length where:

**First 2 digits** = minimum code length.

**Second 2 digits** = maximum code length.

The maximum code length is 32 characters. The minimum code length must always be less than or equal to the maximum.

Examples:

0132 = variable from 1 to 32 digits in the code.

1010 = 10 digit code length only.

The pharmaceutical codes below are part of the Code 39 family but have no check digit selections.

**Code CIP39** French pharmaceutical code



AB 3

**Code 32** Italian pharmaceutical code



AB 4



**Code 128 Family**

disables the family



**Code 128** control without transmission of check digit



**EAN 128** control without transmission of check digit



**add GS before Code**

disabled



enabled



**Enable ISBT 128**



**CODE LENGTH (optional)**

The code length selection is valid for the entire Code 128- family.

set code length



Read **4** numbers for the code length where:

**First 2 digits** = minimum code length.

**Second 2 digits** = maximum code length.

The maximum code length is 99 characters. The minimum code length must always be less than or equal to the maximum.

Examples:

0199 = variable from 1 to 99 digits in the code.

1010 = 10 digit code length only.

**Code 93**

Disables the family



**Code 93** control without transmission of check digit



Codablock- A - Family

disabled



enabled



Codablock- F - Family

disabled Codablock – F Family



enable standard



enable EAN

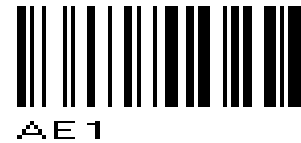


MSI

disabled MSI Familie



no check



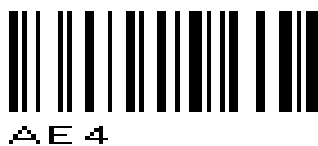
MOD10 no tx



MOD 10 with tx



MOD11-MOD10 no tx



MOD11-MOD10 with tx



MOD11-MOD10 with tx



MOD11-MOD10, no tx

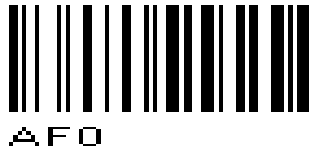


no check → no check digit control  
no tx → no check digit transmission



Plessey

disabled Plessey Familie



Standard check mit tx



Anker no check



Anker no check – no tx



no check → no check digit control  
no tx → no check digit transmission

Telepen

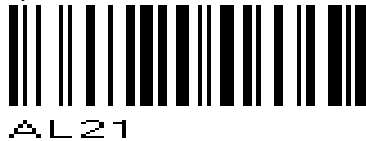
disabled Telepen Family



Numeric check, mit tx



Alpha no check



Alpha check – no tx



standard no check



Standard check no tx



Anker check with tx



Numeric no check



Numeric check – no tx



Alpha check with tx



Delta IBM

disabled Delta IBM Family



Type 1 check



no check



Type 2 check



Code 11

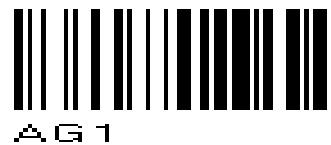
disabled Code 11 Family



Type C with tx



no check



Type C no tx



Type K with tx



Type K no tx



Type C and K with tx



Type C and K no tx

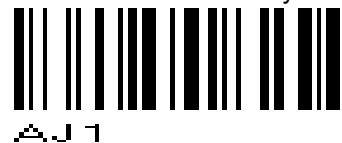


Code 16K

disabled Code 11 Family



enabled Code 11 Family





**Code 49**

disabled Code 49 Family



enabled Code 49 Family



**Codabar - Familie**

disabled



For Standard Codabar:

① Read the desired equality control code

② Read a start/stop transmission selection

**Standard Codabar**

no start/stop character equality control



no transmission



**Standard Codabar**

start/stop character equality control



transmission



Codabar ABC forced concatenation



The Codabar ABC code below uses a fixed start/Stop character transmission selection.

**Codabar ABC**

no start/Stop character equality control  
but transmission



## CODELENGTH (optional)

The code length selection is valid for the entire Codabar family.

set code length



AD\*

Read 4 numbers for the code length where:

**First 2 digits** = minimum code length.

**Second 2 digits** = maximum code length.

The maximum code length is 99 characters. The minimum code length must always be less than or equal to the maximum.

Examples:

0199 = variable from 1 to 99 digits in the code.

1010 = 10 digit code length only.

Start/Stop character case in transmission

The start/stop character selections below are valid for the entire Codabar family

Lower case



ADAO

upper case



ADA1



## 7.2.9 Special settings "2/5 Interleaved"

### Programming model for setting "2/5 Interleaved" code without a check digit

Prerequisites: The scanner must already be connected to the port and started up (refer to the scanner manual). This programming model only describes the setting for "2/5 Interleaved" code **without** a check digit.

The barcode reader EXDLL6110 and EX-Dragon-M101 has "2/5 Interleaved" with a check digit activated as the default setting, in other words if this code type exists without a check digit, it cannot be scanned or decoded unless this setting is changed. The following steps are necessary to do this.

Read the following barcode commands one at a time:

#### 1.) Enter configuration



#### 2.) Disable all code families



#### 3.) 2/5 Interleaved



#### 4.) No check digit control



#### 5.) Number of digits (useful content)

Please read from the table in chap. 14 (Single codes) 4 digits.

- First two digits = minimum code length
- Last two digits = maximum code length

#### 6.) Save and exit configuration



END

## Notes on **5.) Number of digits (useful content)**

### **Example 1:**

A "2/5 Interleaved" code with 12 digits of useful content must be read:

Enter digits: 1 2 1 2 ( $\Rightarrow$  means from 12 to 12 digits = specification of the number of digits).

### **Example 2:**

A "2/5 Interleaved" code with 12 and 14 digits of useful content must be read:

Enter digits: 1 2 1 4 ( $\Rightarrow$  means from 12 to 14 digits).

The "number of digits" range should be as narrow as possible to reduce the risk of partial reading to a minimum. Reason: If the "unsafe" code type "2/5 Interleaved" is processed without a check digit and a variable number of digits is specified (e.g. 4 – 30 digits), the risk of partial reading is very high, i.e. if a barcode to be scanned has 30 digits, the scanner could theoretically read one with one with only four digits.

However, if several different numbers of digits spanning a wide range need to be scanned, each code length should be separately programmed with a fixed length. The memory locations preassigned to the code families (5 locations) must be deleted first. The steps for doing so are described in the following and are not the same as in this programming document (above). The necessary programming codes can be found on the previous pages.

### **Special case:**

#### **Example 3:**

A "2/5 Interleaved" code without a check digit and with 4 and 30 digits of useful content must be read (caution: risk of partial reading, see above):

- 1.) Enter configuration ( $\Rightarrow$  enter programming mode)
- 2.) Disables all code families ( $\Rightarrow$  all predefined code families are deleted)
- 3.) Interleaved 2/5 ( $\Rightarrow$  activates the code type)
- 4.) No check digit control ( $\Rightarrow$  code type without a check digit)
- 5.) Enter digits: 0 4 0 4 ( $\Rightarrow$  means from 4 to 4 digits = specification of the number of digits).
- 6.) Interleaved 2/5 ( $\Rightarrow$  activates the code type again for a new memory location)
- 7.) No check digit control ( $\Rightarrow$  code type without a check digit)
- 8.) Enter digits: 3 0 3 0 ( $\Rightarrow$  means from 30 to 30 digits = specification of the number of digits).
- 9.) Exit and save configuration ( $\Rightarrow$  save the configuration and exit programming mode)

This reduces the risk of partial reading to a minimum. Of course, in theory, it would also be possible to enter "0 4 3 0" for variable directly, but the risk of partial reading would then be very high!

## 7.2.10 Advanced Formatting

# ADVANCED FORMATTING

NOT FOR PEN INTERFACES

⊙ **CONCATENATION** ⊙  
⊙ **ADVANCED FORMATTING** ⊙



NOTE

*Please follow the setup procedure carefully for these parameters.*

1. Read the **Enter Configuration** code ONCE, available at the top of page .
2. Read configuration codes **precisely following the numbered procedure given.**  
 = Read the code and follow the procedure given
3. Read the **Exit and Save Configuration** code ONCE, available at the top of page.

Enter configuration



Exit and Save Configuration



## ADVANCED FORMATTING

### CONCATENATION

◆ disable



enable



Permits the concatenation of two codes defined by code type and length. It is possible to set a timeout for the second code reading and to define code transmission if the timeout expires.

The order of transmission is CODE 1-CODE 2.

### Define Concatenation

1

Code 1

code ID



Read the code type from the Code Identifier Table beginning in Appendix B.

code length



Read a number in the range **01-99** from the Hex/Numeric Table.

## ADVANCED FORMATTING



2

### Code 2

code ID



Read the code type from the Code Identifier Table beginning in Appendix B.

code length



Read a number in the range **01-99** from the Hex/Numeric Table.

3

### Concatenation Result Code ID

use code 1 ID



use code 2 ID



Since you can concatenate codes from different families, you must select the Code ID character of the resulting code. The Code ID character will be sent in the output message only if it is enabled according to the Code Identifier selection (Datalogic, AIM, or Custom).

4

### Concatenation Timeout

timeout



Read two numbers in the range **00 to 99**  
 00= no timeout  
 01-99 = timeout from 1 to 99 seconds

Exit and Save Configuration

## ADVANCED FORMATTING



5

### Transmission after Timeout

no code transmitted  
after timeout



only code 1 transmitted  
(if read) after timeout



only code 2 transmitted  
(if read) after timeout



either code 1 or code 2 transmitted  
after timeout



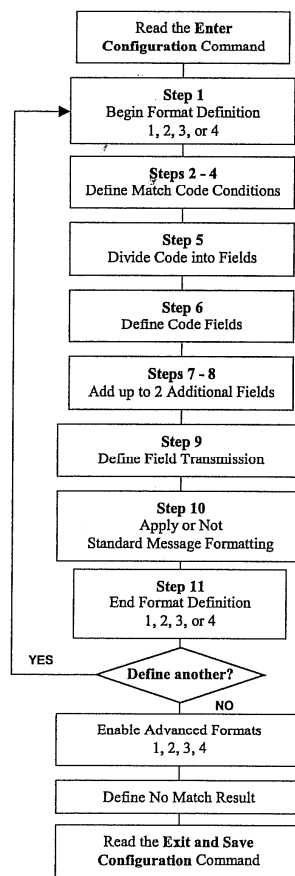
Define the timeout, which determines the valid waiting period between the two codes, in order to accept concatenation. If the timeout expires, the resulting action will be based on the following selection.

## ADVANCED FORMATTING

### *ADVANCED FORMATTING*

Advanced formatting has been designed to offer you complete flexibility in changing the format of barcode data before transmitting it to the host system. This formatting will be performed when the barcode data meets certain criteria which you will define in the following procedure.

Up to 4 advanced code management formats can be defined and saved in memory. For each format you must complete the entire configuration procedure:



Enter configuration



**ADVANCED FORMATTING**

Exit and Save Configuration



---

**1**

**Begin Format Definition**

begin Format 1 definition




begin Format 2 definition




begin Format 3 definition




begin Format 4 definition




---

**2**

**Match Code Type**

match code type




Read the above code + the code type to match from the Code Identifier Table in Appendix B.

OR

any code type



---

**3**

**Match Code Length**

match code length




Read the above code + two numbers in the range **01** to **99** for the exact code length.

OR

any code length



## ADVANCED FORMATTING



4

### Match with Predefined Characters

no match



OR

match with 1 character



match with a 2-character string



match with a 3-character string



match with a 4-character string



After selecting the predefined match code, read the character(s) from the HEX table. Range of characters = 00-FE.

#### Example:

Match code with the 2-character predefined string = "@@".

Match with a 2-character string

Read



+ 40 + 40

AND

position of first character in predefined string



Read the above code + two numbers in the range 01 to 99 representing the character position in the code where the first character of the predefined string must be found.

Read 00 if the match string can be found in any character position.

Exit and Save Configuration



## ADVANCED FORMATTING

5

### Divide Code into Fields

divide code into fields



Read one number in the range 1 to 5 to divide the code into fields.

6

### Define Code Fields

define code fields

Each code field length can be set by either:

- a) defining a field separator character to be found in the code itself. In this case you can choose to **discard** the code separator character or **include** it as the last character of the field.

OR BY

- b) specifying a specific character length up to the maximum of 99 characters.

OR BY

- c) selecting the last field as variable length (if any).

You must define the same number of fields as selected in step 5, including fields that will not be transmitted.

Exit and Save Configuration

## ADVANCED FORMATTING



### DEFINE FIELD 1 BY: EITHER

a) field separator

Read the field separator character from the HEX table. Range of characters = 00-FE.

discard separator

include separator

OR

b) field length

Read two numbers in the range 01 to 99 to define the field length.

OR

c) this is the last field (variable length)

AND

### Field 1 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table.  
Valid range of characters for all readers = 00-FE.

Exit and Save Configuration

## ADVANCED FORMATTING



DEFINE FIELD 2 BY:  
EITHER

a)

field separator



Read the field separator character from the HEX table. Range of characters = 00-FE.

discard separator



include separator



OR

b)

field length



Read two numbers in the range 01 to 99 to define the field length.

OR

c)

this is the last field (variable length)



AND

Field 2 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table.

Valid range of characters for all readers = 00-FE.

