VisionREADER 2300
with integrated Decoder

Technical Description

1   General Information

1.1   Explanation of Symbols

The symbols used in this operating manual are explained below.

Attention!
Pay attention to passages marked with this symbol. Failure to heed this information can lead to injuries to personnel or damage to the equipment.

Notice!
This symbol indicates text passages containing important information.

1.2   Declaration of Conformity

The code reader VR 2300 and the optional connector units MA 2 and MA 2 L have been developed and manufactured under observation of the applicable European standards and directives.

Notice!
The corresponding declaration of conformity can be requested from the manufacturer.

The manufacturer of the product, Leuze electronic GmbH + Co KG in D-73277 Owen/Teck, possesses a certified quality assurance system in accordance with ISO 9001.

2 Safety Notices

2.1 Safety Standards

The code reader VR 2300 and the optional connector units MA 2 and MA 2 L have been developed, produced and tested subject to the applicable safety standards. They correspond to the state of the art.

2.2 Intended Use

⚠️ ***Attention!***
The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not corresponding to its intended use.

Code readers of the type VR 2300 are conceived as stationary scanners with integrated decoders for Data Matrix-Code ECC 200 and all current bar codes used for automatic object recognition.

The optional connector and interface units MA 2 and MA 2 L are intended for the easy connection of code readers of type VR 2300.

In particular, unauthorised uses include:

- rooms with explosive atmospheres
- operation for medical purposes

Areas of application

The code reader VR 2300 with optional connector units MA 2 and MA 2 L is conceived particularly for the following fields of application:

- labelling and packaging machines
- automatic analysers
- space-critical code reading tasks
- storage and conveying engineering, in particular for object identification on fast-moving conveyor belts
- pharmaceutical industry

2.3   Working Safely

⚠ ***Attention!***
Access to or changes on the device, except where expressly described in this operating manual, is not authorised.

Safety regulations
Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

Qualified personnel
Mounting, commissioning and maintenance of the device must only be carried out by qualified personnel.
Electrical work must be carried out by a certified electrician.

3 Description

VR 2300 device construction

Reading window

15-pin sub-D connector
on the rear of the device

2 fastening threads M6 on the
underside of the unit

Dovetail fastening groove
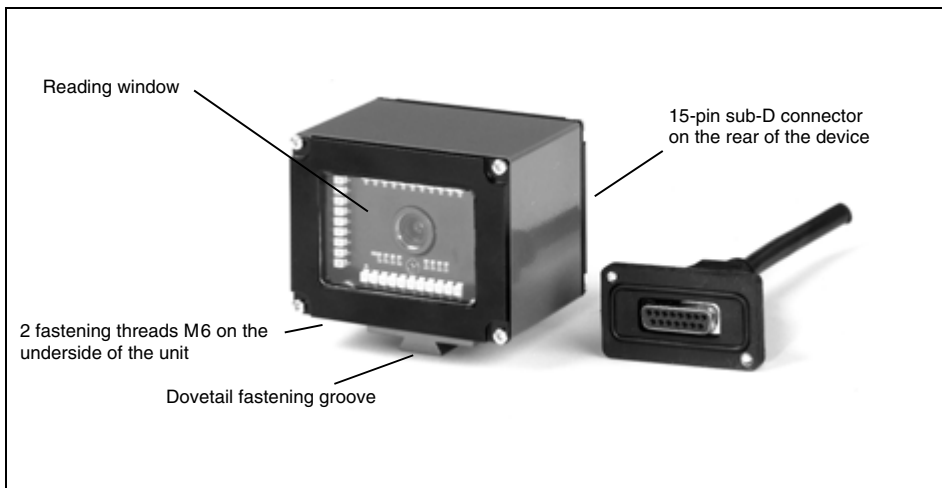
Figure 3.1:   VR 2300 device construction

3.1 The Code Readers VR 2300

The code reader VR 2300 is a scanner with integrated decoder for Data Matrix-Code
ECC 200 and all bar codes currently in use, e.g. 2/5 Interleaved, EAN etc.

The many possible configurations of the device allow its adaptation to a multitude of reading
tasks. Due to the small dimensions of the unit and the short minimum reading distance, the
VR 2300 may also be used in highly constrained spaces.

Information on technical data and characteristics can be found in chapter 4.

3.2 Standalone operation

The code reader VR 2300 is operated as a "stand-alone" device. The VR features a 15-pin
sub-D connector for the electrical connection of the supply voltage, the interface, and the
switching inputs.

With connector units

The connector units simplify the electrical installation of the code readers in standalone
operation.

A listing of the available connector units and associated short descriptions may be found in
chapter 5. Separate data sheets are available that contain further details about the
connector units.

4   Specifications

4.1   General Specifications VR 2300

Optical Data

Optical system	CMOS 800x600 pixel
Contrast	15% (black/white)
Light source	integrated LED (flash/continued)
Point of focus	**SM 100:** 55 mm
	SF 100: 80 mm
	SL 100: 130 mm

Electrical data

Interface type	RS-232 (Host) for code output
Connections	2 electrically insulated inputs
	2 electrically insulated outputs (100 mA max. respectively)
Trigger	serial or digital input
Operating voltage	10 … 30 V
Current	600 mA

Code types

Code types	Data Matrix: ECC 200 (10x10 to 64x64)
	bar codes: 2/5 Interleaved, Codabar
	UPC/EAN/JAN, Code 11, Code 39, Code 93, Code 128
Read direction	omnidirectional, various tilt and
	rotational angles up to 20°

Mechanical data

Protection class	IP 65
Weight	400 g
Dimensions (W x H x D)	80 x 60 x 64 mm
Fastening	2xM6 screws, dovetail
Housing	diecast aluminium

Environmental data

Ambient temp. (operation)	+5 °C … +40 °C
Air humidity	5% to max. 90% rel. humidity, non-condensing

Table 4.1:   General Specifications

4.2   LED indicators

An LED on the unit's rear side indicates whether the read was successful (factory setting: green) or not (factory setting: red).

4.3   Dimensioned drawings

VR 2300

A   For screw M6 x 8
B   15-pin sub-D connector
C   LED green/red
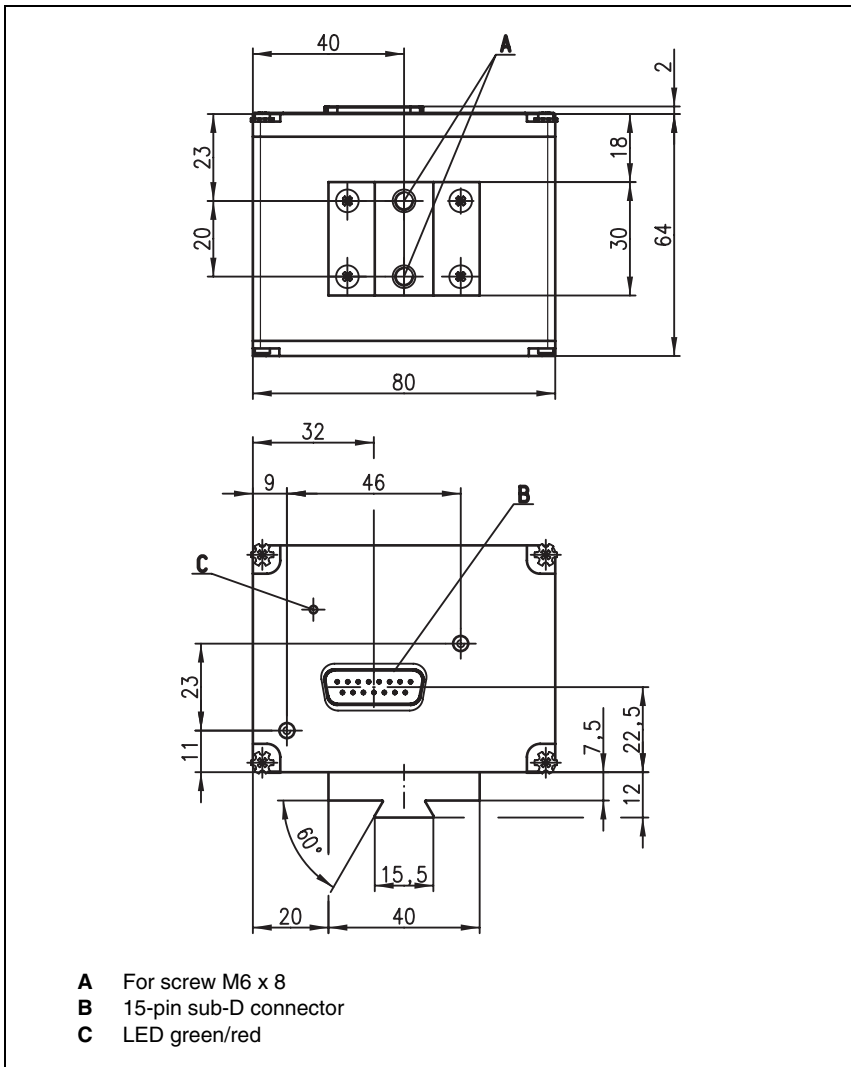
Figure 4.1:   Dimensioned drawing VR 2300

4.4　Optical Data

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Notice!

Please note that the size of the cell resp. the code module influences the maximum reading distance and the width of the reading field. Therefore, when selecting a mounting location and/or the suitable code label, take into account the different reading characteristics of the scanner with various code modules resp. cell sizes.

For different reading tasks, the VR 2300 is available in various versions. Please refer to the following table or the respective scanning curves for ratings.

4.4.1　Type overview

Model	Point of focus	Module/ resolution (mm)	Part No.
VR 2300 SM 100	55 mm	0.25 … 1.27	500 39357
VR 2300 SF 100	80 mm	0.15 … 1.27	500 39358
VR 2300 SL 100	130 mm	0.15 … 1.27	500 40918

Table 4.2:　Type overview

4.4.2　Optics variants and reading fields

The VR 2300 is available with three different optics. The optics differ in range and resolution (see chapter 4.4.1).

- Optic M:　for small to medium modules/cells
- Optic F:　for medium to large modules/cells
- Optic L:　for medium to large modules/cells

The following graphic displays the scanning curves of the various VR models.

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Notice!

Please notice that the real scanning curves are also influenced by factors such as labelling material, printing quality, scanning angle, printing contrast etc., and may thus deviate from the scanning curves specified here.

Scanning curves VR 2300 with optic M
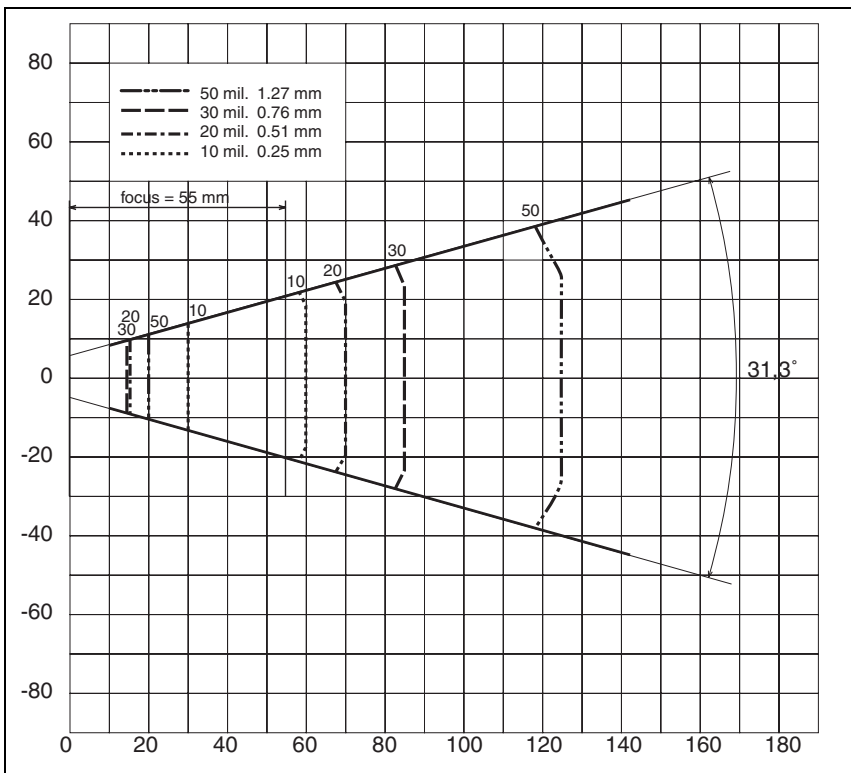
Figure 4.2:   Reading field, optics model M (medium density, normal range)

Scanning curves VR 2300 with optic F
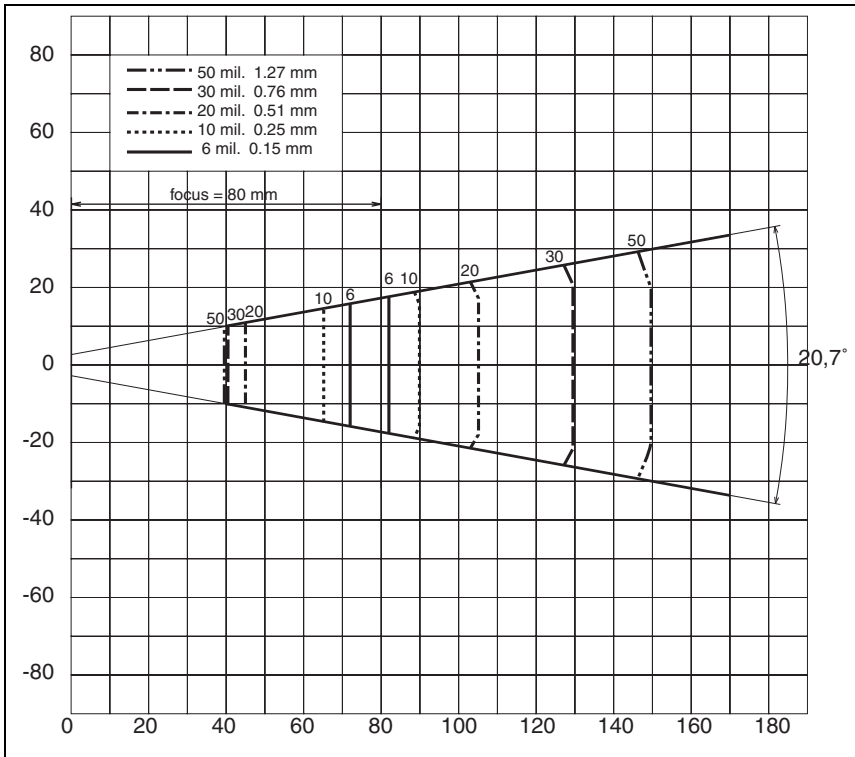
Figure 4.3:   Reading field, optics model F (low density, long range)

VR 2300 with optic L
The focal point is at 130 mm.

