

# UniCAN 3

## Installation Manual



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### Product disposal/recycling

If this symbol (crossed-out wheeled bin) appears on the device, this means that the European Directive 2012/19/EU applies to this device.

The correct disposal of old equipment will protect the environment and people from possible negative consequences.

Become familiar with local regulations for separate collection of electrical and electronic equipment.

Follow local regulations and do not dispose of old equipment with household waste.



### Contact information

CSM offers support for its products over the entire product life cycle. Updates for the individual components (e.g. documentation, configuration software and firmware) are made available on the CSM website. To keep up to date, it is therefore recommended that you check the download area of the CSM website for updates at least once a month.

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# 1 General information

## 1.1 Liability disclaimer

This installation manual and other documents are part of the product and contain important information for its safe and efficient use. To maintain the high quality level the product is continuously being developed, which may result in the product's technical details changing at short notice. As a result, the contents of this documentation may differ from the technical specifications of the product. No claims against the manufacturer can therefore be derived from the contents of the product documentation.

CSM GmbH is not liable for technical or editorial errors or missing information.

CSM GmbH assumes no liability for damage resulting from improper use of the product and/or non-observance of the product documentation, in particular the safety instructions.

→ See chapter 2 „Safety Instructions“.

## 1.2 Warranty and exclusion of warranty

The warranty covers the safety and functionality of the product within the warranty period. Excluded from the warranty are claims based on possible consequential damages caused by malfunction or non-function of the product.


The warranty shall become invalid if:

- ▶ the product is handled improperly,
- ▶ the product is changed,
- ▶ the information in the documentation belonging to the product is not observed,
- ▶ the product is operated with accessories or parts which are not explicitly approved for operation by the manufacturer of the product.

→ See chapter 2 „Safety Instructions“.

## 1.3 Electromagnetic compatibility (EMC)

	The manufacturer declares that UniCAN 3 data loggers are in conformity with the requirements of EU Directive 2014/30/EU.
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NOTE!	
	<p>To ensure that operation is as trouble-free as possible, appropriately suitable cables must be used for connection.</p> <ul style="list-style-type: none"><li>☞ Use only shielded cables for the serial data line outside metal housings.</li><li>☞ Use only suitable shielded and twisted pair wires for the CAN bus.</li></ul>

## 2 Safety Instructions

This chapter contains important safety information. Please read the following sections carefully.

### 2.1 General safety instructions

All relevant safety standards were taken into account during development and manufacturing of the device. The product is produced in accordance with the requirements of an ISO 9001 Quality Management System.

WARNING!	
	<p>Connecting a UniCAN 3 device to an existing CAN bus system (e.g. vehicle or automation system) can affect the behaviour of the CAN bus.</p> <p><b>Improper handling of a CAN bus system can be a danger to life for persons and cause damage to property.</b></p> <ul style="list-style-type: none"><li>☞ Read the accompanying technical documentation before putting into operation.</li><li>☞ Observe relevant safety guidelines.</li><li>☞ Only suitable device versions may be connected (bus type and protocol).</li><li>☞ Ensure that the measurement configuration is suitable.</li><li>☞ Ensure that the work is only carried out by qualified and trained personnel.</li></ul>

### 2.2 Obligations of the operator

The operator must ensure that only qualified and authorized personnel are entrusted with handling the product. This applies to assembly, installation and operation.

In addition to the product's technical documentation, the operator may also have to provide operating instructions in accordance with the Occupational Safety and Health Act and the Ordinance on the Use of Working Materials.

## 3 Installing the Device

### 3.1 General information

Data loggers of the UniCAN 3 family (UniCAN 3 and UniCAN 3 ETH, for the sake of convenience hereafter referred to as UniCAN 3) are used to record measurement data available via CAN and/or Ethernet interface. They can be used for diagnostic purposes and for the long-term monitoring of systems and vehicles. UniCAN 3 data loggers are available in different versions. Each of these versions is also offered with isolated CAN interfaces.