Exit and Save Configuration

## ADVANCED FORMATTING



### DEFINE FIELD 3 BY: EITHER

a) field separator

Read the field separator character from the HEX table. Range of characters = 00-FE.

discard separator

include separator

OR

b) field length

Read two numbers in the range 01 to 99 to define the field length.

OR

c) this is the last field (variable length)

AND

### Field 3 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table.  
Valid range of characters for all readers = 00-FE.

Exit and Save Configuration

## ADVANCED FORMATTING



DEFINE FIELD 4 BY:  
EITHER

a)

field separator



Read the field separator character from the HEX table. Range of characters = 00-FE.

discard separator



include separator



OR

b)

field length



Read two numbers in the range 01 to 99 to define the field length.

OR

c)

this is the last field (variable length)



AND

Field 4 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table.  
Valid range of characters for all readers = 00-FE.

Exit and Save Configuration

## ADVANCED FORMATTING



DEFINE FIELD 5 BY:  
EITHER

a) field separator

Read the field separator character from the HEX table. Range of characters = 00-FE.

discard separator

include separator

OR

b) field length

Read two numbers in the range 01 to 99 to define the field length.

OR

c) this is the last field (variable length)

AND

### Field 5 Terminators

no field terminators



1 field terminator



2 field terminators



Read the field terminator character(s) from the HEX table.  
Valid range of characters for all readers = 00-FE.

Exit and Save Configuration

## ADVANCED FORMATTING



7

### First Additional Fixed Field

no fixed field



1 character fixed field



2 character fixed field



3 character fixed field



4 character fixed field



5 character fixed field



6 character fixed field



After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters = 00-FE.

#### Example:

4 Character Fixed Field



+ 4D + 41 + 49 + 4E = MAIN

Exit and Save Configuration

## ADVANCED FORMATTING



8

### Second Additional Fixed Field

no fixed field



1 character fixed field



2 character fixed field



3 character fixed field



4 character fixed field



5 character fixed field



6 character fixed field



After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters = **00-FE**.

#### Example:

3 Character Fixed Field



+ 53 + 45 + 54 = SET

Exit and Save Configuration

## ADVANCED FORMATTING



9

### Field Transmission

number of fields to transmit



Read one number in the range **1** to **7** for the number of fields to transmit. **Include only fields to be transmitted.**

### Field Order Transmission

Read the codes corresponding to the fields to transmit in the order in which they are to be transmitted, see example.

field 1



field 3



field 5



additional field 2



field 2



field 4



additional field 1



### Example:

The barcode is divided into 2 defined fields plus 1 additional fixed field.

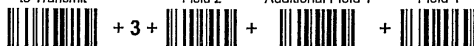
Transmit in the order: Field 2, Additional Field 1, Field 1.

Number of Fields  
to Transmit

Field 2

Additional Field 1

Field 1



Exit and Save Configuration

## ADVANCED FORMATTING



10

### Standard Formatting

do not apply standard formatting



apply standard formatting



After performing Advanced Formatting on the barcode read, Standard Formatting (Headers, Code Length, Code ID, Terminators) can be applied to the message to be transmitted.

11

### End Format Definition

end Format 1 definition



end Format 2 definition



end Format 3 definition



end Format 4 definition



Enter configuration



Exit and Save Configuration



## ADVANCED FORMATTING

### Enable Advanced Format

◆ no Advanced Formats enabled



### Advanced Format 1

enable



disable



### Advanced Format 2

enable



disable



### Advanced Format 3

enable



disable



### Advanced Format 4

enable



disable



Enter configuration



## ADVANCED FORMATTING

Exit and Save Configuration



---

### No Match Result

clear data - no transmission



transmit data using standard format



This selection determines the action to be taken when codes read do not conform to the advanced format requisites (no match).

- Codes not matching can be ignored, cleared from memory and not transmitted.
- Codes not matching can be transmitted using the Standard formatting (Headers, Code Length, Code ID, Terminators).

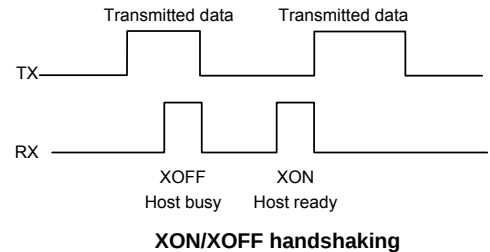
## 8 References

### 8.1 RS232 Parameters

#### 8.1.1 Handshaking

##### Software handshaking (XON/XOFF)

During transmission between Cradle and Host, if the Host sends the XOFF character (13 Hex), the decoder interrupts the transmission with a maximum delay of one character and only resumes when the XON character (11 Hex) is received.



#### 8.1.2 ACK/NACK-Protocol

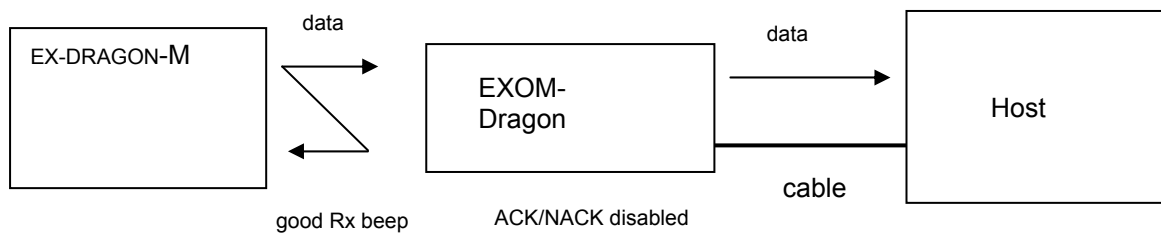
##### **EX-Dragon-M Reader**

The transmission protocol takes place between reader, cradle and Host. The reader passes its data (code read) to the cradle which sends it to the Host. The management of responses (from Host or cradle) depends on the Transmission Mode parameter.

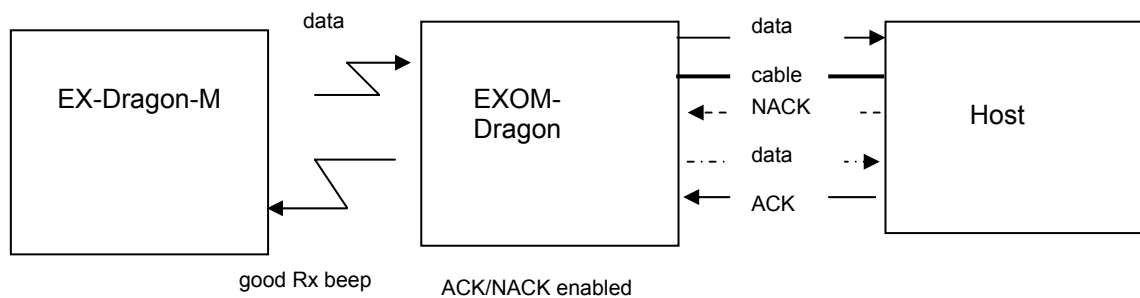
In the following descriptions the completed transmission is indicated by the Beeper control Radio Response parameter with its default setting to Normal.

When ACK/NACK is disabled (in One-Way tx mode), there is no control from cradle to Host transmission, the reader responds with the good reception tone.

Transmission = One-Way



Transmission = Two-Ways



When ACK/NACK is enabled (in Two-Ways tx mode), the Host sends an ACK character (06 HEX) in the case of good reception or the NACK character (15 HEX) requesting re-transmission, in the case of bad reception. Only after the ACK character is received by the EXOM-Dragon does the reader respond with the good reception tone.

If the EXOM-Dragon does not receive an ACK or NACK, transmission is ended after the RX Timeout. See also Radio Protocol Timeout.

Selection of the ACK/NACK protocol temporarily disables FIFO buffering, see par. 8.1.3

### **8.1.3 FIFO**

If enabled the EXOM-Dragon collects all messages sent by EX-Dragon-M and sends them in order of acquisition to the connected Host.

If disabled, EX-Dragon-M blocks message transmission until the EXOM-Dragon has completed transmission towards the Host.

## **8.2 Data Format**

### **8.2.1 Gun/Cradle Address Stamping**

It is possible to include the gun and cradle addresses in the message sent to the host. The Gun Address Stamping and the Cradle Address Stamping parameters consist of a 4-digit number in the range 0000 to 1999. For message output format, refer to the example at the beginning of this chapter.

### **8.2.2 Gun/Cradle Address Delimiter**

The Address Delimiters allow a character to be included to separate the Gun and Cradle Address stamping fields from the next fields in the message. Any character can be included in the hexadecimal range from 00 to FE. For message output format, refer to the example at the beginning of this chapter.

### **8.2.3 Time Stamping Format**

The Time Stamping parameter sets the format for hour and date information. It consists of 1 or 2 groups of numbers, each one made up of 6 decimal digits.

For example, setting the Hour/Minutes/Seconds/Month/Day/Year format, the information *17:03:16 on June 12, 2000* will be formatted as 170316061200.

### **8.2.4 Time Stamping Delimiter**

The Time Stamping Delimiter allows a character to be included to separate the Time Stamping field from the next field in the message. Any character can be included in the hexadecimal range from 00 to FE.

## **8.3 POWER SAVE**

### **8.3.1 Sleep State**

This mode allows the microprozessor in the reader to enter a “Sleep” state for minimum power consumption.

Before entering Sleep mode, the following are verified:

- no commands coming from Host
- no data being transmitted to Host
- Enter Sleep Timeout ended

To exit Sleep mode press the trigger.

For M-series reader, sleep state is entered immediately after reading a code and is not configurable. To exit Sleep mode press the trigger.

### **8.3.2 Enter Sleep Timeout**

For readers that have the Sleep state enabled, this timeout determines when the reader will enter this state.

## **8.4 Reading Parameter**

### **8.4.1 Trigger Signal**

Trigger signal is useful to determine the modality of the reader ON state:

- trigger level: the reader goes ON when the trigger is pressed and goes OFF when it is released;
- trigger pulse: the reader goes ON at the first trigger press and goes OFF only at a second press.

### **8.4.2 Trigger- Timeout**

When this timeout is selected, the reader which is triggered ON but not decoding turns the laser OFF automatically after the desired period of time.

### 8.4.3 Reads per Cycle

A reading cycle depends on the trigger signal selection and on the trigger timeout selection .

When one read per cycle is selected, the scanner turns off as soon as a valid code is decoded. To turn the reader on again, release and again press the trigger in case the scanner is operating in 'trigger level mode', pull the trigger if the reader is operating in 'trigger pulse mode'.

When multiple reads per cycle is selected, the scanner turns off after a good decoding for the time necessary to transmit the code and activate the beeper, then it turns on again. The scanner turns off after a trigger press according to the 'trigger signal' selection or when the timeout expires.

The Safety Time parameter can be used in this case to avoid unwanted multiple reading of the same code, see safety time below.

### 8.4.4 Safety Time

Safety time prevents the device from immediately decoding the same code more than once. Same code consecutive reading can be disabled requiring the reader to be removed from the code (no decoding) for at least 400 ms, or a timeout can be set up to 9.9 seconds before the decoder will accept the same code. Reading is immediate if the code changes

## 8.5 Decoding Parameters



#### Attention

These parameters are intended to enhance the decoding capability of the reader for particular applications. Used incorrectly, they can degrade the reading performance or increase the possibility of a decoding error.

### 8.5.1 Ink-Spread

The ink-spread parameter allows the decoding of codes which are not perfectly printed because the page texture tends to absorb the ink.

### 8.5.2 Overflow Control

The overflow control parameter can be disabled when decoding codes printed on small surfaces, which don't allow the use of an overflow space.

This command does not effect code families 2/5, Code 128 and Code 93.

For the EAN/UPC code family, do not use code combinations. Each code must be selected singularly if this control is disabled.

For example, to read EAN8 and EAN13 without overflow control select two codes: EAN8 and EAN13; do not select the EAN8/EAN13 combination.

### 8.5.3 Interdigit Control

The interdigit control parameter verifies the interdigit spacing for code families Code 39 and Codabar.

## 8.6 Radio Parameters

### 8.6.1 Radio Protocol Timeout

This parameter sets the valid time to wait before transmission between the M series reader and EXOM-Dragon cradle is considered failed.

This parameter should be set taking into consideration the radio traffic (number of readers in the same area).

Wenn die RS232 Schnittstelle is used with ACK/NACK enabled this parameter should be at least equal to the Rx timeout parameter for low traffic environments. It should be increased if there are many readers in the same area.

It can be set between 2 and 19 seconds.

### 8.6.2 Power-Off Timeout

If this command is enabled, after the desired timeout in hours, the EX-DRAGON-M batteries are disconnected and all power consumption ceases. To restore power, press trigger once. The reader will now be ready to read codes.

Power-off does not effect configuration parameters.

### 8.6.3 Transmission Mode

This parameter determines whether the reader receives responses or messages from the Host or not. In One-Way tx mode, neither Host nor cradle responds to the reader.

