Operating instructions

CANwireless

CR3133

GB

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1 Preliminary note

You will find instructions, technical data, approvals and further information using the QR code on the unit / packaging or at documentation.ifm.com.

1.1 Symbols used

✓	Requirement
▶	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

ATTENTION

Warning of damage to property

CAUTION

Warning of personal injury

▷ Slight reversible injuries may result.

WARNING

Warning of serious personal injury

▷ Death or serious irreversible injuries may result.

2 Safety instructions

- The unit described is a subcomponent for integration into a system.
  - The system architect is responsible for the safety of the system.
  - The system architect undertakes to perform a risk assessment and to create documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the architect of the system.
- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Intended use).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, programming, configuration, operation and maintenance of the product must be carried out by personnel qualified and authorised for the respective activity.
- Protect units and cables against damage.
- Replace damaged units, otherwise the technical data and safety will be impaired.
- Observe applicable documents.

2.1 Cyber security

ATTENTION

Operating the machine in an unprotected network environment

▷ Unauthorised read or write access to data is possible.

▷ Unauthorised manipulation of the device function is possible.

▶ Check and restrict access options to the device.

2.2 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.

3 Intended use

The device allows wireless transfer of CAN data of a vehicle or machine via a WLAN or a Bluetooth interface to another CANwireless device or to any Bluetooth device. Available modes are a CAN bridge to another machine or a direct wireless connection to any other device.

Available interfaces: Bluetooth and WLAN

4 Function

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

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

The parameters of the device are set via the CAN interface.

4.1 CAN bridge via Bluetooth

The CAN bridge via Bluetooth enables M2M (machine-to-machine) communication between two machines. The CANwireless devices connect via Bluetooth and exchange CAN messages. This replaces the physical CAN cable.

See also: CAN - CAN bridge via Bluetooth (→ 🗋 18)

Communication via Bluetooth is recommended because the Bluetooth frequency band is used significantly less than the WLAN frequency band. The connection between the machines is thus more stable and less disturbed.

4.2 CAN bridge via WLAN

The CAN bridge via WLAN enables M2M (machine-to-machine) communication between two machines. The CANwireless devices connect via WLAN and exchange CAN messages. This replaces the physical CAN cable.

See also: CAN - CAN bridge via WLAN Mini Access Point (MiniAP) mode (→ 🗋 19)

4.3 CAN via Bluetooth interface

Using the Bluetooth interface, the device can establish a connection to other Bluetooth devices such as smartphones, tablets or laptops. The CAN data is transferred to the connected device and can be stored and evaluated there. The CAN data is formatted with the Byte Command Protocol and then transmitted via Bluetooth. For more information about the byte protocol, see the document “Programming manual - API Description - Byte Command Protocol”.

4.4 CAN via WLAN interface

Using the WLAN interface, the CANwireless device can establish a connection to other WLAN devices such as smartphones, tablets or laptops. The CAN data is transferred to the connected device and can be stored and evaluated there.

Using the CAN connection via the WLAN interface, two different operating modes (WLAN operating modes) are possible:

- Infrastructure
  In the operating mode “Infrastructure”, the CANwireless device connects to an already existing WLAN network. This can be a company network or an access point.
- Mini Access Point
  In the operating mode “Mini Access Point”, the device creates its own WLAN network to which other devices can connect to. The CANwireless device can handle and manage a maximum of seven simultaneous connections at a time.

In both operating modes, the CAN data is formatted with the Byte Command Protocol. For more information about the Byte Command Protocol, see the document “Programming manual - API Description - Byte Command Protocol”.

5 Installation

▶ Disconnect the power of the machine before installation.

The device must be installed in a horizontal position. Installation with the connectors facing upwards or downwards is not permitted.

The device must be fixed with the rear facing the mounting surface.

ATTENTION

Higher impact stress > IK07

▷ Damage possible

▷ Protection rating and electrical protection might be impaired

▷ Risk of injury possible

▶ If necessary, the system creator must take external measures to protect the device depending on the requirements of the corresponding application.

▶ Replace damaged devices, otherwise the technical data and safety will be impaired.