Part No.	Recording			Communication				GPS															
	CAN	ETH	Digital I/O	USB	LAN	WLAN	WWAN																
ART1271006	4	✗	4	✓	✓	+	✗	+															
ART1271206							LTE																
ART1271306							LTE_US																
ART1271004	8	✗					4		✓	✓	+	✗	+										
ART1271204												LTE											
ART1271304												LTE_US											
ART1271002	12	✗										4		✓	✓	+	✗	+					
ART1271202																	LTE						
ART1271302																	LTE_US						
ART1273004	9	✓															4		✓	✓	+	✗	+
ART1273204																						LTE	
ART1273300																						LTE_US	

[✓] enclosed    [✗] optional    [✗] not available

Tab. 3-1: Product versions (excerpt)

A complete UniCAN 3 system consists of the following components:

- ▶ UniCAN 3 with firmware and CF card as storage medium
- ▶ CSMuniconf PC software
- ▶ K212 power cable
- ▶ K201 splitter cable

Optional:

- ▶ CSMdataconv PC software
- ▶ SIM card
- ▶ Antenna (LTE, GPS, WLAN)
- ▶ USB cable
- ▶ K204 DigIO cable
- ▶ K213 Ethernet adapter cable for communication
- ▶ K220 Ethernet adapter cable for UniCAN 3 ETH interface

## 3.2 Connection overview

### 3.2.1 UniCAN 3

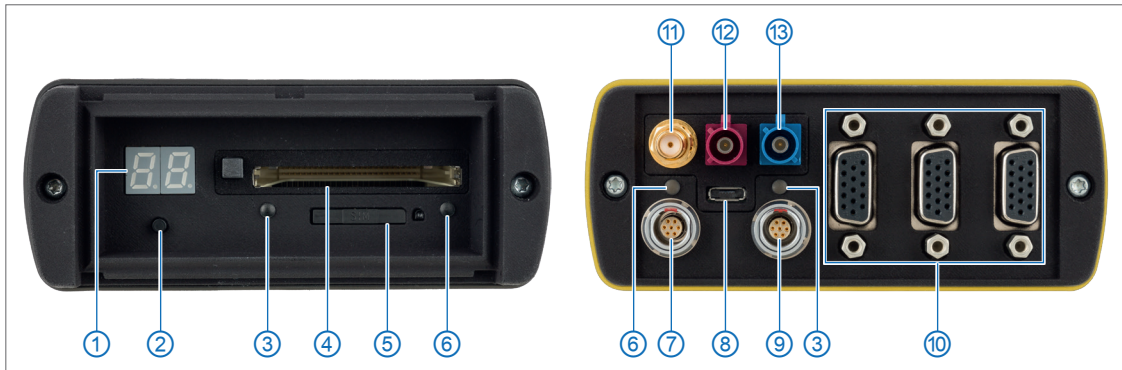


Fig. 3-1: UniCAN 3, full expansion stage: connectors front and rear side Connections front and rear side

- |                             |  |
|-----------------------------|--|
| ① Status display            | ⑦ Power supply, Ethernet                     |
| ② Button for status display | ⑧ USB 2.0 OTG                                |
| ③ Network LED               | ⑨ Digital I/O                                |
| ④ CF card                   | ⑩ CAN interfaces                             |
| ⑤ SIM card slot             | ⑪ WLAN antenna                               |
| ⑥ Status LED                | ⑫ LTE antenna (+ UMTS / EDGE / GPRS)         |
|                             | ⑬ GPS antenna (+ GLONASS / BeiDou / Galileo) |

