



Ethernet/CAN Gateway

EtherCAN/FD-S

User manual

User manual for Ethernet/CAN Gateway EtherCAN/FD-S Version 1.0

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If you discover a security vulnerability in one of our products, please report it to **security@ems-wuensche.com**. Thank you for your support.

Our products are continuously improved. Due to this fact specifications may be changed at any time and without announcement.

FCC: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference,
and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: EtherCAN/FD-S hardware and software may not be used in applications where damage to life, health or private property may result from failures in or caused by these components.

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1 Overview

1.1 Attributes

- Connection of CAN FD and CC systems to Ethernet
- CiA DS 102 and ISO 11898-2 compatible physical layer
- ISO 11898-2:2016 and CiA 601-4 (SIC) compatible bus interface (TI TCAN1462)
- 24 V nominal power supply
- Galvanic decoupling of CAN transceiver
- Power supply for maintenance via USB C possible
- Rail mountable
- Individual default password for each device

1.2 General Description

The rail mountable Ethernet/CAN gateway EtherCAN/FD-S transmits signals between a CAN FD system and an Ethernet network.

Utilizing the Ethernet standard EtherCAN/FD-S is usable in a wide range of applications. It can be used as a standard CAN interface in a LAN environment. Or two EtherCAN/FD-S devices, working back to back, can bridge CAN networks over an Ethernet connection.

A web server on the EtherCAN/FD-S is used to configure the device.

The USB C interface can be used to request basic device information like IPv4 address, serial number or host name (details in 2.2 Maintenance by USB C). It also allows to reset the device to factory default values.

1.3 Ordering Information

12-20-315-xx	EtherCAN/FD-S Ethernet/CAN Gateway
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Note: xx denotes language of delivery:

- 10 German
- 20 English

2 Configuration

2.1 Configuration by Web Access

You can easily configure the device's basic settings via a website. To access the login page, enter the IP address of the EtherCAN/FD-S into the search bar of your web browser. Please use the following login credentials for the initial configuration.

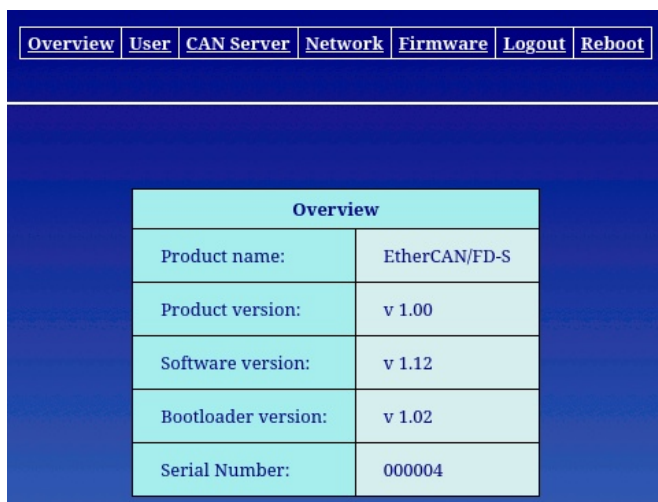
User : admin

Password : <see label on device>



EtherCAN/FD-S	
Login:	admin
Password:	
Login	

After a successful login the following screen appears:



Overview	
Product name:	EtherCAN/FD-S
Product version:	v 1.00
Software version:	v 1.12
Bootloader version:	v 1.02
Serial Number:	000004

To reduce security risks it is strongly recommend to change the password with the first configuration. This change will take effect with the next login attempt. Other changes may need a device reboot to take effect. The factory default password is printed on a label on the device. If the password has been changed and the user has forgotten it, it can be reset to the factory default via the USB interface.

Overview	User	CAN Server	Network	Firmware	Logout	Reboot
--------------------------	----------------------	----------------------------	-------------------------	--------------------------	------------------------	------------------------

Change User Settings	
Username:	admin
Password:	
Submit	

A click on "Network Settings" will lead to the following screen, which allows to change EtherCAN/FD-S network settings.