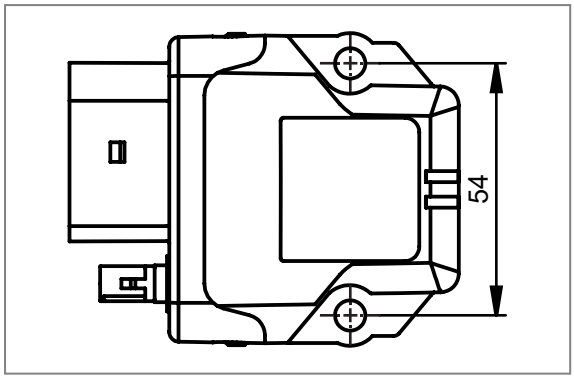


Fig. 1: Holes for mounting

▶ Use 2 M6x30 cylinder head bolts to fix the device on an even surface.
Tightening torque: 3.4 Nm ±10%

5.1 Installation

▶ 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.

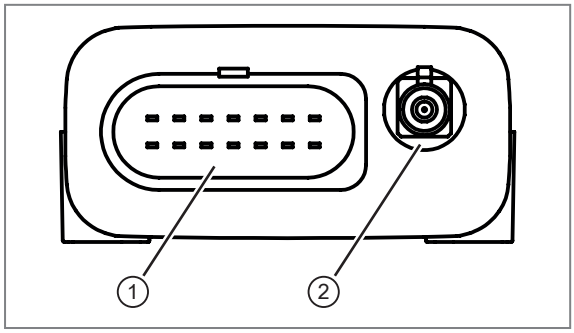
▶ Do not install the antennas in closed metal constructions such as the driver's cab.

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.

6 Electrical connection

6.1 Connectors



1: Micro Timer II connector, 14-pin (CAN, supply, inputs, outputs)
2: FAKRA connector, I-coded

6.1.1 Operating voltage, CAN interface, inputs and outputs

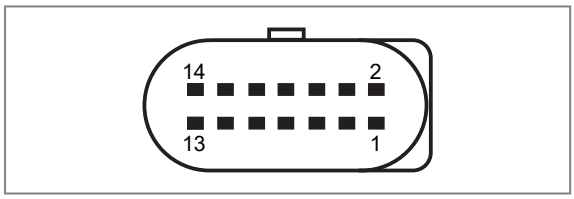


Fig. 2: Micro Timer II connector, 14-pin

1: VCC / terminal 30 (supply)
2: factory setting 1 (input)
3: GND / terminal 31 (supply)
4: analogue input 1
5: analogue input 2
6: not used
7: digital output
8: digital input / terminal 15 (input, ignition signal)
9: factory setting 2 (input)
10: GND / terminal 31 (supply)
11: CAN2_H (CAN interface 1 (high) bidirectional)
12: CAN2_L (CAN interface 1 (low) bidirectional)
13: CAN1_H (CAN interface 1 (high) bidirectional)
14: CAN1_L (CAN interface 1 (low) bidirectional)

6.1.2 Antenna terminal

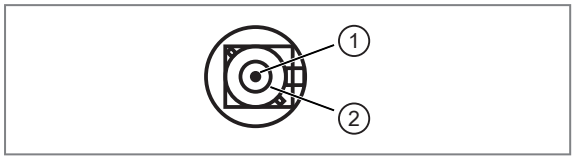
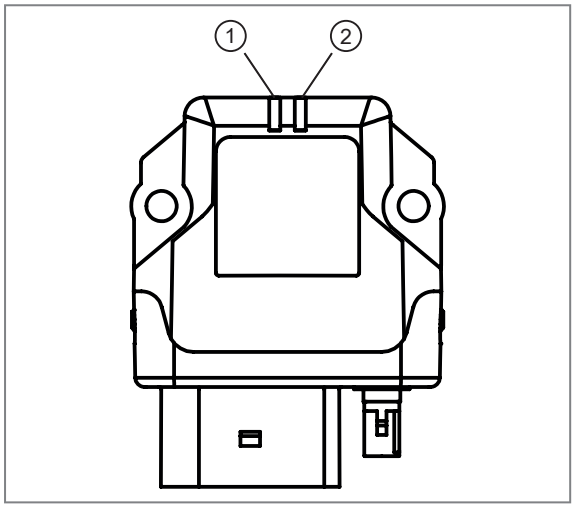


Fig. 3: FAKRA connector, I-coded

1: Signal — WLAN or Bluetooth signal
2: GND — shielding / housing

7 Light indicators



1: ON LED
2: STATUS LED

7.1 ON LED

Colour	State	Meaning
-	Off	The device is switched off or in sleep mode.
Green	Flashing slowly	The device is in update mode and ready to receive a firmware update. The ON and STATUS LEDs flash simultaneously.
Green	Flashing quickly	Firmware is being installed. The ON and STATUS LEDs flash simultaneously.
Green	On	The device is switched on. Terminal 30 voltage is in the permissible range.
Red	On	The device is switched on. Terminal 30 voltage is outside the permissible range.
Orange	On	The device is reset to factory settings. The ON and STATUS LEDs are lit simultaneously.
Turquoise	On	The radio module is being updated (via HTTP server). The ON and STATUS LEDs are lit simultaneously.
Magenta	On	Active connection with CANwireless configurator The ON and STATUS LEDs are lit simultaneously.

