ifm electronic

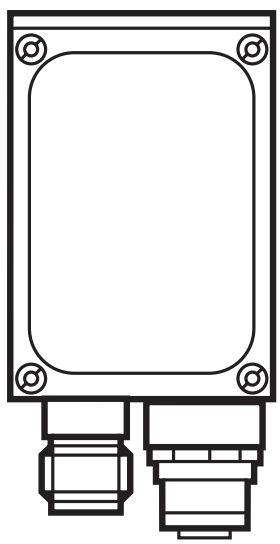
CE

Installation Guide

efector190®

UK

O2Ixxx



706372 / 01 10 / 2015

Contents

1 Preliminary note 4
1.1 Symbols used 4
1.2 Warning signs used 4
2 Safety instructions 4
3 System requirements 5
3.1 PC hardware 5
3.2 PC software 5
4 Items supplied 5
5 Accessories 6
5.1 Required accessories 6
5.2 Optional accessories 6
6 Electrical connection 6
7 Operating and display elements 8
7.1 View of the unit 8
7.2 LEDs 8
7.3 Pushbuttons 9
7.4 Display 9
7.4.1 Operating indicators 9
7.4.2 Connection via the operating program 10
7.4.3 Error messages 10
8 Software 10
8.1 Start program without installation 10
8.2 Download and start program 11
8.3 Connection setting 11
8.3.1 Network setting 11
8.3.2 Factory setting multicode reader 12
8.4 Program start 13
8.5 Basics on the user interface 14
8.6 Connect device to the operating program 15
9 Configuration mode 16
9.1 Functions 16
9.2 Activate configuration mode 17
9.3 Adapt global device settings 19
9.4 Create a new configuration 22
10 Configuration steps 24
10.1 Image quality 24
10.2 Trigger configuration 25
10.3 Example of an external trigger circuit 26
10.4 Define code 27
10.4.1 Code examples 28

10.4.2 Standard recognition and extended recognition 28
10.5 Process interface 30
10.6 Overall function test 32
11 Disconnect sensor 33

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Open source software

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For copyright information and licensing terms please refer to: www.ifm.com/int/GNU

For software subject to the GNU General Public License or the GNU Lesser General Public License the source code can be requested against payment of the copying and shipping costs.

1 Preliminary note

This document serves for the fast set-up of an O2Ixxx multicode reader from the company ifm syntron gmbh.

1.1 Symbols used

► Instruction
> Reaction, result
[…] Designation of keys, buttons or indications
→ Cross-reference

Important note
Non-compliance can result in malfunction or interference.

Information
Supplementary note

1.2 Warning signs used

⚠ WARNING
Warning of serious personal injury.
Death or serious irreversible injuries may result.

⚠ CAUTION
Warning of personal injury.
Slight reversible injuries may result.

NOTE
Warning of damage to property.

2 Safety instructions

Please read the operating instructions "Multicode Reader O2Ixxx" and the software manual "PC operating program for dualis Multicode Reader O2Ixxx" prior to set-up of the multicode reader.

www.ifm.com → New search → e.g. O2I102 → Operating instructions

Ensure that the multicode reader is suitable for your application without any restrictions.

Observe the operating instructions.

Non-observance of the instructions, operation which is not in accordance with use as prescribed below, wrong installation or incorrect handling can affect the safety of operators and machinery.

The installation and connection must comply with the applicable national and international standards. Responsibility lies with the person installing the multicode reader.

Only the signals indicated in the technical data or on the device label may be supplied to the connections or wires.

⚠ WARNING

Visible laser light; laser protection class 2.

Use of controls or adjustments other than those specified herein may result in hazardous radiation exposure. Damage to the retina is possible.

- ► Do not stare into the laser beam!
- ► Apply the enclosed labels (laser warning) in the immediate vicinity of the multicode reader.
- ► Adhere to the caution and warning notes on the product label.
- ► Use the enclosed label for the power supply cable.

3 System requirements

3.1 PC hardware

- – PC with Pentium III processor or higher, clock frequency min. 500 MHz
- – min. 128 MB RAM
- – min. 35 MB freely available hard disc memory
- – CD-ROM drive
- – XGA compatible graphic card with min. 1024 x 768 pixel resolution
- – Ethernet network card for 10Base-T/100Base-TX, TCP/IP protocol

3.2 PC software

- – Operating system Microsoft Windows 2000, XP, Vista or Windows 7.

4 Items supplied

1 multicode reader O2Ixxx, screwdriver to set the focus, installation instructions. The multicode reader is supplied without installation/connection accessories and software.

5 Accessories

5.1 Required accessories

– Crossover cable for parameter setting connection (Ethernet), M12 connector/ RJ45 connector, 4 poles, 2 m, e.g. E11898.

– Connection cable for supply voltage and process connection, M12 socket, 8 poles, 2 m, e.g. E11231.

5.2 Optional accessories

– Modular mounting systems

– Illumination unit

– Protective pane

– Diffuser

www.ifm.com → New search → e.g. O2I102 → Accessories

6 Electrical connection

NOTE

The unit must be connected by a qualified electrician.

► Disconnect power before connecting the unit.

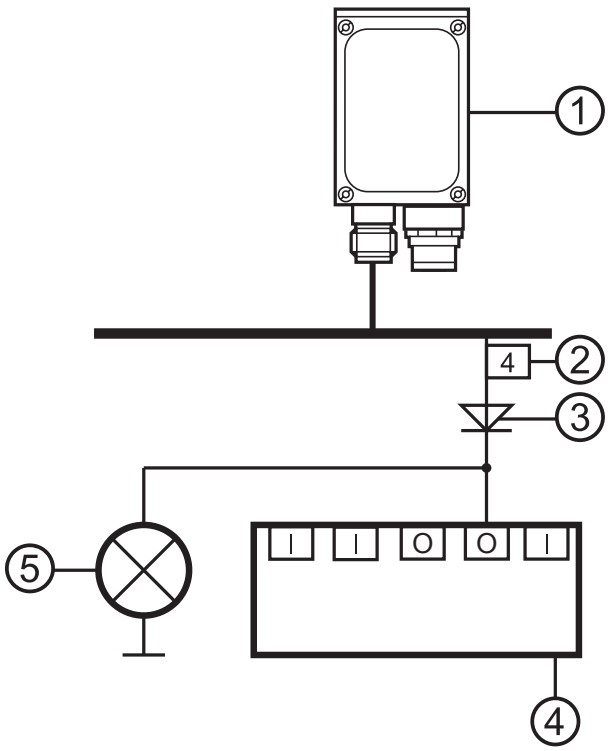
NOTE

The voltage on pins 2, 4, 5, 6, 7 and 8 must not exceed the supply voltage on pin 1 (U+).

► Use the same power supply and protective equipment for

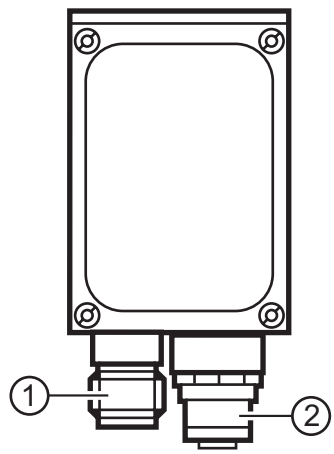
- the device (e.g. O2Dxxx),
- the signal generator at the inputs (e.g. trigger switch, plc),
- the signal pick-up at the outputs (e.g. plc).

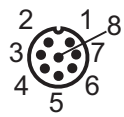
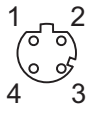
As an alternative, a diode at the switching outputs can prevent feedback (see fig. below).



1 unit
2 switching output
3 diode
4 plc
5 common load

- Connect the parameter setting/process interface of the device via the crossover cable with the Ethernet interface of the PC.
- Supply the process interface of the device via an M12 socket.

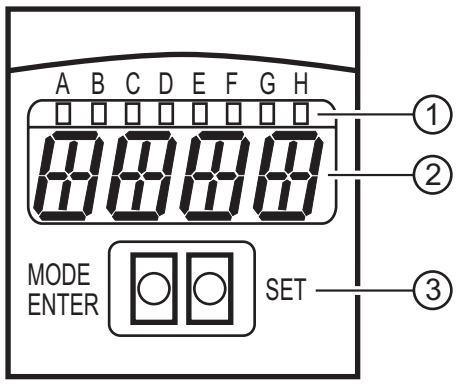


(1) Process interface	
M12 connector, A-coded, 8 poles	
	1 U+ 2 Trigger input, positive switching 3 0 V 4 Trigger output/switching output 1, positive switching (code evaluation) 5 RxD RS-232 6 TxD RS-232 7 Switching output 2 (ready), positive switching 8 GND RS-232 (electrically isolated up to 50 V)
(2) Parameter setting / process interface	
M12 socket, D-coded, 4 poles	
	1 Ethernet TxD + 2 Ethernet RxD + 3 Ethernet TxD - 4 Ethernet RxD -

For information about available sockets and connectors see
www.ifm.com → Product line → Connection technology

7 Operating and display elements

7.1 View of the unit



(1) LEDs (function display)

(2) Display (operation indication/dialogue/parameters)

(3) Pushbuttons (parameter setting)

7.2 LEDs

LED	Name	Colour	Status	Meaning
A	Power	Green	On	Supply voltage applied Device ready for operation
			Flashing (2 Hz)	No configuration saved in the device (factory setting)
			Flashing (20 Hz)	Device fault
B	Eth	Green	On	Ethernet connection exists
			Flashing	Ethernet signal
C	Con	Green	On	Connected with PC operating program
D	–	–	–	Not used
E	TxD	Yellow	Off / flashing	RS-232 TxD status
F	RxD	Yellow	Off / flashing	RS-232 RxD status
G	1	Yellow	On	Switching output 1 switched Code evaluation successful
			Flashing (20 Hz)	Short circuit switching output 1
H	2	Yellow	On	Switching output 2 switched (ready signal) Device ready for next trigger signal
			Flashing (20 Hz)	Short circuit switching output 2

7.3 Pushbuttons

Pushbutton	Function
MODE/ENTER	Change to the parameter setting mode Select the parameters Confirm the parameter values
SET	Select the subparameters Set/change/select the parameter values - incremental by pressing briefly - scrolling by holding pressed

7.4 Display

7.4.1 Operating indicators

Display	Meaning
ui05	Version number of the IO controller software (1st indication after power-on)
Init	Device initialisation (2nd indication after power on)
nnnn	Firmware version (3rd indication after power on)
rEdY	Device ready for trigger (4th indication after power on if a configuration is active with external triggering. Device waiting for triggering.)
WAIT	No active/valid configuration available Device is busy (4th indication after power on if no configuration is active or valid = on delivery)
nr28	Configuration number after successful code evaluation
SCAn	Indication with internal triggering as long as no code has been found
run	Device is waiting for the connection, no active configuration or group
LOAd	Loading a new configuration
donE	Loading a new configuration terminated (indication 1 s)
uLoc	Pushbuttons unlocked Parameter values can be displayed and changed
Lok1	Pushbuttons locked Parameter values cannot be displayed and changed
Lok2	Pushbuttons locked Parameter values can be displayed but not changed
FWUP	Firmware update running

7.4.2 Connection via the operating program

Display	Meaning
OnLI	Configuration mode
Parm	Create or modify a configuration
Moni	Monitor mode
SerP	Service mode

7.4.3 Error messages

Display	Meaning
FAIL	Last code evaluation not successful
ErrT	Temperature of the device too high or too low
ErrD	Fatal device error
SC	Short circuit of a switching output
DHCP noIP	No DHCP server found. Both character strings are displayed alternately.