### 3.2.2 UniCAN 3 ETH

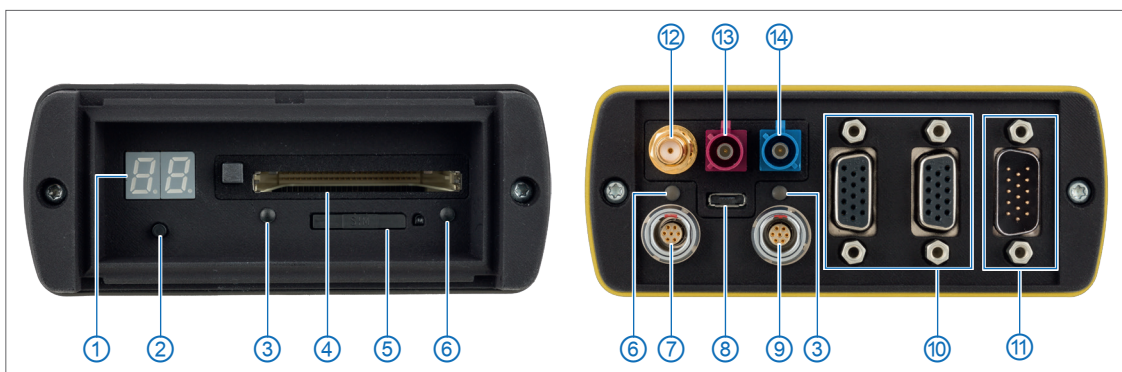


Fig. 3-2: UniCAN 3 ETH, fully upgraded: Connections front and rear side

- |                             |  |
|-----------------------------|--|
| ① Status display            | ⑦ Power supply, Ethernet                     |
| ② Button for status display | ⑧ USB 2.0 OTG                                |
| ③ Network LED               | ⑨ Digital I/O                                |
| ④ CF card                   | ⑩ CAN interfaces                             |
| ⑤ SIM card slot             | ⑪ Ethernet interface and CAN 9               |
| ⑥ Status LED                | ⑫ WLAN antenna                               |
|                             | ⑬ LTE antenna (+ UMTS / EDGE / GPRS)         |
|                             | ⑭ GPS antenna (+ GLONASS / BeiDou / Galileo) |

### 3.3 LED and status indicators

UniCAN 3 data loggers are equipped with one network and one status LED each on the front and the rear side of the module housing.

- ▶ The network LED (Fig. 3-1/Fig. 3-2, ③) indicates the transmission status.
- ▶ The status LED (Fig. 3-1/Fig. 3-2, ⑥) indicates the status of measurement, operation and card access.

#### Color codes of the network LED

LED		Meaning
Color	Status	
—	off	Not ready (network module not switched on)
green	blinking	Not ready (network module booting up)
green	continuously lit	Idle, network module running, no activity
orange / green	blinking	Activity (status indicator: states 4.1 through 4.9)
red	continuously lit	Error state or firmware update in progress

Tab. 3-2: Color codes for transmission (network LED)

#### Color codes of the status LED

LED		Meaning
Color	Status	
—	off	Device not supplied with power or not switched on
green	continuously lit	Idle, no card inserted/detected or no card access
green	flashing	WoC and NML enabled, device is in stand-by mode
orange / green	blinking	Activity (card access)
red	continuously lit	Error state or firmware update in progress
red	flashing	WoC and NML enabled, device is in stand-by mode and the card is being accessed or an error occurred

Tab. 3-3: Color codes for measurement (status LED)

There is also a 2-digit 7-segment display on the front of the UniCAN 3 (Fig. 3-1/Fig. 3-2, ①). This display supplements the two LEDs and is used for the visualization of device status and error codes. An illuminated decimal point in the 2-digit 7-segment display indicates the status that is currently being displayed:

- ▶ If the decimal point of the left-hand 7-segment display is illuminated, the status of the transmission is displayed (→ network LED)
- ▶ If the decimal point of the right-hand 7-segment display is illuminated, the status of the measurement is displayed (→ status LED).

The display is automatically switched on for 10 seconds after the device is restarted or for 2 seconds in case of a change of status. If the display is inactive, pressing the button (Fig. 3-1/Fig. 3-2, ②) initiates the display of the measurement status (for 10 seconds). Pressing the button again switches between the display of measurement and transmission (the display will be lit for another 10 seconds). In standby mode of a Wake-on-CAN with No-Message-Lost configuration, the measurement is started by pressing the button for at least five seconds. While the button is pressed, the display shows a countdown, counting down from 4 to 0.



## UniCAN 3 – Installing the Device

All possible indications and status values are listed in the following.

### Status values of the network LED

Status indications for upload task	
4.0	Transmission activities are identified
4.1	Waiting for available resources
4.2	Establishing network connection
4.3	Writing SOM file
4.4	Searching for updates (immediate)
4.5	Uploading data
4.6	Completing updates
4.7	Searching for updates (delayed)
4.8	Terminating network connection
4.9	Transmitting results
5.0	Error occurred while accessing the modem
5.1	Error occurred while accessing the SIM card
5.2	Pin error occurred
5.3	PUK required
5.4	Error occurred while connecting with PPP
5.5	Error occurred during server login
5.6	Error occurred while reading from server
5.7	Error occurred while writing to server
5.8	Checksum error occurred (FTP)
5.9	Invalid transport configuration
6.0	Resource occupied
6.1	Unspecified connection error
6.2	Error occurred while setting the modem access method
6.3	Non-specified upload error occurred
6.4	Non-specified download error occurred
6.5	Upload was cancelled
6.6	Invalid host definition
6.7	Network interface failure
6.8	Data Centric Mode error of the modem
9.0	Internal error during sequence processing
9.1	Internal upload task error occurred
9.5	WLAN license missing
9.6	Incorrect network settings of the transport configuration
Status indications for PC connection	
8.0	Connected via USB
8.1	USB data transmission to CSMuniconf active
8.2	Connected via USB, device access protection enabled
8.3	USB data transmission to CSMuniconf active, device access protection enabled
9.2	Internal error

