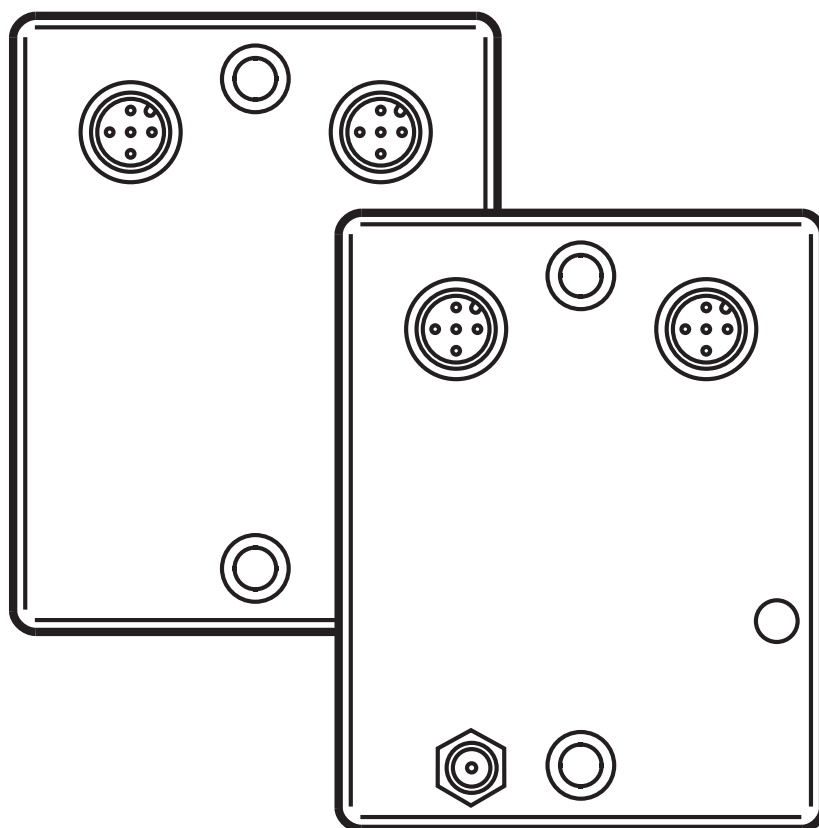


Device manual  
CANwireless  
CAN Wi-Fi /Bluetooth interface

UK

**CR3130**  
**CR3131**



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## 1 Preliminary note

This document applies to devices of the type "CANwireless" (art. no.: CR3130 and CR3131).

Read this document before use to familiarise yourself with operating conditions, installation and operation. Keep this document during the entire duration of use of the device.

Adhere to the safety instructions.

### 1.1 Symbols used

- ▶ Instructions
- > Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note  
Non-compliance may result in malfunction or interference.
-  Information  
Supplementary note

### 1.2 Warnings 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

These instructions are an integral part of the device. They contain information and illustrations about the correct handling of the device and must be read before installation or use.

### 2.1 General

Follow 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

Disconnect the device externally before handling it.

In case of malfunction of the device or queries please contact the manufacturer. Any tampering with the device can seriously affect the safety of operators and machinery. This is not permitted and leads to an exclusion of liability and warranty.

### 2.2 Target group

These instructions are intended for authorised persons according to the EMC and low-voltage directives. The device must be installed, connected and put into operation by a qualified electrician.

### 2.3 Electrical connection

The device is designed for supply via a mobile on-board system (12/24 V DC battery operation).

The connection terminals may only be supplied with the signals indicated in the technical data and/or on the device label and only the approved accessories of ifm electronic may be connected.

### 2.4 Air traffic

The device must not be operated on board aircraft.

Using it in an aircraft can affect the navigation and communication systems. An offence can lead to legal action against the offender.

### 2.5 Explosive substances

In general, radio equipment must not be used in the vicinity of petrol stations, fuel depots, chemical plants or blasting operations.

Do not transport and store any flammable gases, liquids or explosive substances in the part of the vehicle where the device is installed.

### 2.6 Electronic devices

Operation can affect the function of electronic devices that are not correctly shielded.

Disconnect the unit in the vicinity of medical equipment. Please contact the manufacturer of the device in case of problems.

## **2.7 FCC (USA)**

This device complies with Part 15 of the FCC Rules.

Operation presupposes the two following conditions:

- (1) This device must not cause harmful interference, and
- (2) this device must tolerate interference including interference possibly causing undesired operation.

Cautionary Information:

Any changes made to this device without express consent of ifm electronic gmbh may invalidate FCC approval to operate this device.

### 3 Functions and features

CANwireless allows wireless access to the CAN interface of mobile machines for data exchange or error diagnostics.

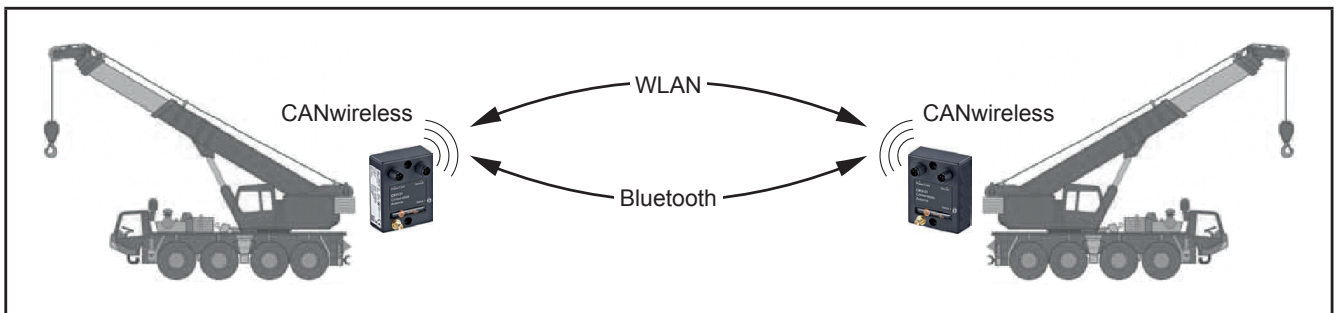
The CR3130 device has an internal antenna. CR3131 has a connection for an external antenna providing a longer range.

The parameter of the devices are set via the CAN interface.

The following functions are available:

- **Wireless CAN bridge:**  
Direct wireless CAN connection between 2 CAN buses via the CANwireless devices (Wi-Fi or Bluetooth at option).