Parameter designations → 8.2.2 Parameter structure

8 Software

The program E2D200 can be ordered as a CD/DVD or downloaded at:
www.ifm.com → Service → Download → Identification systems → O2I1xx
Note the hints in the download area concerning the current versions.

The PC operating program can be started directly from the CD or can be installed on the PC.

8.1 Start program without installation

► Insert the CD in the drive.

> The start menu opens.

► Select the menu item "Start efector dualis".

> The program starts.

If the autostart function for CD drives is deactivated and the start menu does not open automatically:

► Start the "O2IStart.exe" file in the main directory of the CD with a double click.

> The start menu opens.

► Select the menu item "Start efector dualis".

> The program starts.

8.2 Download and start program

► Download the "Operating Software" E2I200 1.3 at:
https://www.ifm.com/ifmgb/web/idsys-download.htm

► Extract the file E2I200_ V1_3.zip.

► Open the extracted folder.

► Execute "Dualis Multicode.exe".

> The program starts.

8.3 Connection setting

The IP address ranges of the sensor and the PC must match.

8.3.1 Network setting

	IP address range (network)	Factory setting (host)
Multicode reader O2I1xx	192.168.0	79
	=	≠
PC	192.168.0	xx

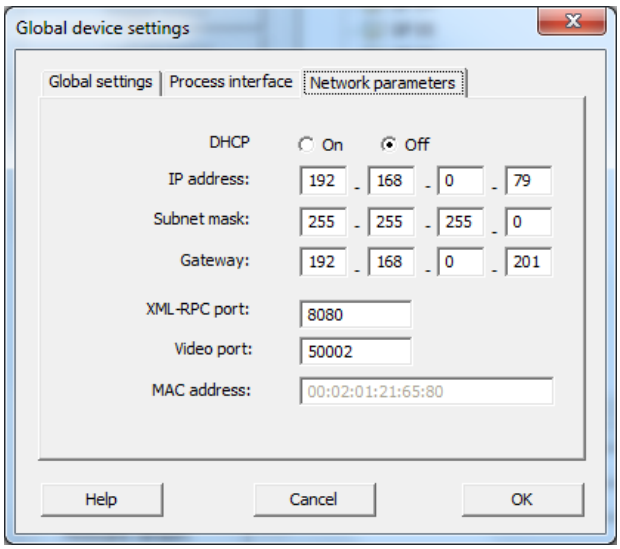
Example:

IP setting multicode reader: 192.168.0.**79**

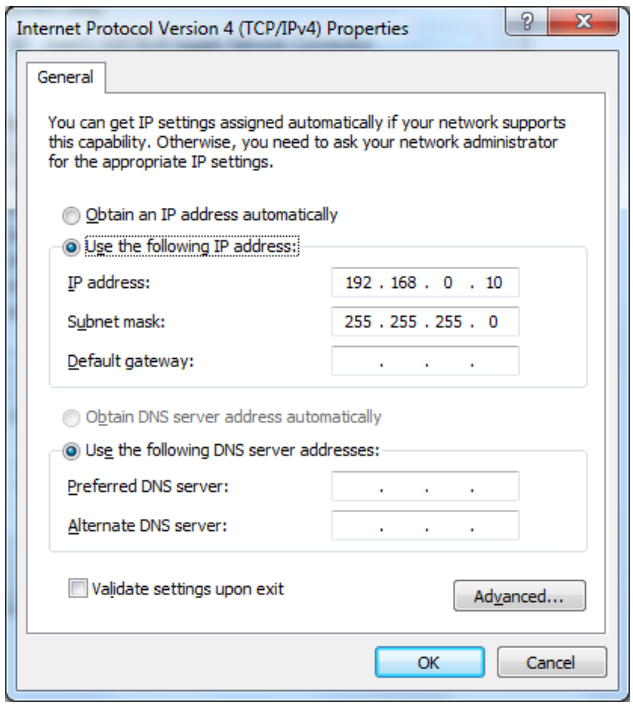
IP setting PC: 192.168.0.**2**

8.3.2 Factory setting multicode reader

Multicode reader O2I1xx parameters	Description	Factory setting
DHCP	Dynamic Host Configuration Protocol	Off
IP	IP address	192.168.0.79
nETm	Subnet mask	255.255.255.0
GWIP	Gateway address	192.168.0.201



O2Ixxx



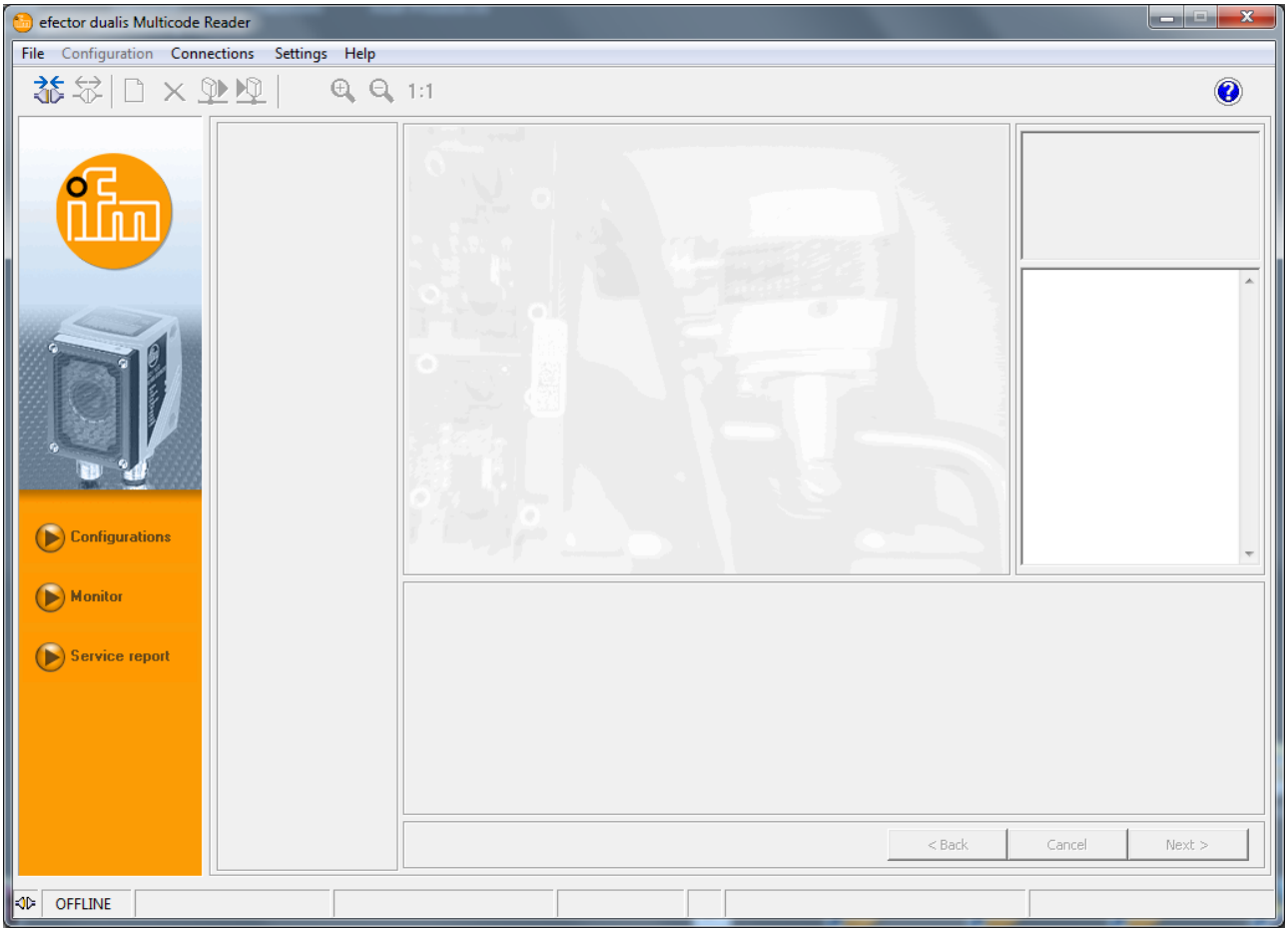
PC

8.4 Program start

► Start the PC operating program

> For approx. 5 s article no., program designation and version no. are displayed.

When the program is started for the first time and the device is as supplied (no configuration saved), the neutral user interface will be displayed.