Other indications	
n.r	not ready (boot process) or switched off (in standby mode in case of WoC with NML)
o.n	Idle (no activity)
r.4	Service mode activated
S.d	Switch off transfer processor (shutdown)
u.b	“uboot” activated
u.F	Updating firmware

Tab. 3-4: Status values for transmission (network LED)

#### Status values of the status LED

Static errors affecting evaluation of the CF card content	
01.	Invalid compact flash card
02.	Invalid DFAT-STFS container
03.	Invalid REC99 version, incompatible configuration format
04.	Invalid firmware version, firmware too old
05.	Invalid device option, incorrect device type
06.	Invalid transport configuration
07.	Invalid measurement configuration
08.	Required license not available
09.	Access denied, CF card data encryption does not match active device protection
Dynamic errors affecting the measurement currently in progress	
13.	Ethernet reception error (frame format, length, checksum error)
14.	Ethernet frame lost (insufficient memory, overload situation)
15.	Protocol error (e.g. initialization of the ECU not possible)
16.	CAN bus error detected
17.	CAN bus message lost
18.	Card FIFO overflow
19.	Internal system error occurred
Other indications	
--.	Idle mode, no card inserted or detected
dr.	In standby mode at WoC with NML: Device waiting for start of measurement (device ready)
on.	Everything OK (measurement running, no errors detected)
Sd.	Switch off device (shutdown)
uF.	Updating firmware

Tab. 3-5: Status values for measurement (status LED)

#### Example

In Fig. 3-3, the orange / green flashing network LED ③ indicates activity. A continuously lit green status LED ④ indicates idleness, as a memory card is not inserted. Pushing the button ② activates the status indicator ①. “--.” appears as status value of the measurement ⑤ and confirmation of idle mode (see Tab. 3-5). Pressing the button again calls up “4.2” as status of the transmission ⑥, i.e. the data logger attempts to establish a network connection (see Tab. 3-4).

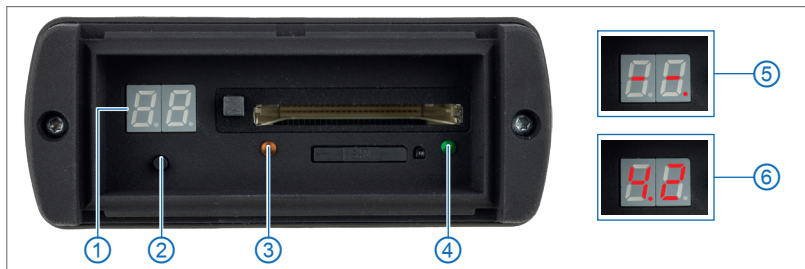






Fig. 3-3: UniCAN 3: example showing LED and status indicators on front

### 3.4 Installation

NOTE!	
	<p>Cable shield, housing and ground of the connections are connected directly to the power supply ground (Power GND, negative pole to ground).</p> <ul style="list-style-type: none"> <li>☞ Incorrect cabling may cause damage to the device.</li> <li>☞ When connecting the device, ensure correct polarity and supply voltage.</li> </ul> <p>→ Please also observe chapter 3.6.2 „CAN interface“.</p>
NOTE!	
	<p>Trouble-free functioning and electrical safety can only be ensured if the product is installed properly.</p> <ul style="list-style-type: none"> <li>☞ Ensure proper installation.</li> <li>☞ The device may only be operated within the working environment specified.</li> </ul> <p>→ See also “UniCAN 3” datasheet.</p>
NOTE!	
	<p>Please observe EMC guideline regulations</p> <ul style="list-style-type: none"> <li>☞ The device and its antennas must be kept more than 20 cm away from the human body during operation.</li> <li>☞ For compliance with FCC regulations, the antenna gain may not exceed 2 dB.</li> </ul>
	<p>Information on the current status of device and associated software can be found in the “readme.txt” file of the CSMuniconf software installation package. The most current version of CSMuniconf can be found in the download area of the CSM website.</p> <p>→ See: <a href="https://s.csm.de/en-uc">https://s.csm.de/en-uc</a></p>