UK

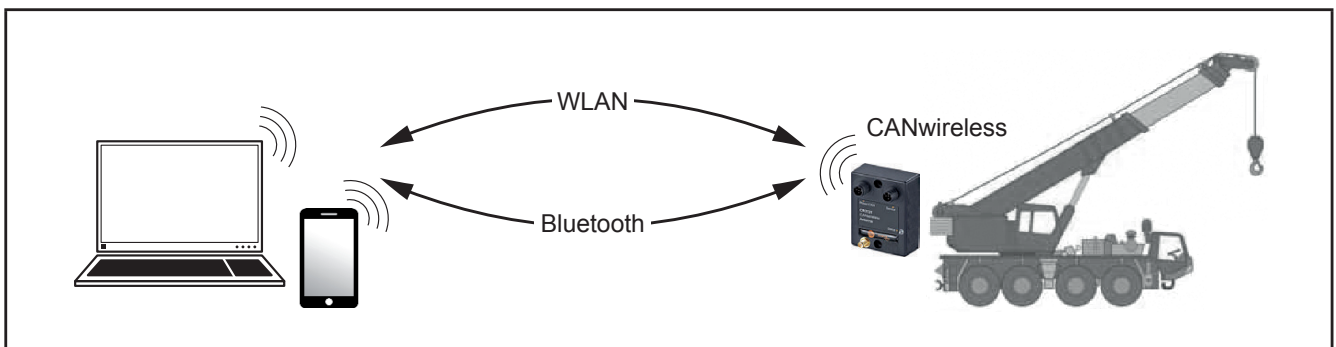


Data exchange via wireless CAN bridge

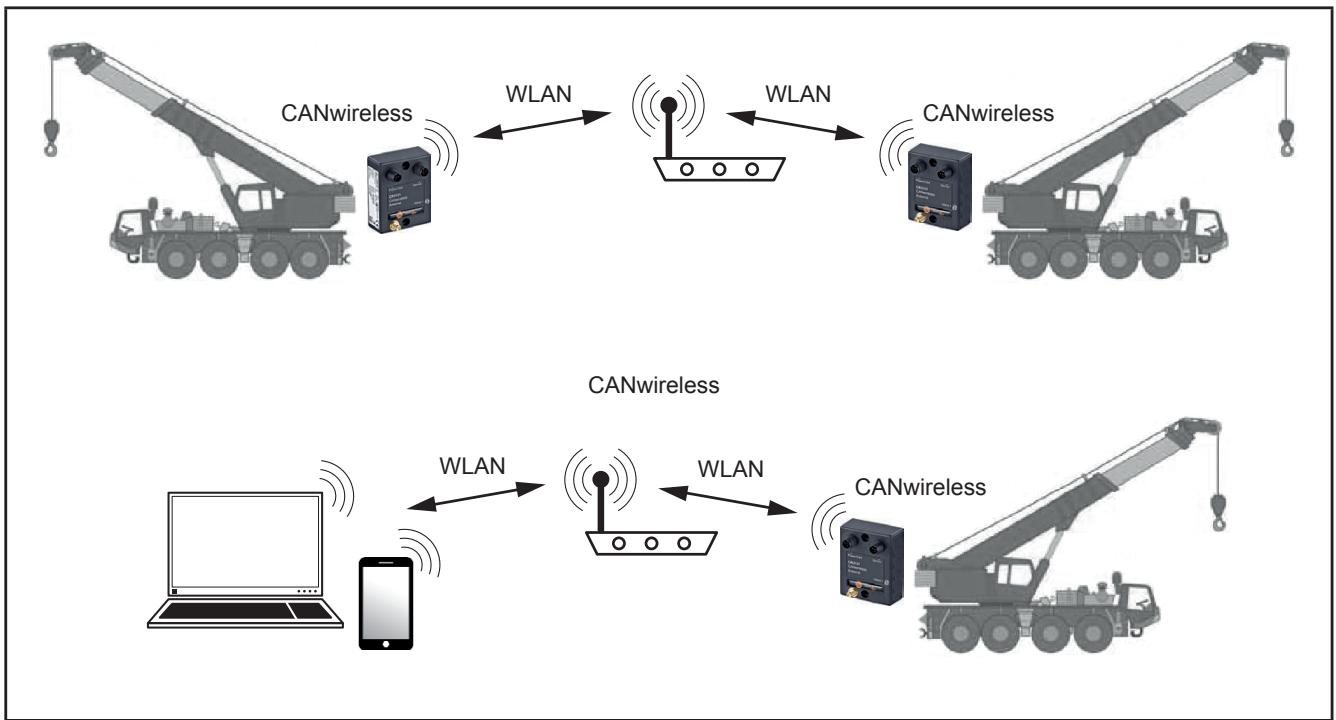
- **CAN Wi-Fi / CAN Bluetooth interface:**  
Wireless CAN connection to other Wi-Fi-capable or Bluetooth devices such as smartphones, tablets or laptops on which the CAN data is recorded and evaluated.

Use as Wi-Fi interface is possible in the following operating modes:

- Infrastructure mode  
Wi-Fi connection via an existing network.
- Mini access point mode  
The device is a Wi-Fi access point and provides its own network.



Wi-Fi / Bluetooth interface



Infrastructure mode

**⚠ WARNING**

The device is not approved for safety-related tasks in the field of operator protection. It is, however, permitted to download safety software via this device to provide it to other devices for installation.

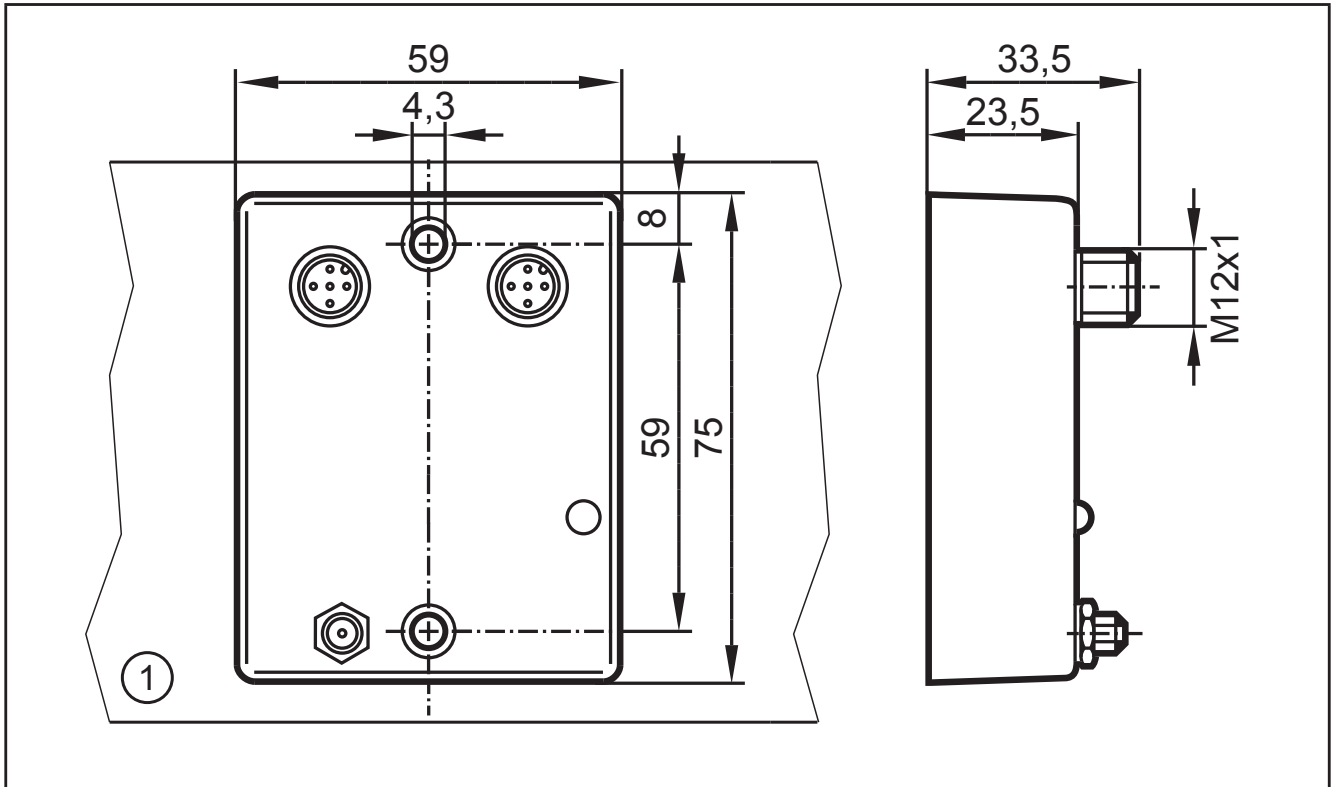
### 3.1 Overview of the functions

- Integration into a machine network via CAN interface
- Provision of its own network, function as Wi-Fi access point
- Real-time diagnostics via CODESYS programming system
- ServiceTool (visualisation tool)

## 4 Installation

### 4.1 Fixing the device

- ▶ Use 2 M4 x 25 cylinder head bolts (to DIN 912) and 2 tooth lock washers for M4 (to DIN 6797) to fix the device on an even surface.