5   Accessories / Order Designation

5.1   Accessories

Notice!
Products from Leuze electronic GmbH + Co KG can be ordered from any of the sales and service offices listed on the back page of this operating manual.

Symbol	Order No.	Short Description
MA 2	500 31256	Connector unit MA 2 for VR 2300; standard design, stand-alone with host interface RS 232
MA 2 L	500 36186	Connector unit MA 2 L for VR 2300; L design, stand-alone with host interface RS 232
MA 42 DP-k	500 35298	Connector unit MA 42 DP-k for VR 2300 at Profibus DP
MA 42 IS	500 32853	Connector unit MA 42 IS for VR 2300 an INTERBUS
BT 56	500 27375	Mounting bracket with dovetail for rod
KB 031-3000	500 35355	Connection cable between VR and MA 2, MA 42… length: 3m
KB 040-3000	500 26658	Connection cable between VR and MA 2 L, length: 3m
KB 040-6000	500 29381	Connection cable between VR and MA 2 L, length: 6m
KB 040-10000	500 29382	Connection cable between VR and MA 2 L, length: 10m
KB 040-3000B	500 29316	Connection cable VR, 3m length with open cable end
KB 040-6000B	500 29317	Connection cable VR, 6m length with open cable end
KB 040-10000B	500 29318	Connection cable VR, 10m length with open cable end

Table 5.1:   Accessories / Order Designation

5.1.1   Connector units

Notice!
The connector units are described here in brief only. For further information regarding the connector units please refer to the relevant data sheets

Connector unit MA 2

The connector units MA 2 are used to simplify the electrical installation of the VR 2300. They have the following advantages compared to the installation of the VR 2300 as a standalone device:

- Terminals for switching inputs and outputs, including supply voltage
- 9-pin sub D plug for service interface
- Operating mode switch: service operation/standard operation
- Rotary switch for address setting (not for VR 2300)
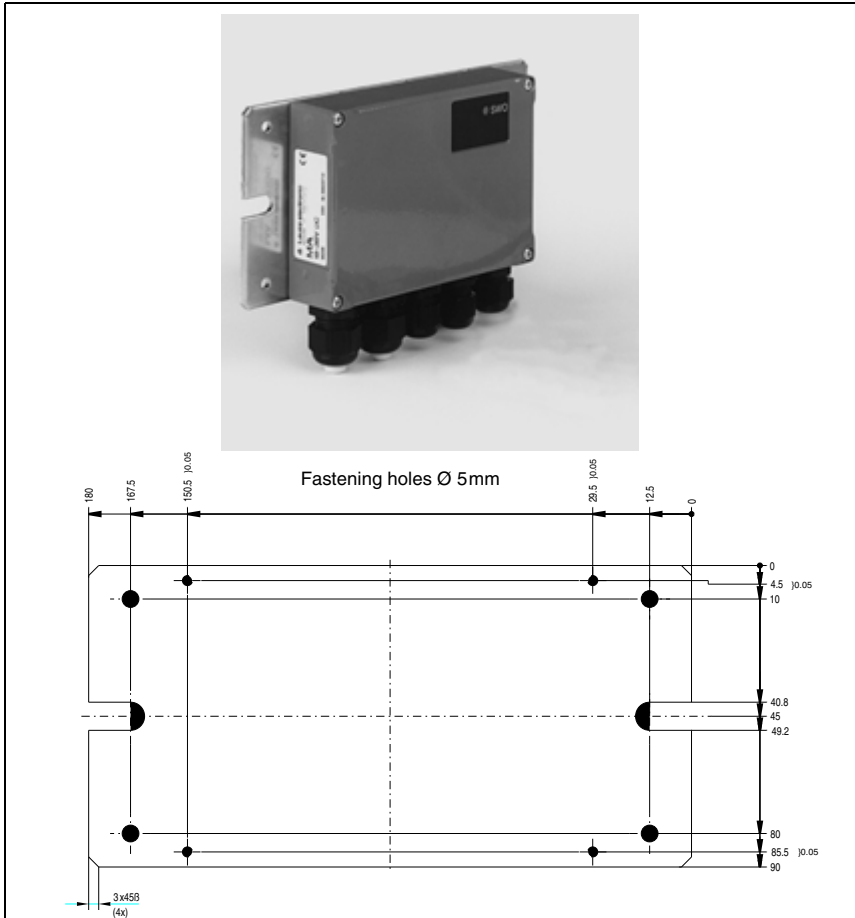
Figure 5.1:   Connector unit MA 2

5.1.2   Mounting accessories

The mounting device BT 56 is available for mounting the VR 2300. It is designed for rod installation.

Mounting device BT 56

Clamping jaws for
mounting on the VR

Clamp profile for mounting
to round or oval pipes
Ø 16 … 20mm
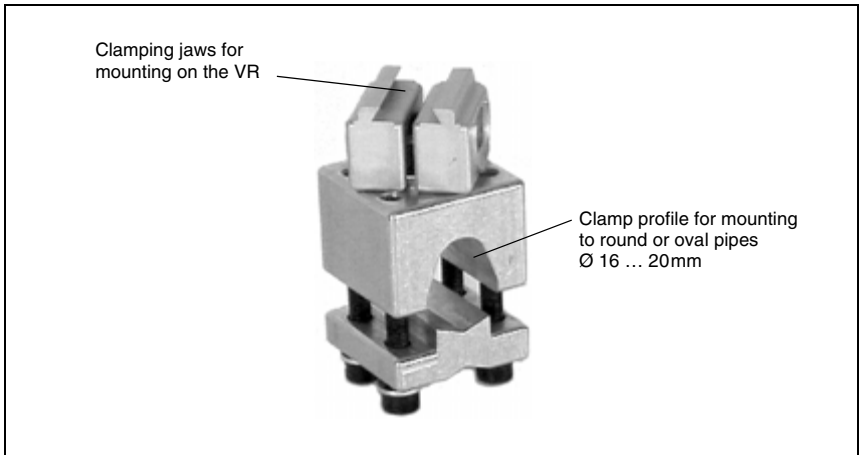
Figure 5.2:   Mounting device BT 56

5.1.3   Connection cable

Specific connection cables in various lengths are available for the connection between VR and connector unit, depending on the model of the connector unit (standard version or L version).

6 Installation

6.1 Storage, Transportation

⚠️ ***Attention!***
When transporting, package the device so that it is protected against collision and humidity. Optimal protection is achieved when using the original packaging. Heed the required environmental conditions specified in the technical data.

Unpacking

✑ *Check the packaging for any damage. If damage is found, notify the post office or shipping agent as well as the supplier.*

✑ *Check the delivery contents using your order and the delivery papers:*

- delivered quantity
- device type and model as indicated on the nameplate
- accessories
- operating manual

The name plate provides information as to what VR type your device is. For specific information, please refer to chapter 4.4.1.

Name plate VR 2300
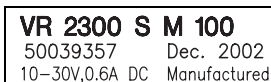
```
VR 2300 S M 100
 50039357      Dec. 2002
10-30V,0.6A DC  Manufactured
```
Figure 6.1:   Device name plate VR 2300

✑ *Save the original packaging for later storage or shipping.*

If you have any questions concerning your shipment, please contact your supplier or your local Leuze electronic sales office.

✑ *Observe the local regulations regarding disposal and packaging.*

Cleaning

✑ *Clean the glass window of the VR 2300 with a soft cloth before mounting. Remove all packaging remains, e.g. carton fibres or Styrofoam balls.*

⚠️ ***Attention!***
Do not use aggressive cleaning agents such as thinner or acetone for cleaning the device.

6.2   Mounting

Accessories

The mounting system BT 56 is available for installation. It may be ordered separately from Leuze electronic. For order numbers, see table 5.1 "Accessories / Order Designation" on page 13.

Mounting the VR 2300

There are two basic types of mounting arrangements for the VR 2300:

- using the dovetail groove and the corresponding mounting accessories (see figure 6.2)
- using the fastening threads on the back- and underside of the devices (chapter 4.3)

Mounting example VR 2300

Mounting device
BT 56
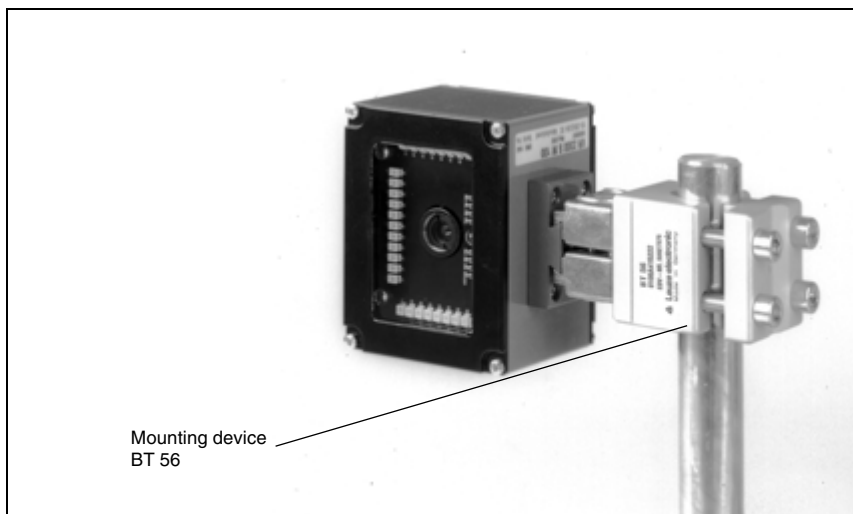
Figure 6.2:   Mounting example VR 2300

Mounting MA

You can mount all connector units individually through the holes located on the mounting plate (see figure 5.1).

Subsequently, connect the VR 2300 with the connector unit via the respective cable (see chapter 5.1.3).

6.2.1 Device Arrangement

Selecting a mounting location

In order to select the right mounting location, several factors must be considered:

- size, orientation, and position tolerance of the codes on the objects to be scanned
- the reading field of the VR 2300 in relation to the code module width resp. cell size
- the resulting minimum and maximum reading distance from the respective reading field

For specific information, please refer to chapter 4.4.

6.3 Connection

⚠ ***Attention!***

Never open the device yourself, as this may compromise protection class IP 65.

Before connecting the device, be sure that the supply voltage agrees with the value printed on the nameplate.

Connection of the device and maintenance work while under voltage must only be carried out by a qualified electrician.

The power supply unit for the generation of the supply voltage for the VR 2300 and the respective connector units must have a secure electrical insulation through double insulation and safety transformers according to DIN VDE 0551 (IEC 742).

Be sure that the earthing conductor is connected correctly. Error-free operation is only guaranteed when the device is properly earthed.

If faults cannot be corrected, the device should be removed from operation and protected against possible use.