Tab. 1: ON LED

7.2 STATUS LED

The STATUS LED indicates the operating status of the active connection.

Colour	State	Meaning
-	Off	The device is switched off or in sleep mode.
Green	Flashes (200 ms on, 200 ms off, 200 ms on, 1000 ms off)	The device is initializing.
Green	Flashes (200 ms on, 200 ms off)	The device is ready for connection.
Green	On	The device has established a connection. The device functions reliably.

Colour	State	Meaning
Green	Flashing slowly	The device is in update mode and ready to receive a firmware update. The ON and STATUS LEDs flash simultaneously.
Green	Flashing quickly	Firmware is being installed. The ON and STATUS LEDs flash simultaneously.
Blue	Flashing	Data is being transferred.
Blue	On	Wireless connection error.
Orange	Single flashing light	The device has received a CANopen SDO request.
Orange	On	Error CAN1
Red	On	Error CAN2
Turquoise	On	The radio module is being updated (via HTTP server). The ON and STATUS LEDs are lit simultaneously.
Magenta	On	Active connection with CANwireless configurator The ON and STATUS LEDs are lit simultaneously.

Tab. 2: STATUS LED

8 Set-up

8.1 Necessary components

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

- Hardware
  - CR3133
  - suitable antenna (e.g. article no. EC3133)
  - connection cable
  - voltage supply 8…32 V DC
  - PC / notebook
  - CAN / PC interface (e.g. CAN/RS232-USB interface CANfox, art. no. EC2112) and adapter cable for CANfox (art. no. EC2113) with CAN bus terminating resistors (2 x 120 Ω)
- Configuration software
  - ifm Maintenance Tool
  - *mobile*IoT device configuration addin for ifm Maintenance Tool

For details on how to configure the device, see the ifm Maintenance Tool documentation.

8.2 Connecting the device

▶ Connect the antenna to the device.

▶ Ensure that the CAN bus is provided with 120 Ω terminating resistors.

▶ Connect the CAN/PC interface with the CAN adapter cable to the device and connect it to the PC.

▶ Connect the ground terminal of the power supply to CAN1-GND.

▶ Apply the supply voltage.

The following table provides an overview of some CAN baud rates in relation to the cable length:

CAN baud rate	Cable length CAN bus
800 kbit/s	50 m
500 kbit/s	100 m
250 kbit/s	250 m
125 kbit/s	500 m
50 kbit/s	1000 m

Tab. 3: CAN baud rate

8.3 Configuration

This chapter describes the configuration of the CANwireless device. The setup of the CAN interface and the settings of the different operating modes are presented.

8.3.1 CANopen

By default, the device is configured to receive CANopen messages such as Tx SDOs, Rx SDOs and error messages (EMCY). The device processes the messages without forwarding them via the wireless interface.

With the following object, this behaviour can be adjusted:

Function	Index	Subindex	Description
Activate / deactivate CANopen objects	0x20F4	0x00	This parameter defines whether the CANopen stack is activated or not: 0: CANopen remains active during connection (default) 1: The CANopen stack is disabled during connection.

If the CANopen stack is disabled during a radio connection, the device CANNOT be configured.

These messages are not sent if the CANopen stack is disabled:

Type	Index
Tx SDO 1	0x580 + Node ID
Rx SDO 1	0x600 + Node ID
Heartbeat / Bootup	0x700 + Node ID
NMT	0x000

CANopen configuration:

Object	Index	Subindex	Data type	Configuration
Heartbeat message CAN1	0x4053	0x03	Unsigned 16	Time in milliseconds 0: switch off
Boot up message CAN1	0x4054	0x03	Unsigned 32	Bit 0: NMT Boot up active 0: no Boot up message 1: send Boot up message
Send NMT start to all nodes at CAN bus CAN1	0x4055	0x03	Unsigned 32	Select NMT startup mode: 0: automatic execution 2: send automatic execution and “NMT start” to all node IDs