Status	OFFLINE
Mode	No button activated
Monitor window	Blank
Result window	Blank

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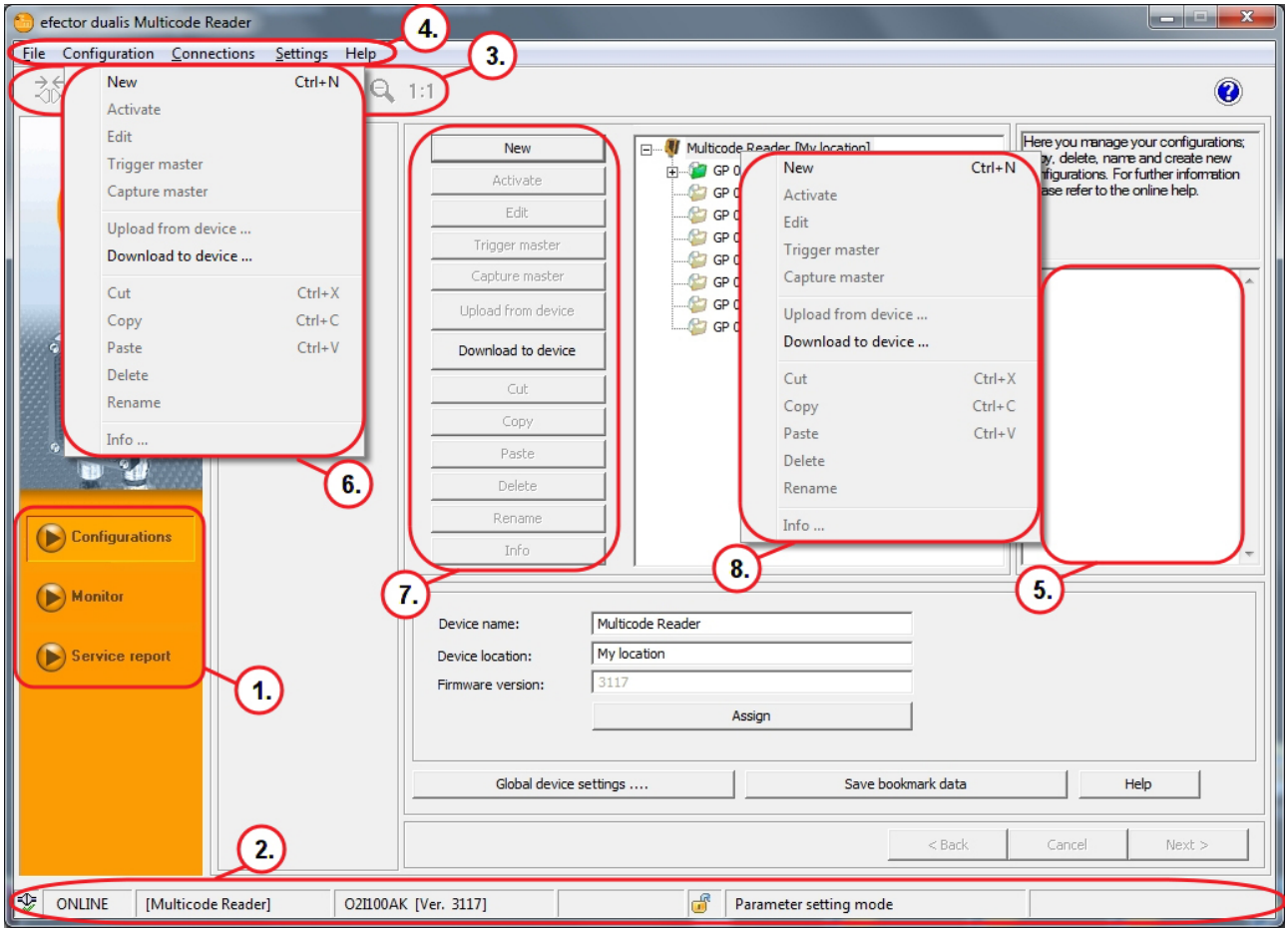
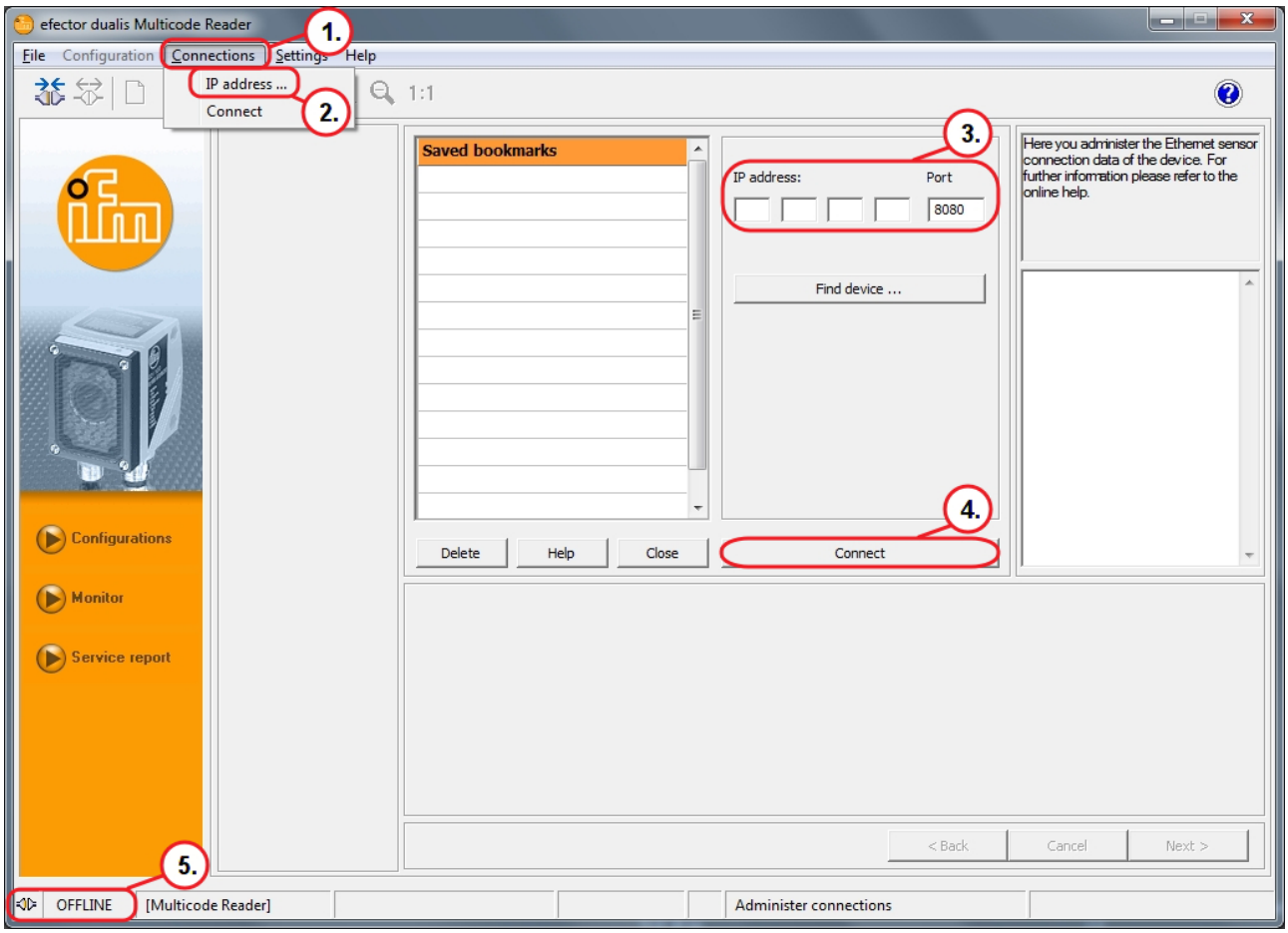
8.5 Basics on the user interface



Pos.	Operating element	Contents
(1.)	Mode	• Configurations Create, manage or group configurations. The reading/verification mode is stopped. • Monitor The device runs independently with the saved and activated configuration. The reading/verification mode can be observed. • Service report Results, statistics and detected images can be displayed and saved. The reading/verification mode is stopped.
(2.)	Status bar	• Network status of the device (OFFLINE/ONLINE) • Device name • Article number/production status/firmware of the connected device • Program status (current program function)
(3.)	Toolbar	• Buttons e.g. "connect" or "disconnect" • Commands which are not available are shown in grey.
(4.)	Menu bar	• Pull-down menus with program functions.
(5.)	Result field	• Reading/verification result • Evaluation of the code quality

Pos.	Operating element	Contents
(6.) (7.) (8.)	Selection variants	• Commands can be selected in different ways (depending on the program function). (6.) = selection via the pull-down menu in the menu bar (7.) = selection via button (8.) = selection via the context menu (right mouse button).

8.6 Connect device to the operating program



► Click on [Connections] (1.).

► Select [IP address) (2.).

► Enter the IP address of the device in the input mask (3.).

► Assign preset port number "8080".

If a firewall is active on the PC, the ports 8080 and 50002 must be enabled for image transmission.

► Click on [Connect] (4.).

> The status changes from "OFFLINE" to "ONLINE" (5.).

Once the sensor is connected, 2 cases are possible:

- No configuration file saved on the device (= as supplied).The user interface starts in the configuration mode.
  - The [Configurations] button is activated.
  - Configurations can be created and managed (→ 9.2).
  - Global device settings are possible (→ 9.3).
- At least one configuration file is saved on the device. The user interface starts in the Monitor mode.
  - The [Monitor] button is activated.
  - Configurations can only be created and managed after the change to the configuration mode by clicking on [Configurations].

9 Configuration mode

9.1 Functions

The device can store up to 32 configuration files (= parameter sets).
A configuration file contains all application-relevant parameters to execute the reading/verification mode independently.

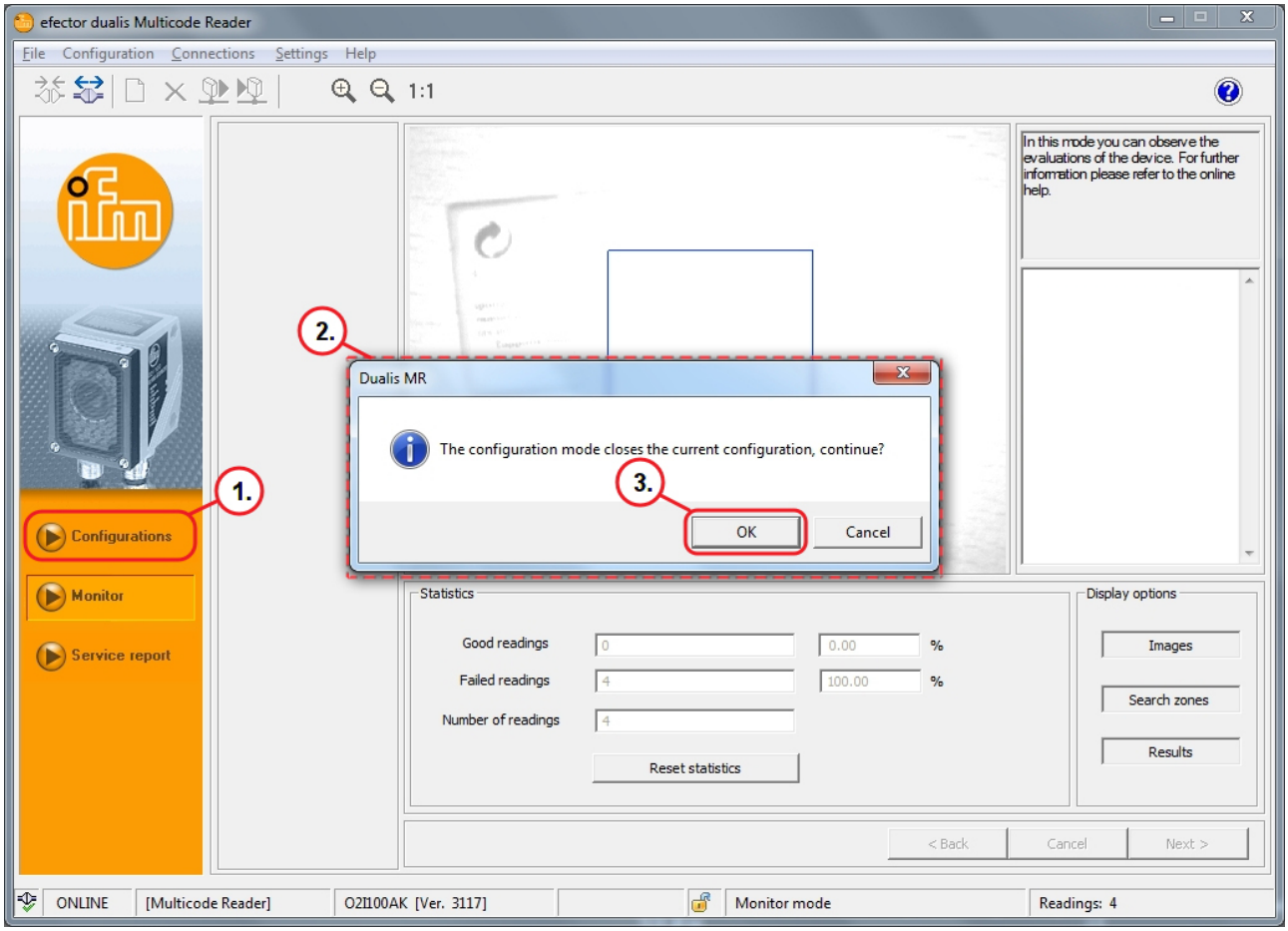
When creating a configuration the user is guided via a navigation.

The following settings are polled and defined step by step:

1. Image quality (internal/external illumination, exposure time, parameters for image quality, trigger configuration etc.).
2. Code definitions and code recognition criteria.
3. Information about the process data (difference reading/verification mode, character strings etc.).
4. Final function test with the defined specifications.

After a step has been completely set click on [Next] to go the next step.