Overview	User	CAN Server	Network	Firmware	Logout	Reboot
--------------------------	----------------------	----------------------------	-------------------------	--------------------------	------------------------	------------------------

Network Settings	
Hostname	EtherCANFD
DHCP	☐
IP	192 168 1 1
Netmask	255 255 255 0
Gateway	0 0 0 0
Submit	
"Submit" will write new values to device. After "Reboot" changes will take effect.	

Current CAN settings are shown in the tab "CAN Settings", which were set by the client.

Overview User CAN Server Network Firmware Logout Reboot											
Mode	Port		Remote IP Address				Fixed Baud Rate				
☒ Server	1500						☐				
☐ Client	1500		192	168	0	1					
Keep Alive Settings											
Keep Alive Idle Time			Keep Alive Interval Time			Keep Alive Count					
[s]			[s]								
1.70000			1.100			1.100					
10			5			5					
Submit			"Submit" button will write parameters to device and reload page with that values. You have to "Reboot" for changes to take effect afterwards.								
	CAN Clk	n.tseg1	n.tseg2	n.brp	n.sjw	n.baudrate	d.tseg1	d.tseg2	d.brp	d.sjw	d.baudrate
	[MHz]	[tq]	[tq]			[kBaud]	[tq]	[tq]			[kBaud]
		1.256	1.128	1.512	1.128		1.16	1.16	1.32	1.16	
Local CAN Config	40	31	8	1	1	1000	15	4	2	1	1000
☐ Reset Mode ☐ Classic CAN ☒ CAN FD ☐ CAN FD Bosch	Local CAN params will always be applied, if gateway is configured as a Client. When configured as a Server they will only be applied, if Fixed Baud Rate is checked.										
☐ Listen Only ☐ Single Shot											
	CAN Clk	n.tseg1	n.tseg2	n.brp	n.sjw	n.baudrate	d.tseg1	d.tseg2	d.brp	d.sjw	d.baudrate
	[MHz]	[tq]	[tq]			[kBaud]	[tq]	[tq]			[kBaud]
		1.256	1.128	1.512	1.128		1.16	1.16	1.32	1.16	
Remote CAN Config	40	31	8	1	1	1000	15	4	2	1	1000
☒ Reset Mode ☐ Classic CAN ☐ CAN FD ☐ CAN FD Bosch	If gateway is configured as a Client remote CAN params will be sent to the Server. If they are accepted depends of the Fixed Baud Rate checkbox on the Server side.										
☐ Listen Only ☐ Single Shot											

It is possible to flash new firmware into the device via CAN. Two CAN identifiers have to be configured for this purpose and the feature has to be activated as it is not by default.

Overview User CAN Server Network Firmware Logout Reboot		
Flash firmware communication parameters		
Active	☐	
ID IN	2021	☐ Extended ID
ID OUT	2020	☐ Extended ID
Submit		
"Submit" will write new values to device and will have immediate effect.		

2.2 Maintenance by USB

The USB-C interface at the top of EtherCAN/FD-S (see Layout and Connection) is used for basic maintenance tasks such as resetting the device to factory default settings or displaying device information like current network settings.

Connect a serial console program like minicom or PuTTY with the associated COM port (115200 baud, 8N1). If the device is connected specific letters can be entered to perform actions:

'h' : Displays an overview of available commands

```
<h> : Show this help
<i> : Show device information
<f> : Reset settings to factory default
<d> : Change mode of DHCP (On/Off)
<r> : Reboot device
```

'i' : Displays current device information

```
Product           : EtherCAN/FD-S
Serial            : 4
Product version   : 1.00
Bootloader version : 1.02
Application version : 1.12
MAC Address       : 00:08:85:04:xx:xx
Hostname          : EtherCANFD
DHCP              : ON
IPv4 Address      : 192.168.1.1
IPv4 Subnet mask  : 255.255.255.0
IPv4 Gateway      : 0.0.0.0
TCP Keep Alive idle time : 10 [s]
TCP Keep Alive interval : 5 [s]
TCP Keep Alive count : 5
Firmware Download : Disabled
```

'f' : Resets the device to factory default settings

'd' : Toggles DHCP mode ON or OFF

'r' : Reboots the device

The commands **<f>**, **<d>**, **<r>** have to be confirmed before they are performed.

