Mounting instructions
Process- and dialogue module
CR9209
CR9210
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1 Safety instructions

⚠️ This description is part of the unit. It contains texts and drawings concerning the correct handling of the module and must be read before installation or use.

Observe the information of the description. Non-observance of the notes, operation which is not in accordance with use as prescribed below, wrong installation or handling can result in serious harm concerning the safety of persons and plant.

The instructions are for authorised persons according to the EMC and low voltage guidelines. The process and dialogue modules must be installed and commissioned by a skilled electrician (programmer or service technician).

If the unit is not supplied by the mobile on-board system (12/24 V battery operation) it must be ensured that the external voltage is generated and supplied according to the criteria for safety extra-low voltage (SELV) as this is supplied without further measures to the connected controller, the sensors, and the actuators.

The wiring of all signals in connection with the SELV circuit of the unit must also comply with the SELV criteria (safe extra-low voltage, safe electrical separation from other electric circuits).

If the supplied SELV voltage has an external connection to ground (SELV becomes PELV) the responsibility lies with the user and the respective national regulations for installation must be complied with. All statements in these operating instructions refer to the unit the SELV voltage of which is not grounded.

The connectors may only be supplied with the signals indicated in the technical data or on the unit label and only the approved accessories of ifm electronic gmbh may be connected.

The unit can be operated within a wide temperature range according to the technical specification indicated below. Due to the additional self-heating the housing walls can have high perceptible temperatures when touched in hot environments.

In case of malfunctions or uncertainties please contact the manufacturer. Tampering with the unit can lead to considerable risks for the safety of persons and plant. It is not permitted and leads to the exclusion of any liability and warranty claims.

Electromagnetic compatibility

This is a class A installation. It can cause radio interference in domestic areas. In this case the operator is requested to take appropriate measures.
2 Function and features

The process and dialogue module is a programmable graphic display for controlling, parameter-setting and operation of mobile machines and plants. Communication with other system components, e.g. decentralised I/O modules, is handled via a CAN interface using the CANopen protocol.

For service purposes, additional service interfaces such as Ethernet, USB, RS-232 or a second CAN interface are available. Together with the Linux operating system they form a universal platform for networking and communication with other CAN devices, networks or PCs.

⚠️ The process and dialogue module is not approved for safety-related tasks in the sense of the safety of persons.

2.1 Features at a glance

- 5,7" display with 6 backlit function keys
- encoder with pushbutton (only CR9210)
- Closed metal housing (IP 67) suitable for panel mounting and surface mounting outside or in the cabin
- Freely programmable in accordance with IEC 61131-3 with target visualisation
- 32-bit controller and Embedded Linux operating system
- CAN interface with CANopen protocol
- PCMCIA slot, types I and II
3 Programming

The application software can be easily created by the user with the programming system CoDeSys 2.3 according to IEC 61131-3.

⚠️ The user is responsible for the safe functioning of the application programs which he creates himself. If necessary, he must additionally obtain an approval according to the corresponding national regulations by the corresponding testing and supervisory organisations.

3.1 Setup and online help

As delivered the unit is prepared for programming with CoDeSys version 2.3.3 or higher.

Shortly after switch-on of the unit the start image is shown for approx. 10 to 15 seconds. During this time booting is running in the background. After booting the setup program opens automatically.

The setup allows settings for communication and file management.

**CR9209**: The menu items are selected by pressing the cursor keys; pressing the pushbutton the respective submenu will appear.

**CR9210**: The menu items are selected by turning the encoder; pressing the encoder pushbutton the respective submenu will appear.

After leaving the setup a project can be loaded. Libraries (.lib) are available for the use of the operating elements, interfaces and other internal functions of the device. They have to be integrated into the application program.

Further information → online help / system manual
4 Mounting

4.1 Mounting accessories
The unit is supplied without mounting accessories. Depending on the intended location and type of mounting the following mounting accessories are available:

- seal/vibration absorber for panel/control cabinet mounting
- snap-in set for panel mounting*
- fixing set for control cabinet mounting*
- RAM® mount system for surface mounting

*) Use the snap-in set and the fixing set only in conjunction with the seal/vibration absorber.

4.2 Seal/vibration absorber
Slide the seal/vibration absorber over the unit from the back.

1: seal/vibration absorber
2: The polyester film is on the dialogue unit
4.3 Control cabinet mounting with mounting brackets (fixing set)

The mounting brackets enable the horizontal, vertical or upside-down mounting of the dialogue module. This type of mounting is suited for materials with a thickness of max. 8 mm.

Please take into account the required clearance space for the mounting brackets!