9.2 Activate configuration mode

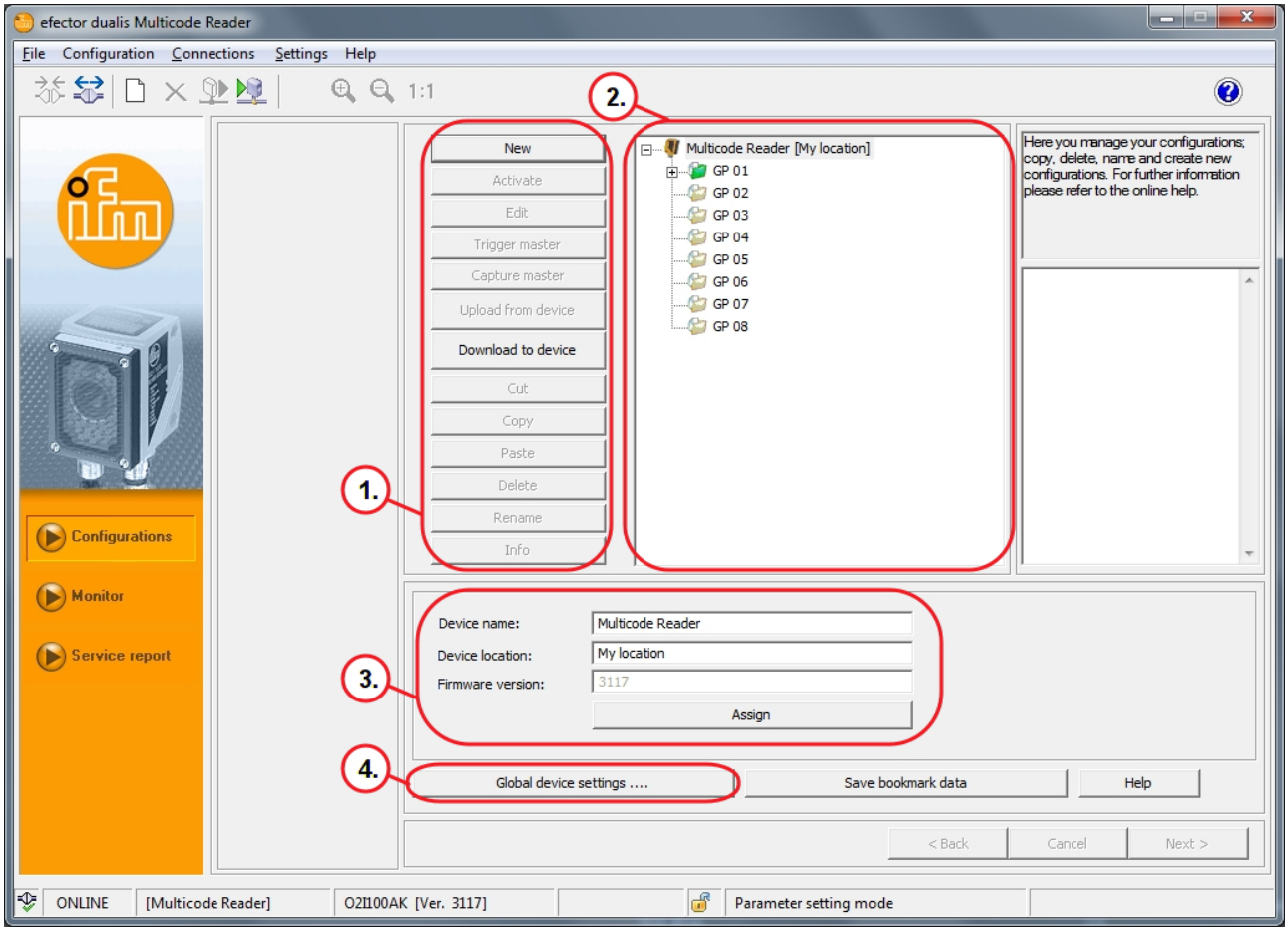


► Click on [Configurations] (1.).

> Warning dialogue window (2.) is displayed.

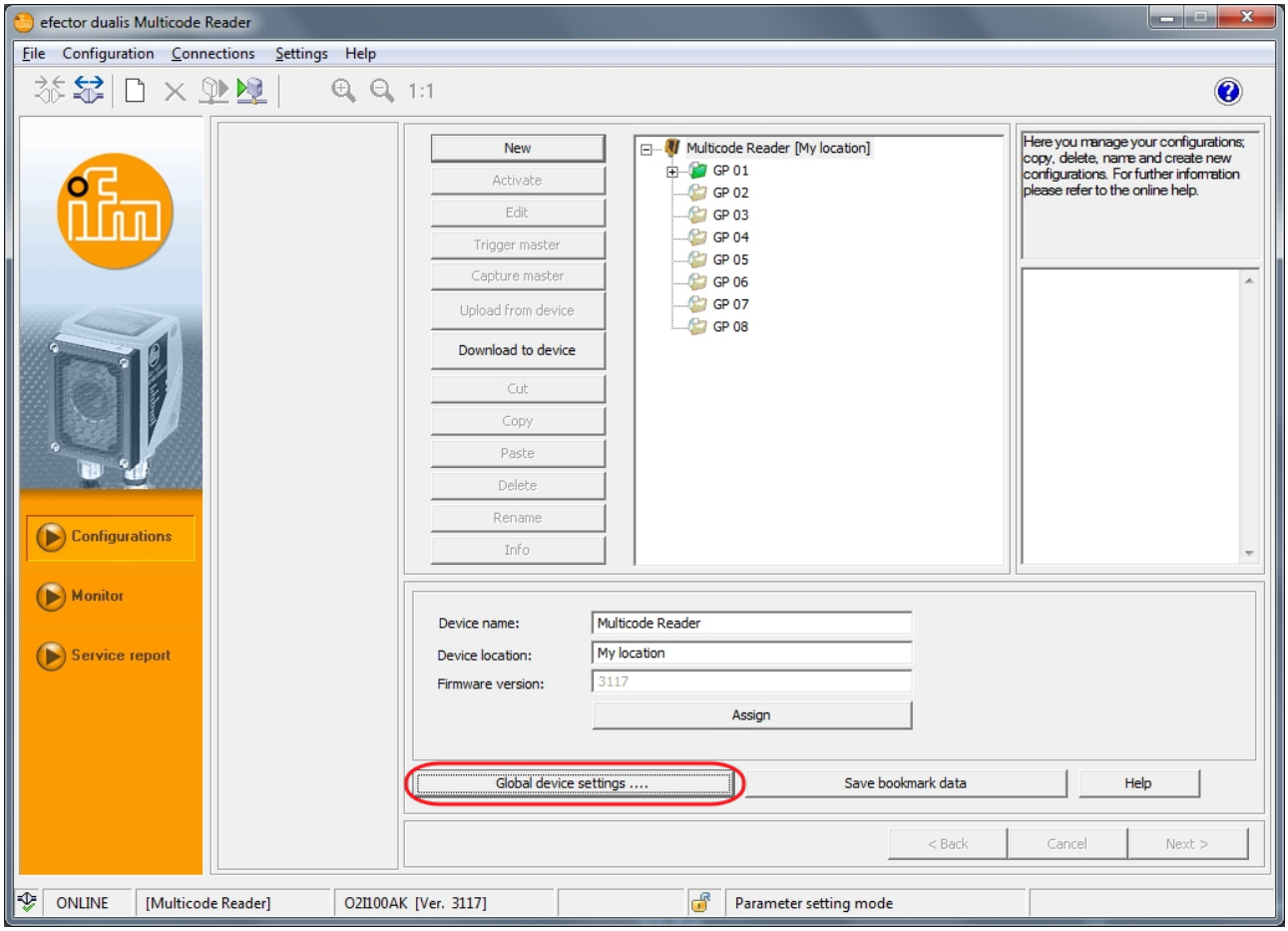
► Click on [OK] to confirm the warning.

> The configuration mode is displayed.



Pos.	Element	Function
(1.)	Configuration management	New, activate, edit, etc.
(2.)	Configuration directory	Overview, structure and selection of the configurations and groups.
(3.)	General administration	Device-specific information.
(4.)	Global device settings	Possible basic settings of the performance and network parameters of the device: ● Trigger input debouncing (on/off) ● Laser pointer (on/off) ● Process interface (RS-232 or TCP/IP) ● Network parameters (DHCP on/off, IP address etc.)

9.3 Adapt global device settings



► Click on [Global device settings].

> The dialogue window "Global device settings" is displayed.

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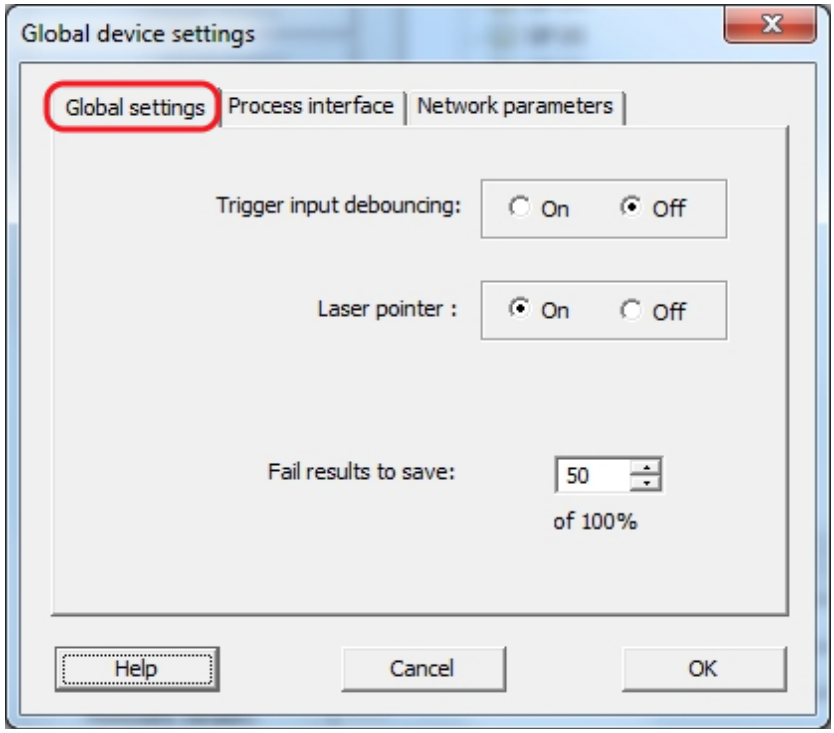
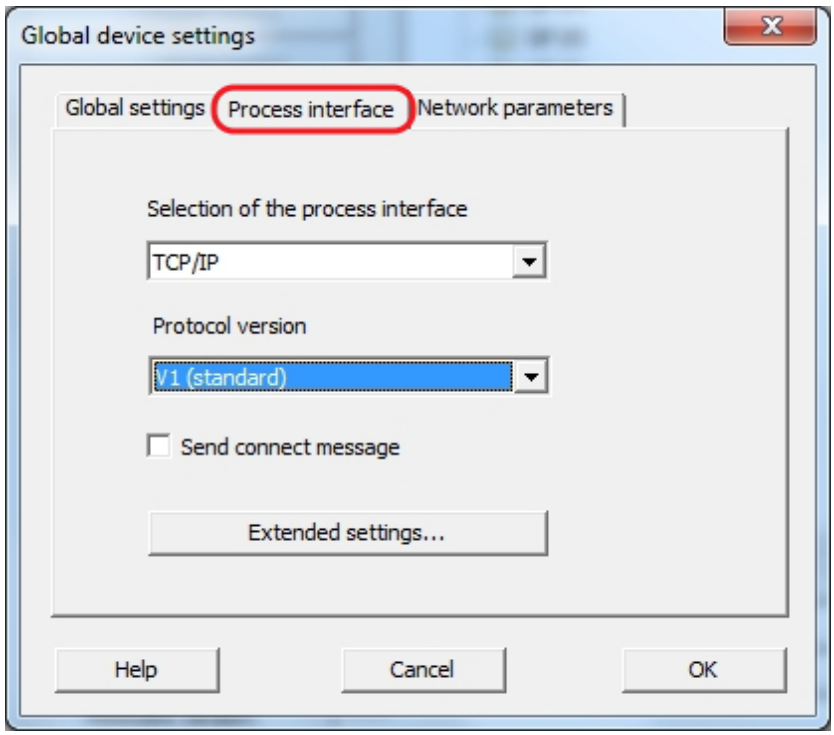
Tab "Global device settings":