Installation (figure shows CR3131 CANwireless)

1: Mounting surface

### 4.2 Mounting the antennas

Wi-Fi /Bluetooth planar antenna for the CR3131 device: art. no. EC2118

- ▶ When mounting the antennas in vehicles avoid the vicinity of fuel tanks, vessels with explosives or insufficiently screened electronic components (→ 2 Safety instructions).
- ▶ Position the antennas so that a permanent distance of min. 0.2 m from people is ensured during operation.
- ▶ Do not install the antennas in closed metal constructions such as the driver's cab.
- ▶ Please observe the notes of the antenna manufacturer.

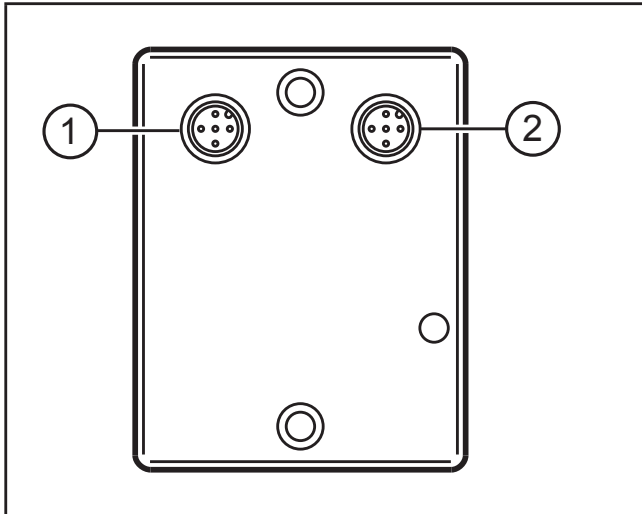


Stable data transmission requires a good antenna signal. In case of problems change the position of the antennas or the mobile equipment if necessary.

A loosely tightened antenna connector also causes signal loss.

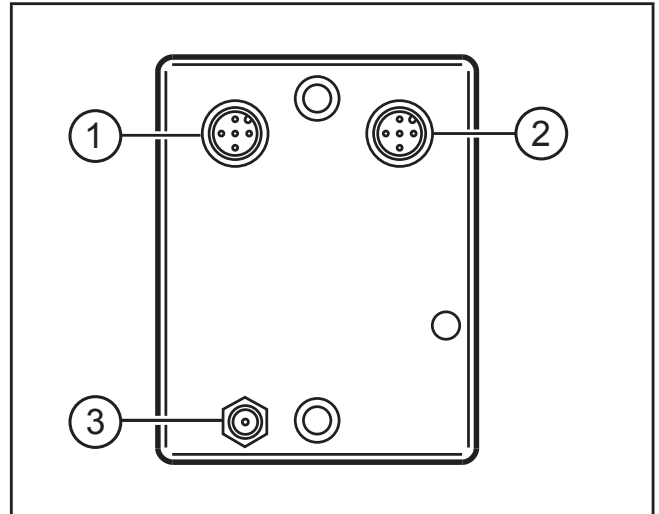
## 5 Electrical connection

### 5.1 Connectors



CR3130

- 1: Operating voltage and CAN interface
- 2: Service interface



CR3131

- 1: Operating voltage and CAN interface
- 2: Service interface
- 3: RP-SMA socket for Wi-Fi / Bluetooth antenna

#### NOTE

IP 65 or IP 67 is only ensured if all connectors are connected or protective caps are screwed onto the sensor.

### 5.2 Operating voltage and CAN interface

No standard pin connection (see table below)

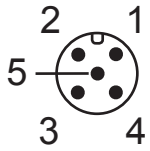
M12 connector (5 poles)	Pin	Potential
	Operating voltage	1
		2
		3
	CAN interface	4
		5

#### NOTE

To avoid damage to the device, connect/disconnect the M12 connector only if the device is disconnected from power.

### 5.3 Service interface

The service interface is mainly used for factory configuration of the device and firmware update.

M12 connector (5 poles)	Pin	Potential
	1	GND
	2	Not connected
	3	DTR (boot)
	4	RxD (input)
	5	TxD (output)

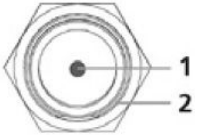
UK

### 5.4 Wi-Fi / Bluetooth antenna (art. no. EC2118, only for CR3131)

#### NOTE

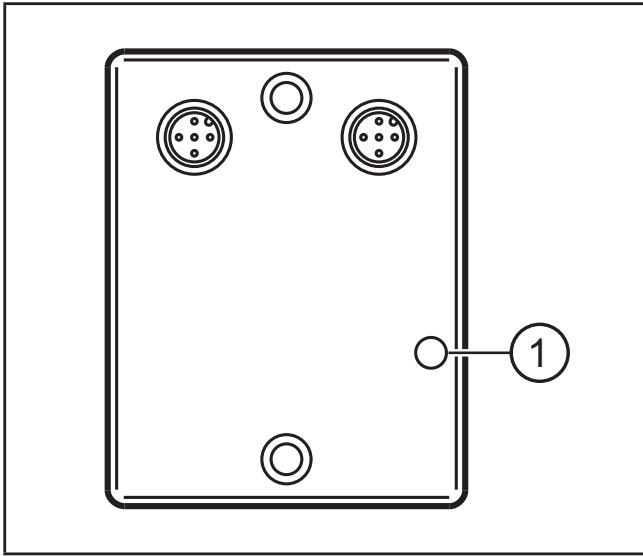
Only connect or remove antennas if the device is disconnected from power. Put the device into operation with connected antennas only.

- ▶ Do not extend or shorten the antenna cable.
- ▶ Please observe the notes of the antenna manufacturer.

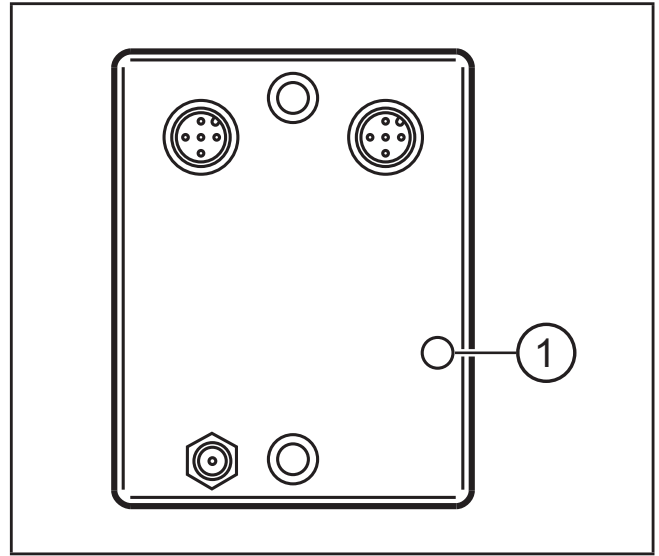
RP-SMA socket		Pin	Potential
	Signal	1	Wi-Fi / Bluetooth
	GND	2	Screen/housing