#### 3.4.1 Check before connection

- ☞ Make sure that the cables required for proper connection are used (connection to power supply is usually made using the K212 cable).
- ☞ Make sure that polarity and supply voltage are correct.
  - See also chapter 3.6.1 „Power supply and Ethernet“.
- ☞ Comply with the specifications for all connected components.

#### 3.4.2 Connecting the device

- ☞ Attach CAN connections of the device to the CAN bus system.
- ☞ Connect device to power supply.

### 3.4.3 Inserting CF card and SIM card

#### 3.4.3.1 Opening the hinged cover

The hinged cover of the device can be opened as follows:

- ☞ Press against the hinge lightly from below (see Fig. 3-4).
- ⇒ The lock is released, the hinged cover opens.
- ☞ Open the hinged cover fully as shown in Fig. 3-5.

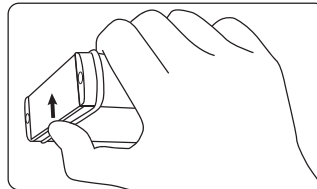


Fig. 3-4: Releasing the lock

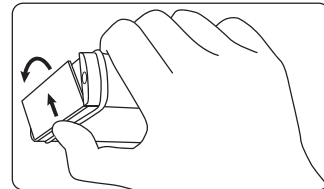


Fig. 3-5: Opening hinged cover

#### 3.4.3.2 Inserting a CF card

- ☞ Insert a formatted and configured CF card<sup>1</sup> into the card slot.

#### NOTE!



Data storage on CF cards ensures a high degree of security against data loss. To avoid potential data loss, the CF card should not be inserted or removed during operation.

#### 3.4.3.3 Inserting a SIM card (model-dependent)



Only certain versions of the UniCAN 3 data logger feature a built-in mobile communications modem (see Tab. 3-1). A SIM card only needs to be inserted if mobile data transmission is desired. The UniCAN 3 must also have a corresponding transport configuration and be connected to a suitable antenna (see chapter 3.6.5).

With the UniCAN 3, the SIM card (in mini-SIM format) is first inserted into a card holder and then into the card slot. The card holder is released by pressing the button to the right of the card slot. We recommend using a pointed object, such as a pen, for this purpose.

- ☞ Insert SIM card into the card holder.
- ☞ Push card holder into the slot with the SIM card facing upward until it snaps into place (see Fig. 3-6).



Fig. 3-6: Inserting SIM card with card holder

#### NOTE!



When inserting the SIM card into a UniCAN 3, make sure that the card holder is inserted into the slot with the SIM card facing upward. If the card holder is inserted with the SIM card facing downward, the card can fall out of the holder and damage the device.

<sup>1</sup> A configuration can either be transmitted from the PC to a CF card inserted into a card reader or directly to a CF card in the data logger over a USB connection.

### 3.4.4 Putting device into operation

- ☞ Switch on the device or connect it to the power supply.
  - ⇒ The start of measurement is indicated by “on.” on the 7-segment display and occurs immediately after switch-on.
  - ⇒ The network module is started approx. 20 seconds later, indicated by “o.n” on the 7-segment display.
  - ⇒ Connection establishment<sup>2</sup> then begins, indicated by statuses “4.1” through “4.9”.
- ☞ If none of the LEDs are lit up red, everything is ready and in order. If this is not the case, check the status values.
  - See chapter 3.3 „LED and status indicators“.

## 3.5 Replacing the battery

### NOTE!



UniCAN 3 data loggers are equipped with a **built-in lithium battery** which can be replaced by CSM if necessary.

- ☞ Send the device to CSM for service if the battery is no longer working.

## 3.6 Connectors

### 3.6.1 Power supply and Ethernet

UniCAN 3 data loggers are designed for operating voltages from 8 V DC (–10 %) to 32 V DC (+10 %). The connection to power supply and Ethernet is made using a 7-pole LEMO 0B socket on the back of the housing (see Fig. 3-1, ⑦ “Power supply, Ethernet”).