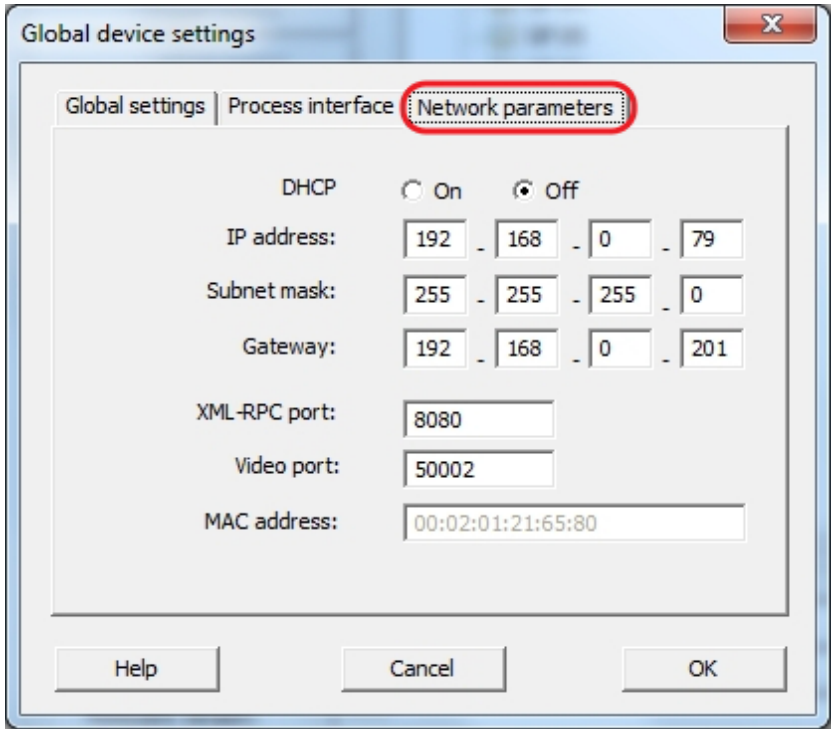
"Trigger input debouncing", "Laser pointer" and "Fail results to save" can be set under "Global settings".

Tab "Process interface":



"Selection of the process interface" and "Protocol version" can be set under "Process interface".

Tab "Network parameters":

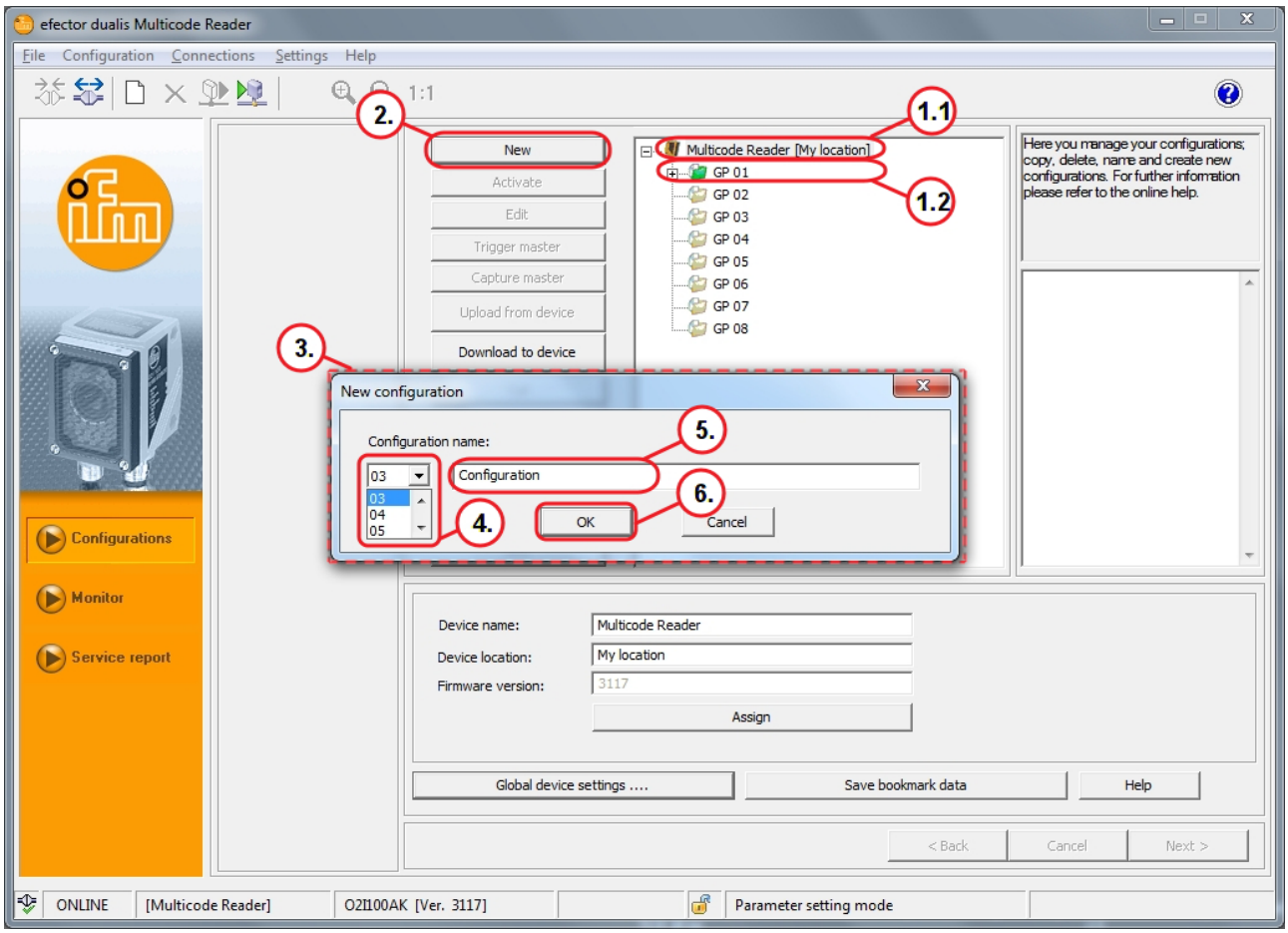


The IP settings of the multicode reader can be selected under "Network parameters".

Refer to → 8.3 Connection setting

9.4 Create a new configuration

A new configuration can be created as a new entry in the directory structure or assigned to an existing group.



Create a new configuration as a new entry:

► Select the name/location of the device in the device structure (1.1).

► Click on [New] (2.).

> The dialogue window "New configuration" (3.) is displayed.

► Select a number (4.).

The selection list (4.) only shows free numbers!

► Enter the name (5.) of the configuration.

► Click on [OK] to create the configuration.

Create a new configuration under an existing group:

► Select the requested group (1.2).

► Click on [New] (2.).

> The dialogue window "New configuration" (3.) is displayed.

► Select a number (4.).

► Enter the name (5.) of the configuration.

► Click on [OK] (6.) to create the configuration.

Requirements for names:

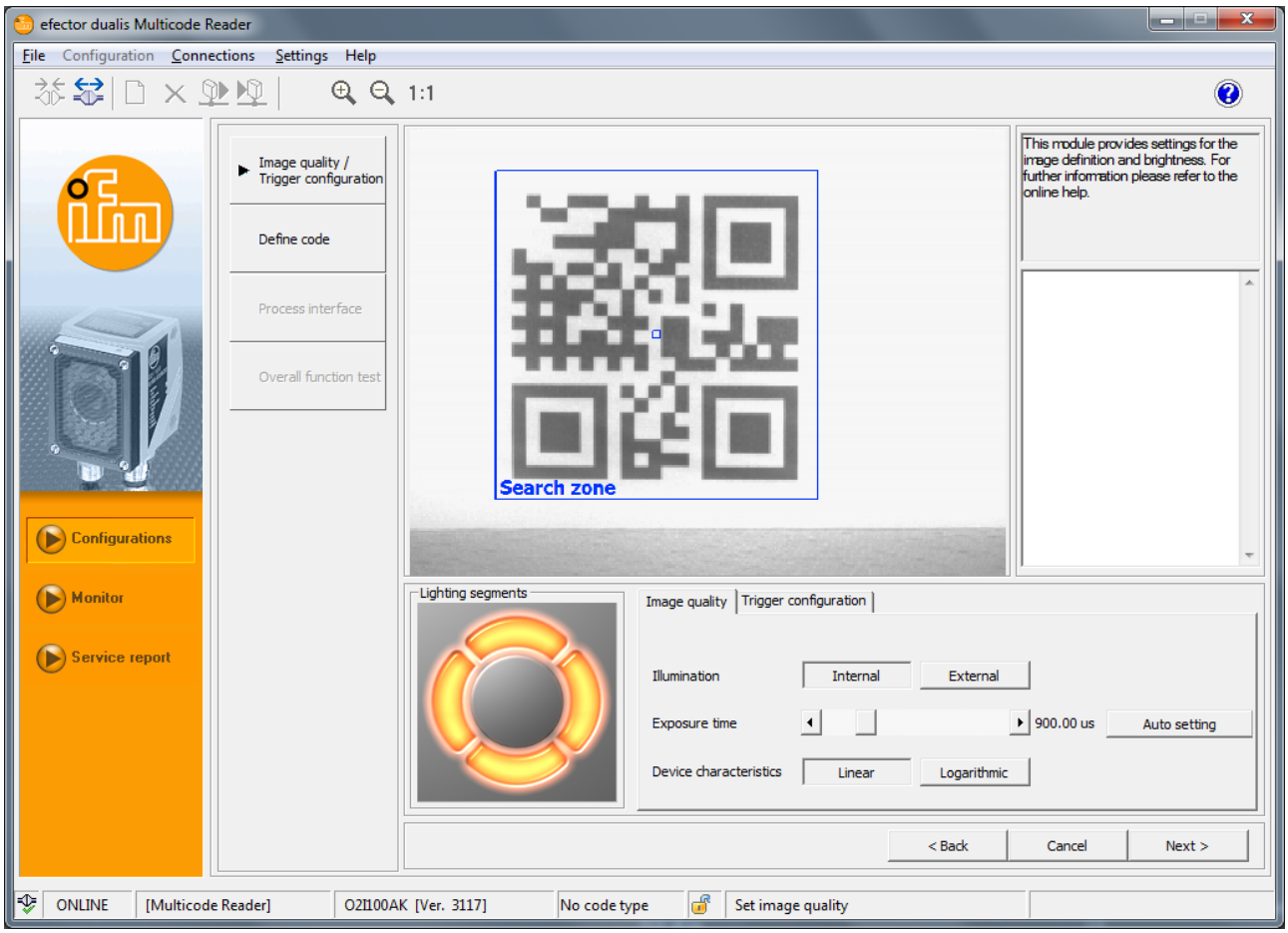
- 1...32 characters
- Umlauts are allowed (Ä, ä, Ö...)
- No blanks/tabulator characters before or after the entry
- No special characters (&, $, -, §...)