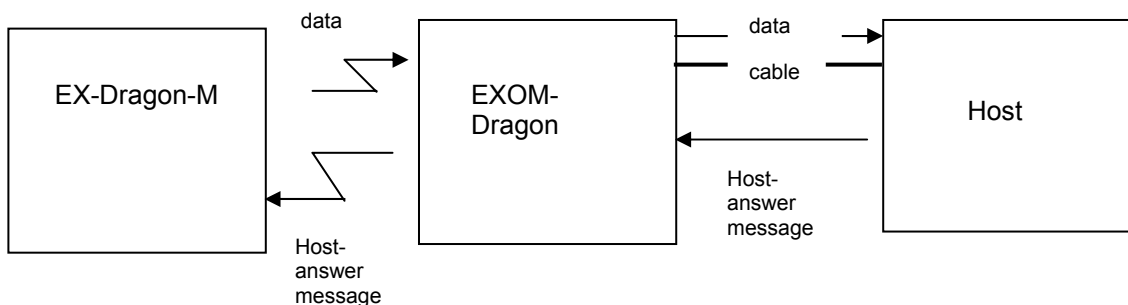
In Two-Ways tx mode, the reader must receive a response from either the cradle or the Host.

In cradle responds (empty message) to the reader, only after good transmission to the Host, for the following conditions: ACK/NACK enabled. For these conditions, it is suggested to prolong the Radio Protocol Timeout.

Enabling Two-Way tx mode temporarily disables FIFO buffering.

With ACK/NACK disabled, the Host responds to the reader (through the cradle) with an answer message (message to reader display or command to reader), see the following figure.

Transmission Mode = Two-Ways



### 8.6.4 Beeper Control for Radio Response

For M-Series readers, the data entry good read tone normally results in two beeps; the first indicates that the reader has decoded the code, the second indicates whether EXOM-Dragon has received the data.

This can be changed according to the following selections:

- Normal: both good decode and good reception are signaled (two beeps).
- Only good decode: only the first beep indicating a good read is signaled.
- Only good reception: only the second beep indicating a good reception is signaled.
- Off: neither good read nor good reception beeps are signaled.

**For all configurations, any transmission errors will always be signaled.**

### 8.6.5 Single Store

When single store mode is enabled, if the EX-Dragon-M fails to transmit a code to the cradle, it enters a special operating mode that prevents the user from reading barcodes. When such operating mode is entered, the trigger no longer enables barcode reading but is used to retry transmission itself for the number of attempts selected in configuration. Once the transmission is successful the reader returns to the standard mode. If transmission is not successful after the number of configured attempts, the code is discarded.

Single store may be useful if you often read codes at the limit of the coverage area and there is a chance that code transmission can fail. In such case single store allows you to move to a more favorable position or location ( i. E. closer to the cradle) to retry transmission without the necessity of re-reading the code since it is already stored in the reader.

Conversely, if single store is disabled, and the user wants to retry transmission, the code must be read again, and therefore the attempt must be made from basically the same location. If the user gives up, he does not know if the transaction was successful. (Actually the transmission could have been successful but the cradle may have been unable to acknowledge the message). There are applications in which there is no risk of transmission failure. In such cases it may be better to disable single store so that the user perceives a more consistent behavior of the trigger in that it always corresponds to code reading.

### 8.6.6 Batch Mode

This Operating Mode allows storing read codes in the internal gun memory. The stored codes are transmitted to the base station at a later time according to the type of batch mode selected.

Batch mode can be enabled either manually (normal batch mode) or automatically.

Normal batch mode temporarily suspends radio communication between gun and base station allowing codes to be stored in the gun on a FIFO basis. This can be useful for example, if codes must be read from a location where there is no radio network. Upon returning to the system working area, this mode requires reading the **Start Normal Batch Transmission** barcodes to successively transmit the list of stored codes to the base station. The FIFO management assures that the first code read will be the first code to be transmitted to the base station.

The **Delete Batch Data** barcode allows canceling all barcode data stored in the gun.

Automatic batch mode allows code to be stored in the gun on a FIFO basis whenever the gun is out of radio range. In this case radio communication is not suspended and transmission is attempted after each code read. If transmission cannot be successfully completed, then the code is added to the list. When the gun returns in range, transmission of the codes to the base station resumes automatically, according to the selected communication protocol upon simply pressing and releasing the trigger or by successfully reading a new code.

Each code is listed on the gun display together with its identifying position number and its total number of characters. The three keys under the display have the following function in batch mode:

|       | Key          | Function                |
|-------|--------------|-------------------------|
| ENTER | (left) Key   | Scroll up in list       |
|       | (center) Key | Delete highlighted code |
|       | (right) Key  | Scroll down in list     |

In batch mode, the selected Transmission Mode determines the behavior of the gun at the time the list of codes is transmitted. If One-way mode is enabled the codes are transmitted one after the other without interruption. In Two-way mode after transmitting each code, the gun waits for the Host answer message to be shown on the display. Therefore, in Two-way transmission mode and normal batch mode, the Start Normal Batch Transmission barcode must be read after each code to continue whereas with automatic batch mode just pull and release the trigger after each code.

The code which has a transmission pending is shown on the display in reverse video indicating that it cannot be deleted.

The selection of batch mode in EEPROM provides the advantage of permanently saving data in the EEPROM to avoid losing them if for example the batteries run down.

The RAM selection allows more data to be saved and is transmitted more quickly to the base station. For example for a list of codes having an average of 20 characters each, the EEPROM can store about 60 codes while the RAM can store almost 100.

## 8.7 Display Parameters

### 8.7.1 Display Mode

The user can control the gun display behavior according to the following selections:

**Normal mode:** When a barcode is read with the gun:

- The code is sent to the Host.
- The gun display is not cleared. Therefore if any previous data was displayed on the gun screen it remains.
- There is no Local Echo to the gun display.

**Clear Display After Decode mode:** When a barcode is read with the gun:

- The code is sent to the Host.
- The gun display is cleared. Therefore if any previous data was displayed on the gun screen it is cancelled and the screen remains blank.
- There is no Local Echo of the code to the gun display.

**Local Echo mode:** When a barcode is read with the gun:

- The code is sent to the Host.
- The gun display is cleared.
- The code is also sent to the gun display (Local Echo).
- The cursor is positioned after the last printed character on the gun display.

Host messages sent to the gun are always written to the gun display.

## 8.8 Configuration and Editing commands

The following commands carry out their specific function and then exit the configuration environment.

| Command                                                                                          | Description                                                                                |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <br>\$+ \$×     | Restore default configuration of the EX-DRAGON-M<br><br>(Default configuration see Manual) |
| <br>\$+ \$!     | Transmit Software-release for EX-DRAGON-M                                                  |
| <br>\$+R×0\$-   | Restore default configuration of the EXOM-DRAGON<br>(Default configuration see manual)     |
| <br>\$+R×1\$- | Software-Release for the EXOM-DRAGON transmission.                                         |
| <br>\$+R×2\$- | Transmit configuration of the EXOM-DRAGON-M Scanners in ASCII-format.                      |

## 9 Communication and Message Formatting

The system always provides gun to host data communication using the following message formatting:

Output Message from EX-DRAGON-M 101 stand alone towards host.

[Header][Gun\_Addr][Gun\_Addr\_delimiter][Cradle\_Addr] [Cradle\_Addr-delimiter]  
[Time stamp][Time stamp\_delimiter][Code-ID][Code Length]CODE[Terminator]

Items in square brackets are optional.

For EX-DRAGON-M models with display, if the RS232 interface is selected for communication between the Host and the EXOM-DRAGON cradle, then the following additional communications between Host and Gun can occur:

The Host can send messages to any gun associated with that cradle to control the Gun's display, LEDs and beeper.

The Gun can send up to 3 user-defined characters to the Host using the 3 commands keys on the gun.

These communications and their relative message formatting are detailed in the following paragraphs.

### 9.1 Messages from Host to Gun

The general format is:

[Gun\_Address][Gun\_Add\_delimiter]<Message>CR

#### NOTE:

- If you have enabled the Gun Address Stamping or the Gun Address Delimiter, you **must** specify them in every message.
- If you have **not** enabled the Gun Address Stamping or the Gun Address Delimiter, you **must not** specify them. In this case all messages will be implicitly addressed to the 'binded' gun of the cradle directly connected to the serial line.
- The gun can only receive messages only if two-way mode is enabled. See par.8.6.3 Transmission mode command is on chapter 7.2.5
- Messages cannot start with '\$+' because they would be interpreted as a configuration command.
- You can send a message to the gun only while it is on. This happens when it has sent a message to the host and the radio timeout has not yet expired. (See chapter 8.6.1 "Radio Timeout" command.)
- If you want to control the gun's beeper from the host, you will also probably want to disable the good transmission beep that is emitted when the code is received from the cradle. (See chapter 7.2.4, "Good Transmission Beep" command.)

The message field can store plain text and escape sequences.

- Escape sequences are interpreted as commands.
- Plain text is directly printed on the display. If writing beyond the end of line, the display does not wrap automatically. Extra characters are ignored. Control characters are not interpreted (i.e. LF, FF, etc.).

### 9.1.1 Cursor Control

|                             |                                                                                                       |
|-----------------------------|-------------------------------------------------------------------------------------------------------|
| ESC [ <i>n</i> A            | Up <i>n</i> rows, no scroll                                                                           |
| ESC [ <i>n</i> B            | Down <i>n</i> rows, no scroll                                                                         |
| ESC [ <i>n</i> C            | Right <i>n</i> columns                                                                                |
| ESC [ <i>n</i> D            | Left <i>n</i> columns                                                                                 |
| ESC [ G                     | CR                                                                                                    |
| ESC [ <i>r</i> ; <i>c</i> H | Move to row <i>r</i> , column <i>c</i> (ESC[1;1H is the upper left character position of the display) |
| ESC D                       | Down 1 row, with scroll                                                                               |
| ESC E                       | CR and cursor down 1 row with scroll                                                                  |
| ESC M                       | Up 1 row and scroll                                                                                   |

**NOTE:**

- Since CR is used as the message terminator, you must use ESC [ G or ESC E to print a CR.
- The cursor row position **is not** affected by the currently selected font. The display always has 4 rows, so when writing with the large font, actually two rows are written to: the current one and the one below it. You will need two ESC E commands to step from one row to the next when using the large font.
- The cursor column position **is** affected by the currently selected font. Therefore, column 6 is 36 pixels from the left border only if you last selected the 6x8 font; otherwise it could be 48 or 72 pixels from the left border.

### 9.1.2 Font Selection

|           |                                                                                                                                                                          |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ESC [ 0 m | Normal mode                                                                                                                                                              |
| ESC [ 7 m | Reverse mode                                                                                                                                                             |
| ESC # 4   | Large font: subsequent characters are written on the current row and the row below it using the 12x16 font which allows for two rows of eight characters on the display. |
| ESC # 5   | Normal font: subsequent characters are written using the 6x8 font which allows for four rows of sixteen characters on the display.                                       |
| ESC # 7   | Medium font: subsequent characters are written using the 8x8 font which allows for four rows of twelve characters on the display.                                        |

### 9.1.3 Clearing Display

|           |                                                              |
|-----------|--------------------------------------------------------------|
| ESC [ 0 K | From cursor position to end of line inclusive                |
| ESC [ 1 K | From beginning of line to cursor position (not inclusive)    |
| ESC [ 2 K | Entire line                                                  |
| ESC [ 0 J | From cursor position to end of display inclusive             |
| ESC [ 1 J | From beginning of display to cursor position (not inclusive) |
| ESC [ 2 J | Entire display; moves cursor to upper left corner on display |

### 9.1.4 LED and Beeper Control

**ESC [ 0 q** Emit short High tone + short delay  
**ESC [ 1 q** Emit short Low tone + short delay  
**ESC [ 2 q** Emit long Low tone + short delay  
**ESC [ 3 q** Emit good read tone  
**ESC [ 4 q** Emit bad tx tone  
**ESC [ 5 q** Wait 100 ms  
**ESC [ 6 q** Turn on the green LED  
**ESC [ 7 q** Turn off the green LED  
**ESC [ 8 q** Turn on the red LED  
**ESC [ 9 q** Turn off the red LED

The LED control escape sequences are intended to activate the LEDs for short periods of time and can be used in combination with the Beeper. The LED and Beeper will be controlled by the system after the entire command sequence is interpreted.

Example:

**ESC [ 6 q ESC [ 3 q ESC [ 7 q** Turns on the green LED, emits a good read tone, and turns off the green LED.

**ESC [ 6 q ESC [ 5 q ESC [ 7 q** Turns on the green LED for 100 ms and then turns off the green LED.

### 9.1.5 Setting RTC

**ESC [ 0 p d d m m y y** Set date to day, month, year  
**ESC [ 1 p h h m m** Set time to hours, minutes; seconds are automatically set to 00.

## 9.2 Messages from gun command keys

The EX-DRAGON-M series guns with display have 3 command keys that can each be associated with a character to send to the host.

By pressing the key on the gun, the associated character with its relative message formatting is sent to the host. For example, keys can be used to select items from a menu sent to the gun display by the application program.

The general format is:

**[Header][Gun\_Addr][Gun\_Addr\_delimiter][Cradle\_Addr][Cradle\_Addr\_delimiter][Time stamp]**  
**[Time stamp\_delimiter][Code-ID][Code Length]Key-ID[Terminator]**

(items in square brackets are optional)

The message are handled by the system as if they were barcodes, that's why KeyID can have so many fields appended to it. If in your application there is some chance of reading a 1 char barcode identical to KeyID, the way you can distinguish between the two is to enable the code ID: The KeyID is the only 1-character long EAN 8 code.

Refer to par. For a complete description of the optional message fields in square brackets.