6.3.1   Connection VR 2300

Sub D pin assignments
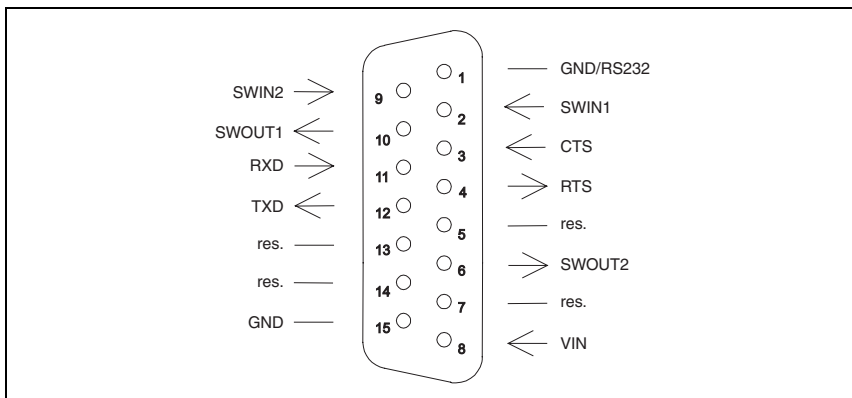
Figure 6.3:   VR 2300 Sub D pin assignments

Wiring description

Pin 1	GND	GND, interface RS 232
Pin 2	SWIN1	Switching input 1 (+12 … 30 V DC)
Pin 3	CTS	CTS signal, host interface RS 232
Pin 4	RTS	RTS signal, host interface RS 232
Pin 5	Res.	Reserved
Pin 6	SWOUT2	Switching output 2 (max. 100 mA)
Pin 7	Res.	Reserved
Pin 8	VIN	Supply voltage +10 … 30 V DC
Pin 9	SWIN2	Switching input 2 (+12 … 30 V DC)
Pin 10	SWOUT1	Switching output 1 (max. 100 mA)
Pin 11	RXD	RXD signal, interface RS 232
Pin 12	TXD	TXD signal, interface RS 232
Pin 13	Res.	Reserved
Pin 14	Res.	Reserved
Pin 15	GND	Supply voltage 0 V DC

Table 6.1:   Wiring description VR 2300

6.3.2   Connection of switching inputs and outputs

The VR 2300 is equipped with two switching inputs and two switching outputs. The connection of the switching inputs and outputs is carried out according to figure 6.4:
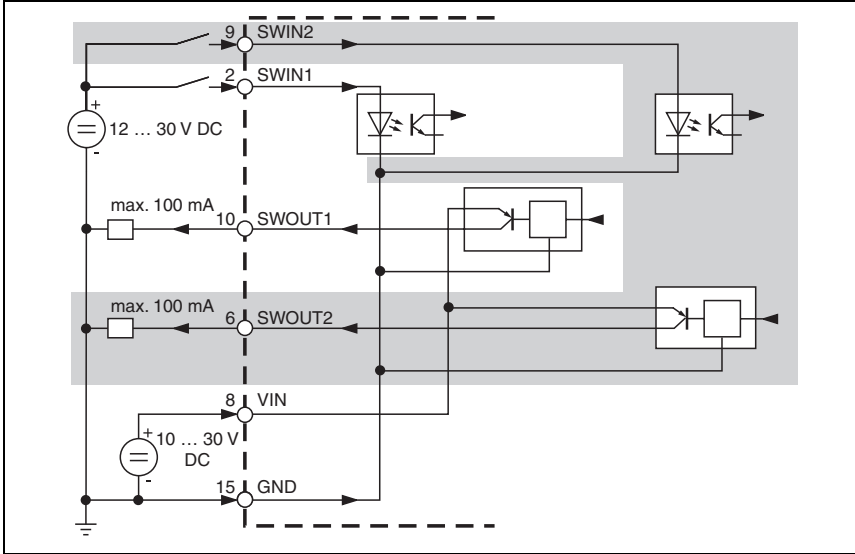
Figure 6.4:   Connection diagram switching inputs and outputs VR 2300

Switching inputs

In the standard setting, you can trigger a reading action via the switching input connections SWIN1/SWIN2 by applying a voltage of 12 … 30 VDC between SWIN1 (pin 2) or SWIN2 (pin 9) and GND (pin 15).

Switching outputs

The switching output connections between SWOUT1 (pin 10) or SWOUT2 (pin 6) and GND (pin 15) are normally open. In the standard setting, SWOUT1 is closed in case of a reading error, SWOUT2 in the case of a detected code.

Notice!
You can configure the switching inputs and outputs according to your needs, using the program supplied.

6.3.3   Wire Lengths and Shielding

The following maximum lengths for wires and the type of shielding to be used must be observed:

Connecting	Interface	Max. wire length	Shielding
VR 2300	RS 232	10m	absolutely required, shield meshing
Switching inputs 1+2		10m	not necessary
Switching outputs 1+2		10m	not necessary

Table 6.2:   Wire Lengths and Shielding

6.4   Disassembling, Packing, Disposing

Repacking

For later reuse, the device is to be packed so that it is protected against shocks and dampness. Optimal protection is achieved when using the original packaging.

Notice!
Electrical scrap is a special waste product! Observe the locally applicable regulations regarding disposal of the product.

7 Commissioning

7.1 Measures to be performed prior to the first commissioning

ꙮ *Before commissioning, familiarise yourself with the operation and configuration of the device(s)!*

ꙮ *Before switching on, recheck all connections and ensure that they have been properly made.*

7.2 Function Test

"Power On" test

After connecting the operating voltage, the VR 2300 carries out an automatic "Power On" function test. Subsequently, the red LEDs (in the standard setting) light up in the optics window of the VR 2300.

Interface

Proper function of the interface can be tested easiest in service operation using the interface with the VisionREADER Setup Tool programming software and a notebook computer. For order numbers, see table 5.1 on page 13.

Problems

Should problems occur during device commissioning, refer first to chapter 8.2. Should a problem persist after checking all electrical connections and settings on the devices and host, please contact a Leuze service office near you (see the back page of this operating manual).

7.3 Setting the Parameters

You have now commissioned the VR. Usually, you will have to configure it before you can use it. Using the parameter options made available by the VR, you may configure the VR to suit your individual area of application. For instructions regarding the various setting options refer to chapter 9 or to the online help of the VisionREADER Setup Tool.

In order to operate the VR, it is typically sufficient to set code type and code length in accordance with the codes that are to be read. However, depending on the application, you will additionally configure the switching inputs and outputs according to your requirements.

To understand what is happening during the parameter setting, the following chapter 7.3.1 briefly explains the various parameter sets.

The setting of the parameter sets then takes place in the operating mode "service", which is described in chapter 7.3.2.

7.3.1 Parameter sets

In the VR 2300, three different parameter sets are administered:
- parameter set with the default settings in the ROM
- current parameter set in the EEPROM
- working copy of the current parameter set in the RAM

Before a parameter set is loaded into the memory of the VR 2300 processor, the validity of the parameter set is verified using checksums.

Factory default parameter set

This parameter set contains the factory default settings for all VR 2300 parameters. It is permanently stored in the ROM of the VR 2300. The parameter set with the default settings is loaded into the memory of the VR 2300
- the first time the device is commissioned after delivery.
- after the command "Default All" in the VisionREADER setup tool (see chapter 9.2.1).
- if the checksums of the current parameter set are invalid.

Current parameter set

In this parameter set, the current settings for all device parameters are stored. When the VR 2300 is in operation, the parameter set is stored in the EEPROM of the VR 2300. The current set can be stored:
- by copying a valid parameter set from the host computer.
- by means of an on-line setup with the PC setup program VisionREADER Setup Tool.

The current parameter set is loaded into the memory of the VR 2300
- each time the supply voltage is connected.
- following a software reset.

The current parameter set is overwritten by the parameter set with the default settings.

7.3.2 Service Operating Mode

Connection

You can connect a PC or terminal to the VR 2300 via the serial interface and configure the VR 2300 through this connection. For this, you need a crossed RS 232 connection cable (null modem cable) that provides the connections RxD, TxD and GND (see figure 7.1).

Notice!
The handshake lines RTS and CTS may be connected but are not required.

Connection of the service interface VR 2300 standalone
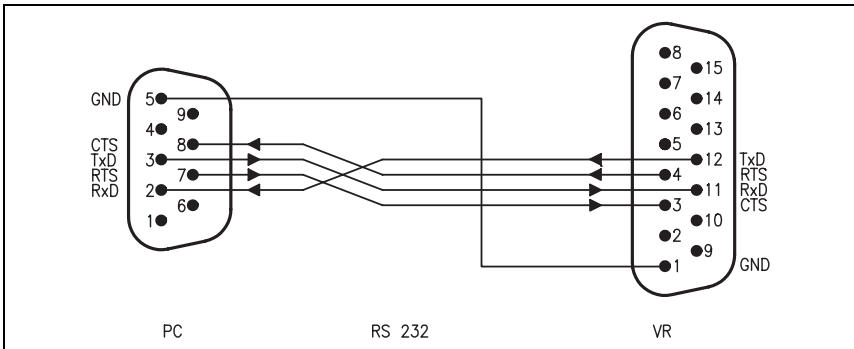
Figure 7.1:   Connecting the service interface of the VR 2300 to a PC/terminal

If the VR 2300 is connected to a connector unit MA 2 or MA 2 L, you can use the 9 pin sub-D service connector in the connector unit or connect the interface cable directly to the terminals of the connector unit (see figure 7.2).

Connection of the service interface (terminals) of the connector unit MA 2/ MA 2 L
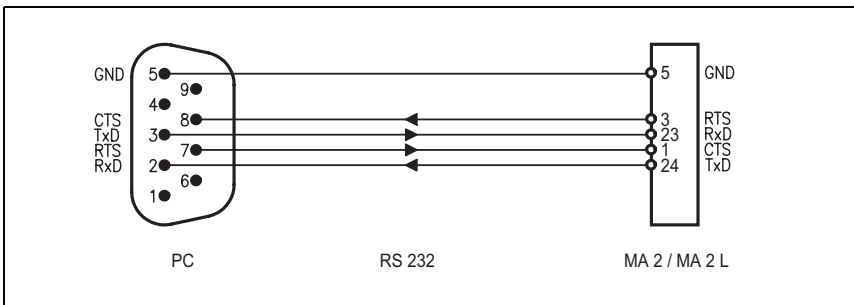
Figure 7.2:   Connecting the service interface (terminals) of the MA 2/MA 2 L to a PC/terminal

8 Operation

8.1 Display Elements

An LED on the unit's rear side indicates whether the read was successful (factory setting: green) or not (factory setting: red).

8.2 Error Handling

Error, warning and status messages of the VR 2300 are transmitted via the host interface only.

Types of errors

Errors are divided up into the following types:

- Warnings
- Serious errors

Warnings

Warnings indicate temporary operating faults which do not effect the proper functioning of the device.

Serious errors

Serious errors impair the proper functioning of the device. The device must be reinitialised.

Troubleshooting

Isolated warnings can be ignored, since the VR 2300 will continue to function properly.

Following a serious error, you should reinitialise the VR. It will then usually again function properly. If a hardware problem is present, the VR 2300 will not reinitialise.

Warnings and errors which occur frequently can be corrected easiest using the Vision-READER software.

If you cannot correct faults and errors with the software, please contact a Leuze electronic sales office or service facility. For addresses, please refer to the back page of this operating manual.

9 Communicating with the Device

The VisionREADER 2300 can be optimally configured for your application using the setup software VisionREADER Setup Tool, which supplied on the CD. The program is not necessary for operating the VisionREADER, but only for the adaptation to the application.

9.1 Installation of the software "VisionREADER Setup Tool"

System requirements

For the installation of the program on your PC, the following are necessary:

Operating system:

The following operating systems support operation of the setup tool:

- Windows 98 Second Edition
- Windows Millenium Edition (Me)
- Windows 2000
- Windows XP

RAM:

The PC must have at least 32 MB RAM.

Java Runtime Environment

A Java Runtime Environment is necessary for operating the setup tool. The installation CD contains a current version. During the automatic installation, the system determines whether a Java Runtime Environment is already installed on the PC. If necessary, the installation program requests that the version on the Installation CD be installed.

Installation of the VisionREADER setup tool

Notice!

You must have administrator privileges in order to install the setup tool!

Please observe the following procedure:

1. Start Windows.
2. Insert the Installation-CD-ROM into your CD-ROM drive. The CD starts automatically with the language selection. You then enter the product selection. Here, select VisionREADER. Below this, you will find the configuration program which you can install after clicking.
   If you have downloaded the VisionREADER Setup Tool as a ZIP file, unzip the files and then execute the file **setup.exe**.
3. Follow the installation routine and, if necessary, also install the Java Runtime Environment.
4. Upon conclusion of the installation, there will be an icon on your desktop and an entry in the Start menu for starting the VisionREADER setup tool.
5. Connect the VisionREADER to a free COM port on your PC.

6.   Double-click the icon to start the setup tool and allow the program to query the interface. Select the COM port to which VisionREADER is connected and click OK.
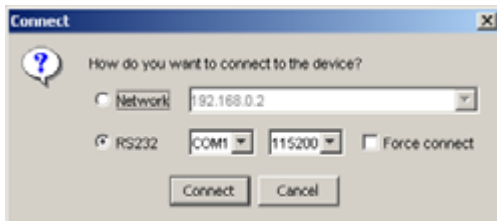
We recommend selection of the highest available Baud rate to speed up the data transfer. The connection is established.

7.   You can now configure the VisionREADER and save the settings in the device with the function **Configuration -> Apply**.

Notice!

For further information, please see the online help for the "VisionREADER" software.

9.2 VisionREADER Setup Tool

9.2.1 Menu

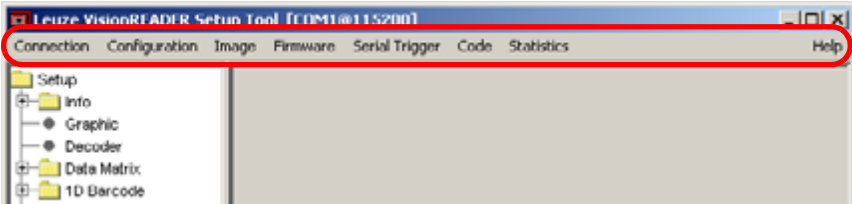| Menu items	Description
Connection->Connect	Establishes a connection to the VR 2300.
Connection->Connect with	Provides a selection for establishing the connection to the VR 2300.
Connection->Disconnect	Cancels the connection to the VR 2300.
Configuration->Get All	Transmits the complete current parameter set from the VR 2300 to the Setup Tool
Configuration->Get	Transfers the parameters of the current parameter set that are displayed in the currently opened panel from the VR 2300 to the Setup Tool.
Configuration->Auto Get	This menu item is not available for the VR 2300.
Configuration->Default	Sets all parameters of the currently displayed panel to default values and transmits these to the VR 2300.
Configuration->Default All	Sets all parameters in the Setup Tool to default values and transmits these to the VR 2300.
Configuration->Apply	Writes the current parameter set permanently to the EEP-ROM of the VR 2300. **Attention**: Without Apply, all parameter changes are lost if the voltage supply is interrupted.
Configuration->Open	Loads a parameter set from a file into the Setup Tool and transmits it to the VR 2300.
Configuration->Save	Saves the current parameter set from the Setup Tool to a file.
Image->Snapshot	Transmits a single image from the VR 2300 to the Setup Tool and displays this image in a separate window (see also chapter 9.4.2).
Image->Save	Saves a single image in a file. (This menu item is only available as long as the window with the transmitted single image is still open.)