> The user interface changes to the first configuration step "Image quality".

10 Configuration steps

10.1 Image quality

A reliable code recognition is only ensured if the multicode reader is adjusted and set according to the following criteria.



- The code must be in focus and displayed with the highest possible contrast (ideal = black/white).
- The code has to be displayed within the search zone.
- The size of the code should be no larger than approx. 2/3 of the image.
- The minimum module size of the code must be taken into account for the selection of the operating distance.
  (Operating instructions "dualis Multicode Reader O2I1xx" at
  www.ifm.com → New search → e.g. O2I102 → Operating instructions).
- Any code position is possible.

If there is any interfering reflectance in the image, install the device transversely to the code plane. Depending on the code size the resulting trapezoidal distortion can be tolerated within certain limits.

► Optimise the image definition (focus) via the setting screw on the back of the device.

- ► Set the blue search zone as follows to ensure a maximum recognition rate and verification security:
  - – In the process the code must be displayed within the search zone.
  - – Only image data from the search zone will be used for reading/ verification.
  - – The reading/verification rate largely depends on the size of the search zone. Set the size of the search zone only as large as necessary.
- ► Switch the lighting segments on and off according to the application and the light conditions. The code should be equally illuminated!
- ► With a mouse click select the 4 lighting segments of the internal lighting independently of each other (factory setting = internal lighting, 4 segments "on").
- ► Define the exposure time with [Auto setting].
  Readjust the exposure time manually for difficult light or surface conditions.

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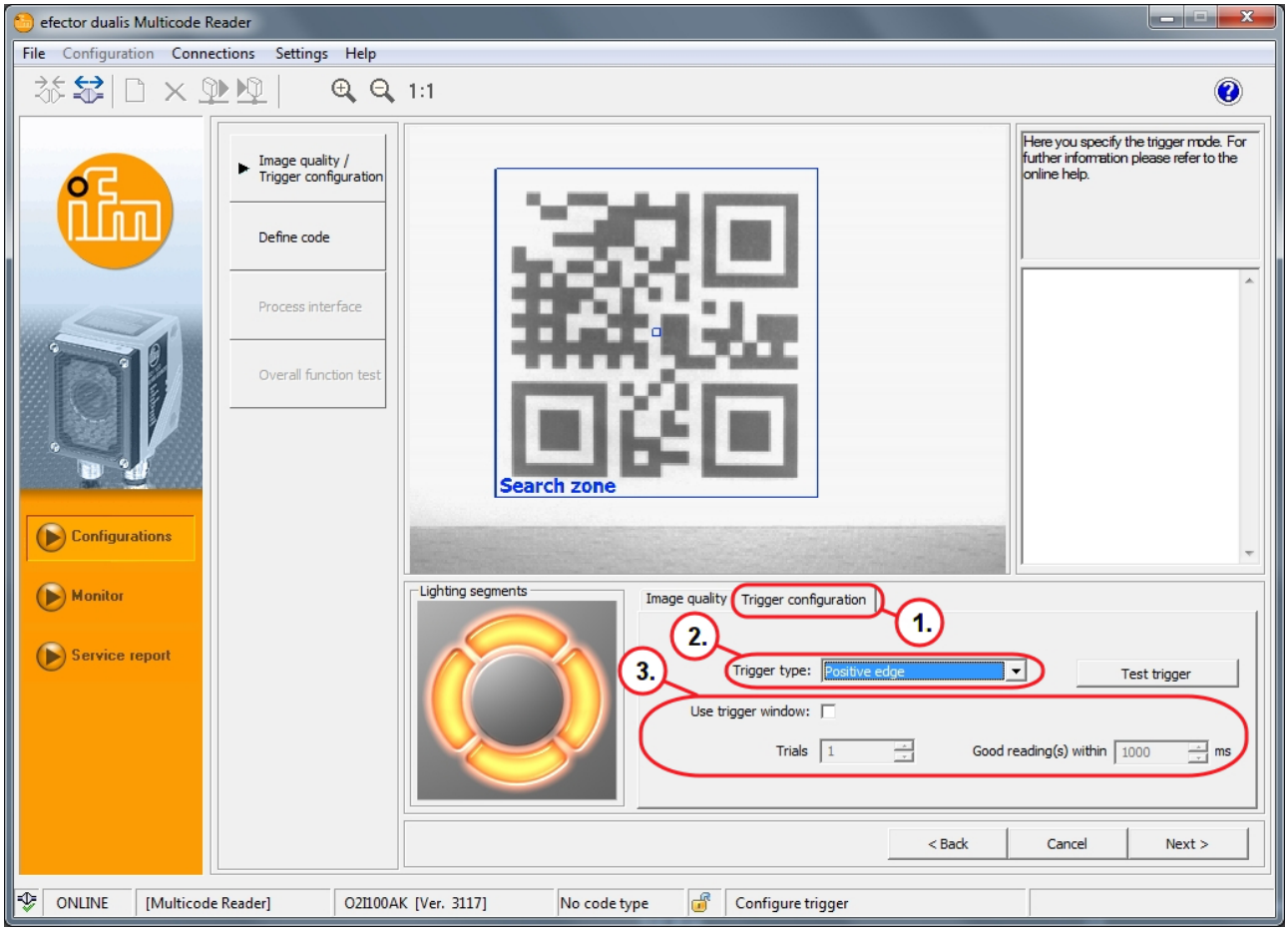
10.2 Trigger configuration



- ► Select the type of triggering (2.) under [Trigger configuration] (1.):
  - – External triggering (positive edge)
  - – External triggering (negative edge)
  - – Triggering via process interface (TCP/IP)
  - – Internal triggering (continuous)

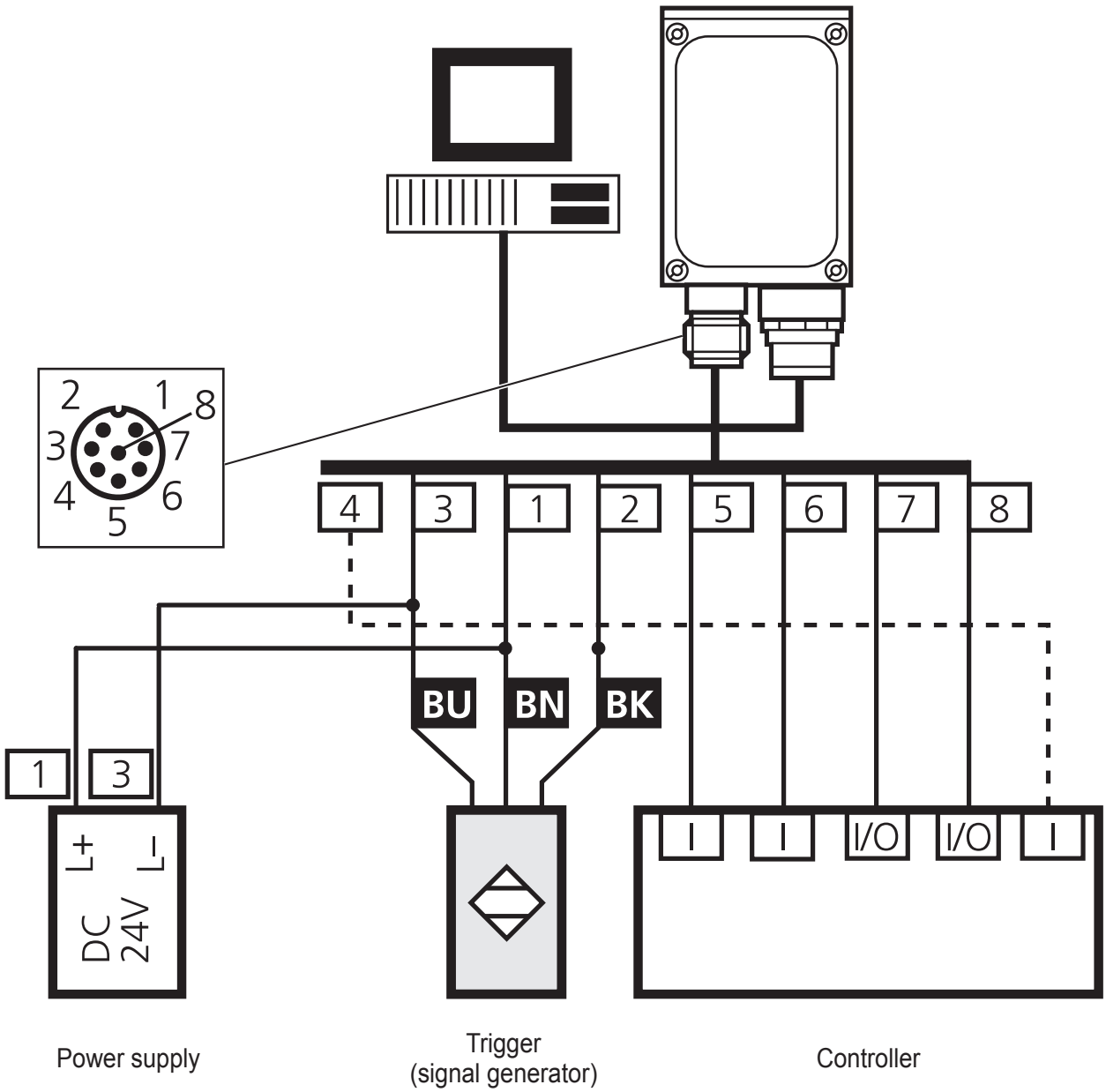
► Select [Use trigger window] (3.) if the device is to perform a defined number of successful readings/verifications in a certain period of time after a trigger pulse. When that number has been reached, the device will wait for a new trigger pulse.

Cannot be selected with internal triggering.

– Trials: 1…100
– Good reading(s): 100...10000 ms (increments 100 ms)

► Click on [Next] to change to the next step "Define code".