## 6 Indicators







### 6.1 LEDs



CR3130  
1: Status LED



CR3131  
1: Status LED

Colour	State	Description
	Off	No data is transmitted / received or no voltage supply
Green	On	Wi-Fi or Bluetooth connection active
	Flashing	 Ready for Wi-Fi or Bluetooth connection
		 Bluetooth connection is established
		 Device initialisation
		 Reset status
Red	On	CAN error, critical voltage
	Flashing	 Device ready for reset to factory settings
		 CAN data transfer
Orange	On	Configuration mode or firmware update

## 7 Set-up

### 7.1 Necessary components

The following components are needed to configure and set up the device:

#### 7.1.1 Hardware

- CR313x CANwireless  
Ensure that all components necessary for the device configuration are used (→ 7.2 Connect the device).
- CANwireless antenna (art. no. EC2118, only for CR3131)
- PC
- CAN/PC interface (e.g. CAN/RS232 USB interface CANfox, art. no.: EC2112)
- CAN bus terminating resistors (2 x 120 Ω)

#### 7.1.2 Software

Device configuration

- ifm maintenance tool as from version V02.02.13

Device integration into the application program

- CODESYS programming system
- CANremote CODESYS client/gateway (optional)
- Electronic data sheet (EDS) (optional)

#### 7.1.3 Documentation

- CODESYS programming manual  
(alternatively as online help)
- System manual of the controller used  
(alternatively as online help)

The manuals are available on the internet in PDF format by entering the corresponding article number:

[www.ifm.com](http://www.ifm.com) → Data sheet search → Article number → More information

Software, function libraries and manuals (as online help):

[www.ifm.com](http://www.ifm.com) → Service → Download → Systems for mobile machines\*

\*) Download area with registration

### 7.2 Connect the device

- ▶ Connect the CANwireless antenna to the device (only CR3131).
- ▶ Provide the CAN bus with 120 Ω terminating resistors.
- ▶ Connect the CAN/PC interface with the CAN adapter cable to the device and connect it to the PC.
- ▶ Apply the supply voltage.

### 7.3 Wi-Fi interface

The use as Wi-Fi interface allows wireless transfer of CAN data to other Wi-Fi capable devices such as PCs, smartphones or tablets on which CAN data can be recorded and evaluated.

The device can be integrated in the existing network infrastructure (infrastructure mode). In the mini access point mode the device can assume the function of a Wi-Fi router and provide a wireless network for other Wi-Fi capable devices in the infrastructure mode. The network parameters can then be provided by CANwireless via DHCP server.

Data is exchanged bidirectionally as soon as the software has established a connection to the device.

The ifm maintenance tool is used for the configuration via the CAN interface.

### 7.4 Wi-Fi configuration

The use as Wi-Fi bridge ensures wireless transfer of CAN data between two CAN bus systems. In this case, two CANwireless devices replace the CAN cable.

To use two devices as Wi-Fi bridge, one device must be configured as slave and one device as master. The device is configured as slave by the factory.

The ifm maintenance tool can be used for the configuration.

#### 7.4.1 Wi-Fi mini access point mode

Configuration device 1 (master):



In the Wi-Fi bridge mode some of the data entered here is also required for the configuration of device 2 (slave).

- ▶ Deactivate Bluetooth under "Bluetooth settings".
- ▶ Activate Wi-Fi under "WLAN settings".
- ▶ Select "Mini AP" under "Operating mode".
- ▶ Enter a network name under "SSID".
- ▶ Select the Wi-Fi encryption under "Authentication type" which complies with the required safety criteria and enter the respective data.
- ▶ Select the required frequency, channel and data rate under "Access Point Settings".
- ▶ Select the DHCP mode "Server" under IP settings.
- ▶ Enter the desired host name (may be identical with the SSID).
- ▶ Activate "Socket Server".
- ▶ Enter the requested port under "Port number".
- ▶ Select the requested communication protocol under "Protocol".

- ▶ Deactivate "Automatic socket connection".
- ▶ Transfer the configuration to device 1.

#### 7.4.2 Wi-Fi infrastructure mode

Configuration device 2 (slave):

- ▶ Deactivate Bluetooth under "Bluetooth settings".
- ▶ Activate Wi-Fi under "WLAN settings".
- ▶ Select the "Infrastructure" operating mode under "Operating mode".
- ▶ Enter the network name configured in device 1 under "SSID".
- ▶ Select the Wi-Fi encryption configured in device 1 and enter the respective data.
- ▶ Select the DHCP mode "Client".
- ▶ Enter the requested host name. (Must not be identical with the host name of device 1.)
- ▶ Deactivate "Socket Server".
- ▶ Activate "Automatic socket connection".
- ▶ Enter the IP address of device 1 under "Remote address" (default value: 192.168.82.246).
- ▶ Enter the data configured in device 1 under "Port number" and "Protocol".
- ▶ Transfer the configuration to device 2.

The connection between a configured master and slave device is made automatically after power-on. Data is exchanged bidirectionally as soon as the connection between the two devices has been established.

#### 7.5 Bluetooth interface

The use as Bluetooth interface allows wireless transfer of CAN data to other Bluetooth capable devices such as PCs, smartphones or tablets on which CAN data can be recorded and evaluated. Data is exchanged bidirectionally as soon as the software has established a connection to the device.

The ifm maintenance tool is used for the configuration via the CAN interface.

## 7.6 Bluetooth configuration

For a Bluetooth bridge the slave configuration should be made first. For the slave configuration the Bluetooth MAC address and the pin code of the master device are required.

Configuration device 1 (master):

- ▶ Deactivate "Wi-Fi" under "WLAN settings".
- ▶ Activate Bluetooth under "Bluetooth settings".
- ▶ Enter a device name under "Device name".
- ▶ Activate "Discoverable" and "Pairable".
- ▶ Set the parameter "Security mode Bluetooth 2.1" under "Security settings" to "Disable".
- ▶ Activate "Allow Bluetooth 2.0 pairing".
- ▶ Enter a four-digit code under "Pin code".
- ▶ Deactivate "Automatic Bluetooth Connection".
- ▶ Activate "SPP Server".
- ▶ Transfer the configuration to device 1.
- ▶ Take down the Bluetooth MAC address of the master device (can be found on the housing).

Configuration device 2 (slave):

- ▶ Deactivate "Wi-Fi" under "WLAN settings".
- ▶ Activate Bluetooth under "Bluetooth settings".
- ▶ Enter a device name under "Device name".
- ▶ Activate "Discoverable" and "Pairable".
- ▶ Set the parameter "Security mode Bluetooth 2.1" under "Security settings" to "Disable".
- ▶ Activate "Allow Bluetooth 2.0 pairing".
- ▶ Enter the four-digit code configured in device 1 under "Pin code".
- ▶ Activate "Automatic Bluetooth Connection".
- ▶ Enter the Bluetooth MAC address of the master device under "Bluetooth MAC address".
- ▶ Deactivate "SPP Server".
- ▶ Transfer the configuration to device 2.