Mounting steps

1: Mounting bracket
2: Guidance

1: Clearance space for mounting brackets
2: For the cutout dimensions see the technical data

Move mounting bracket into guide, slide it backwards and tighten the screws.
4.4 Panel mounting with clips (snap-in set)

Preferably select this type of mounting when the unit is to be laid in the horizontal position as it is only held by the force of the clips.

The angle of inclination of the panel must not exceed 45°.

Note when selecting the mounting location:
To loosen the clips the back of the unit must be accessible.

This type of mounting is suited for materials with a thickness of max. 5 mm.

Mounting steps:

- Insert clips
- Press the unit into the cutout
- End position

4.4.1 Removing the unit from the panel

To insert the screwdriver between the cutout of the panel and the clip, the grooved chamfer of the clips must be fitted with a slot.

Steps for removal:
1. Insert the screwdriver into the slot of the clips on the back.
2. Angle the screwdriver and compress the springs of the clips.
3. Remove the unit from the cutout.
4.5 Surface mounting with RAM® mount system

Using the RAM® mount components, available as accessories, the dialogue unit can be used as a firmly mounted desktop unit. Two balls allow variable orientation of the unit.

The back of the unit has been prepared for fixing the mounting plate.

1: Ball locator  
2: Clamp screw  
3: Mounting arm  
4: Ball  
5: Mounting plate
5 Electrical connection

5.1 General

For pin connections → 7 Technical data

⚠️ To guarantee the electrical interference protection of the module, the housing must be connected to GND (e.g. to the ground of the vehicle).

⚠️ All screened wires of the connection cable must be connected to GND (e.g. to the ground of the vehicle).

⚠️ To protect the whole system (wiring and module) the individual electric circuits must be protected with max. 3 A.

5.2 M23 round connector (central plug)

1: M23 round connector (central plug)
2: Service interfaces (behind side cover)

⚠️ Do not connect or disconnect the M23 round connector (central plug) while live. Connecting or disconnecting the serial interface while live can lead to undefined states, causing damage to the RS-232 driver module.
5.3 Service interfaces (only for service operation)

1: USB (optional) plug type A  
2: RS 232 9-pole D-Sub plug  
3: Ethernet 8-pole RJ45 plug  
4: 24 V DC supply via 3,5 mm hollow plug for service, programming or diagnostic purposes  
5: PCMCIA slot, types I/II

_service interfaces are not intended for actual operation. Connection must be carried out by qualified personnel and with the housing in a horizontal position._

_do not connect or disconnect the serial interface while live. Connecting or disconnecting the serial interface while live can lead to undefined states, causing damage to the RS-232 driver module_

6 Maintenance, repair and disposal  
The process and dialogue module is maintenance-free and may only be repaired by the manufacturer. The unit must be disposed of in accordance with the national environmental regulations.

7 Technical data  
(see following pages)
7.1 CR9209

CR9209

Process and dialogue module
5,7" colour display
6 freely programmable backlit function keys
10...32 V DC

Technical data

Display
Display TFT, cholour, transmissive, with graphics capabilities,
320 x 240 pixels, 115.17 x 86.37 mm (5.7")
Background illumination LED, 500 cd/m² (50,000 h lifetime)
Brightness adjustable via software in 4096 steps
can be uploaded individually
Sets of characters freely scaleable
Height of characters

Mechanical data
Mounting variants

Dimensions (W x H x D) 189 x 165 x 81 mm
Cutout for panel mounting (W x H) 183 ± 0,5 x 154 ± 0,5 mm
die-cast zinc, painted
Polyester with embossed keys

Keys
6 short-stroke keys, with tactile feedback,
backlit (adjustable in 64 steps), freely programmable (softkey function)

Encoder –
Protection IP 67
Operating temperature -10...+70° C
Storage temperature -30...+80° C
Weight 2.0 kg

Electrical data
Operating voltage 10...32 V DC
Current consumption 300 mA (at 24 V DC)
Short-circuit / reverse polarity protection electronic
Processor Motorola PowerPC MPC823E, 50 MHz
Program and data memory 32 Mbytes (Flash)
Data memory 32 Mbytes SDRAM

Programmable graphic display for controlling, parameter-setting
and operation of mobile machines and plants

TFT, cholour, transmissive, with graphics capabilities,
320 x 240 pixels, 115.17 x 86.37 mm (5.7")
LED, 500 cd/m² (50,000 h lifetime)
Sets of characters can be uploaded individually
Sets of characters freely scaleable

Mounting variants
• panel mounting
  support from the front via lip around the cover,
  fixing with clips when mounted into a panel
  or mounting brackets when mounted into a control cabinet
• surface mounting
  via RAM® mount system
  (mounting accessories not included)

Dimensions (W x H x D) 189 x 165 x 81 mm
Cutout for panel mounting (W x H) 183 ± 0,5 x 154 ± 0,5 mm
die-cast zinc, painted
Polyester with embossed keys