Tab. 4: CAN1

8.3.2 Communication settings

Object	Index	Subindex	Data type	Configuration
Node-ID CAN1	0x4050	0x03	Unsigned 8	Enter Node-ID CAN1
Baudrate CAN1	0x4051	0x03	Unsigned 8	Baudrate in kbit/s: 1: 800 2: 500 3: 250 (default) 4: 125 5: 100 6: 50 7: 20 8: 10

Tab. 5: CAN1

Object	Index	Subindex	Data type	Configuration
Node-ID CAN2	0x4050	0x04	Unsigned 8	Enter Node-ID CAN2

Object	Index	Subindex	Data type	Configuration
Baudrate CAN2	0x4051	0x04	Unsigned 8	Baudrate in kbit/s: 1: 800 2: 500 3: 250 (default) 4: 125 5: 100 6: 50 7: 20 8: 10

Tab. 6: CAN2

8.3.3 Rebooting the device

Object	Index	Subindex	Data type	Configuration
Device reboot	0x5000	0x00	Unsigned 32	Value: 0x4E4D5481

Tab. 7: Reboot

8.3.4 Factory reset

The following reset variants can be triggered via the CAN interface:

Function	Index	Subindex	Value / data type	Description
Reset device to factory settings	0x1011	0x01	0x64616F6C / Unsigned 32	The factory configuration is restored. All recorded data is deleted.
Reset communication parameters to factory settings	0x1011	0x02	0x64616F6C / Unsigned 32	The following parameters are reset to factory settings: - Node-ID CAN1: 33 - Node-ID CAN2: 34 - Baudrate CAN1: 3 (250 kbit/s) - Baudrate CAN2: 3 (250 kbit/s) - Heartbeat CAN1: 0 (no Heartbeat) - Heartbeat CAN2: 0 (no Heartbeat) - NMT Startup CAN1: 0 (automatically set to operational)
Reset parameters defined by the manufacturer to factory settings	0x1011	0x19	0x64616F6C / Unsigned 32	The following parameters are reset to factory settings: - CAN1 filter settings - CAN1 mask settings - CAN1 downsampling time

To carry out the factory reset via the CAN interface, CANopen software (e.g. maintenance tool) and a communication gateway (e.g. CANfox, part no. EC2112) are required. The CANopen software writes the value 0x64616F6C into the CANopen object index 0x1011, subindex 0x01, to perform a complete reset.

The following example shows the factory reset via the subindex 0x01 (restoration of the default configuration):

▶ Connect the device with a PC Connecting the device (→ 11).

▶ Start the CANopen software.

▶ Write the value 0x64616F6C into the object index 0x1011, subindex 0x01 via the CANopen software.

▶ Write the value to the object directory of the device.

▷ The ON and STATUS LEDs both light orange.

▷ The device is reset to factory settings.

▶ Wait until the STATUS LED flashes green.

▷ The STATUS LED flashes green.

▷ The device is reset to factory settings.

8.3.5 Filtering CAN messages

You can configure in the device which CAN messages are forwarded from the CAN interface to the radio interface. The bus load of the CAN and radio interfaces is reduced if no more data than necessary is allowed.

A filter and a mask for the CAN ID decide whether a message is forwarded to the radio interface. Up to eight filters can be configured. If there are less than eight messages, a separate filter can be used for each message. Use mask 0x7FF for an 11-bit CAN ID and mask 0x1FFFFFFF for a 29-bit CAN ID.

The device uses the following variables to calculate whether to allow or block a CAN message:

Variable name	Description
RxCANid	CAN ID of the received CAN message
FilterValue	Filter with which a CAN ID is identified as authorised
MaskValue	Mask with which a CAN ID is identified as authorised

The verification mechanism works as follows:

RxCANid XOR FilterValue = checkedCANid
checkedCANid AND MaskValue = RESULT
If RESULT = 0, the message is authorised.

Example 1:

RxCANid: 0x123
FilterValue: 0x421
MaskValue: 0xF8

Description	Hex	Binary
Received CAN message	0x123	0b001.0010.0011
FilterValue	0x421	0b100.0010.0001
XOR		
checkedCANid	0x502	0b101.0000.0010
MaskValue	0x0F8	0b000.1111.1000
AND		
RESULT	0x000	0b000.0000.0000

→ With these settings, the CAN ID 0x123 is authorised; messages with this ID are forwarded.