## 8 Technical data

### 8.1 CR3130

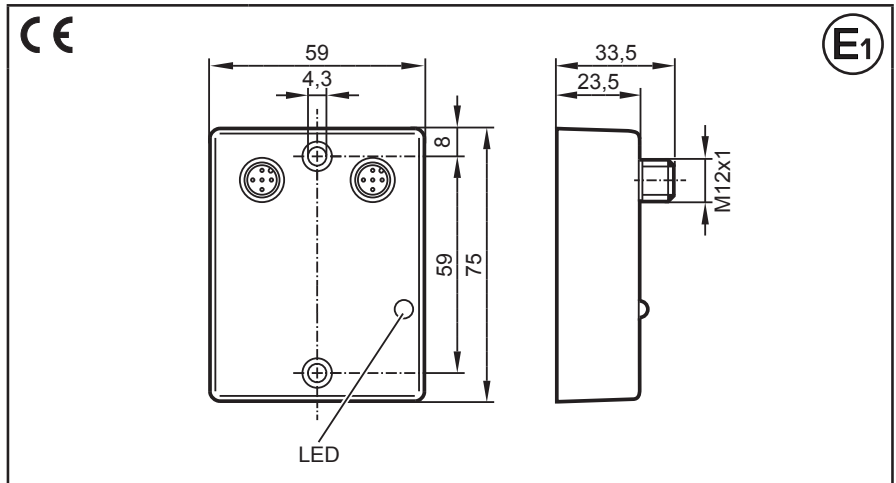
#### CR3130

CANwireless  
with integrated antenna

CAN Wi-Fi/Bluetooth  
interface

Wi-Fi frequency bands  
2.4 GHz and 5 GHz

8...32 V DC



#### Technical data

##### Electrical data

Operating voltage  $U_B$

8...32 V DC

Current consumption

$\leq 60$  mA (at 24 V DC)

Status LED

1 x 2 colours (red / green)

##### CAN interface

Profile

CAN interface 2.0 A/B, ISO 11898-2

Protocol

CANopen, CAN Layer 2, J1939

CAN receive buffer

2048 messages

CAN to Wi-Fi buffer size

2048 messages

##### Wi-Fi

Frequency band

2.4 / 5 GHz

Protocol

IEEE 802.11 a/b/g/n, IEEE 802.11 d/e/i/h

Safety standard

WPA2-PSK, WPA-PSK, WEP64, WEP128, LEAP, PEAP

Range

$\leq 75$  m

Functions

Wi-Fi bridge (infrastructure mode)  
Wi-Fi interface (infrastructure mode or mini access point mode)

Transmission rate <sup>1)</sup>

1600 CAN messages per second

Average latency time <sup>2)</sup>

$\leq 20$  ms (Wi-Fi bridge)

##### Bluetooth

Standard

Bluetooth Classic (2.1 + EDR)

Profile

SPP (Serial Port Profile)

Range

$\leq 75$  m

Functions

Bluetooth bridge  
Bluetooth interface

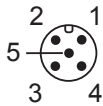
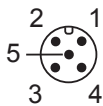
Transmission rate <sup>1)</sup>

4000 CAN messages per second

Average latency time <sup>2)</sup>

$\leq 20$  ms (Bluetooth bridge)

UK

CR3130	Technical data																
<b>Software</b>																	
Device configuration	ifm maintenance tool or CODESYS with EDS file																
Remark	For more information see <a href="http://www.ifm.com">www.ifm.com</a> → CR3130																
<b>Mechanical data</b>																	
Ambient temperature	-30...75 °C																
Protection rating	IP 67																
Housing material	polyamide (black)																
Weight	0.060 kg																
<b>Test standards and regulations</b>																	
CE	EN 60950-1 EN 301489-1 V1.9.2 EN 301489-17 V2.2.1 EN 61000-6-2 EN 61000-6-3 EN 300328 V1.9.1 EN 301893 V1.8.1																
E1	UN/ECE-R10																
FCC	FCC Part 15/47 CFR Conducted Limits FCC Part 15/47 CFR Radiated Emission Limits regarding Part 15 of the FCC rules (Class B digital devices)																
<b>Wiring</b>																	
CAN / supply M12 connector, 5 poles		<table border="1"> <tr> <td>1</td> <td>GND</td> <td>Ground</td> </tr> <tr> <td>2</td> <td>U<sub>B</sub></td> <td>Supply</td> </tr> <tr> <td>3</td> <td>Not connected</td> <td>Not connected</td> </tr> <tr> <td>4</td> <td>CAN_H</td> <td>CAN interface (high)</td> </tr> <tr> <td>5</td> <td>CAN_L</td> <td>CAN interface (low)</td> </tr> </table>	1	GND	Ground	2	U <sub>B</sub>	Supply	3	Not connected	Not connected	4	CAN_H	CAN interface (high)	5	CAN_L	CAN interface (low)
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2	U <sub>B</sub>	Supply															
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RS-232 M12 connector, 5 poles		<table border="1"> <tr> <td>1</td> <td>GND</td> <td>Ground</td> </tr> <tr> <td>2</td> <td>Not connected</td> <td>Not connected</td> </tr> <tr> <td>3</td> <td>DSR</td> <td>Data Set Ready (boot)</td> </tr> <tr> <td>4</td> <td>RxD</td> <td>RS-232 receive (input)</td> </tr> <tr> <td>5</td> <td>TxD</td> <td>RS-232 transmit (output)</td> </tr> </table>	1	GND	Ground	2	Not connected	Not connected	3	DSR	Data Set Ready (boot)	4	RxD	RS-232 receive (input)	5	TxD	RS-232 transmit (output)
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3	DSR	Data Set Ready (boot)															
4	RxD	RS-232 receive (input)															
5	TxD	RS-232 transmit (output)															
Remarks	<sup>1)</sup> for CAN messages and 1 MBit/s  <sup>2)</sup> for transmission of a single CAN message																

## 8.2 CR3131

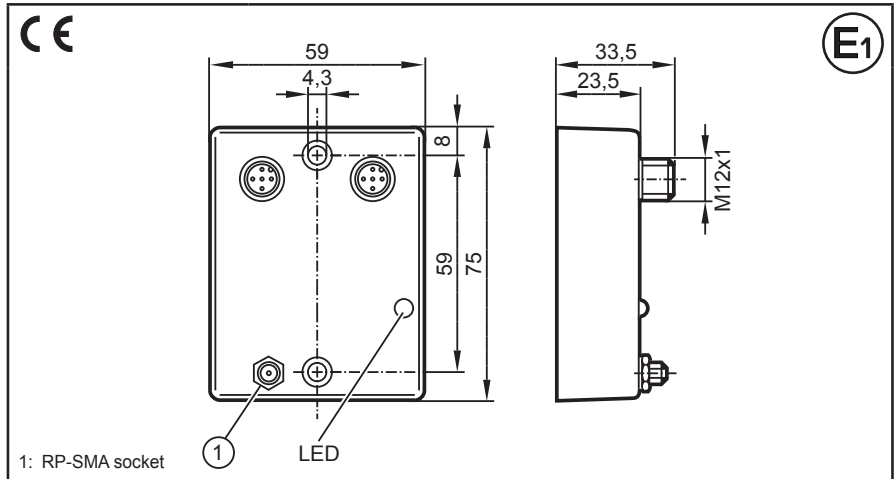
### CR3131

CANwireless  
for connection to an  
external antenna

CAN Wi-Fi/Bluetooth  
interface

Wi-Fi frequency bands  
2.4 GHz and 5 GHz

8...32 V DC



#### Technical data

##### Electrical data

Operating voltage  $U_B$

8...32 V DC

Current consumption

$\leq 60$  mA (at 24 V DC)

Status LED

1 x 2 colours (red / green)

##### CAN interface

Profile

CAN interface 2.0 A/B, ISO 11898

Protocol

CANopen, CAN Layer 2, J1939

CAN receive buffer

2048 messages

CAN to Wi-Fi buffer size

2048 messages

##### Wi-Fi

Frequency band

2.4 / 5 GHz

Protocol

IEEE 802.11 a/b/g/n, IEEE 802.11 d/e/i/h

Safety standard

WPA2-PSK, WPA-PSK, WEP64, WEP128, LEAP, PEAP

Range <sup>1)</sup>

$\leq 200$  m

Functions

Wi-Fi bridge (infrastructure mode)  
Wi-Fi interface (infrastructure mode or mini access point mode)