We reserve the right to make technical alterations without prior notice.
## Technical data

### Interfaces

| CAN              | 2 interfaces in accordance with ISO 11898 version 2.0 B
|                 | individual communication protocol and CANopen master/slave
|                 | baud rate: 20 Kbits/s...1 Mbit/s (default 125 Kbits/s)
|                 | connection via 19-pole M23 round connector
| 1. RS 232        | transmission rate up to 115.2 Kbaud
|                 | connection via 9-pole D-Sub plug behind side cover
|                 | signals: RxD, TxD, GND
| 2. RS 232        | transmission rate up to 19,200 baud
|                 | connection via 19-pole M23 round connector
|                 | signals: RxD, TxD, GND
| Ethernet         | transmission rate up to 10 Mbits/s
|                 | connection via 8-pole RJ 45 plug (IEEE 802.3, 10 BASE-T) behind side cover
|                 | and via 19-pole M23 round connector
| USB (optional)   | USB v 1.1, transmission rate up to 12 Mbits/s
|                 | connection via standard USB connector type A (master) behind side cover
| PCMCIA           | PCMCIA-ATA interface (standard header)
|                 | master interface, version 2.1

### Software/Programming

| Operating system | embedded Linux 2.4
| Programming system | CoDeSys version 2.3
| Graphic functions | via integrated target visualisation

### Other features

| Signal output | integrated buzzer
| Temperature monitoring | sensor for measuring the temperature inside the housing
| Clock | realtime clock (Li battery buffered, 10 years lifetime)

### Tests/Approvals

| e1 marking | RL 06/28/EG (noise emission and noise immunity)
| Noise immunity | ISO 7637-2: 2004
|               | pulses 1, severity level 4, function state C
|               | pulses 2a, severity level 4, function state A
|               | pulses 2b, severity level 4, function state C
|               | pulses 3a, severity level 4, function state A
|               | pulses 3b, severity level 4, function state A
|               | pulses 4, severity level 4, function state A
|               | pulses 5a, severity level 3, function state A

### Other tests

| EN 60068 for climatic and mechanical testing |
## CR9209 Technical data

### Wiring

M23 round connector
central plug on the rear of the unit

#### M23 round connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND (Power)</td>
</tr>
<tr>
<td>2</td>
<td>GND (Power)</td>
</tr>
<tr>
<td>3</td>
<td>VBB + (Supply)</td>
</tr>
<tr>
<td>4</td>
<td>CAN 1 Low</td>
</tr>
<tr>
<td>5</td>
<td>CAN 1 High</td>
</tr>
<tr>
<td>6</td>
<td>n.c.</td>
</tr>
<tr>
<td>7</td>
<td>2. RS 232, RxD</td>
</tr>
<tr>
<td>8</td>
<td>2. RS 232, TxD</td>
</tr>
<tr>
<td>9</td>
<td>VBB + (Supply switched)</td>
</tr>
<tr>
<td>10</td>
<td>GND (Power)</td>
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<tr>
<td>11</td>
<td>GND (Power)</td>
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<tr>
<td>12</td>
<td>n.c.</td>
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<tr>
<td>13</td>
<td>CAN 2 Low</td>
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<tr>
<td>14</td>
<td>CAN 2 High</td>
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<tr>
<td>15</td>
<td>Ethernet RxD –</td>
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<tr>
<td>16</td>
<td>Ethernet RxD +</td>
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<tr>
<td>17</td>
<td>Ethernet TxD –</td>
</tr>
<tr>
<td>18</td>
<td>Ethernet TxD +</td>
</tr>
<tr>
<td>19</td>
<td>Shield</td>
</tr>
</tbody>
</table>

#### Service interfaces behind side cover

1. RS 232
   for serial null modem cable

#### Ethernet

IEEE 802.3, 10BASE-T

#### USB (optional)

type A, master

#### Operating voltage

(3.5 mm hollow plug for service, programming or diagnostic purposes)

#### Power

<table>
<thead>
<tr>
<th>Pin</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>10...32 V DC</td>
</tr>
</tbody>
</table>

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We reserve the right to make technical alterations without prior notice.
## 7.2 CR9210

**CR9210**

- Process and dialogue module
- OEM version
- 5.7" colour display
- 6 freely programmable backlit function keys
- Encoder with pushbutton
- 10...32 V DC

### Technical data

| Display
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Display</strong></td>
</tr>
<tr>
<td>Background illumination</td>
</tr>
<tr>
<td>Brightness</td>
</tr>
<tr>
<td>Sets of characters</td>
</tr>
<tr>
<td>Height of characters</td>
</tr>
</tbody>
</table>

| Mechanical data
<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mounting variants</strong></td>
</tr>
</tbody>
</table>

| Dimensions (W x H x D)
| --- |
| Cutout for panel mounting (W x H)
| Housing material
| Protective film
| Keys

| Encoder
| --- |
| Lifetime (revolutions)
| Protection
| Operating temperature
| Storage temperature
| Weight