3 Electrical Characteristics

3.1 Absolute Limiting Values

Any (also temporary) stress in excess of the limiting values may cause permanent damage on EtherCAN/FD-S and connected devices.

Exposure to limiting conditions for extended periods may affect the reliability and shorten the life cycle of the device.

Parameter	Min.	Max.	Unit
Storage temperature	-40	+85	°C
Operating temperature	-20	+70	°C
Supply voltage	-100	+35	V
Voltage on bus pins (CANH, CANL) with respect to CAN GND*	-36	+36	V
Differential Voltage on bus pins (CANH-CANL)*	-45	+45	V

* According to CAN transceiver and ESD protection diode specification.

3.2 Nominal Values

Parameter	Min.	Typ.	Max.	Unit
Current consumption (running idle, no CAN and no Ethernet connection)	-	40	-	mA
Current consumption (250 kBit/s / 2 MBit/s, 100 % busload)	-	75	-	mA
Power supply voltage	11	24	30	V
Power supply voltage on USB C for maintenance	4,5	5	5,5	V

All values, unless otherwise specified, refer to a supply voltage of 24 V and an environmental temperature of 20 °C.

4 Operating Instructions

4.1 Pin Assignment

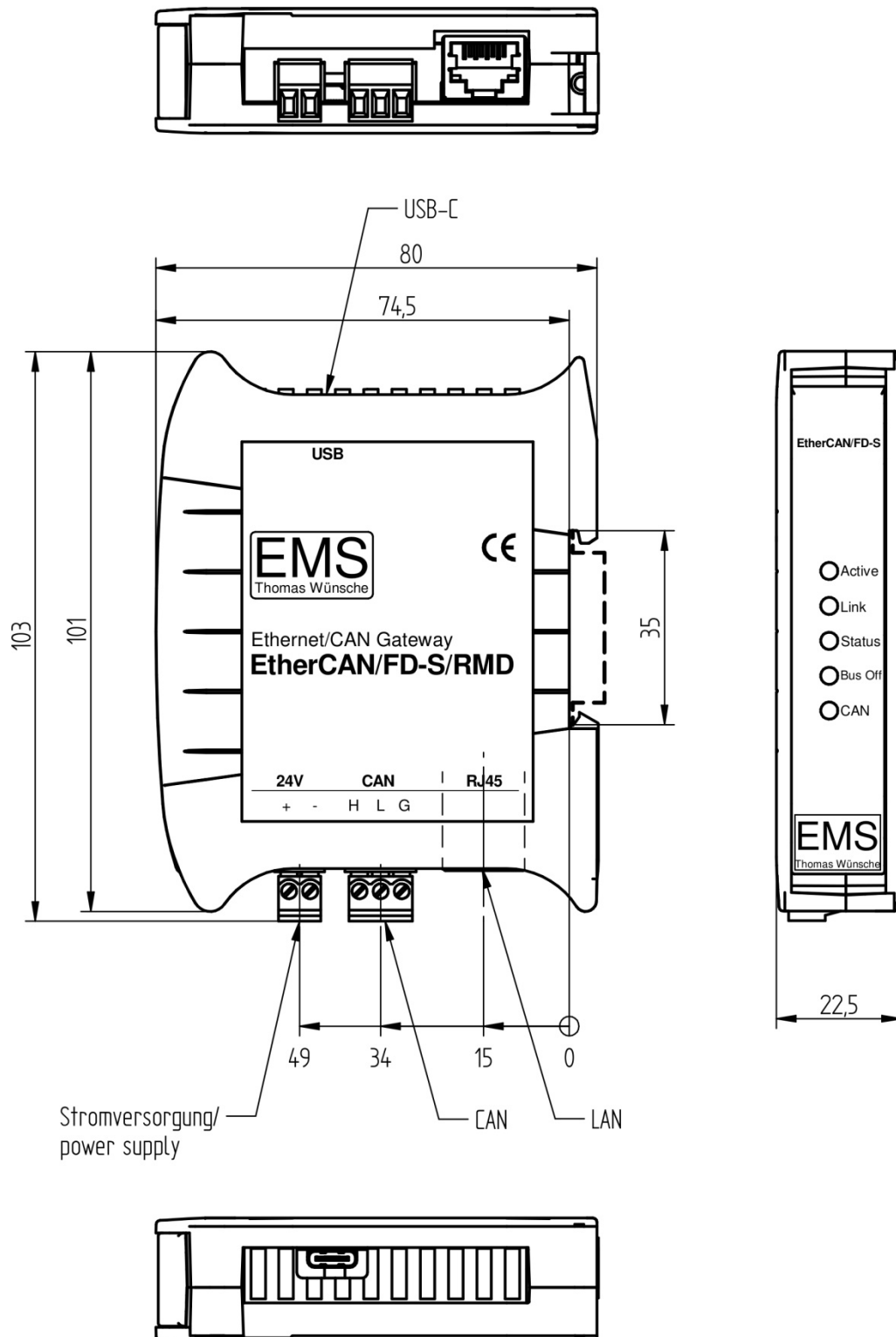
The CAN interface connector is wired by terminal blocks with 3 clamps. The power supply of EtherCAN/FD-S is separately wired by a terminal block with 2 clamps.