Image->Upload	Loads a stored image (*.bmp format, max. 800 x 600 pixels) into the main memory of the VR 2300 for evaluation. This requires the functions 'single step' and 'freeze image' on the Input panel to be activated.
Image->Live Stream	Displays a (pseudo) Live Stream of the camera images in a separate window. In the case of serial connection, the image frame rate is relatively low.
Firmware->Update	Opens an input dialog for the selection of a new firmware (*.bin file) and starts the update process. As the current parameter set is overwritten and replaced by the default parameters when a firmware update is performed, we recommend that you save the parameters before the update process. A notification window reminds you of this.
Serial Trigger->On	Activates a trigger window.
Serial Trigger->Off	Deactivates a trigger window.
Code->Output	Opens a window and displays the read codes (plus extended information, if activated) in the window.
Statistics->Stats Window	Shows the window with the statistical data.
Statistics->Display Image Storage	Shows a window that permits the error images stored in the RAM to be selected.
Help -> About	Output information about the setup tool's version number and the copyright.

9.2.2　Configuration panels

The Setup Tool of the VR 2300 permits various settings to be altered to adapt the scanning process to your requirements. In order to make the configuration of the VR 2300 easier for you, the Setup Tool features different panels.

On the one hand, you can configure the code reading processes and set the camera properties. On the other hand, you can define the communication between the VR 2300 and the host system it is connected to.

Structure of the configuration panels

The different configuration panels are shown in a hierarchical tree as follows.
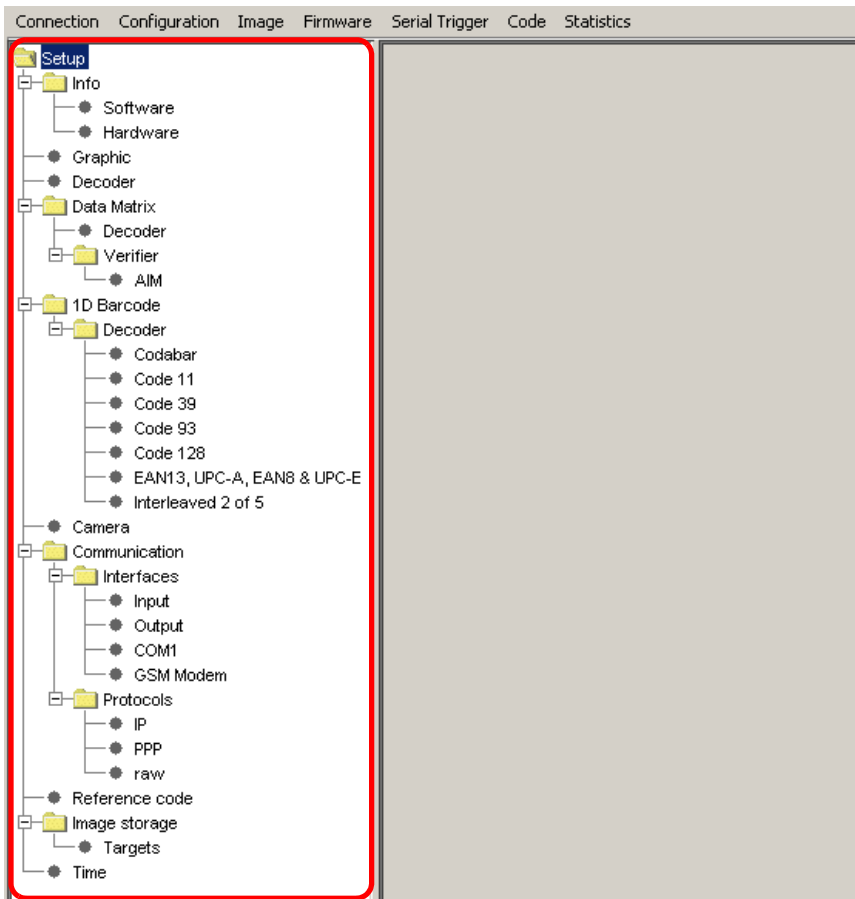
Figure 9.1:　Structure of the configuration panels

9.3   Configuration and adjustment

9.3.1   Info Panel

To display the **Info** panel, click on the corresponding folder. This panel displays information regarding the serial number and the type of the reading system.

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工   *Notice!*
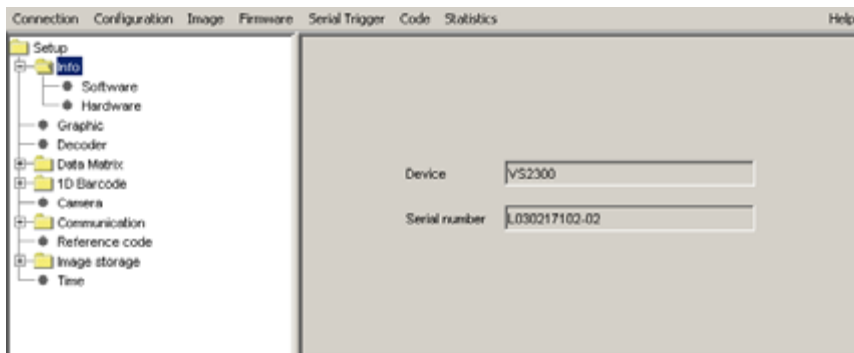
You cannot carry out any settings on this panel.

9.3.2   Info / Software Panel

In order to display the **Software** panel, double-click on the **Info** folder and then on the respective item. This panel informs you about the versions of the software, firmware and decoding routines used.

○
工   *Notice!*
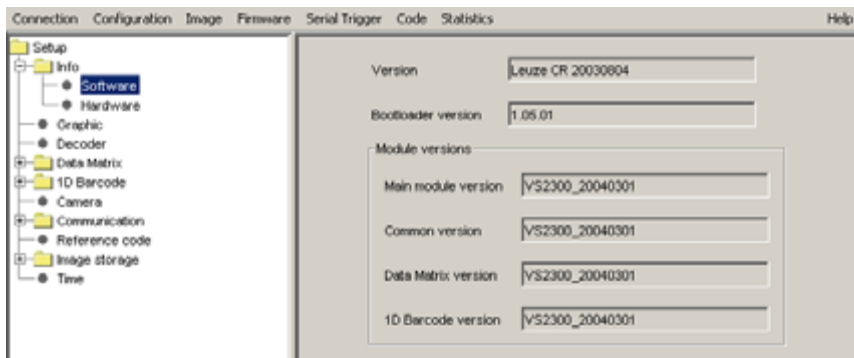
You cannot carry out any settings on this panel.

9.3.3   Info / Hardware Panel

In order to display the **Hardware** panel, double-click on the **Info** folder and then on the respective item.

This panel shows information about the hardware components.
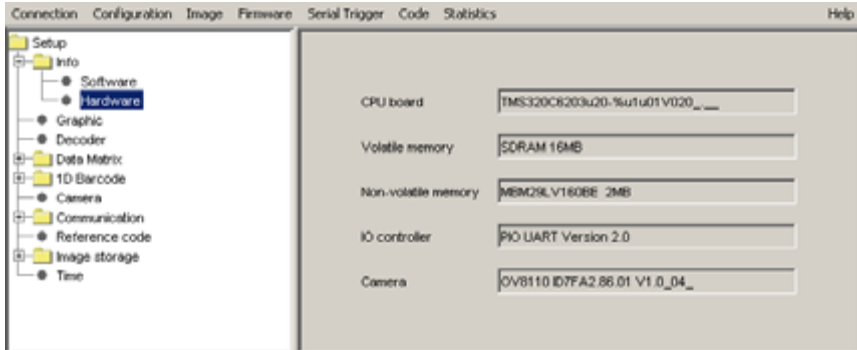
○ *Notice!*
You cannot carry out any settings on this panel.

9.3.4   Graphic Panel

In this panel, you can set the image parameters to be used with snapshots and the Livestream function (see menu item Image).
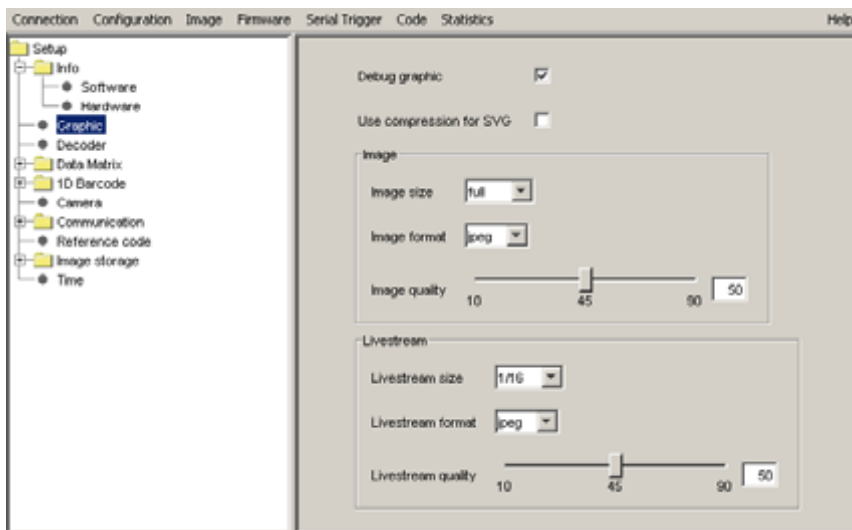
| Parameter	Description
Debug graphic	Activates additional graphical output in the snapshot image. For an explanation of the additional output please refer to chapter 9.4.2.
Use compression for SVG	Activates the compression of the debug information (see chapter 9.4.2) that is transmitted by the VR 2300 in SVG format (scalable vector graphics). This accelerates the snapshot function, but extends the decoding time considerably.
Image size	Indicates the desired size of the image to be transmitted. Up to 800 x 600 pixels are available. In order to accelerate the image transfer, the image size can be reduced by the factors specified here.
Image format	Defines the image format. The formats supported are **bitmap** and **jpeg**.
Image quality	The image quality can be set here, if JPG is selected. A higher value increases image quality and the amount of data to be transmitted.
Livestream size	Specifies the desired size of the Livestream. Up to 800 x 600 pixels are available. In order to accelerate the Livestream, the image size can be reduced by the factors specified here.

Livestream format	Defines the image format. The formats supported are **bitmap** and **jpeg**.
Livestream quality	If JPG is selected, the Livestream image quality can be set here. A higher value increases image quality and the amount of data to be transmitted.

9.3.5 Decoder Panel

To display the **Decoder** panel, click on the corresponding tab.
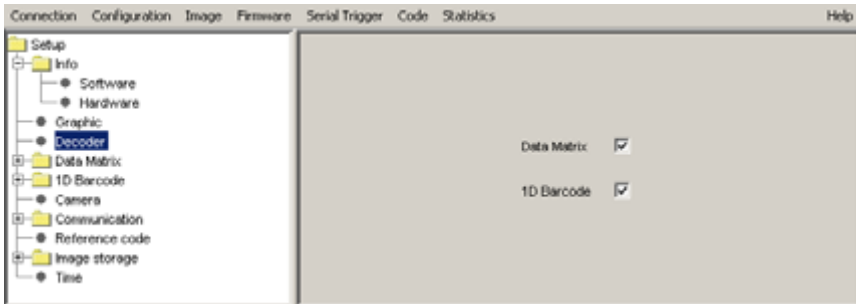
Activate the checkboxes **Data Matrix** and/or **1D Barcode** to activate the reading of Data Matrix Codes and/or 1D bar codes.

9.3.6 Data Matrix Panel

In order to display the **Data Matrix** panel, click on the respective folder.
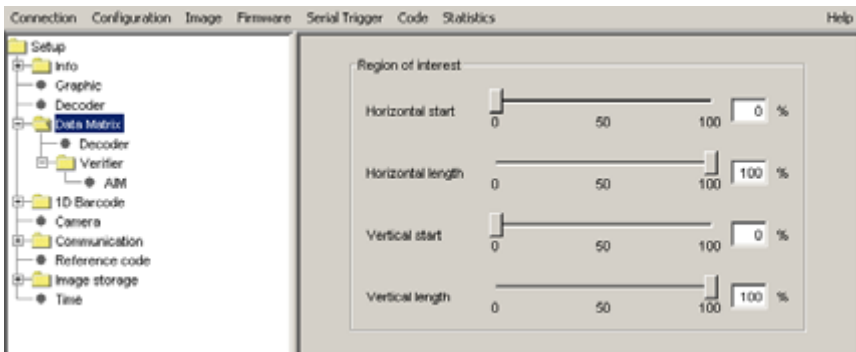
By specifying of percentages, you can define to which section of the camera image the decoding of Data Matrix Codes is to be limited. The reference point for the section is the upper left corner of the camera image. The section is marked by dark green lines in the debug graphics window (see chapter 9.4.2).

9.3.7   Data Matrix / Decoder Panel

In order to display the **Decoder** panel, double-click on the **Data Matrix** folder and then on the respective item.

On this panel, you can carry out various settings regarding the decoding strategy for Data Matrix codes.