### Electrical data

| Operating voltage
| Current consumption |
| Short-circuit / reverse polarity protection |
| Processor |
| Program and data memory |
| Data memory |

### Programmable graphic display for controlling, parameter-setting and operation of mobile machines and plants

- TFT, colour, transmissive, with graphics capabilities, 320 x 240 pixels, 115.17 x 86.37 mm (5.7"
- LED, 500 cd/m² (50,000 h lifetime)
- adjustable via software in 4096 steps
- can be uploaded individually
- freely scaleable

- * panel mounting
  - support from the front via lip around the cover,
  - fixing with clips when mounted into a panel
  - or mounting brackets when mounted into a control cabinet
- * surface mounting
  - via RAM® mount system
  - (mounting accessories not included)

- 189 x 165 x 81 mm
- 183 ± 0.5 x 154 ± 0.5 mm
- die-cast zinc, painted
- polyester with embossed keys
- 6 short-stroke keys, with tactile feedback,
  - backlit (adjustable in 64 steps), freely programmable (softkey function)

- with mechanical rotation detection, latching
  - and central mechanical pushbutton
  - > 100000
- IP 67
- -10...+70° C
- -30...+80° C
- 2.0 kg

| Operating voltage |
| Current consumption |
| Short-circuit / reverse polarity protection |
| Processor |
| Program and data memory |
| Data memory |

We reserve the right to make technical alterations without prior notice.
### Technical data

#### Interfaces

**CAN**
- 2 interfaces in accordance with ISO 11898 version 2.0 B
- individual communication protocol and CANopen master/slave
- baud rate: 20 Kbits/s...1 Mbit/s (default 125 Kbits/s)
- connection via 19-pole M23 round connector
- transmission rate up to 115.2 Kbaud
- connection via 9-pole D-Sub plug behind side cover
- signals: RxD, TxD, GND
- transmission rate up to 19,200 baud
- connection via 19-pole M23 round connector
- signals: RxD, TxD, GND
- Ethernet
- transmission rate up to 10 Mbits/s
- connection via 8-pole RJ 45 plug (IEEE 802.3, 10 BASE-T) behind side cover and via 19-pole M23 round connector
- signals: RxD, TxD, GND

1. **RS 232**
- transmission rate up to 115.2 Kbaud
- connection via 9-pole D-Sub plug behind side cover
- signals: RxD, TxD, GND

2. **RS 232**
- transmission rate up to 19,200 baud
- connection via 19-pole M23 round connector
- signals: RxD, TxD, GND

**PCMCIA**
- PCMCIA-ATA interface (standard header)
- master interface, version 2.1

#### Software/Programming

**Operating system**
- embedded Linux 2.4

**Programming system**
- CoDeSys version 2.3

**Graphic functions**
- via integrated target visualisation

#### Other features

**Signal output**
- integrated buzzer

**Temperature monitoring**
- sensor for measuring the temperature inside the housing

**Clock**
- realtime clock (Li battery buffered, 10 years lifetime)

#### Tests/Approvals

**CE marking**
- EN 61000-6-2: 2005
- EN 61000-6-4: 2007
- EN 61010-1: 2001

**E1 marking**
- UN/ECE-R10 (noise emission and noise immunity)

**Noise immunity**
- ISO 7637-2: 2004
- pulses 1, severity level 4, function state C
- pulses 2a, severity level 4, function state A
- pulses 2b, severity level 4, function state C
- pulses 3a, severity level 4, function state A
- pulses 3b, severity level 4, function state A
- pulses 4, severity level 4, function state A
- pulses 5a, severity level 3, function state A

**Other tests**
- EN 60068 for climatic and mechanical testing

#### Wiring
**M23 round connector**
- Central plug on the rear of the unit

**Service interfaces behind side cover**
- 1. RS 232 for serial null modem cable

**Ethernet**
- IEEE 802.3, 10BASE-T

**Operating voltage**
- (3.5 mm hollow plug for service, programming or diagnostic purposes)

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**Technical data**

### M23 round connector

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### RS 232

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<tbody>
<tr>
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<tr>
<td>3</td>
<td>TxD</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
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### Ethernet

<table>
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<tr>
<th>Pin</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TxD + pair 1</td>
</tr>
<tr>
<td>2</td>
<td>TxD –</td>
</tr>
<tr>
<td>3</td>
<td>RxD + pair 2</td>
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<td>6</td>
<td>RxD – ”</td>
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### Power

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Process- and dialogue module
Process- and dialogue module
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Nous nous réservons le droit de modifier les données techniques sans préavis.