Transmission rate <sup>2)</sup>

1600 CAN messages per second

Average latency time <sup>3)</sup>

$\leq 20$  ms (Wi-Fi bridge)

##### Bluetooth

Standard

Bluetooth Classic (2.1 + EDR)

Profile

SPP (serial port profile)

Range <sup>1)</sup>

$\leq 100$  m

Functions

Bluetooth bridge  
Bluetooth interface

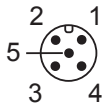
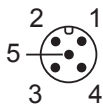
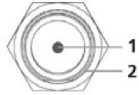
Transmission rate <sup>2)</sup>

4000 CAN messages per second

Average latency time <sup>3)</sup>

$\leq 20$  ms (Bluetooth bridge)

UK

CR3131	Technical data																
<b>Software</b>																	
Device configuration	ifm maintenance tool or CODESYS with EDS file																
Remark	For more information see <a href="http://www.ifm.com">www.ifm.com</a> → CR3131																
<b>Mechanical data</b>																	
Ambient temperature	-30...75 °C																
Protection rating	IP 65																
Housing material	polyamide (black)																
Weight	0.065 kg																
<b>Test standards and regulations</b>																	
CE	EN 60950-1 EN 301489-1 V1.9.2 EN 301489-17 V2.2.1 EN 61000-6-2 EN 61000-6-3 EN 300328 V1.9.1 EN 301893 V1.8.1																
E1	UNECE-R10																
FCC	FCC Part 15/47 CFR Conducted Limits FCC Part 15/47 CFR Radiated Emission Limits regarding Part 15 of the FCC rules (Class B digital devices)																
<b>Wiring</b>																	
CAN / supply M12 connector, 5 poles		<table border="1"> <tr> <td>1</td> <td>GND</td> <td>Ground</td> </tr> <tr> <td>2</td> <td>U<sub>B</sub></td> <td>Supply</td> </tr> <tr> <td>3</td> <td>Not connected</td> <td>Not connected</td> </tr> <tr> <td>4</td> <td>CAN_H</td> <td>CAN interface (high)</td> </tr> <tr> <td>5</td> <td>CAN_L</td> <td>CAN interface (low)</td> </tr> </table>	1	GND	Ground	2	U <sub>B</sub>	Supply	3	Not connected	Not connected	4	CAN_H	CAN interface (high)	5	CAN_L	CAN interface (low)
1	GND	Ground															
2	U <sub>B</sub>	Supply															
3	Not connected	Not connected															
4	CAN_H	CAN interface (high)															
5	CAN_L	CAN interface (low)															
RS-232 M12 connector, 5 poles		<table border="1"> <tr> <td>1</td> <td>GND</td> <td>Ground</td> </tr> <tr> <td>2</td> <td>Not connected</td> <td>Not connected</td> </tr> <tr> <td>3</td> <td>DSR</td> <td>Data Set Ready (boot)</td> </tr> <tr> <td>4</td> <td>RxD</td> <td>RS-232 receive (input)</td> </tr> <tr> <td>5</td> <td>TxD</td> <td>RS-232 transmit (output)</td> </tr> </table>	1	GND	Ground	2	Not connected	Not connected	3	DSR	Data Set Ready (boot)	4	RxD	RS-232 receive (input)	5	TxD	RS-232 transmit (output)
1	GND	Ground															
2	Not connected	Not connected															
3	DSR	Data Set Ready (boot)															
4	RxD	RS-232 receive (input)															
5	TxD	RS-232 transmit (output)															
Wi-Fi antenna RP-SMA socket <sup>1)</sup>		<table border="1"> <tr> <td>1</td> <td>Signal</td> <td>Wi-Fi / Bluetooth</td> </tr> <tr> <td>2</td> <td>GND</td> <td>Ground</td> </tr> </table>	1	Signal	Wi-Fi / Bluetooth	2	GND	Ground									
1	Signal	Wi-Fi / Bluetooth															
2	GND	Ground															
Remarks	<sup>1)</sup> with / for antenna article no. EC2118 <sup>2)</sup> for CAN messages and 1 MBit/s <sup>3)</sup> for transmission of a single CAN message																

## 9 Maintenance, repair and disposal

### 9.1 Servicing

The device does not contain any components that need to be maintained by the user.

### 9.2 Cleaning the housing surface

- ▶ Clean the device from dirt using a soft, chemically untreated and dry cloth.
- ▶ In case of heavy dirt, use a damp cloth.

### 9.3 Repair

- ▶ The device must only be repaired by the manufacturer.  
Observe the safety instructions (→ 2).

### 9.4 Disposal

- ▶ Dispose of the device in accordance with the national environmental regulations.

UK

## 10 Approvals/standards

Test standards and regulations

The EC declaration of conformity and approvals can be found at:  
www.ifm.com → Data sheet search → Article number → More information

## 11 Appendix

### 11.1 Wi-Fi encryption

(→ 8 Technical data)

Name	Authentication	Data protection
none	no	no
WEP64	yes	to WEP64
WEP128	yes	to WEP128
WPA/WPA2 mixed mode	yes	to WPA or WPA2
PEAP	yes	via RADIUS server

### 11.2 Wi-Fi frequencies and channels

The radio module of the device has an automatic domain recognition and supports the following regulatory domains: WORLD, ETSI, FCC.

If neither ETSI nor FCC are recognised, the radio module uses WORLD as a standard.

Name	Band	TX channel
WORLD	2.4 GHz	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
	U-NII-1	36, 40, 44, 48
	U-NII-2	52, 56, 60, 64
	U-NII-2e	100, 104, 108, 112, 116, 132, 136, 140
	U-NII-3	-
ETSI	2.4 GHz	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
	U-NII-1	36, 40, 44, 48
	U-NII-2	52, 56, 60, 64
	U-NII-2e	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140
	U-NII-3	149, 153, 157, 161, 165
FCC	2.4 GHz	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
	U-NII-1	36, 40, 44, 48
	U-NII-2	52, 56, 60, 64
	U-NII-2e	100, 104, 108, 112, 116, 132, 136, 140
	U-NII-3	149, 153, 157, 161, 165



If the Wi-Fi network uses a channel that is not present in the recognised domain, communication may not function.

## 11.3 Object directory

Index	S-Idx	Designation	Type		Default	Description
0x1000	0	Device Type	UInt32	ro	0	Default value: 00000000 = Device that does not follow a standardised CANopen device profile. This parameter is read only.
0x1001	0	Error register	UInt32	ro	0	
0x1008	0	Device Name	String	rw	"CANwireless"	CANwireless
0x1009	0	Hardware version as string	String	ro	-	
0x1009	1	Hardware version as u16	UInt16	ro	-	
0x100A	0	Software version as string	String	ro	-	
0x100A	1	Software version as u16	UInt16	ro	-	
0x1011	1	Restore all Default Parameters	UInt32	wo	0	Restore all parameters to default after next device reset. Write ,load' to this entry.
0x1011	2	Restore Communication Default Parameters	UInt32	wo	0	Restore the communication parameters to default after next device reset. Write ,load' to this entry.
0x1011	19	Restore CAN EEP Filter, Masks and Inhibit-Time	UInt32	wo	0	Restore the CAN receiver settings to default after next device reset. Write ,load' to this entry.
0x1018	1	Vendor ID	UInt32	rw	0x524D	The vendor id value
0x1018	4	Serial Number	UInt32	rw	-	The product serial number
0x1018	6	Date of Manufacture	UInt32	rw	-	Time in UNIX u32 format
0x1201	1	COB-ID Client->Server (rx)	UInt32	rw	0x600	Rx COB Server 1
0x1201	2	COB-ID Server->Client (tx)	UInt32	rw	0x580	Tx COB Server 1
0x1202	1	COB-ID Client->Server (rx)	UInt32	rw	0x600	Rx COB Server 2
0x1202	2	COB-ID Server->Client (tx)	UInt32	rw	0x580	Tx COB Server 2