The decoding of Data Matrix symbols is based on the detection of grey-scale edges in the image area. The detected grey-scale edges are merged into line elements with respect to their direction (light to dark or dark to light). The horizontal and vertical line elements give rise to line pairs whose shapes resemble the "finder pattern" of the Data Matrix code. These are sorted and parsed according to various criteria.
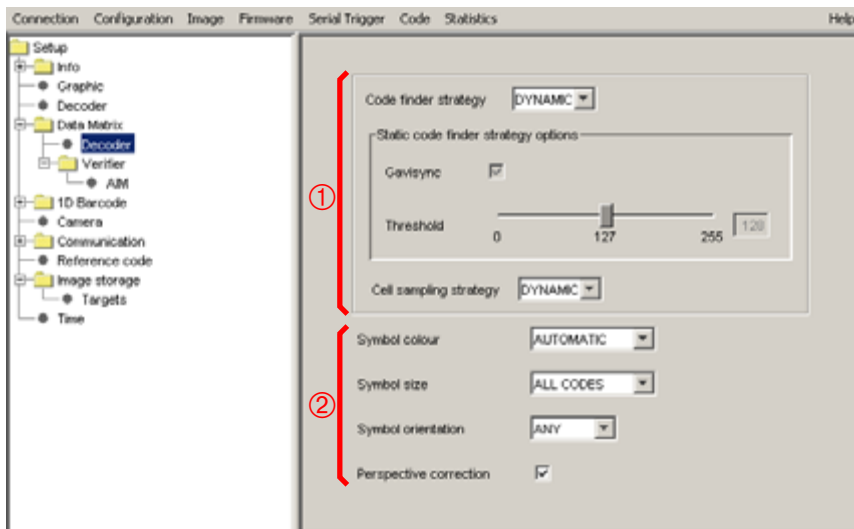
①

Under **Code finder strategy**, the detection method for grey-scale edges in the image area can be selected.

The **dynamic** method (**DYNAMIC**) works in defined steps (filter) and uses an edge filter to detect the grey-scale edges.

The **static** method uses a binarisation threshold that applies to the entire image to detect the grey-scale edges.

Gavisync　finding the threshold for binarisation using the Gavisync algorithm. This is the option we recommend.

Threshold　permits the setting of a fixed binarisation threshold that is used in place of the Gavisync algorithm. For this purpose, the checkbox for the Gavisync algorithm must not be activated.

Notice!

*The two parameters mentioned can only be set if you have chosen **STATIC** as the strategy.*

Under **Cell sampling strategy**, you can choose the method that is used to compute the threshold within the Data Matrix code found. A distinction is made between static (**STATIC**) and dynamic (**DYNAMIC**) strategies here as well.

The **static** strategy determines a fixed threshold value within the Data Matrix symbol. This value is used to help distinguish between light and dark cells.

The **dynamic** strategy divides the symbol into many subsections, and calculates a threshold value for each individual region.

②

Symbol colour　The colour representation of the Data Matrix symbol to be decoded is specified. With the parameter **DARK-ON-LIGHT**, only dark symbols/icons on light background are detected. With the parameter **LIGHT-ON-DARK**, only light symbols on dark background are detected. With the parameter **AUTOMATIC**, the detection is carried out automatically

Symbol size　The size of the Data Matrix symbol to be decoded is specified. With the parameter **ALL CODES** all symbol sizes, square as well as rectangular symbols, are automatically detected. With the parameter **SQUARE CODES**, only quadratic symbols will be read. The remaining selection options specify a single symbol size (e.g. 16 x 16).

Symbol orientation　The software detects the code orientation automatically. The setting **0 DEGREE** determines that the code edges must be parallel to the horizontal or vertical axis, respectively. This has the advantage of a higher reading security. If the code orientation is permitted to vary, the value **ANY** must be set.

Perspective correction　Permits the use of a distortion correction. If Data Matrix codes are read that are not in a perpendicular position with respect to the device, a perspective-based distortion arises. This method compensates the distortion computationally.

9.3.8   Verifier Panel

In order to display the **Verifier** panel, double-click on the **Data Matrix** folder and then on the respective tab.

This lets you switch the verifier on or off. The checkbox **Verifier enabled** activates or deactivates the verifier functionality.

Under **Verifier type**, you can only select the type **AIM**. The implementation of the verifiers acc. to AIM is based on the document "International Symbology Specification - Data Matrix" (ISO/IEC 16022).

The AIM specification classifies the individual measurement parameters into the quality grades A, B, C, and D. The letter F shows that the quality has fallen below the lowest grade (D) and is thus insufficient.
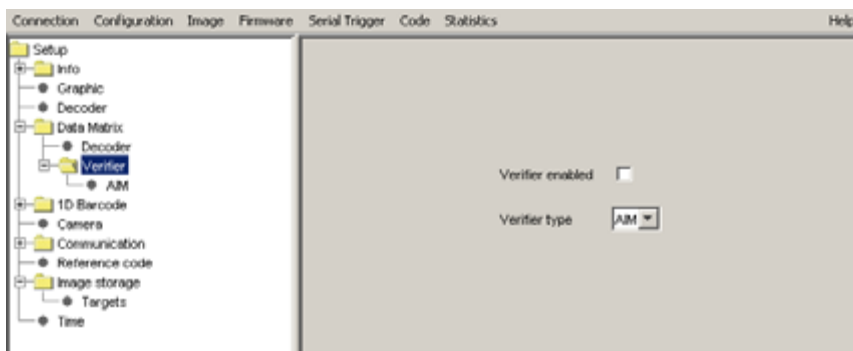
Notice!
Currently, the VisionREADER 2300 only supports the verifier according to AIM.

9.3.9   AIM Panel

In order to display the **AIM** panel, double-click on the **Verifier** tab and then on the respective item.

Here you can set the quality grades of the individual measurement parameters of the verifier according to AIM. The switching output is set only if the specified quality grade is achieved or exceeded.
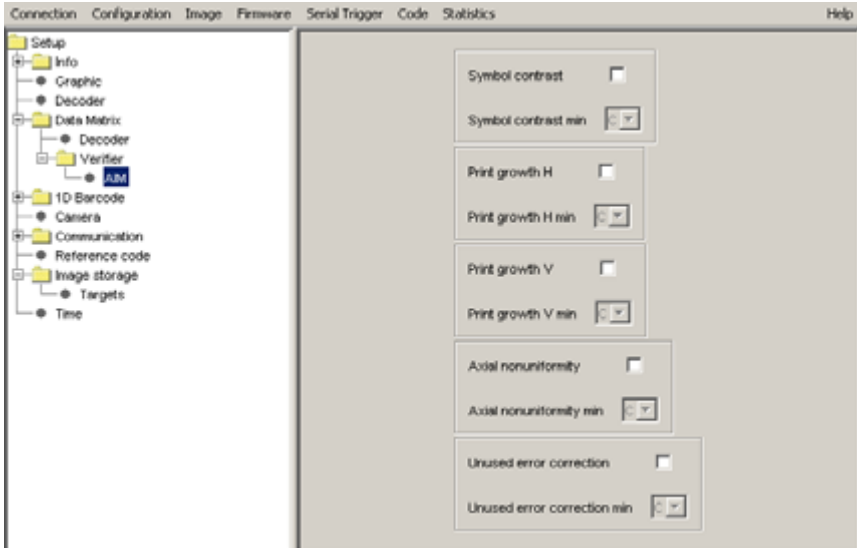
9.3.10 1D Barcode / Decoder Panel

The settings in this panel are valid for all 1D bar code types.
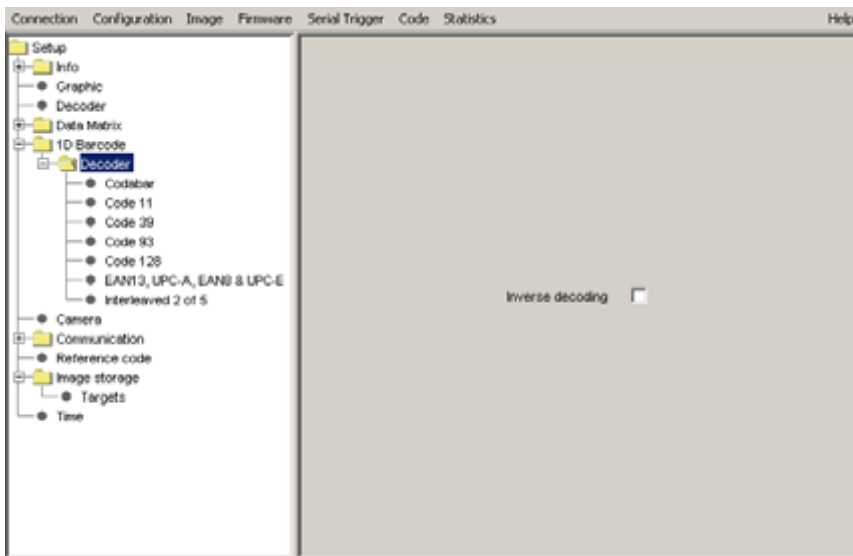
Parameter	Description
Inverse decoding	Enables additional decoding of inverted bar codes (white on black background).

9.3.11 Codabar Panel
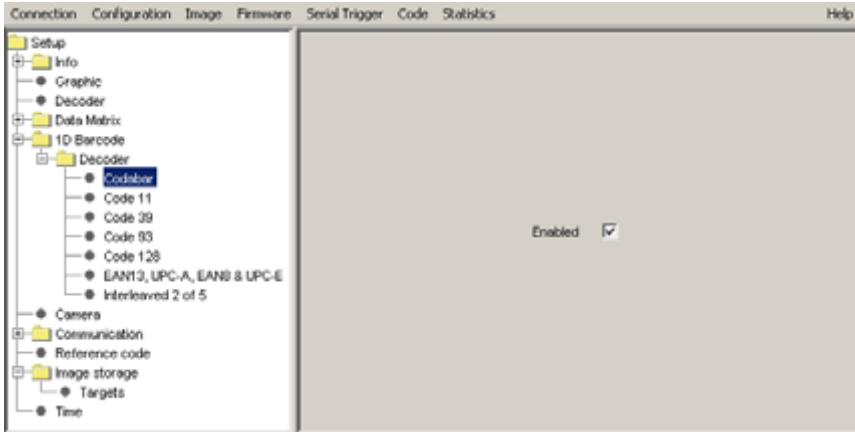
Parameter	Description
Enabled	Enables the decoding of Codabar bar codes.

9.3.12 Code 11 Panel
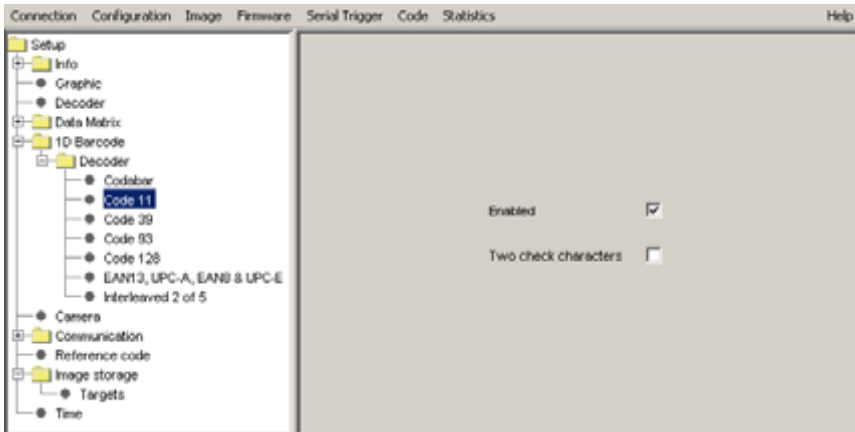
Parameter	Description
Enabled	Enables the decoding of Code 11 bar codes.
Two check characters	The VR 2300 only outputs Code 11 bar codes with two valid check characters.

9.3.13   Code 39 Panel
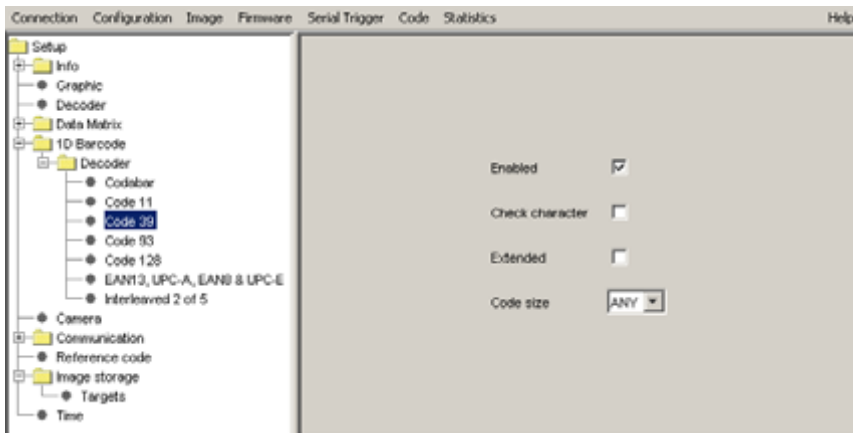
Parameter	Description
Enabled	Enables the decoding of Code 39 bar codes.
Check character	The VR 2300 only outputs Code 39 bar codes with a valid check character.
Extended	Code 39 Extended (full ASCII) is enabled for decoding.
Codesize	Only Code 39 bar codes that contain the specified number of digits are output. Specifying a defined number of digits minimises the probability of an erroneous reading.

9.3.14   Code 93 Panel
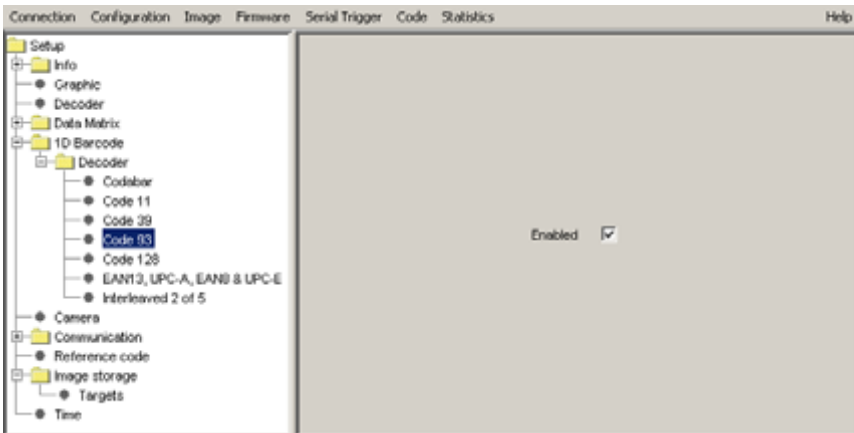
Parameter	Description
Enabled	Enables the decoding of Code 93 bar codes.