The default characters associated with each key (keyID) are shown in the following table:

| Default Key Identifiers |              |       |
|-------------------------|--------------|-------|
|                         | Key          | KeyID |
| ▲                       | (left) Key   | '<'   |
| ENTER                   | (center) Key | '='   |
| ▼                       | (right) Key  | '>'   |

### 9.3 EX-DRAGON-M101: Messages from the host to the scanner

The Dragon-M101 (the current cordless scanner model) can be used in two different modes:

- Dragon Mode (default setting on delivery)
- Compatibility Mode (special mode for the EXDLL6110 scanner)

The new Dragon Mode has led to several important changes regarding messages back from the host PC to the scanner (displayed information etc.).

**Please note the following points if you are using the current model in the Dragon-M101 series:**

If a host application (software) for 2-way communication that was specifically created for the EXDLL6110 scanner type already exists:

a.) The Dragon-M101 scanner must be used in Compatibility Mode. In this case, only the EXDLL6110 functionality is available (refer chap. 7.1.7.2 in this manual for programming).

**or**

b.) The software (host application) must be modified in order to use Dragon Mode. In this case, the new *Dragon* functionality is additionally available.

**Note on b.): Scanner in Dragon Mode**

Please note the following changes/differences:

- 1.) You must activate "2-way Mode" ("Radio Parameters" chapter in the manual).
- 2.) Control sequences (ESC sequences) with up to 240 characters can be transmitted (the EXDLL6110 system only supported 100 characters but control sequences could also be split;  $\Rightarrow$  this is no longer possible in Dragon Mode!).
- 3.) Only complete sequences can be transmitted to the scanner. Control sequences can no longer be split! If the scanner receives the terminating character "CR", the control sequence is sent and all subsequent sequences are ignored. No more control sequences can then be sent to the scanner until a new code has been read and transmitted or until a scan signal (scanner keys) has been sent to the host.

**IMPORTANT:**

A message can only be transmitted back to the scanner in response to a previous action on the scanner, i.e. after either

- a.) a code has been read and transmitted or
- b.) a scan signal (scanner keys) has been sent to the host. This return message to the scanner is declared as the "*answer*" to a scanner action.

It is no longer possible to permanently activate the radio protocol on the scanner. The maximum value is 19 seconds, after which the scanner starts the *radio protocol timeout* ("Radio Protocol Timeout" chapter 7.2.5 in the manual).

## 10 Technical Features

### 10.1 EX-DRAGON-M101 Technical Features

| Electrical Features                          |                                                                                  |
|----------------------------------------------|----------------------------------------------------------------------------------|
| Battery Type                                 | 2 NiMh batteries                                                                 |
| Time of recharge NiMh                        | 2 hours                                                                          |
| Operating autonomy (typ. continuous reading) | 30,000 reads - NiMh                                                              |
| Display (Only available with some models)    | LCD 4 lines x 16 chars<br>Programmable font                                      |
| Indicators                                   | Laser On / battery low LED (red)<br>Good Read LED (green)<br>Programmable Beeper |
| Laser Features                               |                                                                                  |
| Power (typical) in mW                        | 0.9 mW                                                                           |
| Light Source                                 | VLD 630 - 680 nm                                                                 |
| Scan rate                                    | 35 ± 5 scans/sec                                                                 |
| Reading field width                          | see reading diagram (chap. 6.1.2)                                                |
| Max. resolution                              | 0.12 mm, 5 mils                                                                  |
| PCS minimum                                  | 15% (Datalogic Test Chart)                                                       |
| Scan angle                                   | 42°                                                                              |
| Laser Safety Class                           | 2 (IEC 825-1 / CDRH)                                                             |
| Environmental Features                       |                                                                                  |
| Working Temperature                          | 0 °C to + 40 °C                                                                  |
| Storage Temperature                          | -20 °C to + 50 °C                                                                |
| Humidity                                     | 90% non condensing                                                               |
| Drop resistance (on concrete)                | 1.5 m                                                                            |
| Protection                                   | sealed against rain and dust                                                     |
| Mechanical Features                          |                                                                                  |
| Weight (with batteries)                      | about 440 g.                                                                     |
| Dimensions                                   | 203 x 117 x 69 mm                                                                |
| Material                                     | ABS and Polycarbonate molded with rubber                                         |

#### 10.1.1 Resistance of the housing against chemicals

The housing of the scanner consists of THERMOPLAST K (black part) and POLYCARBONAT with ABS (green part).

The scanner is not resistant against (heavy swelling of THERMOPLAST K):

|                   |                          |                              |
|-------------------|--------------------------|------------------------------|
| Acetone           | Ethyl acetate            | Azotic acid 50%              |
| Brake fluid       | Isooctan:Toluol = 1:1    | Sulfuric acid (concentrated) |
| Butanol           | Oil IRM 901 (paraffinic) | Hydrogen peroxide            |
| Ethanoic acid 10% | Oil IRM 903 (aromatic)   |                              |

The scanner is short time resistant against (for longer times swelling of the THERMOPLAST K):

|                                         |                   |                       |
|-----------------------------------------|-------------------|-----------------------|
| Formic acid                             | Formaldehyde      | Phosphoric acid 30%   |
| Ethyl alcohol                           | Isopropanol       | Propionaldehyd        |
| Ethylene glycol                         | Isooctan          | Azotic acid 10%       |
| Fat (multi purpose fat Shell Retimax A) | Methylethylketone | Hydrochloric acid 10% |

## 10.2 EXOM DRAGON Technical Features

|                               |                                           |
|-------------------------------|-------------------------------------------|
| <b>Electrical Features</b>    |                                           |
| Supply voltage                | 9 V DC (by ENT-DC or indirect via TERMEX) |
| Power consumption             | max. 350 mA                               |
| <b>Host interfaces</b>        |                                           |
| RS232                         | 300..19200 baud (by ENT-DC)               |
| <b>Environmental Features</b> |                                           |
| Working temperature           | -10 to +40 °C                             |
| Storage temperature           | -10 to +60 °C                             |
| Humidity                      | 90 % non condensing                       |
| Protection                    | IP65                                      |
| <b>Mechanical Features</b>    |                                           |
| Weight with mounting support  | about 1,2 kg.                             |
| Dimensions (without antenna)  | W x D x H 128 x 230 x 82 mm               |
| Material                      | stainless steel                           |

## 10.3 OM-Dragon Technical Features

|                               |                               |
|-------------------------------|-------------------------------|
| <b>Electrical Features</b>    |                               |
| Supply voltage                | 9 .. 28 V DC                  |
| Power consumption             | max. 8 W ( charging) *        |
| <b>Host-interfaces</b>        |                               |
| RS232                         | 300..19200 Baud (über ENT-DC) |
| <b>Environmental Features</b> |                               |
| Working temperature           | -10 bis +40 °C                |
| Storage temperature           | -10 bis +60 °C                |
| Humidity                      | 90 % not condensing           |
| protection                    | IP40                          |
| <b>Mechanical Features</b>    |                               |
| Weight with mounting support  | about. 600 g.                 |
| Dimensions (without antenna)  | B x T x H 185 x 115 x 104 mm  |
| Material                      | ABS                           |

\* Having a switching regulator inside, the OM-DRAGON draws the same power, regardless of the supply voltage i.e. as the input voltage increases the current drawn decreases.

## 10.4 LD DRAGON Technical Features

| Electrical Features          |                                                                |
|------------------------------|----------------------------------------------------------------|
| Supply voltage               | 10..28 Vdc                                                     |
| Power consumption            | max. 8 W (charging) *                                          |
| Indicators                   | Charger on (red)<br>Charge completed (green)<br>Power (yellow) |
| Time of recharge             | NiMh batteries: 2 hours                                        |
| Environmental Features       |                                                                |
| Working temperature          | -10 to +40 °C                                                  |
| Storage temperature          | -10 to +60 °C                                                  |
| Humidity                     | 90 % non condensing                                            |
| Protection                   | IP40                                                           |
| Mechanical Features          |                                                                |
| Weight with mounting support | about 600 g.                                                   |
| Dimensions (without antenna) | 185 x 115 x 104 mm                                             |
| Material                     | ABS                                                            |

\* Having a switching regulator inside, the LD DRAGON draw the same power, regardless of the supply voltage. i.e. as the input voltage increases the current drawn decreases.

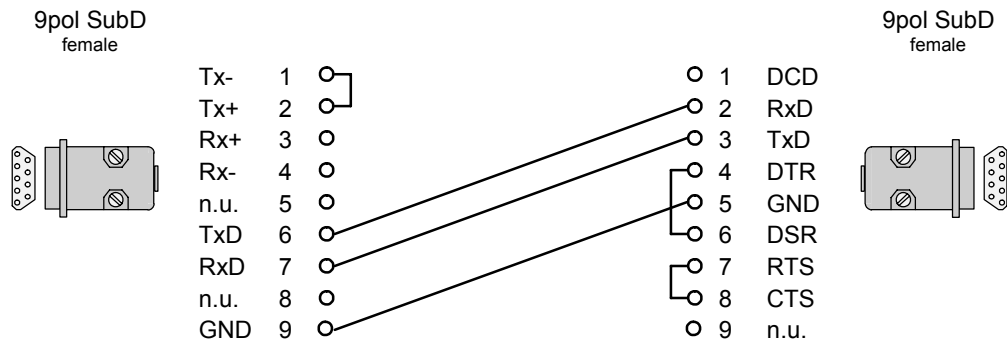
## 10.5 System Features

| Radio Features                |               |
|-------------------------------|---------------|
| Working Frequency             | 433.92 MHz    |
| Bit rate                      | 19200 baud    |
| Range                         | 50 m open air |
| Max number of guns per cradle | 32            |

## 11 Connecting Cable

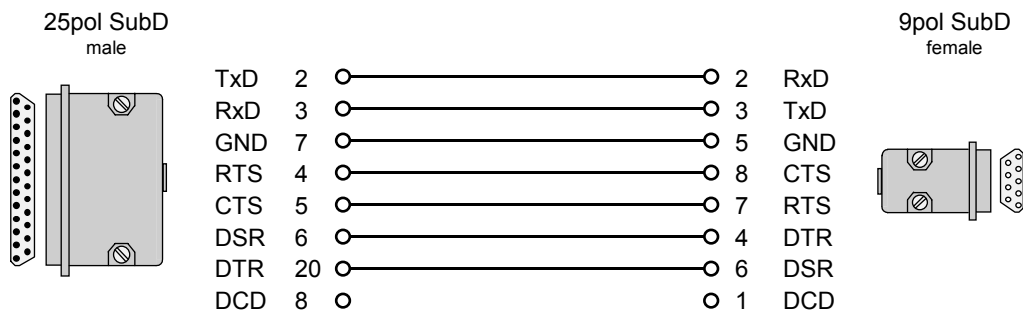
The following cables are necessary for operation:

### 11.1 S-ENT/PC-9



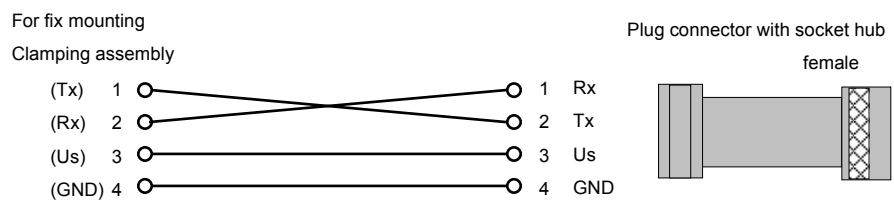
Useable for connecting:  
ENT-DC <-> PC Com port