Example 2:

RxCANid: 0x123
FilterValue: 0x431
MaskValue: 0xF8

Description	Hex	Binary
Received CAN message	0x123	0b001.0010.0011
FilterValue	0x431	0b100.0011.0001
XOR		
checkedCANid	0x512	0b101.0001.0010
MaskValue	0x0F8	0b000.1111.1000
AND		
RESULT	0x010	0b000.0001.0000

→ With these settings, the CAN ID 0x123 is rejected; messages with this ID will not be forwarded.

8.3.6 Filter functionality

The filter set in the device consists of two components: the filter (FilterValue) and the mask (MaskValue). With these two components, the device calculates which CAN IDs are permitted and will only forward these CAN messages to the radio interface.

You can determine the correct FilterValue by ORing all desired CAN IDs.

You can determine the correct MaskValue by XNORing all desired CAN IDs.

The bigger the MaskValue, the stricter the filter works.
Zeros in the MaskValue have no influence on the result.

Example: MaskValue = 0x0F8 → 0b000.1111.1000 → 0bxxx.1111.1xxx
Only bit 3, bit 4, bit 5, bit 6 and bit 7 have an influence on the filter.

Example 1:

Only messages with CAN IDs 0x123, 0x124 and 0x125 are to be forwarded.

▶ Determine the FilterValue:

Description	Hex	Binary
Received CAN message 1	0x123	0b001.0010.0011
Received CAN message 2	0x124	0b001.0010.0100
Received CAN message 3	0x125	0b001.0010.0101
OR		
Required value for FilterValue	0x127	0b001.0010.0111

▶ Determine the MaskValue:

Description	Hex	Binary
Received CAN message 1	0x123	0b001.0010.0011
Received CAN message 2	0x124	0b001.0010.0100
Received CAN message 3	0x125	0b001.0010.0101
XNOR		
Required value for MaskValue	0xFF8	1b111.1111.1000

▶ Test with CAN message 3:

Description	Hex	Binary
Received CAN message 3	0x125	0b001.0010.0101
FilterValue	0x127	0b001.0010.0111
XOR		
checkedCANid	0x002	0b000.0000.0010
MaskValue	0xFF8	1b111.1111.1000
AND		
RESULT	0x000	0b000.0000.0000

→ CAN ID 0x125 is authorised; messages with this ID are forwarded.

Example 2:

Only messages with the CAN ID 0x123 are to be forwarded.

Description	Hex	Binary
Received CAN message	0x123	0b001.0010.0011

Description	Hex	Binary
FilterValue	0x123	0b001.0010.0011
XOR		
checkedCANid	0x000	0b000.0000.0000
MaskValue	0xFFF	1b111.1111.1111
AND		
RESULT	0x000	0b000.0000.0000

→ Only CAN ID 0x125 is authorised; messages with this ID are forwarded.
→ All other received CAN messages are blocked and not forwarded.

If there are more than eight messages, the CAN IDs must be grouped and several IDs share one filter.

Example:

The following CAN IDs are to be forwarded to the radio interface:

0x10, 0x11, 0x12, 0x13 and 0x14
and
0x627, 0x628, 0x629

Two filters and masks should be used here, for the 0x1 IDs and the 0x62 IDs respectively.

Description	Hex	Binary
	0x10	0b001.0000
	0x11	0b001.0001
	0x12	0b001.0010
	0x13	0b001.0011
	0x14	0b001.0100
OR		
FilterValue 1	**0x17**	**0b001.0111**

Description	Hex	Binary
	0x10	0b001.0000
	0x11	0b001.0001
	0x12	0b001.0010
	0x13	0b001.0011
	0x14	0b001.0100
XNOR		
MaskValue 1	**0xF8**	**1b111.1000**

Description	Hex	Binary
	0x627	0b110.0010.0111
	0x628	0b110.0010.1000
	0x629	0b110.0010.1001
OR		
FilterValue 2	**0x62F**	**0b110.0010.1111**

Description	Hex	Binary
	0x627	0b110.0010.0111
	0x628	0b110.0010.1000
	0x629	0b110.0010.1001
XNOR		

Description	Hex	Binary
MaskValue 2	**0xFF0**	**1b111.1111.0000**

8.3.7 Downsampling

The downsampling time can be used to reduce the number of messages via the radio interface. It is configured in 10 ms intervals. According to the configured value (e.g. 20), the reception and transmission of CAN messages is delayed (20 x 10 ms = 200 ms). A value of 0 disables the delay.

Only use downsampling with filters for individual CAN IDs to avoid data loss.