0x20F4	0	Disable CANopen Objects	UInt8	rw	0	0: Keep CANOpen Stack active while connected
						1: Keep CANOpen Stack not active while connected
0x3000	0	Configuration Mutex	UInt8	rw	0	NOT NEEDED FOR CUSTOMERS
0x3000	1	Operating Mode	UInt8	rw	1	1: Infrastructure
0x3000	2	SSID	String	rw	"CANwireless_XXXXXXX"	Network SSID
						Default: CANwireless_XXXXXXX, where XXXXXXX = serial number
0x3000	4	Authentication Type	UInt8	rw	0	0: None
						3: WEP64
						4: WEP128
						7: WPA/WPA2 Mixed
						8: LEAP
9: PEAP						
0x3000	5	Authentication Key	String	rw	-	WPA/WPA2 Key or WEP Key
0x3000	6	User Name	String	rw	-	User Name for PEAP
0x3000	7	Domain Name	String	rw	-	Domain Name for PEAP
0x3000	8	Password	String	rw	-	Password for PEAP
0x3000	9	DHCP Mode	UInt8	rw	1	0: Disabled
						1: DHCP Client
0x3000	A	IP Address	String	rw	192.168.82.246	Static IP Address
0x3000	B	Network Mask	String	rw	255.255.255.0	Static Network Mask
0x3000	C	Gateway Address	String	rw	192.168.82.1	Static Gateway Address
0x3000	D	Primary DNS Server	String	rw	192.168.0.1	Static Primary DNS Address
0x3000	E	Secondary DNS Server	String	rw	192.168.0.2	Static Secondary DNS Address
0x3000	0xF	Access Point Channel	UInt32	rw	0	How is the channel formatted?
0x3000	0x10	802.11b Data rates	UInt16	rw	0	Bit 0 = 1 Mbit/s
						Bit 1 = 2 Mbit/s
						Bit 2 = 5.5 Mbit/s
						Bit 3 = 11 Mbit/s



0x3000	0x11	802.11ag Data rates	UInt16	rw	0	Bit 0 = 6 Mbit/s
						Bit 1 = 9 Mbit/s
						Bit 2 = 12 Mbit/s
						Bit 3 = 18 Mbit/s
						Bit 4 = 24 Mbit/s
						Bit 5 = 36 Mbit/s
						Bit 6 = 48 Mbit/s
						Bit 7 = 54 Mbit/s
0x3001	1	Current SSID	String	ro	0	Current SSID Used (WLAN)
0x3001	2	Current BSSID	String	ro	0	Current BSSID Used (WLAN)
0x3001	3	Current RSSI	Int32	ro	0	Current RSSI [in dbm] (WLAN)
0x3001	4	Current Channel	UInt32	ro	0	Current Channel Used (WLAN)
0x3001	5	Current IP	String	ro	0	Current IP Used (WLAN)
0x3001	6	Current Network Mask	String	ro	0	Current Network Mask Used (WLAN)
0x3001	7	Current Gateway Address	String	ro	0	Current Gateway Address (WLAN)
0x3001	8	Current Primary DNS Server	String	ro	0	Current Primary DNS Server (WLAN)
0x3001	9	Current Secondary DNS Server	String	ro	0	Current Secondary DNS Server (WLAN)
0x3001	A	WLAN/Bluetooth Error Code	UInt16	ro	0	Error Code
0x3001	B	WLAN/Bluetooth State	UInt8	ro	0	1: Ini
						2: Pre-Operational
						3: WLAN/Bluetooth connected
						4: Server/Client connected (TCP/UDP connection)
						5: Save Bluetooth Pairing State Active
						0xFF: Fatal Error
0x3002	1	Discoverable	UInt8	rw	1	0: Disabled
						1: Enabled
0x3002	2	Pairable	UInt8	rw	1	0: Disabled
						1: Enabled

0x3002	3	Security Mode Bluetooth 2.1	UInt8	rw	1	1: Disabled
						2: Just Works
0x3002	4	Allow Pairing Bluetooth 2.0	UInt8	rw	1	0: Disabled
						1: Enabled
0x3002	5	Devicename	String	rw	"CANwireless_XXXXXXX"	Bluetooth Device Name
0x3002	6	PinCode Bluetooth 2.0	String	rw	0	Pin Code for Pairing with Bluetooth 2.0 Devices
0x3003	1	Socket Server Enable/WLAN	UInt8	rw	1	0: Disabled
						1: Enabled
0x3003	2	Socket Listen Port Number/WLAN	UInt16	rw	30000	Socket Server Listen Port Number
0x3003	3	Socket Listen Protocol/WLAN	UInt8	rw	0	0: TCP
						1: UDP
0x3003	4	SPP Server enable/Bluetooth	UInt8	rw	1	0: Disabled
						1: Enabled
0x3003	5	SPP ServiceName/Bluetooth	String	rw	0	Service Name for SPP
0x3004	0	Socket Auto Connect Enable/WLAN	UInt8	rw	0	0: Disabled
						1: Enabled
0x3004	1	Socket Auto Connect Address/WLAN	String	rw	0	e.g. IP of Peer
0x3004	2	Socket Auto Connect Port Number/WLAN	UInt16	rw	30000	Port Number of Peer
0x3004	3	Socket Auto Connect Protocol/WLAN	UInt8	rw	0	0: TCP
						1: UDP
0x3004	5	SPP Auto Connect Enable/Bluetooth	UInt8	rw	0	0: Disabled
						1: Enabled
0x3004	6	SPP Auto Connect MAC/Bluetooth	String	rw	0	Bluetooth MAC Address of Peer

0x3005	1	Host Name/ WLAN	String	rw	0	Friendly Name of Device in Network
0x3006	1	Bluetooth Scan (Inquiry)	UInt8	rw	0	0: Default
						2: Bluetooth Scan
0x3006	2	Save Bluetooth Pairing Command (only for Security Mode Just works)	UInt8	rw	0	0: Default
						1: Start Save Pairing Mode (60s)
0x3006	4	Bluetooth Scan Result (Inquiry)	Raw Data	ro	0	Struct with Data(MAC[0]: 13 Bytes; RSSI[0]: 11 Bytes; Class of Device[0]: 8 Bytes; Device Name[0]: 32 Bytes; MAC[1] ...)
0x3006	5	WLAN/Bluetooth Connection Control Command	UInt8	rw	0	0: Default
						1: Disconnect WLAN/Bluetooth Connections
						2: Connect WLAN and Bluetooth to Nonvolatile Address
						3: Connect WLAN to Nonvolatile Address, Connect Bluetooth to Volatile Address
						4: Connect WLAN to Volatile Address, Connect Bluetooth to Nonvolatile Address
						5: Connect WLAN to Volatile Address, Connect Bluetooth to Volatile Address
						Setting command is triggered as soon as value is not 0, will always read back 0
0x3006	8	Socket Auto Connect URL/ WLAN (Dynamic Connect, Volatile)	String	rw	0	e.g. IP for Dynamic Connect to Volatile Address
0x3006	9	Socket Auto Connect Port/ WLAN (Dynamic Connect, Volatile)	UInt16	rw	0	e.g. Port for Dynamic Connect to Volatile Address