9.3.15   Code 128 Panel
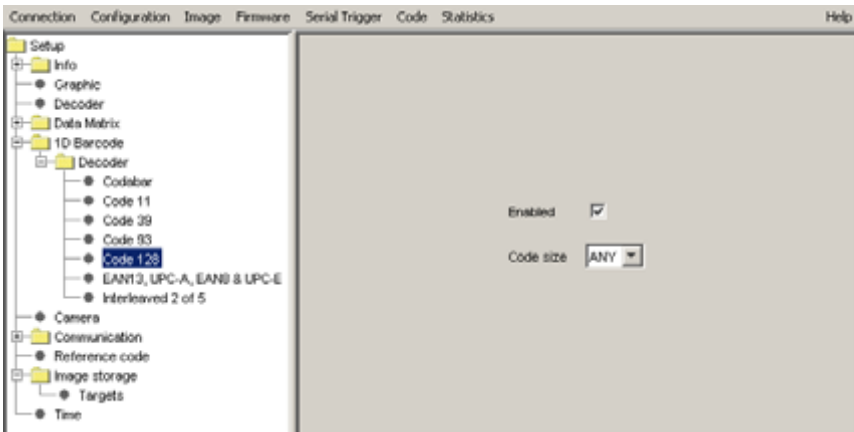
Parameter	Description
Enabled	Enables the decoding of Code 128 bar codes.
Codesize	Only Code 128 bar codes that contain the specified number of digits are output. Specifying a defined number of digits minimises the probability of an erroneous reading.

9.3.16   EAN13, UPC-A, EAN8 & UPC-E

Parameter	Description
Enabled	Enables the decoding of EAN13, UPC-A, EAN8, and UPC-E bar codes.
Supplementals	Defines the treatment of the 2- or 5-digit extension (e.g., price information for magazines): **Ignore** An extension is ignored, **Required** An extension is required, **Required 2 digit** The 2-digit extension is required, **Required 5 digit** The 5-digit extension is required, **Not required** No extension is required. When the extension is issued, it is appended to the bar code data without separator.
Delete leading zero	The leading zeros for UPC-A and UPC-E bar codes are not output.
Bookland	EAN13 codes starting with ISBN number 978 are converted to the corresponding ISBN number.

9.3.17   Interleaved 2 of 5

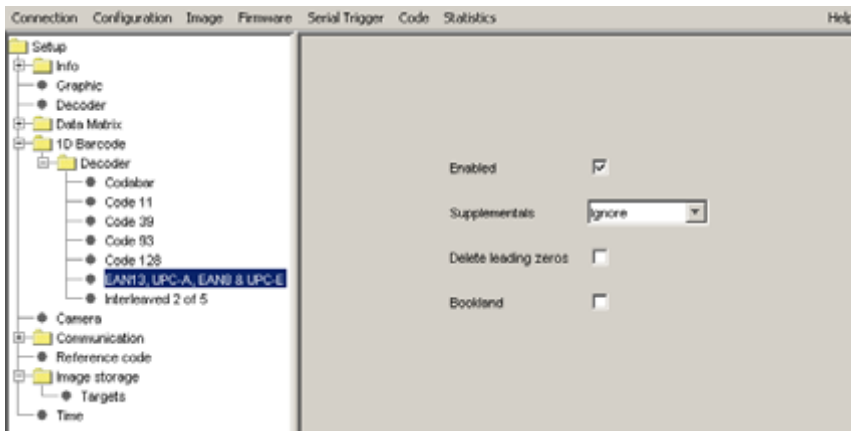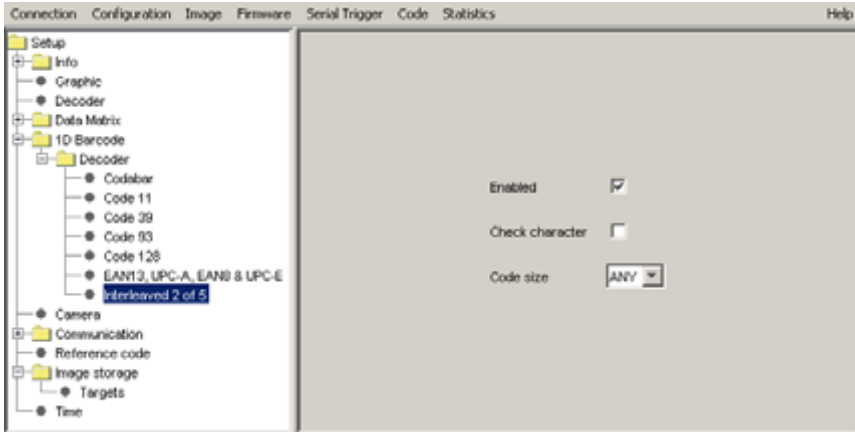| Parameter	Description
Enabled	Enables the decoding of Interleaved 2 of 5 bar codes.
Check character	The VR 2300 only outputs Interleaved 2 of 5 bar codes with a valid check character.
Code size	Only Interleaved 2 of 5 bar codes that contain the specified number of digits are output. Specifying a defined number of digits minimises the probability of an erroneous reading.

9.3.18   Camera Panel

The panel **Camera** is used for setting various camera parameters for adapting to different reading and lighting situations.
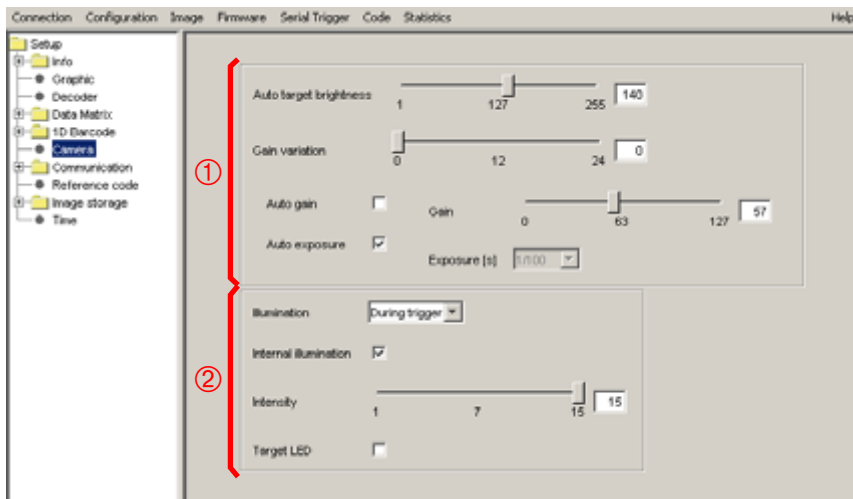
①

Auto target brightness	Influences the automatic functions **Auto gain** and **Auto exposure** such that the mean grey-scale value of the camera image reaches the value set here.
Gain variation	Causes a variation in the brightness amplification. For this purpose, the Gain value in the positive and negative direction is changed by the amount specified here.
Auto gain	Enables an automatic amplification regulation for adapting to the lighting conditions.
Gain	Enables a manual gain control. For this purpose, the checkbox **Auto gain** must not be activated.
Auto exposure	Sets the automatic regulation of the exposure time.
Exposure [s]	Permits the exposure time to be set manually. For this purpose, the checkbox **Auto exposure** must not be activated.

②

Illumination	Describes the illumination control. **Off** turns the illumination off permanently, **On** turns it on permanently. The setting **During trigger** only turns on the illumination during the decoding time.
Internal Illumination	Activates the internal red LED illumination.
Intensity	Determines the illumination intensity of the internal illumination.
Target LED	Allows the target aim LED (5mm LED) to be switched on.

9.3.19 Communication Panel

This panel permits the configuration of the setup interface and of the setup protocol.
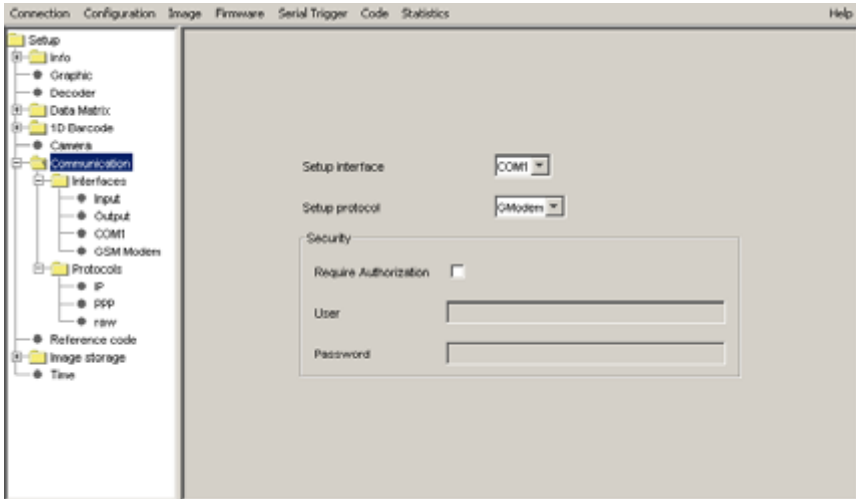
Setup interface   Determines via which interface of the VR 2300 the Setup Tool can be started. The choice includes COM1, COM2 and Ethernet.

○ *Notice!*
For the VR 2300, only the COM1 interface in connection with GModem protocol is suitable as a setup interface.

Setup protocol   Determines the protocol that handles the communication with the Setup Tool.

GModem   Handles the communication via the RS232 protocol without hardware handshake.

SLIP   Transmits IP packets via the serial line using the SLIP protocol.

PPP   Transmits IP packets via the serial line using the PPP protocol.

Require Authorization   By activating this checkbox, the VR 2300 can be protected from unauthorised access by specifying a username (**User**) and password (**Password**).

9.3.20 Communication / Interfaces / Input Panel

This panel permits the adjustment of trigger modes as well as the behaviour of the digital outputs of the VR 2300.
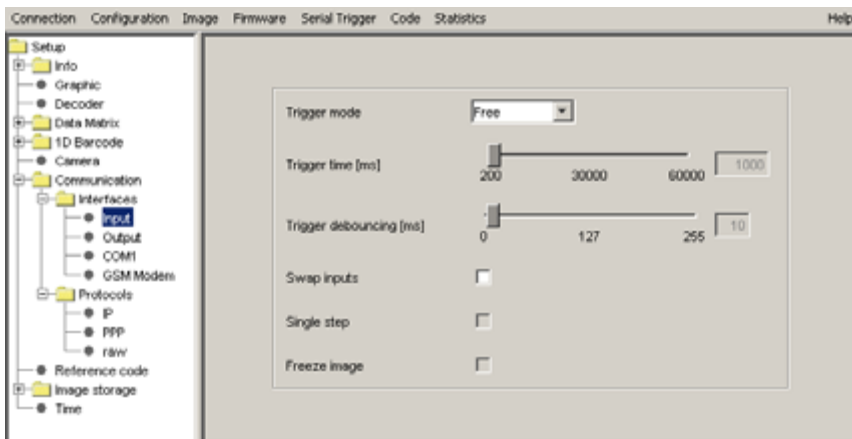
Trigger mode   Defines the read mode. **Free** freely decodes. With this setting, the camera image read will continuously be evaluated for potential code information.
Trigger frame specifies that evaluation of the camera image should only take place during a time window. At the start of the window, the digital outputs (Code read/Code not read) are reset. After a successful read or at the end of the reading window, the result is presented at the respective output.
Time frame decodes up to the time set under **Trigger Time** has expired, beginning with the positive flank of an external trigger signal.
Image stream decodes a sequence of 2 images beginning with the positive edge of an external trigger.

In the case of the three triggered modes, the signal may be supplied either via the digital input or by the software via serial connection.

Trigger time [ms]   Specifies the maximum decoding time in milliseconds. This parameter can only be set if **Time frame** is selected as trigger.

Trigger debouncing [ms] Specifies the debounce time of the digital inputs.

Swap inputs   The function of inputs 1 and 2 is swapped. In the default setting (factory setting), input 1 is the trigger input and input 2 activates the teach-in of the reference code.

Single Step   Carries out one single decoding attempt only for one image (only for trigger frame and time frame).

Freeze Image	Does not load a further image into memory. Instead, it works with the last image that was been supplied by the camera or uploaded to the VR 2300 via image upload.

9.3.21 Communication / Interfaces / Output Panel

To display the **Output** panel, double-click on the **Communication** tab, then on the **Interfaces** tab and then on the respective point in the structure tree.

This panel permits the adjustment of the behaviour of the digital outputs of the VR 2300.
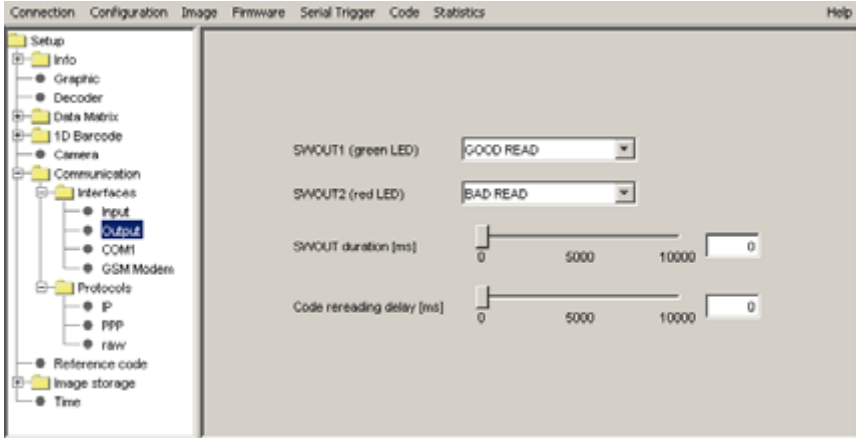
SWOUT1 (green LED)	shows the event upon which the green LED illuminates. Simultaneously, switching output 1 is activated (pin 10).
SWOUT2 (red LED)	shows the event upon which the red LED illuminates. Simultaneously, switching output 2 is activated (pin 6).