8.3.8 Filter configuration

Using the calculated FilterValues and MaskValues and the desired downsampling times, the filters can be configured via corresponding SDOs:

Function	Index	Subindex	Description
Filter setting (FilterValue) **non-volatile**	0x5020	0x01…0x08	Non-volatile object in which the FilterValue for the eight filters is configured. After restarting the device, these values are copied into the volatile object that controls the filter. The filter is only active when the radio interface is active. Bit-31 = 0 This filter setting is active and used by the filter. Bit-31 = 1 This filter setting is not active. Bit-29 = 0 11-bit CAN ID Bit-29 = 1 29-bit CAN ID
Filter setting (FilterValue) **volatile**	0x5021	0x01...0x08	Volatile object in which the FilterValue for the eight filters is configured. This setting is taken over directly from the filter and can be adjusted dynamically. The filter is only active when the radio interface is active. Bit-31 = 0 This filter setting is active and used by the filter. Bit-31 = 1 This filter setting is not active. Bit-29 = 0 11-bit CAN ID Bit-29 = 1 29-bit CAN ID
Mask setting (MaskValue) **non-volatile**	0x5022	0x01...0x08	Non-volatile object in which the MaskValue for the eight filters is configured. After restarting the device, these values are copied into the volatile object that controls the filter. The filter is only active when the radio interface is active. Bit 0…28 = MaskValue Bit 29...31 = not used → set to 0. Bit = 0: has no filter effect on the corresponding binary digit. Bit = 1: The corresponding bit of the received CAN ID and the FilterValue must match.

Function	Index	Subindex	Description
Mask setting (MaskValue) **volatile**	0x5023	0x01...0x08	Volatile object in which the MaskValue for the eight filters is configured. This setting is taken over directly from the filter and can be adjusted dynamically. The filter is only active when the radio interface is active. Bit 0…28 = MaskValue Bit 29...31 = not used → set to 0. Bit = 0: has no filter effect on the corresponding binary digit. Bit = 1: The corresponding bit of the received CAN ID and the FilterValue must match.
Downsampling **non-volatile**	0x5024	0x01..:0x08	Non-volatile object in which the downsampling for the eight filters is configured. After restarting the device, these values are copied into the volatile object that controls the filter. This time must elapse before another CAN message is received that matches the corresponding filter. If this value is set to 0, every message that corresponds with the filter is received.
Downsampling **volatile**	0x5025	0x01…0x08	Volatile object in which the downsampling for the eight filters is configured. This setting is taken over directly from the filter and can be adjusted dynamically. This time must elapse before another CAN message is received that matches the corresponding filter. If this value is set to 0, every message that corresponds with the filter is received.

8.3.9 CAN - CAN bridge via Bluetooth

In this mode, a wireless connection (CAN bridge) is established between two CANwireless devices via Bluetooth. The devices need to be configured as follows:

Object	Index	Subindex	Data type	Configuration
WLAN Enable	0x3008	0x02	Unsigned 8	0: switch off
Bluetooth Enable	0x3008	0x03	Unsigned 8	1: switch on
Bluetooth Devicename	0x3002	0x05	Visible_string	Enter a unique name
Bluetooth Discoverable	0x3002	0x01	Unsigned 8	1: switch on
Bluetooth Pairable	0x3002	0x02	Unsigned 8	1: switch on
Security mode Bluetooth 2.1	0x3002	0x03	Unsigned 8	0: switch off
Bluetooth PIN	0x3002	0x06	Visible_string	Enter four-digit PIN Default: 0000
Server Enable	0x3010	0x15	Unsigned 8	2: switch on server
Server Type	0x3010	0x16	Unsigned 8	2: SPP (Default)

Tab. 8: Bluetooth server

Object	Index	Subindex	Data type	Configuration
WLAN Enable	0x3008	0x02	Unsigned 8	0: switch off
Bluetooth Enable	0x3008	0x03	Unsigned 8	1: switch on
Bluetooth Devicename	0x3002	0x05	Visible_string	Enter a unique name
Bluetooth Discoverable	0x3002	0x01	Unsigned 8	1: switch on
Bluetooth Pairable	0x3002	0x02	Unsigned 8	1: switch on
Security mode Bluetooth 2.1	0x3002	0x03	Unsigned 8	0: switch off

Object	Index	Subindex	Data type	Configuration
Bluetooth PIN	0x3002	0x06	Visible_string	Enter four-digit PIN Default: 0000
Client Enable	0x3010	0x15	Unsigned 8	3: switch on Client
Server Type	0x3010	0x16	Unsigned 8	2: SPP (Default)
Bluetooth SPP MAC	0x3010	0x1a	Visible_string	Enter master MAC address