0x3006	A	Socket Auto Connect Protocol/WLAN (Dynamic Connect, Volatile)	UInt8	rw	0	0: TCP
						1: UDP
0x3006	B	SPP Auto Connect MAC/ Bluetooth (Dynamic Connect, Volatile)	String	rw	0	Bluetooth MAC for Dynamic Connect to Volatile Address
0x3006	C	Scan Bluetooth Ready Flag	UInt8	ro	0	0: not ready/not started
						1: ready
0x3006	D	Save Pairing Ready Flag	UInt8	ro	0	0: not ready/not started
						1: ready
0x3007	1	Bluetooth MAC Address (Bluetooth Address)	String	ro	0	Own Bluetooth Address
0x3007	2	WLAN MAC Address	String	ro	0	Own WLAN MAC Address
0x3007	3	Firmware Version Radio Module	String	ro	0	Firmware Version of Radio Module, e.g. 1.0.0.5
0x3008	1	Request WLAN/ Bluetooth Info Enable	UInt8	rw	0	0: Disabled
						1: Enabled
0x3008	2	WLAN Enable	UInt8	rw	1	0: Disabled
						1: Enabled
0x3008	3	Blueooth Enable	UInt8	rw	1	0: Disabled
						1: Enabled
0x3333	2	Clamp 30	UInt8	ro	0	Voltage of the power supply measured in V.
						This parameter is read-only.
0x3333	3	CANopen NMT state	UInt8	ro	0	0: Initialization
						5: Operational



0x3333	D	CAN1 on (Bit 0: CAN1 on Bit 1: Echo1 on)	UInt8	ro	0	[VOLATILE]
						Bit 0: CAN1 on à Enable transmission of CAN messages over the air
						Bit 1: Echo1 on à CAN messages which are sent to CAN via the air, will be send back to transmitter as feedback
0x3333	18	CAN Overflow	UInt8	ro	0	CAN receive buffer overflow
						Value = 0 - No error
						Value > 0 - CAN buffer overflow error occurred
						The Parameter is read-only.
0x3333	23	CAN1 Mode	UInt8	ro	0	0: Normal
						1: Error
						2: Bus off
						3: Silent
0x4000	18	CAN Message Output	UInt8	rw	0	[NON-VOLATILE]
						Bit 0: CAN1 on à Enable transmission of CAN messages over the air
						Bit 1: Echo1 on à CAN messages which are sent to CAN via the air, will be send back to transmitter as feedback
0x4000	19	Timestamp Mode	UInt8	rw	0	Bit0: (1=Timest. on 0=Timest. off)
						Bit1: (0=Abs 1=Rel)
						Bit4: (1=Error and Echo Feedback Timestamp on 0 = off)
0x4000	1A	WLAN/Bluetooth Messages checked per Loop	UInt16	rw	32	Wireless Bytes Checked per Mainloop
0x4000	1B	CAN Messages checked per Loop	UInt16	rw	32	Maximum number of CAN messages read and processed from the receive buffer per one CAN message handling function call.
0x4000	1C	SDO Server Timeout	UInt16	rw	2000	SDO server Timeout in ms
0x4000	22	Operation-Hour Counter	UInt32	rw	0	Operation-Hour Counter with resolution of 1 minute.
0x4050	3	Node Id CAN 1	UInt8	rw	33	CANOpen Node ID. A CANopen Slave is able to have a Node ID between 1 .. 127.

0x4051	3	CAN 1 Baudrate	UInt8	rw	3	Available Baud Rates on CAN interface:
						- 0: 1 Mbits
						- 1: 800 kbits
						- 2: 500 kbits
						- 3: 250 kbits
						- 4: 125 kbits
						- 5: 100 kbits
						- 6: 50 kbits
						- 7: 20 kbits
						- 8: 10 kbits
						- 9: 83.333 kbits
- 10: Customer specific Baud Rate						
0x4052	3	CAN 1 Baudrate SFR	UInt32	rw	0	User Defined Baudrate as Register Value (Proemion Support)
0x4053	3	CAN 1 Producer Heartbeat Time	UInt16	rw	0	Time in ms for the CANopen Heartbeat Object, active on CAN 1.
						Value = 0: No Producer Heartbeat active.
0x4054	3	CAN1 Behaviour	UInt32	rw	0	Bit0: NMT Bootup active? (0: No Bootup message, 1: Send Bootup message)
						Bit1: reserved
						Bit2: CAN Analyzer Mode (0: CAN-active, 1: CAN-passive)
0x4055	1	Version	UInt8	ro	0	
0x4055	3	CAN NMT startup	UInt32	rw	0	Available NMT Startup Modes
						- 0: Enter Operational automatically
						- 2: Enter Operational automatically and send NMT Start to all Nodes
0x500A	0	Bootloader Firmware Version as String	String	ro		Reserved
0x500A	1	Bootloader Version as u16	UInt16	ro	0	Reserved



0x5020	1	CAN Receive Object ID (EEPROM)	UInt32	rw	80000000	CAN receive object ID (EEPROM).
						This value is used to set the RAM receive ID automatically after a device reset.
						Combined with the value of the corresponding mask register it is possible to specify which CAN message identifiers will be received during „Realtime mode“ is active.
						The bits of this variable have the following function:
						Bit 31 = 0: Receive object will be receiving data (is active)
						Bit 31 = 1: Receive object is deactivated
						Bit 30: not used, set to 0
						Bit 29 = 0: 11-bit CAN-ID type
						Bit 29 = 1: 29-bit CAN-ID type
						Bits 0 to 28: CAN identifier
0x5021	1	CAN Receive Object ID (RAM)	UInt32	rw	80000000	CAN receive object ID (RAM).
						Combined with the value of the corresponding mask register it is possible to specify which CAN message identifiers will be received while „CAN Communication“ is active. This value may be changed dynamically during operation.
						The bits of this variable have the following function:
						Bit 31 = 0: Receive object will be receiving data (is active)
						Bit 31 = 1: Receive object is deactivated
						Bit 30: not used, set to 0
						Bit 29 = 0: 11-bit CAN-ID type
						Bit 29 = 1: 29-bit CAN-ID type
Bits 0 to 28: CAN identifier						

0x5022	1	CAN Receive Object Mask (EEPROM)	UInt32	rw	0	CAN receive object mask (EEPROM).
						This value is used to set the RAM mask automatically after a device reset. Combined with the value of the corresponding receive object ID it is possible to specify which CAN message identifiers will be received during „Realtime mode“ is active.
						The bits of this variable have the following function:
						Bits 0 to 28: Mask value
						Bits 29 to 31= unused, set to 0
						Bit set to 0: don't care mode
Bit set to 1: the corresponding bit in the received identifier has to match to the setting of the filter register bit						
0x5023	1	CAN Receive Object Mask (RAM)	UInt32	rw	0	CAN receive object mask (RAM).
						Combined with the value of the corresponding receive object ID it is possible to specify which CAN message identifiers will be received during „Realtime mode“ is active. This value may be changed dynamically during operation.
						The bits of this variable have the following function:
						Bits 0 to 28: Mask value
						Bits 29 to 31= unused, set to 0
						Bit set to 0: don't care mode
Bit set to 1: the corresponding bit in the received identifier has to match to the setting of the filter register bit						
0x5024	1	CAN Receive Object - Downsampling Time (EEPROM)	UInt16	rw	0	These are the preset values at the device after reset and loaded into the RAM. Please refer to the CAN Receive Object - Downsampling time (RAM)

0x5025	1	CAN Receive Object - Downsampling time (RAM)	UInt16	rw	0	<p>CAN receive object - downsampling time in ms (RAM).</p> <p>This time period must elapse before another CAN message matching the corresponding object filter (ID and mask) will be received.</p> <p>If this value is set to 0, every message matching the filter will be received.</p> <p>This value may be changed dynamically during operation.</p>
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