### 11.2 S-TERM/RS232-PC-M25-F9



Useable for connecting:  
SK-PW, X1 host port <-> PC Com port

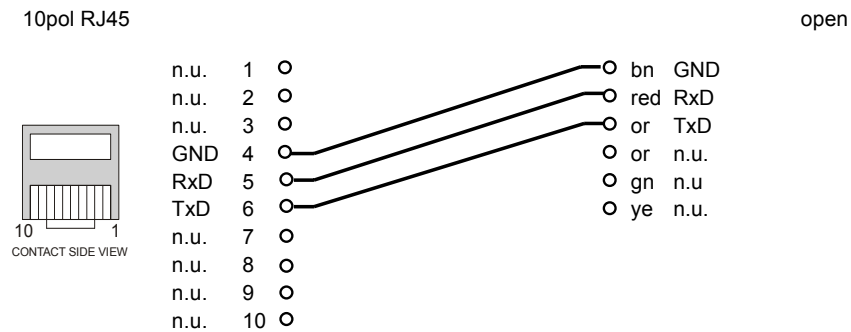
### 11.3 DATL A4-3



Useable for connecting:  
ENT-DC <-> EXOM-DRAGON-M101

## 11.4 S-OM/PCS

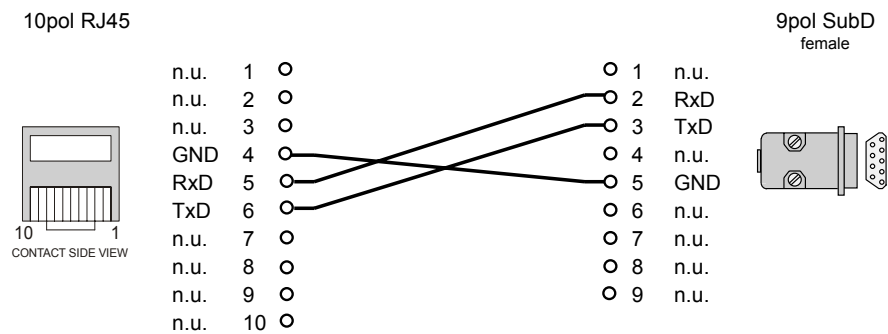
### S-OM/PCS



Useable for connecting:  
OM-DRAGON-10-RS232-AB-P <> terminal block

## 11.5 S-OM/PC-9F (Cradle in plastic housing)

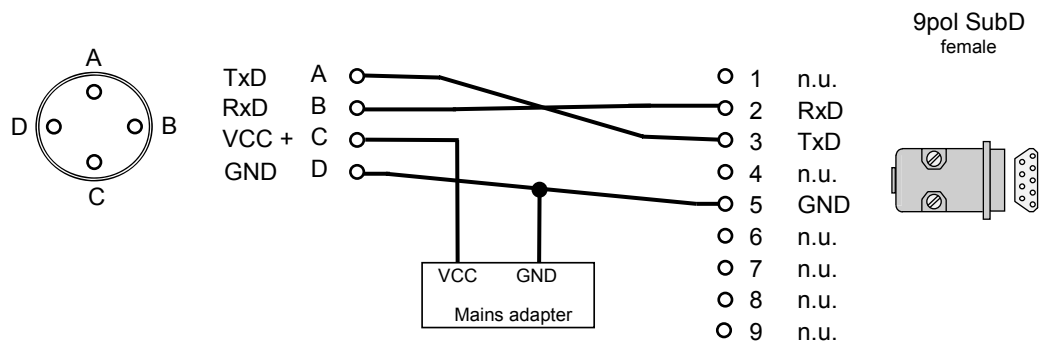
### S-OM/PC-9F



Useable for connecting:  
OM-DRAGON-10-RS232-AB-P <> PC

## 11.6 S-OM-AB/PC-9F (Cradle in V2A housing)

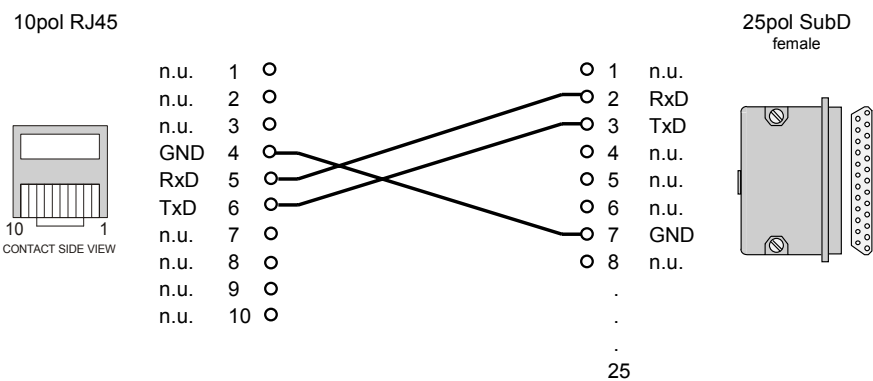
S-OM-AB/PC-9F



Usable for connecting:  
OM-Dragon-10-RS232-AB-V2A <-> PC

## 11.7 S-OM/PC-25F

S-OM/PC-25F



Usable for connecting:  
OM-Dragon-10-RS232-AB-P <-> PC

## 12 Order designations

### Radio scanner

aaaaaaaaaaaa - b - cc - dd

#### Scanner typ

Dragon M101 : Radio scanner non-ex-version  
EX-Dragon M101 : Exi-radio scanner

#### Ex-Zulassung /Ex approval

**C** : ATEX II 2G  
**D** : ATEX II 3D  
**N** : Non Ex-version

#### Version

10 : Version 10

#### Interface type:

NM : Only for non-ex- available

### Cradle for radio scanner

aaaaaaaaaaaa - b - cc - dddddddd - eeeee

#### Typ

OM-DRAGON : Non-Ex cradle  
EXOM-DRAGON : Exi- Ex-cradle

#### Ex approval

**D** : ATEX II 3D  
**E** : ATEX II 2G, II 3D  
**N** : Non Ex device

#### Version

10 : Version 10

#### Interface, protokol

5-AB : 5mA interface  
(for TERM or TERMEX)  
20-AB : 20 mA interface  
RS232 : Serial interface non-Ex-radio scanner  
RS232-AB : Serial interface non-Ex-radio scanner

#### Connector (option)

Male plug-in connector for  
Data/Supply cable to TERMEX,  
VISUEX, Box A2, ENT...  
-ST-4W

## **LD DRAGON Charging station**

LD DRAGON

## **PG220 Mains adapter**

PG220/DVE-1212A

## **Interface Cable**

|               |                                                                    |
|---------------|--------------------------------------------------------------------|
| DATL-A4-4     | Cradle to Termex                                                   |
| DATL-A4-3     | Cradle to ENT-DC or IPC-4                                          |
| S-ENT/PC-9    | ENT-DC to PC                                                       |
| S-OM/PC25     | OM-DRAGON-10-RS 232-AB-P to PC (25-pol female)                     |
| S-OM/PCS      | OM-DRAGON-10-RS 232-AB-P to open                                   |
| S-OM/PC-9F    | OM-DRAGON-10-RS 232-AB-P to PC (9-pol female)<br>(Housing plastic) |
| S-OM-AB/PC-9F | OM-DRAGON-10-RS 232-AB-V2A to PC (9-pol female)<br>(Housing V2A)   |
| S-OM/PC-25F   | OM-DRAGON-10-RS 232-AB-P to PC (25-pol female)                     |

## **Other components**

For ENT-DC please see Technical Manual ENT-DC  
For TERMEX 2xx/3xx please see Technical Manual TERMEX 2xx / 3xx  
For TERMEX 7xx please see Technical Manual TERMEX 7xx  
For IPC-EX please see Technical Manual IPC-EX  
For VisuNet please see Technical Manual VisuNet

## 13 Rating plates (examples depending upon variant)

### EX-DRAGON-M101 Ex radio scanner



### EXOM-DRAGON Ex cradle



### OM-DRAGON cradle (only for safe area)



### LD DRAGON Charging station (only for safe area)



## 14 Single codes



0



1



2



3



4



5



6



7



8



9



A



B



C



D



E



F



G



H



I



J



K



L



M



N



O



P



Q



R



S



T



U



V



W



X



Y



Z

## 15 Code Identifier Table

2/5 Interleaved



2/5 Industrial



2/5 normal 5 bars



2/5 matrix 3 bars



EAN 8



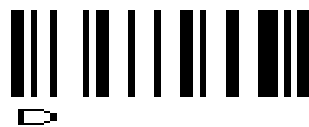
EAN 13



UPC A



UPC E



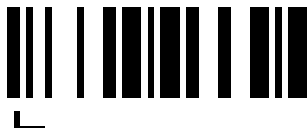
EAN 8 with 2 ADD on



EAN 8 with 5 ADD on



EAN 13 with 2 ADD on



EAN 13 with 5 ADD on



UPC A with 2 ADD on



UPC A with 5 Add on



UPC E with 2 ADD on



UPC E with 5 ADD on



Code 39



Code 39 Full ASCII



CODABAR



ABC CODABAR



Code 128



EAN 128



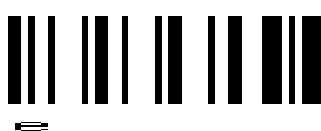
Code 93



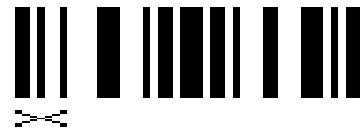
CIP/39



CIP/HR



Code 32



ISBT 128



CODABLOCK-A



CODABLOCK-F Standard



CODABLOCK-F EAN



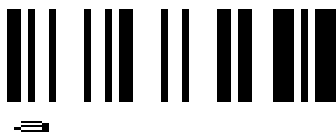
MSI



Plessey Anker



Plessey Standard



Delta IBM



Telepen



Code 16K



Code 11



Code 49



## 16 Configuration Codes

Enter Configuration



\$+

Abort current setting



\$%

Send Firmware Version



\$+\$!

Exit & Save Configuration



\$-

Cancel all Settings (without exit)



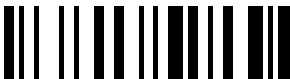
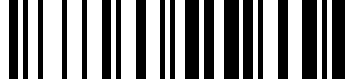
\$/

Restore Default

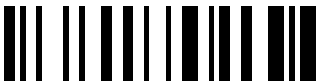
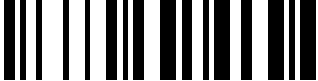


\$+\$\*

## 17 Scannerconfiguration IPC4 on keyboard interface

1. Enter Config Mode  
  
 \$ +
2. Default Scanner  
  
 \$ \*
3. Only EXOM-DRAGON  
 Default EXOM-DRAGON-M  
  
 \$+R×0\$-
3. Only EXOM-6110  
 Default EXOM-6110  
  
 \$+H×0\$-
4. Enter Config Mode  
  
 \$ +
5. 8 Bit Data Bit  
  
 CA1
6. 1 Stop Bit  
  
 CB0
7. Parity Even  
  
 CC1
8. 1200 Baud  
  
 CD3
9. Protocol none  
  
 CF0
10. Delay Character  
  
 CK
11. Hex 5  
  
 5
12. Hex 0  
  
 0
13. Save and Exit  
  
 \$ -

## 18 Scannerconfiguration IPC4 on Serial Port

1. Enter Config Mode  
  
\$ +
2. Default Sanner  
  
\$ =
3. Only EXOM-DRAGON  
Default EXOM-DRAGON-M  
  
\$+R×0\$-
3. Only EXOM-6116  
Default EXOM-6110  
  
\$+H×0\$-
4. Enter Config Mode  
  
\$ +
5. 8 Bit Data Bit  
  
CA1
6. 1 Stop Bit  
  
CB0
7. Parity Even  
  
CC1
8. 1200 Baud  
1200 Baud  
  
CD3
8. 9600 Baud  
9600 Baud  
  
CF0
9. Protocol none  
  
CF0
10. Delay Character  
  
CK
11. Hex 5  
  
5
12. Hex 0  
  
0
13. Save and Exit  
  
\$ -

## 19 Character Sets / Character Codes

| Decimal | Hexa-decimal | Character | Decimal | Hexa-decimal | Character | Decimal | Hexa-decimal | Character  |
|---------|--------------|-----------|---------|--------------|-----------|---------|--------------|------------|
| 32      | 20 h         | ' '       | -       | -            |           | 96      | 60 h         | `          |
| 33      | 21 h         | !         | 65      | 41 h         | <b>A</b>  | 97      | 61 h         | <b>a</b>   |
| 34      | 22 h         | "         | 66      | 42 h         | <b>B</b>  | 98      | 62 h         | <b>b</b>   |
| 35      | 23 h         | #         | 67      | 43 h         | <b>C</b>  | 99      | 63 h         | <b>c</b>   |
| 36      | 24 h         | \$        | 68      | 44 h         | <b>D</b>  | 100     | 64 h         | <b>d</b>   |
| 37      | 25 h         | %         | 69      | 45 h         | <b>E</b>  | 101     | 65 h         | <b>e</b>   |
| 38      | 26 h         | &         | 70      | 46 h         | <b>F</b>  | 102     | 66 h         | <b>f</b>   |
| 39      | 27 h         | '         | 71      | 47 h         | <b>G</b>  | 103     | 67 h         | <b>g</b>   |
| 40      | 28 h         | (         | 72      | 48 h         | <b>H</b>  | 104     | 68 h         | <b>h</b>   |
| 41      | 29 h         | )         | 73      | 49 h         | <b>I</b>  | 105     | 69 h         | <b>i</b>   |
| 42      | 2A h         | *         | 74      | 4A h         | <b>J</b>  | 106     | 6A h         | <b>j</b>   |
| 43      | 2B h         | +         | 75      | 4B h         | <b>K</b>  | 107     | 6B h         | <b>k</b>   |
| 44      | 2C h         | ,         | 76      | 4C h         | <b>L</b>  | 108     | 6C h         | <b>l</b>   |
| 45      | 2D h         | -         | 77      | 4D h         | <b>M</b>  | 109     | 6D h         | <b>m</b>   |
| 46      | 2E h         | .         | 78      | 4E h         | <b>N</b>  | 110     | 6E h         | <b>n</b>   |
| 47      | 2F h         | /         | 79      | 4F h         | <b>O</b>  | 111     | 6F h         | <b>o</b>   |
| 48      | 30 h         | <b>0</b>  | 80      | 50 h         | <b>P</b>  | 112     | 70 h         | <b>p</b>   |
| 49      | 31 h         | <b>1</b>  | 81      | 51 h         | <b>Q</b>  | 113     | 71 h         | <b>q</b>   |
| 50      | 32 h         | <b>2</b>  | 82      | 52 h         | <b>R</b>  | 114     | 72 h         | <b>r</b>   |
| 51      | 33 h         | <b>3</b>  | 83      | 53 h         | <b>S</b>  | 115     | 73 h         | <b>s</b>   |
| 52      | 34 h         | <b>4</b>  | 84      | 54 h         | <b>T</b>  | 116     | 74 h         | <b>t</b>   |
| 53      | 35 h         | <b>5</b>  | 85      | 55 h         | <b>U</b>  | 117     | 75 h         | <b>u</b>   |
| 54      | 36 h         | <b>6</b>  | 86      | 56 h         | <b>V</b>  | 118     | 76 h         | <b>v</b>   |
| 55      | 37 h         | <b>7</b>  | 87      | 57 h         | <b>W</b>  | 119     | 77 h         | <b>w</b>   |
| 56      | 38 h         | <b>8</b>  | 88      | 58 h         | <b>X</b>  | 120     | 78 h         | <b>x</b>   |
| 57      | 39 h         | <b>9</b>  | 89      | 59 h         | <b>Y</b>  | 121     | 79 h         | <b>y</b>   |
| 58      | 3A h         | :         | 90      | 5A h         | <b>Z</b>  | 122     | 7A h         | <b>z</b>   |
| 59      | 3B h         | ;         | 91      | 5B h         | [         | 123     | 7B h         | {          |
| 60      | 3C h         | <         | 92      | 5C h         | \         | 124     | 7C h         |            |
| 61      | 3D h         | =         | 93      | 5D h         | ]         | 125     | 7D h         | }          |
| 62      | 3E h         | >         | 94      | 5E h         | ^         | 126     | 7E h         | ~          |
| 63      | 3F h         | ?         | 95      | 5F h         | _         | 127     | 7Fh          | <b>DEL</b> |