### NOTE!



The shield and GND of a signal line, as well as the housing of the data logger, are electrically connected to the power GND of the supply line.

There is a risk of damage from short-circuit current or compensating current.

- ☞ Never connect the supply voltage to shield, GND or housing.
- ☞ Ensure that shield, GND and housing are held on the same potential.

Image	Pin	Signal	Description
	1	K30 (Power +)	Power supply, plus
	2	K15 (Ignition)	Control signal for switching the device on and off
	3	TX+	Ethernet transmitter, plus
	4	TX -	Ethernet transmitter, minus
	5	RX+	Ethernet receiver, plus
	6	RX -	Ethernet receiver, minus
	7	K31 (Power GND)	Power supply, ground
	Housing	Shield	Cable shield


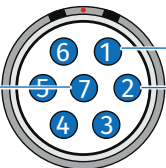
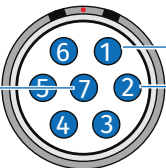

Tab. 3-6: Pin assignment of a connector (front view) for socket "Power supply, Ethernet"

<sup>2</sup> A connection is only established if the data logger has a transport configuration involving data transmission over mobile communications or WLAN.

The following table shows the assignment of the signals to the wire colors for a K212 cable (LEMO 0B, 7-pole to open cable end):

Signal	Description	Wire color
K30 (Power +)	Power supply, plus	Red
K31 (Power GND)	Power supply, ground	Black
K15 (Ignition)	Control signal for switching the device on and off	Yellow

Tab. 3-7: K212 signal cable: Assignment of the colors of the signal wires

NOTE!	
	<p>To prevent data loss in case of a sudden interruption of the power supply, we recommend switching the device on and off with the ignition signal (terminal 15). Please use the following connection:</p> <div></div> <p>If no ignition signal is available, or the device is to be switched on and off by Wake-on-CAN or a set alarm instead, use the following connection:</p> <div></div> <p>Make sure that the device switches itself off using a suitable configuration while it is still supplied with power (steady plus) to avoid data loss.</p>
	<p>If only a switched power supply is available, we recommend additional buffering using the <b>CSM power control module (PCMM)</b>. For additional information, please contact the sales department.</p>

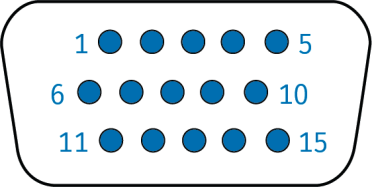
### 3.6.2 CAN interface

#### D-SUB-HD socket, 15-pole

Depending on the device version, the UniCAN 3 features up to three 15-pole D-SUB-HD sockets for up to 12 CAN interfaces (Fig. 3-1, ⑩ “CAN interfaces”). When equipped with three CAN sockets, these are assigned from left to right as follows:

- ▶ Socket 1: CAN 1–4
- ▶ Socket 2: CAN 5–8
- ▶ Socket 3: CAN 9–12

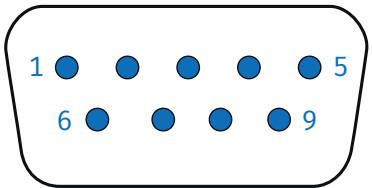
Tab. 3-8 shows the pin assignment of a connector (front view) for the left socket (CAN 1–4).

Image	Pin	Signal	Description
	1	CAN1H	CAN 1 High
	2	CAN2H	CAN 2 High
	3	CAN3H	CAN 3 High
	4	CAN4L	CAN 4 Low
	5	not assigned	—
	6	CAN1L	CAN 1 Low
	7	CAN2L	CAN 2 Low
	8	CAN3L	CAN 3 Low
	9	not assigned	—
	10	CAN4H	CAN 4 High
	11	CAN1GND	CAN 1 Ground
	12	CAN2GND	CAN 2 Ground
	13	CAN3GND	CAN 3 Ground
	14	CAN4GND	CAN 4 Ground
	15	not assigned	—

Tab. 3-8: Pin assignment of a connector (front view) for the left 15-pin D-SUB-HD socket (CAN 1–4)

#### D-SUB plug, 9-pole (K201 cable)

With a CSM cable K201<sup>3</sup>, four CAN connections are wired to separate 9-pin D-SUB connectors with a CiA-compatible pin assignment. Tab. 3-9 shows the pin assignment of such a D-SUB connector (front view).