10.3 Example of an external trigger circuit

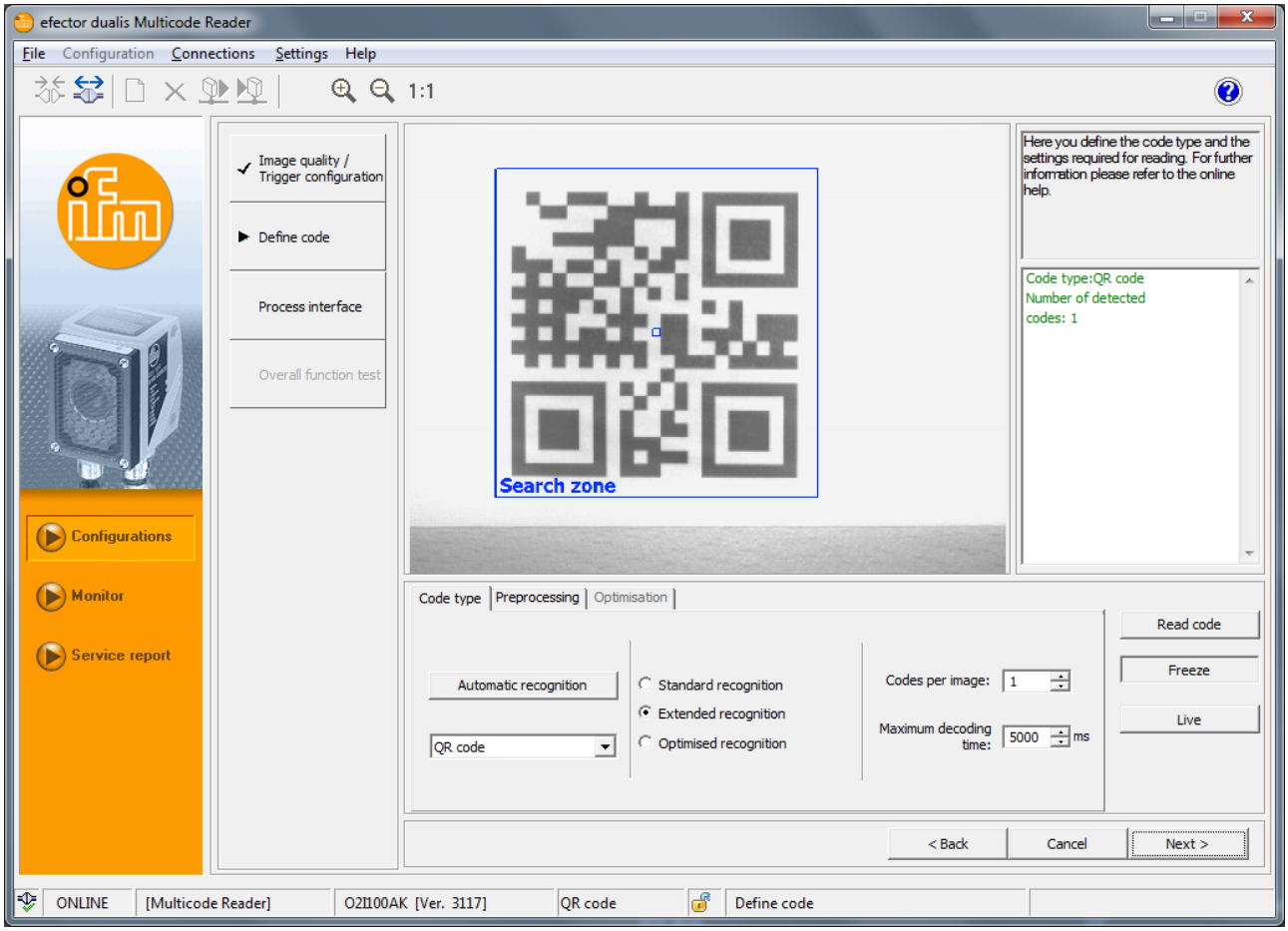


8-pole RS-232 process connection:

Socket	Connection
1	U+
2	Trigger input
3	0 V
4	Trigger output / switching output 1
5	RxD RS-232
6	TxD RS-232
7	Switching output 2
8	GND RS-232 (electrically isolated up to 50 V)

10.4 Define code

When a new configuration is created the program executes an automatic code recognition after "Image quality" → "Define code". Recognition may take several seconds.



10.4.1 Code examples

		
Data Matrix code	QR code	PDF417 code

10.4.2 Standard recognition and extended recognition

Preferred for code applications:

- with good contrast, surface and light conditions
- no need for filter functions
- no time-critical requirements

Distinction criteria standard and extended recognition

Parameter		**Standard recognition (default setting)**	**Extended recognition**
Module colour		Dark symbols on light background	Dark symbols on light background and light symbols on dark background
Min. contrast		30 %	10 %
Module size	ECC200; QR	6...20 pixels	≥ 4 pixels (for high-contrast images ≥ 2 pixels)
	PDF417	3...15 pixels	≥ 3 pixels (for high-contrast images ≥ 2 pixels)
Column and line spacing		No / small distance between adjoining modules (≤ 10 % of the module size)	Greater distances possible (≤ 50 % of the module size)
Max. inclination	ECC200	10°	30°

► Select [Standard recognition].

► Enter number of codes in the search zone.

> The codes are of the same type.

► Select the code type in the pull-down menu.

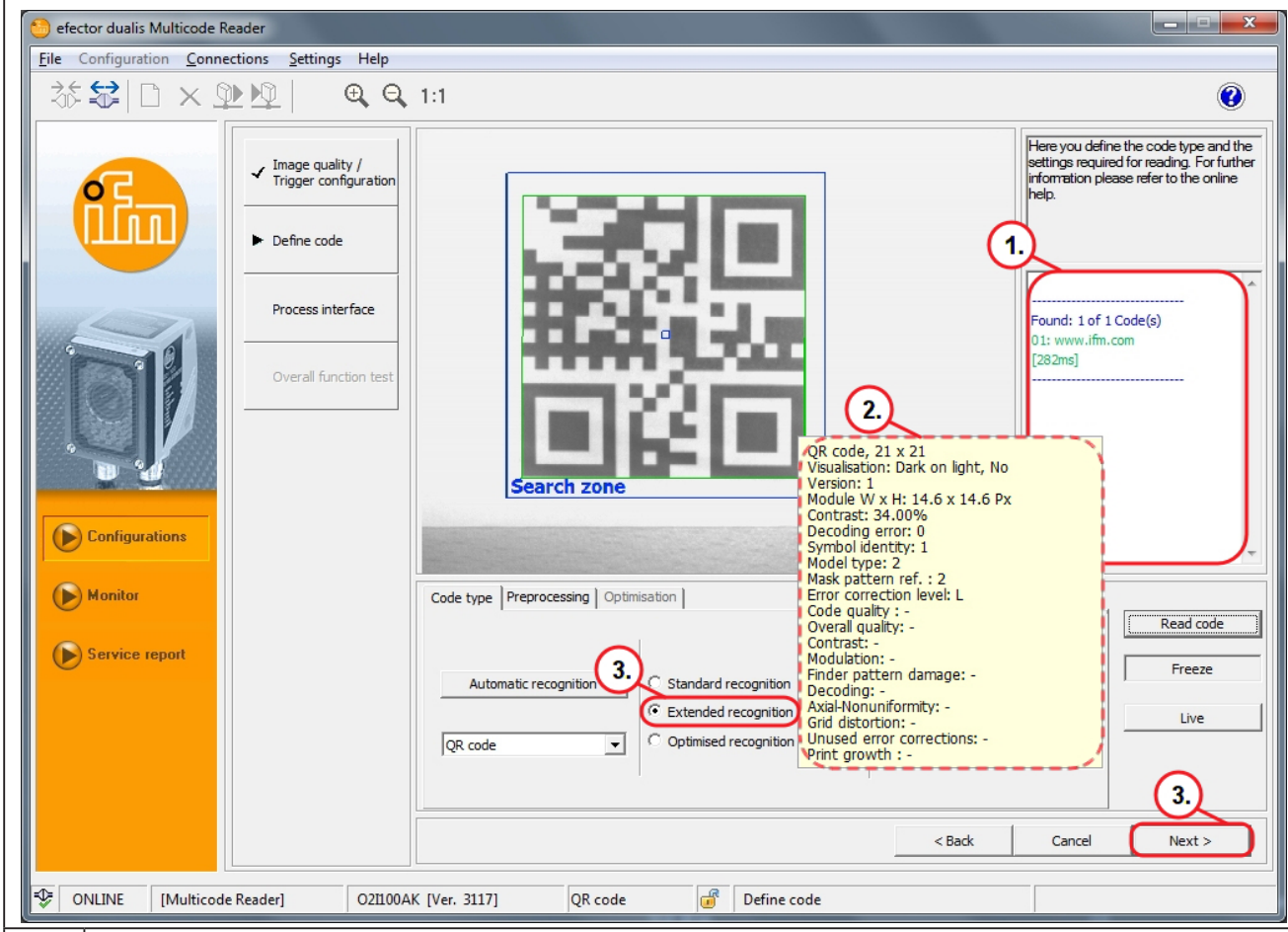
► If the code type is not known select [Automatic recognition].

Depending on the volume of the image information, automatic code recognition may take several seconds.

► Click on [Read code].

> The result field (1.) displays details regarding the image information found:

- Number of codes found (figure)
- Number of codes searched (figure)
- Code string (contents)
- Total decoding time (ms)
- Total time (ms)



(1.)	Result field: Recognised codes and information are numbered and displayed in green.
(2.)	Tooltip field: Code type, representation, module etc. are displayed. The tooltip field opens when the mouse pointer passes over the result field.

► Click on [Next] (3.) to go to the next step "Process interface".

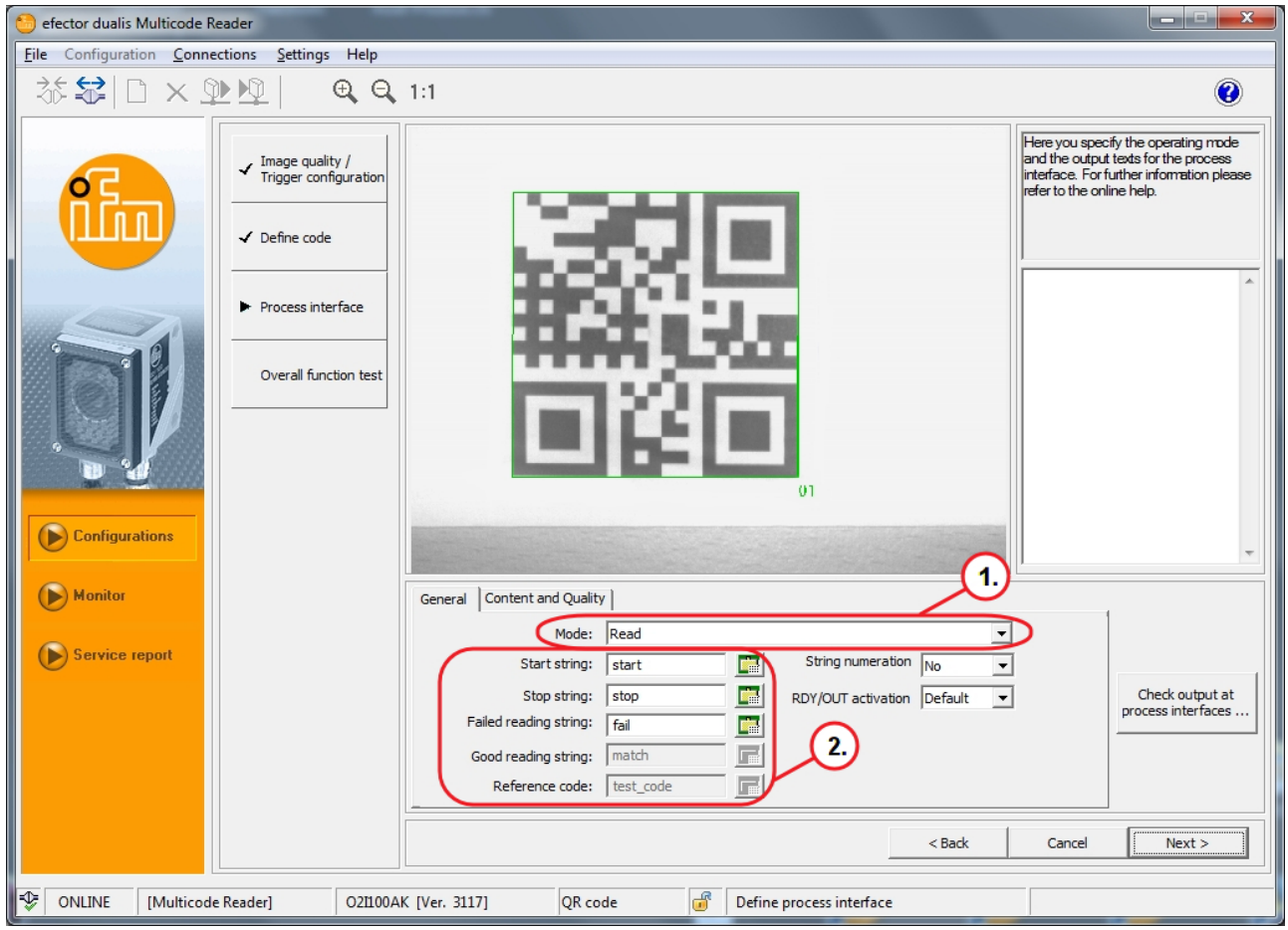
► Select [Extended recognition] (4.) if the code recognition failed.