## ASCII control characters

| Decimal | Hexa-decimal | Character | Meening of the most important control characters |
|---------|--------------|-----------|--------------------------------------------------|
| 0       | 00 h         | NUL       | Null                                             |
| 1       | 01 h         | SOH       | Start of header                                  |
| 2       | 02 h         | STX       | Start of text                                    |
| 3       | 03 h         | ETX       | End of text                                      |
| 4       | 04 h         | EOT       | End of transmission                              |
| 5       | 05 h         | ENQ       | Enquiry                                          |
| 6       | 06 h         | ACK       | Acknowledge                                      |
| 7       | 07 h         | BEL       | Bell                                             |
| 8       | 08 h         | BS        | Back space                                       |
| 9       | 09 h         | HT        | Horizontal tabulating                            |
| 10      | 0A h         | LF        | Line feed                                        |
| 11      | 0B h         | VT        | Vertical tabulating                              |
| 12      | 0C h         | FF        | Form Feed                                        |
| 13      | 0D h         | CR        | Carriage Return                                  |
| 14      | 0E h         | SO        | SHIFT out                                        |
| 15      | 0F h         | SI        | SHIFT in                                         |
| 16      | 10 h         | DLE       | Data link escape                                 |
| 17      | 11 h         | DC1       | XON                                              |
| 18      | 12 h         | DC2       | Device control 1                                 |
| 19      | 13 h         | DC3       | XOFF                                             |
| 20      | 14 h         | DC4       | Device control 4                                 |
| 21      | 15 h         | NAK       | Negative acknowledge                             |
| 22      | 16 h         | SYN       | Synchronisation character                        |
| 23      | 17 h         | ETB       | End of transmission block                        |
| 24      | 18 h         | CAN       | Cancel                                           |
| 25      | 19 h         | EM        | End of Medium                                    |
| 26      | 1A h         | SUB       | Substitute                                       |
| 27      | 1B h         | ESC       | ESCAPE Umschaltung                               |
| 28      | 1C h         | FS        | Field separator                                  |
| 29      | 1D h         | GS        | Group separator                                  |
| 30      | 1E h         | RS        | Record Separator                                 |
| 31      | 1F h         | US        | Unit separator, Space                            |

## 20 Applied harmonized standards of the applicable directives

This is an addition to Pepperl+Fuchs Declaration of Conformity in accordance with EN 45014:1998 in the appendix:

| <b>Directives</b> |               | <b>Applied harmonized standards</b> |
|-------------------|---------------|-------------------------------------|
| Directive         | 94/9EG (ATEX) | EN 50014:1997<br>EN 50020:2002      |
|                   |               |                                     |

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## **22 Appendix**

### **22.1 EEx Certifications**

Please refer the following pages.

BVS 03 ATEX E 282 (3 pages in German, 3 pages in English)

1. Amendment BVS 03 ATEX E 282 (1 page in German, 1 page in English)
2. Amendment BVS 03 ATEX E 282 (1 page in German, 1 page in English)
3. Amendment BVS 03 ATEX E 282 (2 pages in German, 2 pages in English)

Declaration of Conformity Ex-Dragon-M101-10-3D (2 pages)

Declaration of Conformity EXOM-Dragon-10-XX-AB (2 pages)

### **22.2 Form for reshipment (in case of reparation)**

Repair send back form

## Konformitätserklärung / Declaration of Conformity

nach EN 45014:1998 / in accordance with EN 45014:1998

Diese Konformitätserklärung gilt nur in Zusammenhang mit dem gültigen Pepperl+Fuchs Datenblatt für alle Pepperl+Fuchs Produkte, die unter die Richtlinie 89/336/EWG (EMV) fallen.

This Declaration of Conformity is only valid in connection with the valid datasheet of Pepperl+Fuchs, for all Pepperl+Fuchs products that are relevant to the EC-directive 89/336/EWG (EMV)

Die Pepperl+Fuchs GmbH in 68301 Mannheim erklärt hiermit in alleiniger Verantwortung, daß alle richtlinienrelevanten Produkte mit den angegebenen Normen oder normativen Dokumenten übereinstimmen und, wenn notwendig, von einer zuständigen Stelle freigegeben wurden.

We, Pepperl+Fuchs GmbH at 68301 Mannheim hereby declare under our sole responsibility that all directive relevant products are in accordance with the listed harmonized standards or normative documents and, where necessary, a competent body has been released.

**Angewandte harmonisierte Normen :**  
Applied harmonized standards

**Siehe gültiges Datenblatt**  
See valid datasheet



Hersteller Unterschrift :  
Signature of manufacturer

*Dr. Adolphs*  
Dr. Adolphs

Funktion des Unterzeichners :  
Function of the signer

Geschäftsführer  
Managing Director

*Dr. Kegel*  
Dr. Kegel  
Geschäftsführer  
Managing Director

Datum / date : September 2003





- (1) **EG-Baumusterprüfbescheinigung**
- (2) **- Richtlinie 94/9/EG -**  
Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung  
in explosionsgefährdeten Bereichen
- (3) **BVS 03 ATEX E 282**
- (4) **Gerät:** Scanner Typ EX-DRAGON-M101-10-\* mit  
Sendestation Typ EXOM-DRAGON-10-\*\*-AB
- (5) **Hersteller:** EX TEC Oesterle GmbH
- (6) **Anschrift:** D 73730 Esslingen
- (7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.
- (8) Die Zertifizierungsstelle der Deutsche Montan Technologie GmbH, benannte Stelle Nr. 0158 gemäß Artikel 9 der Richtlinie 94/9/EG des Europäischen Parlaments und des Rates vom 23. März 1994, bescheinigt, dass das Gerät die grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie erfüllt.  
Die Ergebnisse der Prüfung sind in dem Prüfprotokoll BVS PP 03.2182 EG niedergelegt.
- (9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit  
EN 50014:1997 + A1 – A2 Allgemeine Bestimmungen  
EN 50020:2002 Eigensicherheit 'i'
- (10) Falls das Zeichen „X“ hinter der Bescheinigungsnummer steht, wird in der Anlage zu dieser Bescheinigung auf besondere Bedingungen für die sichere Anwendung des Gerätes hingewiesen.
- (11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und die Baumusterprüfung des beschriebenen Gerätes in Übereinstimmung mit der Richtlinie 94/9/EG.  
Für Herstellung und in Verkehr bringen des Gerätes sind weitere Anforderungen der Richtlinie zu erfüllen, die nicht durch diese Bescheinigung abgedeckt sind.
- (12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

**Ex II 2G EEx ib IIC T4 bzw. II 2G EEx ib IIB T4**

**Deutsche Montan Technologie GmbH**  
Bochum, den 20. August 2003

*alligen da*  
Zertifizierungsstelle

*P. H. Q.*  
Fachbereich





(13) Anlage zur

(14) **EG-Baumusterprüfbescheinigung**

**BVS 03 ATEX E 282**

(15) 15.1 Gegenstand und Typ

Scanner Typ EX-DRAGON-M101-10-\* mit  
Sendestation Typ EXOM-DRAGON-10-\*\*-AB

Anstelle der \*\*\* werden in der vollständigen Benennung beim Scanner der Buchstabe B oder C, der die Gasgruppe kennzeichnet, und bei der Sendestation die Ziffer 5 oder 20, die die Schnittstellenstromkreise kennzeichnen, eingefügt.

Die folgenden Ausführungen sind möglich:

| Typ                  | Kennzeichnung        |
|----------------------|----------------------|
| EX-DRAGON-M101-10-B  | II 2 G EEx ib IIB T4 |
| EX-DRAGON-M101-10-C  | II 2 G EEx ib IIC T4 |
| EXOM-DRAGON-10-20-AB | II 2 G EEx ib IIC T4 |
| EXOM-DRAGON-10-5-AB  | II 2 G EEx ib IIC T4 |

15.2 Beschreibung

Der Scanner dient zum Lesen von Barcodes und zur drahtlosen Übertragung der Signale zur Sendestation; diese Station setzt die empfangenen Signale in elektrische Daten um.

15.3 Kenngrößen

15.3.1 Scanner EX-DRAGON-M101-10-\*

Batterie-Nennspannung

DC 2,4 V

Nenn-Sendeleistung

10 mW

Umgebungstemperaturbereich

Ta

-20 °C bis +60 °C

15.3.2 Sendegerät Typ EXOM-DRAGON-10-\*\*-AB

15.3.2.1 Speisestromkreis +Us und Gnd

Spannung

Ui

DC 9 V

Stromstärke

Ii

350 mA

Leistung

Pi

für Umgebungstemperaturbereich -20 °C bis +40°C

1,3 W

für Umgebungstemperaturbereich -20 °C bis +60°C

1,2 W

für Umgebungstemperaturbereich -20 °C bis +70°C

1,1 W

wirksame innere Kapazität

Ci

vernachlässigbar

wirksame innere Induktivität

Li

vernachlässigbar





### 15.3.2.2 Signalstromkreise

bei Typ EXOM-DRAGON-10-20-AB Sender und Empfänger passiv

|                                                 |                |    |     |                  |
|-------------------------------------------------|----------------|----|-----|------------------|
| Spannung                                        | U <sub>i</sub> | DC | 9   | V                |
| Stromstärke                                     | I <sub>i</sub> |    | 350 | mA               |
| Leistung                                        | P <sub>i</sub> |    |     |                  |
| für Umgebungstemperaturbereich -20 °C bis +40°C |                |    | 1,3 | W                |
| für Umgebungstemperaturbereich -20 °C bis +60°C |                |    | 1,2 | W                |
| für Umgebungstemperaturbereich -20 °C bis +70°C |                |    | 1,1 | W                |
| wirksame innere Kapazität                       | C <sub>i</sub> |    |     | vernachlässigbar |
| wirksame innere Induktivität                    | L <sub>i</sub> |    |     | vernachlässigbar |

bei Typ EXOM-DRAGON-10-5-AB Empfänger passiv, Sender aktiv  
Empfängerstromkreis Rx

|                                                 |                |    |     |                  |
|-------------------------------------------------|----------------|----|-----|------------------|
| Spannung                                        | U <sub>i</sub> | DC | 9   | V                |
| Stromstärke                                     | I <sub>i</sub> |    | 350 | mA               |
| Leistung                                        | P <sub>i</sub> |    |     |                  |
| für Umgebungstemperaturbereich -20 °C bis +40°C |                |    | 1,3 | W                |
| für Umgebungstemperaturbereich -20 °C bis +60°C |                |    | 1,2 | W                |
| für Umgebungstemperaturbereich -20 °C bis +70°C |                |    | 1,1 | W                |
| wirksame innere Kapazität                       | C <sub>i</sub> |    |     | vernachlässigbar |
| wirksame innere Induktivität                    | L <sub>i</sub> |    |     | vernachlässigbar |

Senderstromkreis Tx

|                          |                |    |     |    |
|--------------------------|----------------|----|-----|----|
| Spannung                 | U <sub>o</sub> | DC | 5,2 | V  |
| Stromstärke              | I <sub>o</sub> |    | 11  | mA |
| Leistung                 | P <sub>o</sub> |    | 14  | mW |
| max. äußere Kapazität    | C <sub>o</sub> |    | 71  | µF |
| max. äußere Induktivität | L <sub>o</sub> |    | 290 | µH |

15.3.2.3 Die Summenstrom in den Stromkreisen +U<sub>s</sub>, Rx und Tx darf den Wert von 350 mA nicht überschreiten.

### 15.3.2.4 Umgebungstemperaturbereich

|                            |                |                   |
|----------------------------|----------------|-------------------|
| für Speiseleistung ≤ 1,1 W | T <sub>a</sub> | -20 °C bis +70 °C |
| für Speiseleistung ≤ 1,2 W |                | -20 °C bis +60 °C |
| für Speiseleistung ≤ 1,3 W |                | -20 °C bis +40 °C |

### 15.3.2.5 Nenn-Sendeleistung

10 mW

### (16) Prüfprotokoll

BVS PP 03.2182 EG, Stand 20.08.2003

### (17) Besondere Bedingungen für die sichere Anwendung

Entfällt





## 1. Nachtrag

(Ergänzung gemäß Richtlinie 94/9/EG Anhang III Ziffer 6)

### zur EG-Baumusterprüfbescheinigung BVS 03 ATEX E 282

**Gerät:** Funkscanner Typ EX-DRAGON-M101-10-\* mit  
Sendestation Typ EXOM-DRAGON-10-\*\*-AB

**Hersteller:** EX TEC Oesterle GmbH

**Anschrift:** D - 73730 Esslingen

#### Beschreibung

Die Sendestation kann auch nach den im zugehörigen Prüfprotokoll aufgeführten Prüfungsunterlagen gefertigt werden.