Tab. 9: Bluetooth client

8.3.10 CAN - Mobile device / PC interface P2P Bluetooth

In this mode, a wireless connection is established between a CANwireless device and any other Bluetooth device via Bluetooth. The CANwireless device needs to be configured as follows:

Object	Index	Subindex	Data type	Configuration
WLAN Enable	0x3008	0x02	Unsigned 8	0: switch off
Bluetooth Enable	0x3008	0x03	Unsigned 8	1: switch on
Bluetooth Devicename	0x3002	0x05	Visible_string	Enter a unique name
Bluetooth Discoverable	0x3002	0x01	Unsigned 8	1: switch on
Bluetooth Pairable	0x3002	0x02	Unsigned 8	1: switch on
Security mode Bluetooth 2.1	0x3002	0x03	Unsigned 8	0: switch off
Bluetooth PIN	0x3002	0x06	Visible_string	Enter four-digit PIN Default: 0000
Server Enable	0x3010	0x15	Unsigned 8	2: switch on server
Server Type	0x3010	0x16	Unsigned 8	2: SPP (Default)

8.3.11 CAN - CAN bridge via WLAN Mini Access Point (MiniAP) mode

In this mode, a wireless connection (CAN bridge) is established between two CANwireless devices via WLAN. The devices need to be configured as follows:

Object	Index	Subindex	Data type	Configuration
Bluetooth Enable	0x3008	0x03	Unsigned 8	0: switch off
WLAN Enable	0x3008	0x02	Unsigned 8	1: switch on
WLAN Operating Mode	0x3000	0x01	Unsigned 8	2: Mini Access Point (Default)
SSID	0x3000	0x02	Visible_string	Enter a unique name for the WLAN network
Authentication Type	0x3000	0x04	Unsigned 8	7: WPA/WPA2 Mixed
Authentication Key	0x3000	0x05	Visible_String	Enter a secure authentication key with at least 8 characters
DHCP	0x3000	0x09	Unsigned 8	2: server (Default) (only for WLAN MiniAP)
Hostname	0x3005	0x01	Visible_string	Enter a unique device name.
IP address	0x3000	0x0a	Visible_string	192.168.82.34
Network mask	0x3000	0x0b	Visible_string	255.255.255.0
Gateway address	0x3000	0x0c	Visible_string	192.168.82.1
Primary DNS Server	0x3000	0x0d	Visible_string	192.168.82.1
Secondary DNS Server	0x3000	0x0e	Visible_string	192.168.82.2
Server Enable	0x3010	0x15	Unsigned 8	2: switch on server
Server Type	0x3010	0x16	Unsigned 8	1: socket (TCP/UDP)

Object	Index	Subindex	Data type	Configuration
Server Type	0x3010	0x18	Unsigned 16	30000 (Default)

Tab. 10: WLAN server (Mini Access Point)

Object	Index	Subindex	Data type	Configuration
Bluetooth Enable	0x3008	0x03	Unsigned 8	0: switch off
WLAN Enable	0x3008	0x02	Unsigned 8	1: switch on
WLAN Operating Mode	0x3000	0x01	Unsigned 8	1: infrastructure
SSID	0x3000	0x02	Visible_string	Enter the SSID of the WLAN network
Authentication Type	0x3000	0x04	Unsigned 8	7: WPA/WPA2 Mixed
Authentication Key	0x3000	0x05	Visible_String	Enter the authentication key of the WLAN network
DHCP	0x3000	0x09	Unsigned 8	1: Client (only for WLAN infrastructure)
Hostname	0x3005	0x01	Visible_string	Enter a unique device name.
Client Enable	0x3010	0x15	Unsigned 8	3: switch on Client
Server Type	0x3010	0x16	Unsigned 8	1: socket (TCP/UDP)
Server Type	0x3010	0x18	Unsigned 16	30000 (Default)
EEP URL Address/ WLAN Client only 1	0x3010	0x17	Visible_string	Enter the IP address of the WLAN MiniAP

Tab. 11: WLAN client (infrastructure)

8.3.12 CAN - Mobile device / PC interface P2P WLAN Mini Access Point

In this mode, a wireless connection is established between a CANwireless device and any other WLAN-enabled device via WLAN. The CANwireless device needs to be configured as follows:

Object	Index	Subindex	Data type	Configuration
Bluetooth Enable	0x3008	0x03	Unsigned 8	0: switch off
WLAN Enable	0x3008	0x02	Unsigned 8	1: switch on
WLAN Operating Mode	0x3000	0x01	Unsigned 8	2: Mini Access Point (Default)
SSID	0x3000	0x02	Visible_string	Enter a unique name for the WLAN network
Authentication Type	0x3000	0x04	Unsigned 8	7: WPA/WPA2 Mixed
Authentication Key	0x3000	0x05	Visible_String	Enter a secure authentication key with at least 8 characters
DHCP	0x3000	0x09	Unsigned 8	2: server (Default) (only for WLAN MiniAP)
Hostname	0x3005	0x01	Visible_string	Enter a unique device name.
IP address	0x3000	0x0a	Visible_string	192.168.82.34
Network mask	0x3000	0x0b	Visible_string	255.255.255.0
Gateway address	0x3000	0x0c	Visible_string	192.168.82.1
Primary DNS Server	0x3000	0x0d	Visible_string	192.168.82.1
Secondary DNS Server	0x3000	0x0e	Visible_string	192.168.82.2
Server Enable	0x3010	0x15	Unsigned 8	2: switch on server
Server Type	0x3010	0x16	Unsigned 8	1: socket (TCP/UDP)
Server Type	0x3010	0x18	Unsigned 16	30000 (Default)

8.3.13 CAN - Mobile device / PC interface P2P WLAN infrastructure mode

In this mode, a wireless connection is established between a CANwireless device and any other WLAN-enabled device via WLAN. The CANwireless device needs to be configured as follows:

Object	Index	Subindex	Data type	Configuration
Bluetooth Enable	0x3008	0x03	Unsigned 8	0: switch off
WLAN Enable	0x3008	0x02	Unsigned 8	1: switch on
WLAN Operating Mode	0x3000	0x01	Unsigned 8	1: infrastructure
SSID	0x3000	0x02	Visible_string	Enter the SSID of the WLAN network
Authentication Type	0x3000	0x04	Unsigned 8	7: WPA/WPA2 Mixed
Authentication Key	0x3000	0x05	Visible_String	Enter the authentication key of the WLAN network
DHCP	0x3000	0x09	Unsigned 8	1: Client (only for WLAN infrastructure)
Hostname	0x3005	0x01	Visible_string	Enter a unique device name.
Client Enable	0x3010	0x15	Unsigned 8	3: switch on Client
Server Type	0x3010	0x16	Unsigned 8	1: socket (TCP/UDP)
Server Type	0x3010	0x18	Unsigned 16	30000 (Default)
EEP URL Address/ WLAN Client only 1	0x3010	0x17	Visible_string	Enter the IP address of the WLAN MiniAP

8.3.14 Sleep mode

The device features a sleep mode to save energy during inactive states.

The following events can trigger the sleep mode:

- no voltage at terminal 15 within a defined time period
- no reception of CAN messages within a defined time period

The sleep mode is configured as follows:

Object	Index	Subindex	Data type	Configuration
PMM Shutdown Delay Time **non-volatile**	0x3333	0x32	Unsigned 16	Time in seconds After terminal 15 is switched off, the device continues to operate for the time configured here and then goes into sleep mode. Default: 60 s This function is only active if bit 7 is set for “PMM Wakeup enable flags”.
PMM Wakeup enable flags **non-volatile**	0x3333	0x37	Unsigned 8	Enable activation of sleep mode via terminal 15. Bits 0...6: Reserved → set to 0. Bit 7: 1 → Monitoring of terminal 15 for sleep mode active Default: 0
PMM Shutdown time-out **non-volatile**	0x3333	0x40	Unsigned 32	Time in milliseconds If the prerequisites for the sleep mode are met, it will be enforced when this time has elapsed. This ensures switchover to sleep mode even if the regular activation of this mode should fail. Default: 60000

Object	Index	Subindex	Data type	Configuration
PMM Sleep on no CAN time **non-volatile**	0x3333	0x41	Unsigned 32	Time in milliseconds If the device does not receive any CAN messages within this time period, it goes to sleep mode. Default: 0 (function deactivated)

9 Repair, maintenance and disposal

The unit is maintenance-free.

- ▶ Contact ifm in case of malfunction.
- ▶ Do not open the housing as the unit does not contain any components which can be maintained by the user. The unit must only be repaired by the manufacturer.
- ▶ Clean the device using a dry cloth.
- ▶ Dispose of the unit in accordance with the national environmental regulations.