Image	Pin	Signal	Description
	1	not assigned	—
	2	CAN L	CAN Low
	3	CAN GND	CAN Ground
	4	not assigned	—
	5	Shield	Shield/housing
	6	not assigned	—
	7	CAN H	CAN High
	8	not assigned	—
	9	CAN PWR	CAN power (not required)

Tab. 3-9: Pin assignment of a 9-pole D-SUB plug (front view)

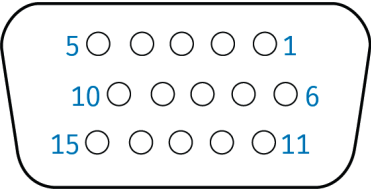
<sup>3</sup> The other end of cable K201 is equipped with a 15-pin D-SUB HD connector (see Tab. 3-8).

### 3.6.3 Ethernet interface (UniCAN 3 ETH only)

#### D-SUB-HD socket, 15-pole

The UniCAN 3 ETH is equipped with a 15-pin D-SUB socket for Fast Ethernet and CAN 9 (Fig. 3-2, ⑪).

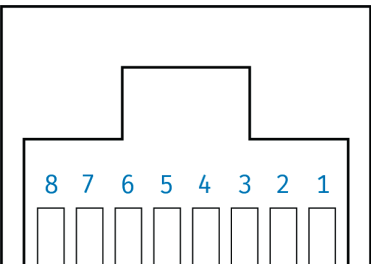
Tab. 3-10 shows the pin assignment of a connector (front view) to this socket.

Image	Pin	Signal	Description
	1	CAN9GND	CAN 9 Ground
	2	Shield	—
	3	—	—
	4	Shield	—
	5	—	—
	6	CAN9L	CAN 9 Low
	7	TX-	Ethernet transmitter, minus
	8	—	—
	9	—	—
	10	RX+	Ethernet receiver, plus
	11	CAN9H	CAN 9 High
	12	TX+	Ethernet transmitter, plus
	13	—	—
	14	RX-	Ethernet receiver, minus
	15	—	—

Tab. 3-10: Pin assignment of a connector (front view) for a 15-pin D-SUB-HD socket (Fast Ethernet/CAN9)

#### RJ45 socket, 8-pole (cable K220)

With a CSM cable K220, the Ethernet connection is led to an RJ45 socket. Tab. 3-11 shows the pin assignment of the socket (front view).

Image	Pin	Signal	Description
	1	TX+	Ethernet transmitter, plus
	2	TX-	Ethernet transmitter, minus
	3	RX+	Ethernet receiver, plus
	4	—	—
	5	—	—
	6	RX-	Ethernet receiver, minus
	7	—	—
	8	—	—

Tab. 3-11: Pin assignment of the 8-pole RJ45 socket



3.6.4 Digital inputs and outputs

The connection to the digital inputs and outputs is made using a 7-pole LEMO 0B socket on the rear side of the housing (Fig. 3-1, ⑨ “Digital I/O”).

<b>i</b>	The additional service access connected to this socket is usually not relevant for customers.
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Digital I/O

Image	Pin	Signal	Description
	1	$D_{IN1}/D_{OUT1}$	Digital Input/Output 1
	2	$D_{IN2}/D_{OUT2}$	Digital Input/Output 2
	3	$D_{IN3}/D_{OUT3}$	Digital Input/Output 3
	4	$D_{IN4}/D_{OUT4}$	Digital Input/Output 4
	5	GND	Signal Ground
	6	—	Reserved for service access
	7	—	Reserved for service access
	Housing	Shield	Shield

Tab. 3-12: Pin assignment of a connector (front view) for socket “Digital I/O”

The digital inputs accept voltage levels of more than +2.5 V as a logical “1” ( $U_{IN-High}$ , “high” level) and voltage levels below +1 V as logical “0” ( $U_{IN-Low}$ , “low” level). The input voltage may be within the range of 0 V to 10 % above the supply voltage of the battery ( $1.1 \times U_{Batt}$ ). If the input voltage is less than +3.8 V, the impedance is 1 M $\Omega$ . Otherwise, it is 220 k $\Omega$ . The input voltage level  $U_{IN}$  of all digital inputs is determined 1,000 times per second ( $f_s = 1$  kHz).