Die grundlegenden Sicherheits- und Gesundheitsanforderungen der geänderten Ausführung werden erfüllt durch  
Übereinstimmung mit  
EN 50014:1997 + A1 – A2 Allgemeine Bestimmungen  
EN 50020:2002 Eigensicherheit 'i'

#### Prüfprotokoll

BVS PP 03.2182 EG, Stand 21.07.2004

**EXAM BBG Prüf- und Zertifizier GmbH**

Bochum, den 21. Juli 2004

  
Zertifizierungsstelle

  
Fachbereich





## 2. Nachtrag

(Ergänzung gemäß Richtlinie 94/9/EG Anhang III Ziffer 6)

### zur EG-Baumusterprüfbescheinigung BVS 03 ATEX E 282

**Gerät:** Scanner Typ EX-DRAGON-M101-10-\* mit  
Sendestation Typ EXOM-DRAGON-10\*\*-AB

**Hersteller:** Pepperl+Fuchs - EXTEC GmbH,

ehemals EX TEC Oesterle GmbH

**Anschrift:** 73730 Esslingen

#### Beschreibung

Der Scanner und die Sendestation können auch nach den im zugehörigen Prüfprotokoll aufgeführten Prüfungsunterlagen gefertigt werden.

Die grundlegenden Sicherheits- und Gesundheitsanforderungen der geänderten Ausführung werden erfüllt durch Übereinstimmung mit

EN 50014:1997 + A1 – A2 Allgemeine Bestimmungen

EN 50020:2002 Eigensicherheit 'i'

Die Kennzeichnung der Geräte muss die folgenden Angaben enthalten:

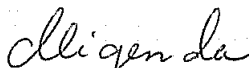
 II 2G EEx ib IIB/IIC T4

#### Prüfprotokoll

BVS PP 03.2182 EG, Stand 05.10.2005

**EXAM BBG Prüf- und Zertifizier GmbH**

Bochum, den 05. Oktober 2005

  
Zertifizierungsstelle

  
Fachbereich





### 3. Nachtrag

(Ergänzung gemäß Richtlinie 94/9/EG Anhang III Ziffer 6)

#### **zur EG-Baumusterprüfbescheinigung BVS 03 ATEX E 282**

**Gerät:** **Scanner Typ EX-DRAGON-M101-10-\* mit  
Sendestation Typ EXOM-DRAGON-10-\*\*-AB**

**Hersteller:** **Pepperl + Fuchs GmbH**

**Anschrift:** **68307 Mannheim**

ehemals EXTEC Oesterle GmbH, 73730 Esslingen

#### Beschreibung

Der Scanner und die Sendestation können auch nach den im zugehörigen Prüfprotokoll aufgeführten Prüfungsunterlagen gefertigt werden.

Die Geräte wurden nach den Normen EN 60079-\* geprüft.

Die in dem Scanner verwendeten Batterien wurden geändert.

Der Name des Herstellers hat sich geändert

|                     |                      |
|---------------------|----------------------|
| von                 | in                   |
| EXTEC Oesterle GmbH | Pepperl + Fuchs GmbH |
| 73730 Esslingen     | 68307 Mannheim       |

Die grundlegenden Sicherheits- und Gesundheitsanforderungen der geänderten Ausführung werden erfüllt durch Übereinstimmung mit

EN 60079-0:2006 Allgemeine Anforderungen

EN 60079-11:2007 Eigensicherheit 'i'

Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

**II 2G Ex ib IIB/IIC T4**

#### Geänderte Kenngrößen

Scanner EX-DRAGON-M101-10-\*

Umgebungstemperaturbereich

Ta

-10 °C bis +60 °C

#### Besondere Bedingungen für die sichere Anwendung

Entfällt



Prüfprotokoll

BVS PP 03.2182 EG, Stand 06.05.2008

**DEKRA EXAM GmbH**

Bochum, den 06. Mai 2008

A blue ink signature, possibly "J. J. J. J.", written over a horizontal line.

Zertifizierungsstelle

A blue ink signature, possibly "G. G. G. G.", written over a horizontal line.

Fachbereich



## Konformitätserklärung / Declaration of Conformity

Nach DIN EN ISO/IEC 17050-1: 2004 / in accordance with DIN EN ISO/IEC 17050-1: 2004

Diese Konformitätserklärung gilt für folgende Produkte:

This Declaration of Conformity is valid for the following parts:

Produktbezeichnung/Description :

Ex Barcodeleser /

Ex Scanner:

Ex-Dragon-M101-10-3D

Part.Nr.: 520452

**Diese Konformitätserklärung gilt nur in Zusammenhang mit dem gültigen Pepperl+Fuchs Datenblatt, der gültigen Pepperl+Fuchs Betriebsanleitung sowie den besonderen Bedingungen für den Einsatz in Zone 22.**

This Declaration of Conformity is only valid in connection with the valid datasheet of Pepperl+Fuchs, the valid instruction of Pepperl+Fuchs and the special conditions for the installation in zone 22.

---

**Die Pepperl+Fuchs GmbH, Königsberger Allee 87, 68307 Mannheim erklärt hiermit in alleiniger Verantwortung, dass das oben genannte Produkt mit den angegebenen Normen oder normativen Dokumenten übereinstimmt.**

We, Pepperl+Fuchs GmbH, Königsberger Allee 87, 68307 Mannheim hereby declare under our sole responsibility that the above mentioned product is in accordance with the listed harmonised standards or normative documents.

---

**EG-Richtlinie**  
EU-Directive

94/9/EG (ATEX)

**Angewandte harmonisierte Normen**  
Applied harmonized standards

EN 50281-1-1:1998 / A1: 2002

---



**Besondere Bedingungen / Special conditions for safe use:**

Das Gehäuse erfüllt die Anforderungen der Norm mit niedriger Schlagenergie

The housing fulfills the requirements of the standard with low impact energy.

**Kennzeichnung**  
 Marking

**II 3 D IP53 T80°C X**
**Technische Daten:**  
 Technical data:

**siehe gültiges Datenblatt, Betriebsanleitung**  
 see valid datasheet, instruction

[www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)



Reg. Nr. 14 760-02

Hersteller-Unterschrift:  
 Signature of Manufacturer

ppa. Hermann Best

i.V. Achim Rausenberger

Funktion des Unterzeichners:  
 Function of the signer

Director Business Unit  
 Systems + Solutions

Manager R+D and  
 Production

Datum / date : Mai / May 2008



## Konformitätserklärung / Declaration of Conformity

Nach DIN EN ISO/IEC 17050-1: 2004 / in accordance with DIN EN ISO/IEC 17050-1: 2004

Diese Konformitätserklärung gilt für folgende Produkte:  
This Declaration of Conformity is valid for the following parts:

Produktbezeichnung/Description :

Ex Übertragungsstation /  
Ex cradle: EXOM-DRAGON-10-XX\*-AB

Part.Nr.: 520456

**Diese Konformitätserklärung gilt nur in Zusammenhang mit dem gültigen Pepperl+Fuchs Datenblatt, der gültigen Pepperl+Fuchs Betriebsanleitung sowie den besonderen Bedingungen für den Einsatz in Zone 22.**

This Declaration of Conformity is only valid in connection with the valid datasheet of Pepperl+Fuchs, the valid instruction of Pepperl+Fuchs and the special conditions for the installation in zone 22.

---

**Die Pepperl+Fuchs GmbH, Königsberger Allee 87, 68307 Mannheim erklärt hiermit in alleiniger Verantwortung, dass das oben genannte Produkt mit den angegebenen Normen oder normativen Dokumenten übereinstimmt.**

We, Pepperl+Fuchs GmbH, Königsberger Allee 87, 68307 Mannheim hereby declare under our sole responsibility that the above mentioned product is in accordance with the listed harmonised standards or normative documents.

---

**EG-Richtlinie**  
EU-Directive

94/9/EG (ATEX)

**Angewandte harmonisierte Normen**  
Applied harmonized standards

EN 50281-1-1:1998 / A1: 2002

---



**Besondere Bedingungen / Special conditions for safe use:**

Das Gehäuse erfüllt die Anforderungen der Norm mit niedriger Schlagenergie

The housing fulfills the requirements of the standard with low impact energy.

**Kennzeichnung**  
Marking



**II 3 D IP53 T80°C X**

**Technische Daten:**  
Technical data:

**siehe gültiges Datenblatt, Betriebsanleitung**  
see valid datasheet, instruction

[www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)



Reg. Nr. 14 760-02

Hersteller-Unterschrift:  
Signature of Manufacturer

ppa. Hermann Best

i.V. Achim Rausenberger

Funktion des Unterzeichners:  
Function of the signer

Director Business Unit  
Systems + Solutions

Manager R+D and  
Production

Datum / date : Mai / May 2008



CERTIFIED TRANSLATION

**Ex**

**DMT**

**EC Type Examination Certificate**

(1)

(2)

**- Directive 94/9/EC -**  
Equipment and protective systems for use to the intended purpose  
in potentially explosive atmospheres

(3)

**BVS 03 ATEX E 282**

(4)

**Equipment:** Scanner Type EX-DRAGON-M101-10-\* with  
Transmitting Station Type EXOM-DRAGON-10-\*\*-AB

(5)

**Manufacturer:** EXTEC Oesterle GmbH

(6)

**Address:** D 73730 Esslingen

(7)

The design of this equipment and the various permissible variants are specified in the Appendix to this  
Type Examination Certificate.

(8)

The certification body of Deutsche Montan Technologie GmbH, accredited as body no. 0158 in  
accordance with Article 9 of Directive 94/9/EC of the European Parliament and the Council dated March  
23 1994, hereby certifies that the equipment conforms with the basic safety and health requirements  
relating to the design and construction of equipment and protective systems for use to the intended  
purpose in potentially explosive atmospheres in accordance with Annex II of the same Directive.  
The results of the test are recorded in Test Report No. BVS PP 03.2182 EG.

(9)

The basic safety and health requirements are satisfied through conformance with:  
EN 50014:1997 + A1 - A2 General requirements  
EN 50020:2002 Intrinsic safety 'I'

(10)

If the mark "X" appears after the certificate number, it means that this equipment is subject to the special  
conditions for safe usage specified in the Appendix to this certificate.

(11)

This EC Type Examination Certificate only refers to the design of, and the type examination for, the  
equipment described here in conformance with Directive 94/9/EC.  
The manufacture and introduction into circulation of the equipment are subject to other Directive  
requirements which are not covered by this certificate.

(12)

The marking on the equipment must include the following information:

**Ex II 2G EEx ib IIC T4 or II 2G EEx ib IIB T4**

**Deutsche Montan Technologie GmbH**

Bochum, August 20, 2003

(signature illegible)  
Certification body

(signature illegible)  
Department

Page 1 of 3 of BVS 03 ATEX E 282

This certificate may only be passed on to others without change.

Dinnendahlstrasse 9, D-44809 Bochum, Phone +49 (0)201/172-3947, Fax +49 (0)201/172-3948

(Until May 31, 2003: Deutsche Montan Technologie GmbH, Am Technologiepark 1, D-45307 Essen)

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document  
drawn up in the German language

Date: 24.09.03

David Allison

Officially appointed and sworn document translator for the English language at the  
Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.





CERTIFIED TRANSLATION

DMT

- (13) Appendix to
- (14) **EC Type Examination Certificate**
- BVS 03 ATEX E 282**

(15) 15.1 Subject and type

Scanner Type EX-DRAGON-M101-10-\* with  
Transmitting Station Type EXOM-DRAGON-10-\*\*-AB

In the full designation the \*\*\* are replaced in the case of the scanner by the letter B or C, which identifies the gas group, and in the case of the transmitting station by the number 5 or 20, which identifies the interface circuits.

The following variants are possible:

| Type                 | Marking             |
|----------------------|---------------------|
| EX-DRAGON-M101-10-B  | II2 G EEx ib IIB T4 |
| EX-DRAGON-M101-10-C  | II2 G EEx ib IIC T4 |
| EXOM-DRAGON-10-20-AB | II2 G EEx ib IIC T4 |
| EXOM-DRAGON-10-5-AB  | II2 G EEx ib IIC T4 |

15.2 Description

The scanner is used to read barcodes and to transmit signals wirelessly to the transmitting station; the received signals are converted by this station into electrical data.

15.3 Parameters

15.3.1 Scanner Type EX-DRAGON-M101-10-\*

|                           |    |                  |    |
|---------------------------|----|------------------|----|
| Battery rated voltage     | DC | 2.4              | V  |
| Rated transmitting power  |    | 10               | mW |
| Ambient temperature range | Ta | -20 °C to +60 °C |    |

15.3.2 Transmitting Station Type EXOM-DRAGON-10-\*\*-AB

15.3.2.1 Supply circuit +Us and Gnd

|                                                |    |    |            |    |
|------------------------------------------------|----|----|------------|----|
| Voltage                                        | Ui | DC | 9          | V  |
| Current                                        | Ii |    | 350        | mA |
| Power                                          | Pi |    |            |    |
| for ambient temperature range -20 °C to +40 °C |    |    | 1.3        | W  |
| for ambient temperature range -20 °C to +60 °C |    |    | 1.2        | W  |
| for ambient temperature range -20 °C to +70 °C |    |    | 1.1        | W  |
| Effective internal capacitance                 | Ci |    | Negligible |    |
| Effective internal inductance                  | Li |    | Negligible |    |

Page 2 of 3 of BVS 03 ATEX E 282

This certificate may only be passed on to others without change.