Notice!

If both events apply, the LED illuminates in orange.

SWOUT duration [ms]	specifies the time during which the digital outputs make the result available after decoding. In this context, the value 0 means that the outputs are held until the next triggering.
Code rereading delay [ms]	specifies the time in the free-running trigger mode in which a code which is decoded multiple times is not transmitted multiple times.

9.3.22 Communication / Interfaces / COM1 Panel

The **COM1** panel is used to configure the RS-232 interface.

○ *Notice!*

Ⴎ *The VR 2300 only has a single COM interface. As a result, no settings can be changed in the COM2 panel.*
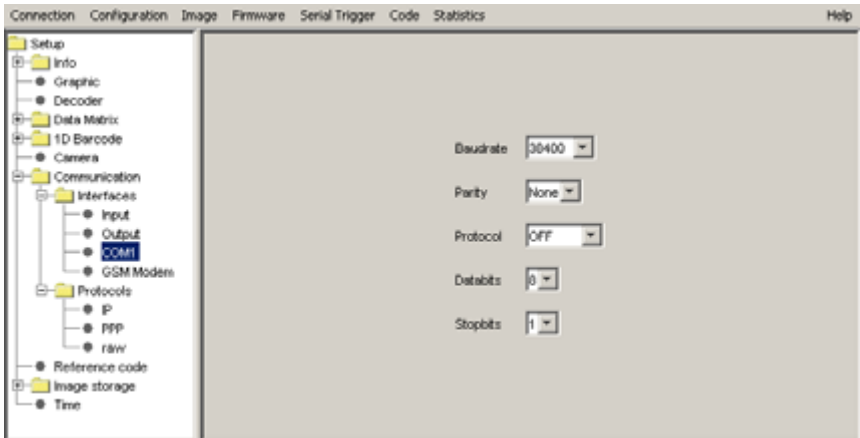
	Baudrate	Determines the transmission rate of the serial interface. The VR 2300 and the host terminal must be set to the same baud rate.

Baudrate   Determines the transmission rate of the serial interface. The VR 2300 and the host terminal must be set to the same baud rate.

Parity   Enables the detection of transmission errors by means of an additionally inserted parity bit. If the parity is **None**, no parity bit is added. The setting **Even** adds an odd parity, the setting **Odd** an even parity.

Protocol   Defines the data exchange between the VR 2300 and the host terminal. Possible settings are no protocol (**Off**) or hardware protocol (**RTS/CTS**).

Databits   Specifies the number of bits that make up the characters that are to be transmitted. You can choose between 7 or 8 bits.

Stopbits   Indicate the end of each character. One or two stop bits may be selected for terminating the data block.

9.3.23 Communication / Interfaces / GSM Modem Panel

The **GSM Modem** panel is used to administer a potentially connected GSM modem (not possible with the VR 2300).

○ *Notice!*

Ⴎ *This functionality is not available for the VR 2300!*

9.3.24　Communication / Protocols / IP Panel

The **IP** panel is used to configure the IP addresses.

○
⫿　*Notice!*
*In order to be able to perform settings in this panel, the protocols **SLIP** or **PPP** must be ac-
tivated in the **Communication** panel (see chapter 9.3.19).*
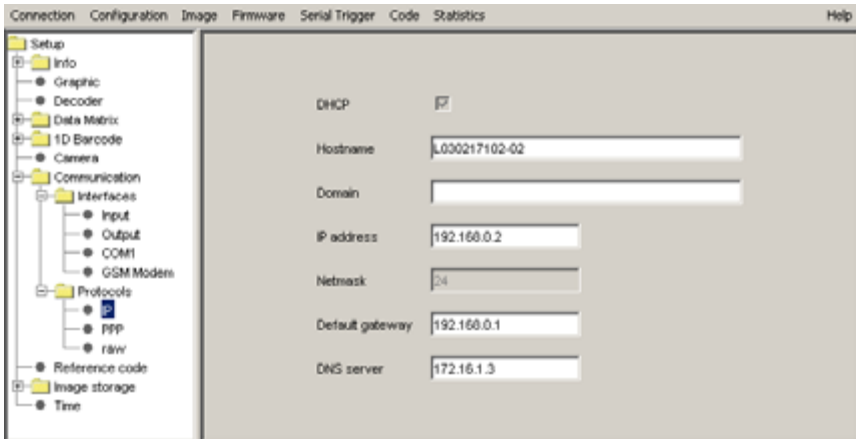
DHCP	Dynamic assignment of the IP address.
Hostname	Name of the VR 2300 in the network.
Domain	Name of the network domain.
IP address and netmask	Describes the IP address and the network mask.
Default Gateway	Describes the IP address of the gateway server.
DNS server	IP address of the DNS server.

9.3.25   Communication / Protocols / PPP Panel

The **PPP** panel is used to register the VR 2300 with a PPP server.

○   *Notice!*

*In order to be able to perform settings in this panel, the protocol **PPP** must be activated in the Communication panel (see chapter 9.3.19).*
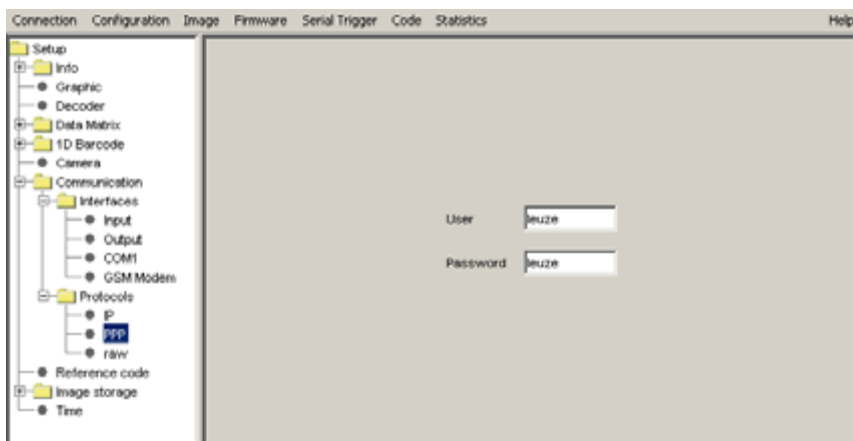
Enter your **Username** and the **Password** to enable the VR 2300 to register with the PPP server.

9.3.26 Communication / Protocols / raw Panel

The **raw** panel is used to define character sequences to control the system via the software.
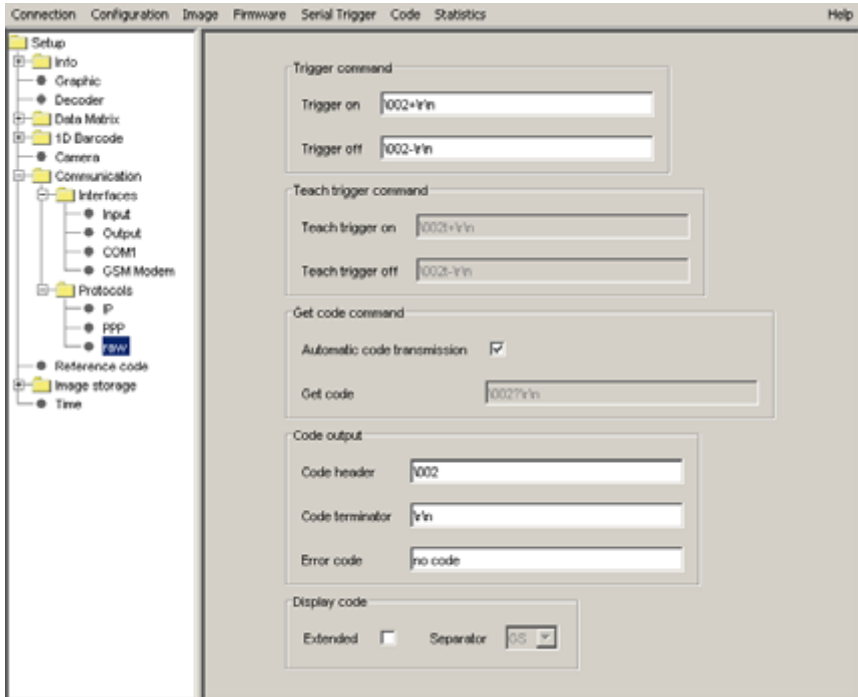
"Trigger on" command	Defines the character string that trips a serial trigger. (see also chapter 9.3.20 on page 47). The string must not be longer than 7 characters and must be framed by header and terminator during transmission.
"Trigger off" command	Defines the character string that terminates a serial trigger. The string must not be longer than 7 characters and must be framed by header and terminator during transmission.
Automatic code transmission	Permits a newly-read code to be output immediately via the interface, without a **"Get code" command** having been sent.
"Get code" command	Defines the character set which requests the output of a read code. The string must not be longer than 7 characters and must be framed by header and terminator during transmission.

Code Header	Allows the selection of seven characters that are output before the actual code content. The characters may be input as ASCII characters, special characters may be entered in three digit octal backslash notation.
Code Terminator	Allows the selection of up to seven characters that are output after the actual code content (and possible additional information). The characters may be input as ASCII characters, special characters may be entered in three digit octal backslash notation. The terminator must contain at least one character.
Error Code	Determines the error string that is output if no code was read after the close of a reading window in the triggered mode (see also chapter 9.3.20 on page 47). The error string may have a maximum of 7 characters.
Extended	Outputs additional information about the code read. The meaning of this information and its format are described in chapter 9.4.1 on page 59.

Notice!

If the AIM verifier functionality (see chapter 9.3.8) and the checkbox Extended are activated, the quality grades of the individual measurement parameters are also output.

Separator	Allows the selection of a defined separation character between code and additional information.

9.3.27 Reference Code Panel

The **Reference Code** panel is used to define a reference code which is compared to the decoded code.

Use reference code	Activates/deactivates reference code comparison.
Code content	Code content of the reference codes.
Match mode	Type of comparison between decoded and reference code:

	Exact match	The decoded code content must exactly match the reference code content.
	Prefix	The start of the decoded code content must match the reference code content.
	Postfix	The end of the decoded code content must match the reference code content.

9.3.28   Image Storage Panel

The **Image Storage** panel is used to configure the error image storage of the VR 2300.
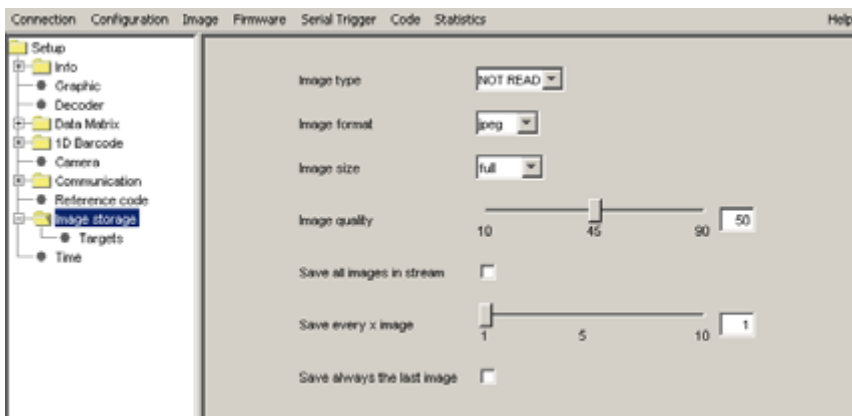
The error image storage holds up to 10 images in the device's RAM.

Notice!

*The error image storage can only be used in trigger mode **Trigger frame** or **Time Frame**!*

Image type	Defines the type of the error image:	
	NOT READ	Stores only images in which no code could be decoded.
	READ	Stores only images in which a code could be decoded.
	ALL	All images are stored.
Image format	Defines the image format. The formats supported are **bitmap** and **jpeg**.	
Image size	Specifies the desired size of the image to be stored. Up to 800 x 600 pixels (**full**) are available. In order to accelerate the image transfer, the image size can be reduced by the factors specified here.	
Image quality	The image quality can be set here, if **jpeg** is selected. A higher value increases image quality and the amount of data to be transmitted.	
Save all images in stream	All images of the data stream since triggering are stored in one image on top of each other.	
Save every x image	Every xth image of the data stream since triggering is stored.	
Save always the last image	The last image is always stored.	

9.3.29　Image Storage / Targets Panel

The panel **Targets** is used to define the location of the error image storage of the VR 2300.
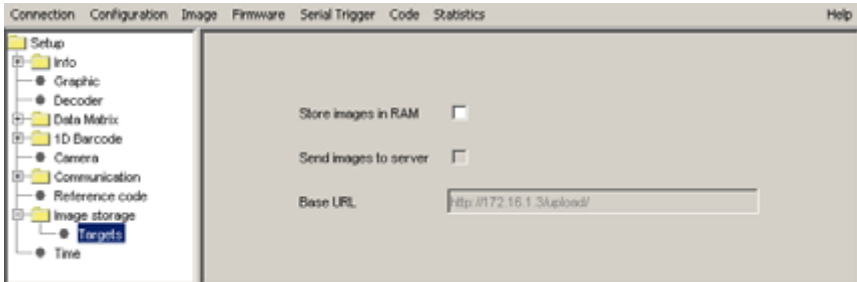
Store images in RAM	The error images are stored in the RAM of the VR 2300.