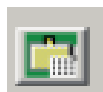
► Repeat the operation.

10.5 Process interface

Depending on the parameter setting of the process interface the sensor's response can be adapted. Therefore a customer-specific response string can be implemented at any time.

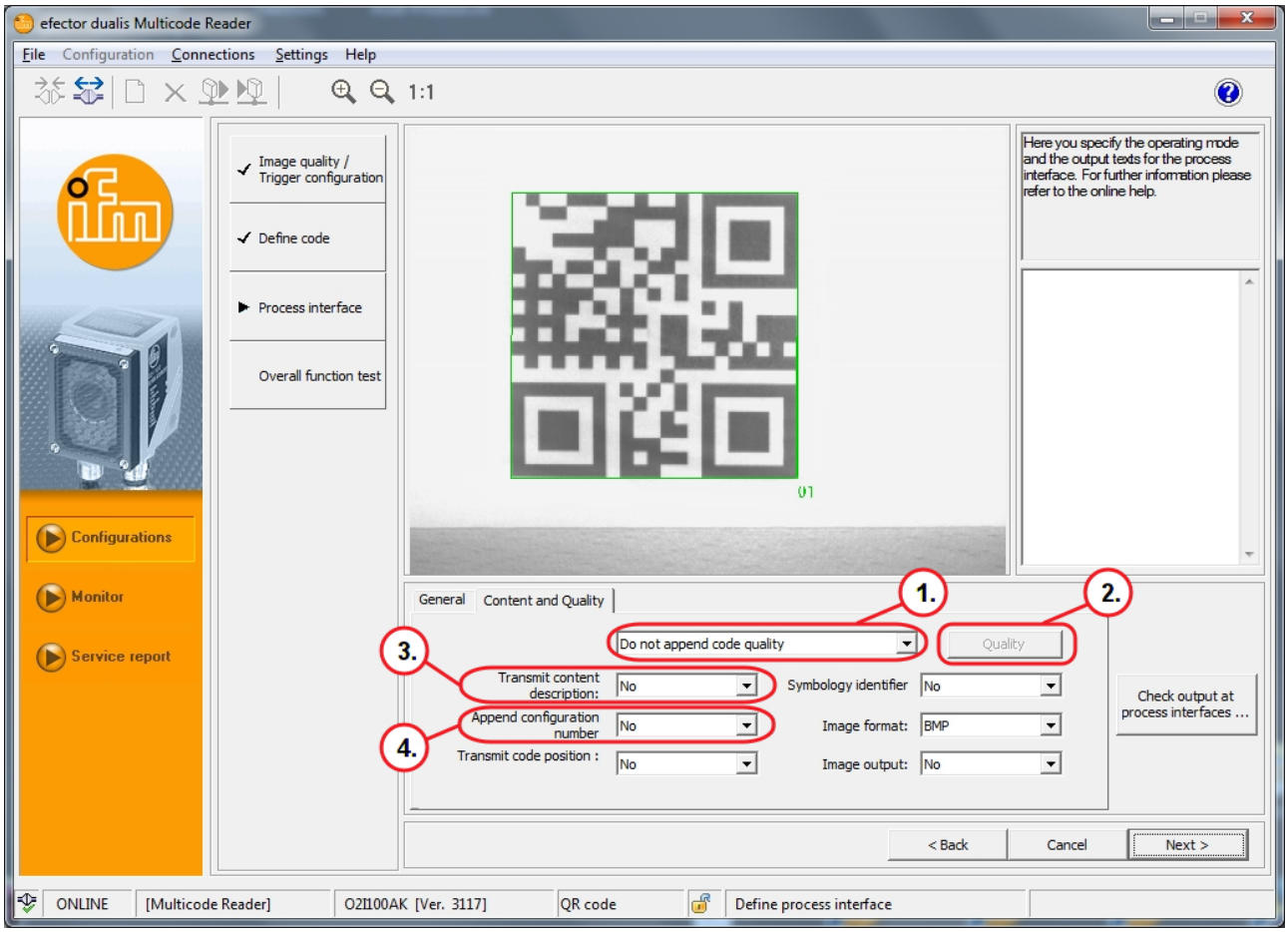
Parameters in the tab: General



(1.)	Mode	Select the process performance of the device, e.g. "reading or verification mode".	
(2.)	Character strings (data strings)	For every active field an ASCII editor is available as input help.	
		Activation via button:	

For detailed explanations refer to the software manual. www.ifm.com → New search → e.g. O2I102 → Operating instructions → Software manual E2I200 / V1.3. → Chapter 9.

Parameters in the tab: Content and quality



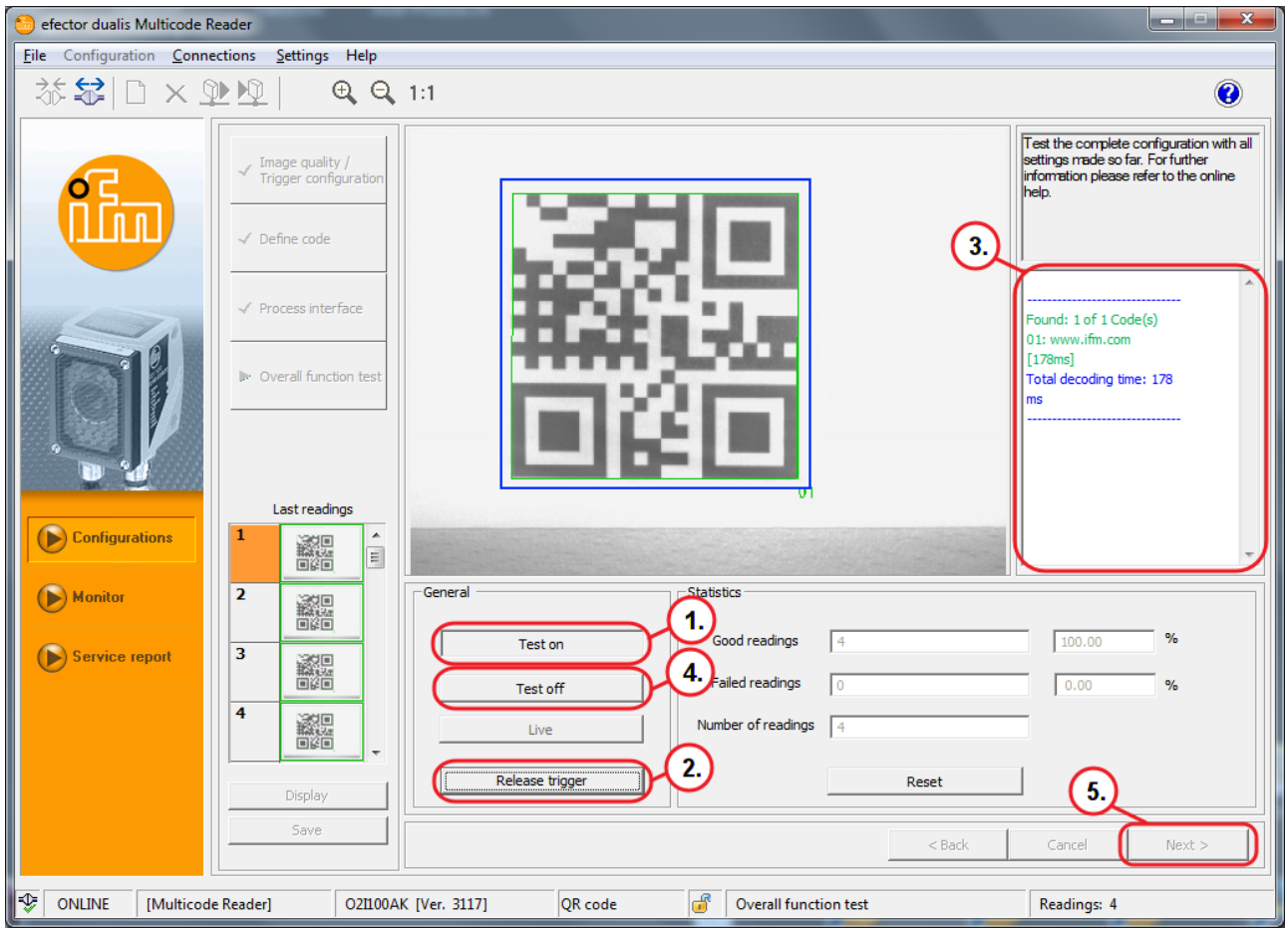
(1.)	Append code quality [evaluation 0-4] or [evaluation A-F]	Activate to select the quality parameters to be transferred.
(2.)	Quality	Adapt quality parameters.
(3.)	Transmit content description	[Yes] or [No] determines whether the activated quality parameters are to be appended automatically to the process data.
(4.)	Append configuration number	[Yes] or [No] determines whether the configuration number read is to be appended automatically to the process data.

For detailed explanations refer to the software manual. www.ifm.com → New search → e.g. O2I102 → Operating instructions → Software manual E2I200 / V1.3. → Chapter 9.5.

► Click on [Next] to go to the next step "Overall function test".

10.6 Overall function test

This final step tests all settings of the new configuration.



► Click on [Test on] (1.).

► Click on [Release trigger] (2.).

> The device performs reading/verification on the basis of the previous settings.

> The result field (3.) shows:

- Number of codes found (figure)
- Number of codes searched (figure)
- Code string (contents)
- Total decoding time (ms)
- Total time (ms)

With an activated internal triggering [Release trigger] is deactivated. Click on [Test on] to carry out the reading/verification process continuously.

► Click on [Test off] (4.) to quit.

► Click on [Next] (5.) to finish the configuration.

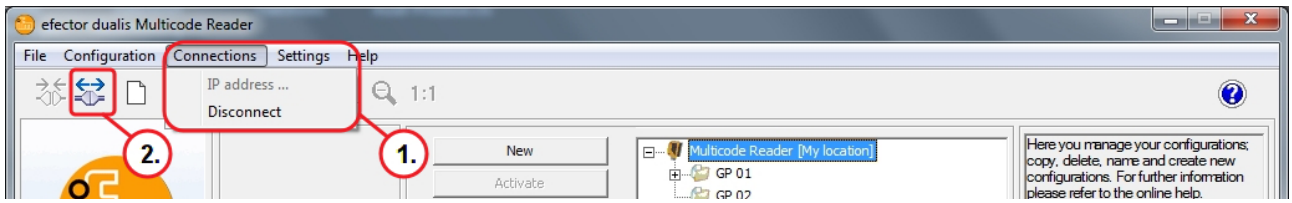
> The note [Do you want to save the configuration changes?] is displayed.

► Click on [OK].

> The configuration is saved. The program returns to the directory structure (→ 9.4 Create a new configuration).

The newly created configuration is active.

11 Disconnect sensor



Option 1.)

► Click on [Connections].

► Click on [Disconnect].

Option 2.)

► Click on the disconnect symbol.

► Click on [OK] to confirm the warning [Do you really want to disconnect the device?].

> The multicode reader is disconnected from the program.

With the group or configuration activated last the multicode reader changes to the operating mode and waits for a trigger pulse.

UK