Dinnendahlstrasse 9, D-44809 Bochum, Phone +49 (0)201/172-3947, Fax +49 (0)201/172-3948  
(Until May 31, 2003: Deutsche Montan Technologie GmbH, Am Technologiepark 1, D-45307 Essen)

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: 24.09.03

David Allison

Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.





# CERTIFIED TRANSLATION

DMT

## 15.3.2.2 Signal circuits

Type EXOM-DRAGON-10-20-AB, transmitter and receiver passive

|                                                |                |    |     |            |
|------------------------------------------------|----------------|----|-----|------------|
| Voltage                                        | U <sub>i</sub> | DC | 9   | V          |
| Current                                        | I <sub>i</sub> |    | 350 | mA         |
| Power                                          | P <sub>i</sub> |    |     |            |
| for ambient temperature range -20 °C to +40 °C |                |    | 1.3 | W          |
| for ambient temperature range -20 °C to +60 °C |                |    | 1.2 | W          |
| for ambient temperature range -20 °C to +70 °C |                |    | 1.1 | W          |
| Effective internal capacitance                 | C <sub>i</sub> |    |     | Negligible |
| Effective internal inductance                  | L <sub>i</sub> |    |     | Negligible |

Type EXOM-DRAGON-10-5-AB, receiver passive, transmitter active

Receiver circuit Rx

|                                                |                |    |     |            |
|------------------------------------------------|----------------|----|-----|------------|
| Voltage                                        | U <sub>i</sub> | DC | 9   | V          |
| Current                                        | I <sub>i</sub> |    | 350 | mA         |
| Power                                          | P <sub>i</sub> |    |     |            |
| for ambient temperature range -20 °C to +40 °C |                |    | 1.3 | W          |
| for ambient temperature range -20 °C to +60 °C |                |    | 1.2 | W          |
| for ambient temperature range -20 °C to +70 °C |                |    | 1.1 | W          |
| Effective internal capacitance                 | C <sub>i</sub> |    |     | Negligible |
| Effective internal inductance                  | L <sub>i</sub> |    |     | Negligible |

Transmitter circuit Tx

Type EXOM-DRAGON-10-20-AB, transmitter and receiver passive

|                           |                |    |     |    |
|---------------------------|----------------|----|-----|----|
| Voltage                   | U <sub>o</sub> | DC | 5.2 | V  |
| Current                   | I <sub>o</sub> |    | 11  | mA |
| Power                     | P <sub>o</sub> |    | 14  | mW |
| Max. external capacitance | C <sub>o</sub> |    | 71  | µF |
| Max. external inductance  | L <sub>o</sub> |    | 290 | µH |

15.3.2.3 The total current for the +Us, Rx and Tx circuits must not exceed 350 mA.

15.3.2.4 Ambient temperature range

T<sub>a</sub>

|                                 |                  |
|---------------------------------|------------------|
| for supply system power ≤ 1.1 W | -20 °C to +70 °C |
| for supply system power ≤ 1.2 W | -20 °C to +60 °C |
| for supply system power ≤ 1.3 W | -20 °C to +40 °C |

(16) Test report  
BVS PP 03.2182 EG, dated August 20, 2003

(17) Special conditions for safe usage  
Not applicable

Page 3 of 3 of BVS 03 ATEX E 282

This certificate may only be passed on to others without change.

Dinnendahlstrasse 9, D-44809 Bochum, Phone +49 (0)201/172-3947, Fax +49 (0)201/172-3948  
(Until May 31, 2003: Deutsche Montan Technologie GmbH, Am Technologiepark 1, D-45307 Essen)

## LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: 24.09.03

David Allison

Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.





CERTIFIED TRANSLATION

Ex

EXAM

BBG Prüf- und Zertifizier GmbH

**Addendum 1**

(Amendment in accordance with Directive 94/9/EC Annex III Clause 6)

**to EC Type Examination Certificate  
BVS 03 ATEX E 282**

**Equipment:** Radio Scanner Type EX-DRAGON-M101-10-\* with  
Transmitting Station Type EXOM-DRAGON-10-\*\*-AB

**Manufacturer:** EX TEC Oesterle GmbH

**Address:** D – 73730 Esslingen

Description

The transmitting station can also be manufactured in accordance with the test documentation mentioned in the associated Test Report.

The basic safety and health requirements of the modified version are satisfied through conformance with  
EN 50014:1997 + A1 - A2 General requirements  
EN 50020:2002 Intrinsic safety 'i'

Test Report

BVS PP 03.2182 EG, dated July 21, 2004

**EXAM BBG Prüf- und Zertifizier GmbH**

Bochum, July 21, 2004

(Signature illegible)

(Signature illegible)

Certification body

Certification body

Page 1 of 1 of BVS 03 ATEX E 282 / NI

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(Until May 31, 2003: Deutsche Montan Technologie GmbH, Am Technologiepark 1, D-45307 Essen)

LEGAL CERTIFICATION

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Date:

1 July 2005 *D. Allison*

David Allison

Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.





CERTIFIED TRANSLATION

Ex

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BBG Prüf- und Zertifizier GmbH

**Addendum 2**

(Amendment in accordance with Directive 94/9/EC Annex III Clause 6)

**to EC Type Examination Certificate  
BVS 03 ATEX E 282**

**Equipment:** Scanner Type EX-DRAGON-M101-10-\* with  
Transmitting Station Type EXOM-DRAGON-10-\*\*-AB

**Manufacturer:** Pepperl+Fuchs EXTEC GmbH

**Formerly:** EX TEC Oesterle GmbH

**Address:** D – 73730 Esslingen

Description

The scanner and the transmitting station can also be manufactured in accordance with the test documentation mentioned in the associated Test Report.

The basic safety and health requirements of the modified version are satisfied through conformance with  
EN 50014:1997 + A1 - A2 General requirements  
EN 50020:2002 Intrinsic safety 'i'

The marking on the devices must contain the following information:

**Ex II 2G EEx ib IIB/IIC T4**

Test Report

BVS PP 03.2182 EG, dated October 5, 2005

**EXAM BBG Prüf- und Zertifizier GmbH**

Bochum, October 5, 2005

(Signature illegible)

(Signature illegible)

Certification body

Certification body

Page 1 of 1 of BVS 03 ATEX E 282 / N2

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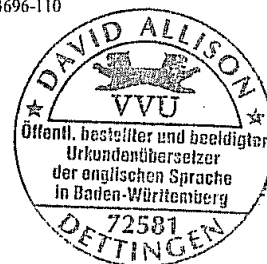
Dinnendahlstrasse 9, D-44809 Bochum, Phone +49 (0)234/3696-105, Fax +49 (0)234/3696-110

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Date: 27.10.2005 *DA*

David Allison  
Officially appointed and sworn document translator for the English language at the  
Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.





**Ex****DEKRA****Addendum 3**

(Amendment in accordance with Directive 94/9/EC Annex III Clause 6)

**to EC Type Examination Certificate  
BVS 03 ATEX E 282**

**Equipment:** Scanner Type EX-DRAGON-M101-10-\* with  
Transmitting Station Type EXOM-DRAGON-10-\*\*-AB

**Manufacturer:** Pepperl+Fuchs GmbH

**Address:** D – 68307 Mannheim

**Formerly** EX TEC Oesterle GmbH, D – 73730 Esslingen

Description

The scanner and the transmitting station can also be manufactured in accordance with the test documentation mentioned in the associated Test Report.

The devices were tested in accordance with EN 60079-\*.

The batteries used in the scanner have been modified.

The name of the manufacturer has changed

|                     |                      |
|---------------------|----------------------|
| from                | to                   |
| EXTEC Oesterle GmbH | Pepperl + Fuchs GmbH |
| D – 73730 Esslingen | D – 68307 Mannheim   |

The basic safety and health requirements of the modified version are satisfied through conformance with

|                  |                      |
|------------------|----------------------|
| EN 60079-0:2006  | General requirements |
| EN 60079-11:2007 | Intrinsic safety 'i' |

The marking on the equipment must contain the following information:

**Ex II 2G Ex ib IIB/IIC T4**

Modified parameters

Scanner EX-DRAGON-M101-10-\*

|                           |    |                |
|---------------------------|----|----------------|
| Ambient temperature range | Ta | -10°C to +60°C |
|---------------------------|----|----------------|

Special conditions for safe usage

Not applicable

Page 1 of 2 of BVS 03 ATEX E 282 / N3

This certificate may only be passed on to others without change.

DEKRA EXAM GmbH, Dinnendahlstrasse 9, D-44809 Bochum, Phone +49 (0)234/3696-105, Fax +49 (0)234/3696-110, e-mail [zs-exam@dekra.com](mailto:zs-exam@dekra.com)  
(Until March 31, 2007: EXAM BBG Prüf- und Zertifizier GmbH)

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: 3.06.08 *DAH*

David Allison  
Officially appointed and sworn document translator for the English language at the  
Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.





**DEKRA**

Test Report

BVS PP 03.2182 EG, dated May 6, 2008

**DEKRA EXAM GmbH**

Bochum, May 6, 2008

(Signature illegible)  
Certification body

(Signature illegible)  
Department

Page 2 of 2 of BVS 03 ATEX E 282 / N3

This certificate may only be passed on to others without change.

DEKRA EXAM GmbH, Dinnendahlstrasse 9, D-44809 Bochum, Phone +49 (0)234/3696-105, Fax +49 (0)234/3696-110, e-mail [zs-exam@dekra.com](mailto:zs-exam@dekra.com)  
(Until March 31, 2007: EXAM BBG Prüf- und Zertifizier GmbH)

---

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date:

3. 06 08 *DA*

David Allison

Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.





## Rücksendung Reparatur / Repair send back form

Please make absolutely sure to include it with the shipping documents, or – even better – attach it to the outside of the packaging

|                   |                                  |                                      |
|-------------------|----------------------------------|--------------------------------------|
| Kunde / Customer  | Firmenname / Company Name:       | Abteilung / Department               |
| Adresse / Address | Ansprechpartner / Contact person | Telefon / Phone Number               |
|                   | Fax / E-Mail                     | Ihre Auftragsnummer / Your Order No. |

|                                                                                          |            |                              |                        |
|------------------------------------------------------------------------------------------|------------|------------------------------|------------------------|
| Gerät / Device                                                                           | Typ / Type | Seriennummer / serial number |                        |
| Fehlerbeschreibung / error description (compulsory):                                     |            | sporadisch/<br>sporadic      | permanent/<br>constant |
|                                                                                          |            |                              |                        |
|                                                                                          |            |                              |                        |
|                                                                                          |            |                              |                        |
| Konfigurationsdetails / configure details (e.g. bar code scanner: baudrate, code family) |            |                              |                        |

### Erklärung zur Kontamination und Reinigung Declaration of Contamination and cleaning

Aufgrund der gesetzlichen Vorschriften und zum Schutz unserer Mitarbeiter und Betriebseinrichtungen, benötigen wir die unterschriebene "Erklärung zur Kontamination", bevor ihr Auftrag bearbeitet werden kann. Legen Sie diese unbedingt den Versandpapieren bei oder bringen Sie sie idealerweise außen an der Verpackung an.

Because of legal regulations and for the safety of our employees and operating equipment, we need the "declaration of contamination" with your signature, before your order can be handled. Please make absolutely sure to include it with the shipping documents, or – even better – attach it to the outside of the packaging.

### Warnhinweise zum Medium Medium and warnings



| Medium/Konzentration<br>Medium/concentration                       | identification<br>CAS no. | entzündlich<br>flammable | giftig<br>toxic | ätzend<br>corrosive | Gesundheits-<br>Schädlich/<br>reizend<br>harmful/irritant | sonstiges *<br>other * | unbedenklich<br>harmless |
|--------------------------------------------------------------------|---------------------------|--------------------------|-----------------|---------------------|-----------------------------------------------------------|------------------------|--------------------------|
| Medium im Prozess<br>Process medium /                              |                           |                          |                 |                     |                                                           |                        |                          |
| Medium zur<br>Prozessreinigung<br>Medium for process<br>cleaning / |                           |                          |                 |                     |                                                           |                        |                          |
| Medium zur<br>Endreinigung<br>Returned part cleaned<br>with /      |                           |                          |                 |                     |                                                           |                        |                          |

Zutreffendes bitte ankreuzen; trifft einer der Warnhinweise zu, Sicherheitsdatenblatt und ggf. spezielle Handhabungsvorschriften beilegen.  
Please tick should one of the above be applicable, include security sheet, if necessary, special handling instructions.

Hiermit bestätigen wir, dass die zurückgesandten Teile sorgfältig gereinigt wurden und nach unserem Wissen frei von Rückständen in gefährbringender Menge sind.  
We hereby certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free from any residues in dangerous quantities.

(Ort, Datum / Place, date )

(Firmenstempel und rechtsverbindliche Unterschrift)  
(Company stamp and legally binding signature)





# PROCESS AUTOMATION – PROTECTING YOUR PROCESS



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