A logical “1” of the digital output ( $U_{OUT-High}$ , “high” level) corresponds to an output voltage  $U_{OUT-High} \geq U_{Batt} - 1.1$  V, with an output voltage of up to 25 mA.

With a logical “0” ( $U_{OUT-Low}$ , “low” level), the digital output is connected with high resistance (220 k $\Omega$  with  $U_{OUT} > +3.8$  V and 1 M $\Omega$  with  $U_{OUT} < +3.8$  V) to the ground (GND), i.e. the voltage characteristic of  $U_{OUT}$  with a logical “0” of the digital output is primarily influenced by the connected consumer.

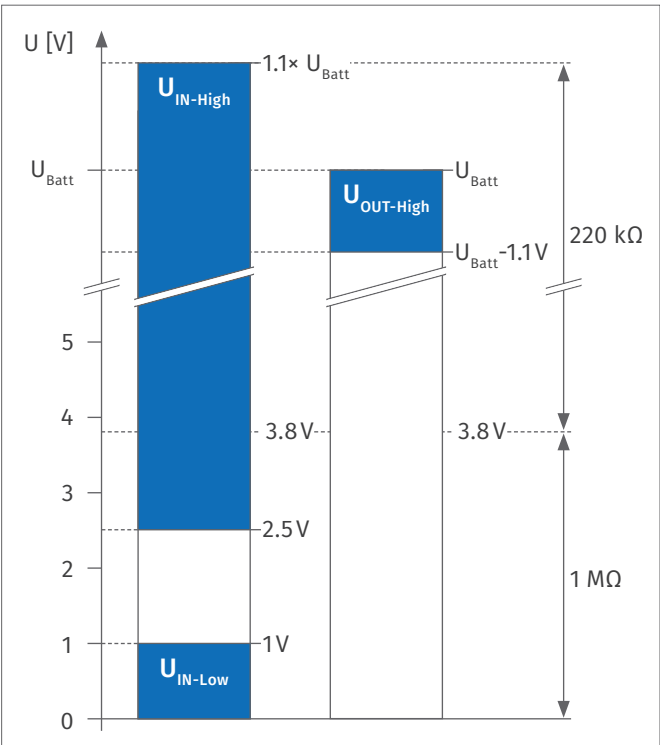



Fig. 3-7: Voltage level and impedance of the digital inputs/outputs

All outputs and the signal ground are short-circuit proof ( $D_{OUTx}$  to GND and GND to  $U_{Batt}$ ).


3.6.5 Antenna connectors



**NOTE!**

Please observe EMC guideline regulations

- ☞ The device and its antennas must be kept more than 20 cm away from the human body during operation.
- ☞ For compliance with FCC regulations, the antenna gain may not exceed 2 dB.



UniCAN 3 data loggers are available in different versions. Not all device versions include a mobile communications modem (LTE / UMTS / EDGE / GPRS). Activation of the WLAN module and the GNSS module (GPS / GLONASS / BeiDou / Galileo) is always available as an option.

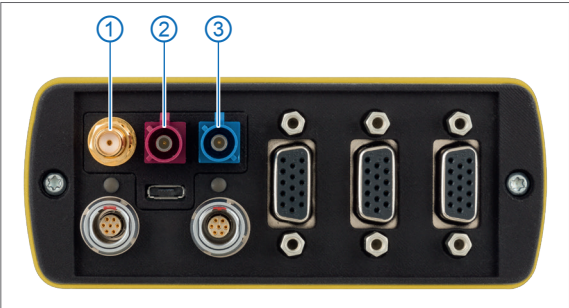


Fig. 3-8: UniCAN 3: Rear side of the housing with antenna connectors

- |   |  |                                |
|---|--|--------------------------------|
| ① | Connection for WLAN antenna                  | RP-SMA socket                  |
| ② | Connection for mobile communications antenna | FAKRA socket, code D, bordeaux |
| ③ | Connection for GPS antenna <sup>4</sup>      | FAKRA socket, code C, blue     |

The antenna connectors are identical for the dataloggers UniCAN 3 and UniCAN 3 ETH.

<sup>4</sup> The internal GNSS module also supports GLONASS, BeiDou and Galileo.



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