○
⨼ *Notice!*
*The checkbox **Store images in RAM** must be activated for the error image memory to function.*
*The options **Send images to server** and **Base URL** are not available for the VR 2300.*

Transmission of images from the error image storage to the PC

Clicking the menu item **Statistics -> Display Image Storage**, opens the **Image Storage** window (error image storage):

In this window, you can select individual images from the error image memory. By clicking on the file name, e.g.,**1.jpg**, the selected image is opened in a separate window.

Using the menu item **Image -> Save…** in the Setup Tool, you can then save the image on the PC under an arbitrary name.

9.3.30 Time Panel

The panel **Time** is used to set the time of the VR 2300's internal clock.
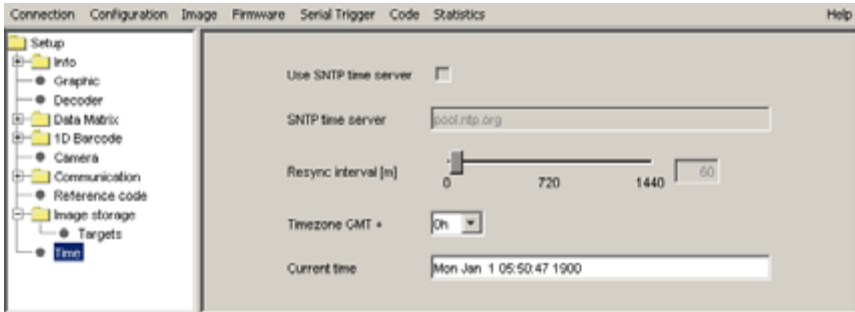
| **Timezone GMT +** | defines the time zone with respect to Greenwich Mean Time. |
| **Current time** | Time and date to be set in the format: **day_of_the_week month day hour:minute:second year**. |

Notice!

The blurred options **Use SNTP time server** *,* **SNTP time server**, *and* **Resync interval [m]** *are not available for the VR 2300.*

9.4   Functionality check and faultfinding

9.4.1   Code Output

To open the **Code Output** window, click on the menu item **Code->Output** in the menu bar of the Setup Tool.

A window opens. It displays the code content and additional information (only if checkbox **Extended** is ticked, see chapter 9.3.26) read.
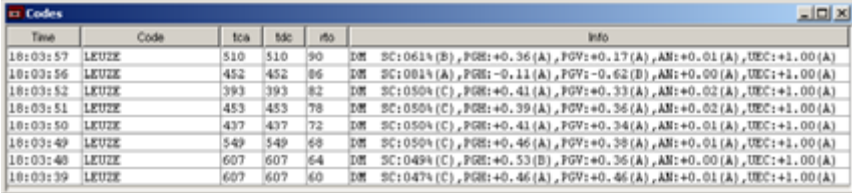
In the extended information, statistical data regarding the read code are output. All times are in milliseconds.

Parameter	Description
Time	PC system time
Code	Data contents of the code
tca	Calculation time: net processing time for evaluation of the current image
tdc	Decoding time: total time from trigger start until a code is read or the trigger is stopped
rto	Outputs the reading rate. In free running mode: number of codes read within the last 1000 images. In trigger mode: number of codes read correctly.
Info	Output of the code type: **DM** Data Matrix Code **BC** Bar Code

Output of additional information with activated AIM verifier

If the AIM verifier functionality (see chapter 9.3.8 and chapter 9.3.9) for Data Matrix Codes and the checkbox **Extended** (see chapter 9.3.26) are activated, the quality grades of the individual measurement parameters are output as well in the **Info** column.

Time	Code	tca	tdc	rfo	Info
18:03:57	LEUZE	510	510	90	DM	SC:061%(B),PGH:+0.36(A),PGV:+0.17(A),AN:+0.01(A),UEC:+1.00(A)
18:03:56	LEUZE	452	452	86	DM	SC:081%(A),PGH:-0.11(A),PGV:-0.62(B),AN:+0.00(A),UEC:+1.00(A)
18:03:52	LEUZE	393	393	82	DM	SC:050%(C),PGH:+0.41(A),PGV:+0.33(A),AN:+0.02(A),UEC:+1.00(A)
18:03:51	LEUZE	453	453	78	DM	SC:050%(C),PGH:+0.39(A),PGV:+0.36(A),AN:+0.02(A),UEC:+1.00(A)
18:03:50	LEUZE	437	437	72	DM	SC:050%(C),PGH:+0.41(A),PGV:+0.34(A),AN:+0.01(A),UEC:+1.00(A)
18:03:49	LEUZE	549	549	68	DM	SC:050%(C),PGH:+0.46(A),PGV:+0.38(A),AN:+0.01(A),UEC:+1.00(A)
18:03:48	LEUZE	607	607	64	DM	SC:049%(C),PGH:+0.53(B),PGV:+0.36(A),AN:+0.00(A),UEC:+1.00(A)
18:03:39	LEUZE	607	607	60	DM	SC:047%(C),PGH:+0.46(A),PGV:+0.46(A),AN:+0.01(A),UEC:+1.00(A)

Meaning of the AIM measurement parameters (ISO/IEC 16022)

SC - Symbol Contrast

To determine the symbol contrast, all pixels of the code symbol, including a quiet zone of the size of one cell are used. Subsequently, the arithmetic mean of the 10% darkest and 10% lightest pixels is determined. The distance of the two resulting grey values yields the value for **Symbol Contrast**, with the output in percent being normalised to the maximal distance of 255 (8 bit greyscale cameras capture 256 shades of grey). The arithmetic mean of the two resulting grey values is used as the threshold for the measurement described in the section on **Print Growth**.

PGH, PGV - Print Growth

This quality parameter reflects the degree of fill cover of the code's individual light and dark modules within their virtual module limits. A distinction is made between **horizontal** (**PGH**) and a **vertical** (**PGV**) degree of fill. This measurement uses the pair of raster lines associated with the code frame, since these are the only symbol areas in which dark and light modules are definitely alternatingly arranged. The raster line is cut in the middle and its grey values are assigned to the foreground or background depending on whether a value lies above or below the threshold (see section **Symbol Contrast**). Subsequently, the ratio between the pixels in the foreground colour and the total number of pixels on the line is calculated. The deviation from the ideal value 50% measures the degree of fill. **Print Growth** is standardised so that a marking percentage of 35% (which corresponds to a deviation of -30% from the ideal value) results in -100%, and a marking percentage of 65% (equals a deviation of +30% from the ideal value) results in +100%. To achieve a higher stability and process security compared to the specification, three parallel lines are read and a majority decision of the binary state (foreground or background) is computed for every measurement point.

AN - Axial Nonuniformity

This parameter is a measure of the distortion of the two main axes (horizontal and vertical) of the code symbol. For this purpose, the median value of the distances of all neighbouring module centres in horizontal and vertical direction is calculated. The absolute difference between these two values in relation to the total mean is the value of **Axial Nonuniformity** in percent. If the code is affixed to a flat surface and optical distortions are disregarded, the code's asymmetry may be calculated via the code's four corner points.

UEC - Unused Error Correction

The ECC200 version of Data Matrix uses Reed Solomon error correction. Depending on the symbol size, a fixed number of code words are reserved for error correction. The number of errors that can be corrected is always half the number of existing code words.

Symbol size	8x18	8x32	12x26	12x36	16x36	16x48
Corrected bytes	3	5	7	9	12	14

Symbol size	10x10	12x12	14x14	16x16	18x18	20x20	22x22	24x24	26x26
Corrected bytes	2	3	5	6	7	9	10	12	14

Symbol size	32x32	36x36	40x40	44x44	48x48	52x52	64x64	72x72
Corrected bytes	18	21	24	28	34	42	56	72

The value **Unused Error Correction** returns the amount of error correction that was not required. It is a measure for the currently available safety margin ensured by the error correction.

Format of the serial output

The code may be prepended with a **Code header**, if one is selected. After the code content (or the **Error code**), the configurable **Separator** is sent, followed by the additional information (**Extended** activated) if switched on, with "field name=value", each separated by a space. The number of characters for a value is as follows:

- **tca** and **tdc** consist of 5 characters each
- **rto** consists of 4 characters

The digits are left-aligned. If the value does not use the entire width, the remaining length is padded with space characters.

If the AIM verifier is switched on, the **Separator** is sent again after the additional information described above. This is followed by the verification values, each separated by a comma (,). The format of the parameters is as follows:

- **SC** is a three digit percentage value with the character "%".
- **PGH**, **PGV**, **AN**, and **UEC** are signed numbers with two decimal places.

The point (.) is used as the decimal marker.

The result (A, B, C, D, or F) in brackets is appended to all verification values. The string ends with the **Code terminator**, if selected.

9.4.2　Debug Graphics

If Debug Output is enabled (see chapter 9.3.4 on page 33), the Snapshot function (see chapter 9.2.1, description of the menu items on page 28) opens a window, whose right side shows an individual image from the camera. This image can be augmented with additional graphical information. This display may be controlled via the tree structure on the left side of the window by enabling the display of the individual functions via the checkboxes.

Vertical lines	All vertical edges that can be combined into a line are entered into the image as a solid blue line.
Horizontal lines	All horizontal edges that can be combined into a line are entered into the image as a solid blue line.
Best line candidates	All line pairs that could correspond to the "L"-shaped peripheral of a Data Matrix Code, are marked with two solid yellow lines.
Code candidate	Using validity checks, some of these line pairs are discarded. The remaining line pairs become code candidates that are investigated in more detail.
Best lines	The "L"-shaped peripheral of the code candidate is marked with two solid red lines.
Code frame	The area spanned by the **Best lines** is marked with green lines.
Data bits	If a potential Data Matrix Code is found, the code cells that were scanned via a two-dimensional grid are marked in colour. Dark cells are marked in bright blue and light cells are marked in purple.
Error cells	If a Data Matrix Code is read, all corrected bit positions are marked with a red circle.

Code contents   If a Data Matrix Code is read, the code content is written into the image with red colour at the L-peripheral.

Within the image itself, the right mouse button can be used to specify the zoom factor of the image. The bottom line displays the current mouse position, the grey value at this position, and the current zoom factor.

9.5   Serial low-level communication protocol without Setup Tool

You can also communicate with the VR 2300 outside the Setup Tool. The protocol used in this case is adapted to the standard protocol of Leuze's bar code readers. The protocol is described below.

In order to transmit commands to the VR 2300, the **Automatic code transmission** should be deactivated (see chapter 9.3.26) and no code reading or transmission of code information should take place. All commands are transmitted as simple ASCII characters. In this context, the frame format of the commands stored in the VR 2300 plays an important role. (Factory setting is STX .... CR LF).

Commands

Description of the command structure:

PT < bcc-type >< parameter >:< value > [BCC]	Send parameter
PR < bcc-type >< parameter > [BCC]	Request parameter
PS < status >	Parameter status as answer to PT
PC < mode >	Copy parameter
{Trigger on}	Activate decoding (configurable)
{Trigger off}	Deactivate decoding (configurable)
{get code}	Send the code that was read, if available (configurable)

All values are read from or written to the current parameter set (RAM) in the VR 2300. If necessary, they have to be stored in the EEPROM using the command **PCxx**.

Notice!

*The parameter **< PS-Type >** (communication with a BCL 3x) is not used on the VR 2300!*

< bcc- type >

0   no check sum is used.

1   the last byte of the transmission is the XOR check sum of this command, starting after
     < bcc- type >

< status >

0   no error

1   invalid command

2   incorrect length of the command **PC**

3   incorrect **< bcc- type >**

4   incorrect check sum

6   invalid parameter

8   invalid **< parameter >** or **< value >**

< parameter >

A valid name of a parameter of the device. The parameters may vary, depending on the
device type, configuration, and firmware version. You can see the available parameters in
the tree structure of the device when you query the device with the Setup Tool.

Example: **…/Communication/Interfaces/Input/Trigger mode…**

○   *Notice!*
    Please adhere strictly to the correct syntax and use of upper and lower case!

< value >

The new value for the parameter specified.

< mode >

03   load parameter from EEPROM.

20   reset parameter to factory setting and store it in the EEPROM.

30   write the current settings to the EEPROM
     (corresponds to the function **Apply** of the Setup Tool).

Configurable commands

The commands for the functions **Trigger on/off** and **Get code** may be configured using the
Setup Tool or PT commands (see chapter 9.3.26).

Factory setting: **{Trigger on}** =   "**+**"
                     {Trigger off} =   "**-**"
                     {get code} =   "**?**"

The trigger is automatically deactivated after a code has been read.

Command examples

Notice!

The following examples do not show the frame format even though its use is essential!

Example 1: Switching off the decoder for bar codes

HOST:　　　PT0/Decoder/1D Barcode:false

VR 2300:　PS0

Example 2: Changing the command {get code}

HOST:　　　PT0/Communication/Protocols/raw/Get Code Command:GET

VR 2300:　PS0

Example 3: Setting a non-existent parameter

HOST:　　　PT0/Decoder/foo:7

VR 2300:　PS8

Example 4: Transmitting the value of the Data Matrix Code finder strategy parameter

HOST:　　　PR0/Data Matrix/Decoder/Code finder strategy

VR 2300:　PT0/Data Matrix/Decoder/Code finder strategy:1

10   Maintenance

10.1   General Maintenance Information

Usually, the code reader VR 2300 does not require any maintenance by the operator.

Cleaning
Should it become soiled, clean the glass window of the VR 2300 with a soft cloth.

Notice!
Do not use aggressive cleaning agents such as thinner or acetone for cleaning the device.

10.2   Repairs, Servicing

Repairs to the device must only be carried out by the manufacturer.

♦ *Contact your Leuze distributor or service organisation should repairs be required.*
For addresses, please refer to the back page of this operating manual.

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