The following table shows the terminal assignment of the CAN connector:

Pin	Name	Function
1	CAN_H	CAN high bus line
2	CAN_L	CAN low bus line
3	GND	CAN ground

4.2 Dimensions

All values in [mm].



DIMENSIONS ARE IN MILLIMETERS
GENERAL TOLERANCES ISO 2768-1 c
DRAWINGS ARE NOT COMPLETELY TRUE TO THE ORIGINAL

4.3 Installation

To setup and use EtherCAN/FD-S within a network, the following is needed:

- A PC running Windows 8/8.1/10/11 or Linux, connected to the Ethernet network
- An Ethernet network with a free twisted pair connection for EtherCAN/FD-S
- 24 V DC power supply

To avoid damage please pay attention to the following hints:

WARNING: Avoid damage by achieving equal potential between the corresponding devices before plugging any connections to EtherCAN/FD-S.

To the CAN connector of EtherCAN/FD-S only CAN networks with a connector and electrical character complying with this specification may be attached.

Besides the instructions mentioned in this manual carefully observe the instructions in your computers users manual.

If you are not sure about the installation please contact **EMS Dr. Thomas Wünsche**.

5 Appendix

5.1 Instruction for Disposal

Electronic Equipment Act (WEEE)

EMS is selling its products exclusively to commercial customers. This is the reason why all devices are designed for commercial use and have to be disposed appropriately. In accordance to § 10 para. 2 clause 3 Electronic Equipment Act (WEEE) the disposal of EMS products is regulated the following way.

The equipment must not be disposed at the public collection points. In accordance with the applicable law the disposal has to be done by the customer for own account. The same applies to products, which have been sold to third parties, if those parties do not take care of a disposal in accordance to the applicable law. As an alternative the products can be returned to EMS free of charge.

5.2 FCC Statement

EtherCAN/FD-S has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

5.3 Declaration of Conformity

Declaration of Conformity



The manufacturer

EMS Dr. Thomas Wünsche e.K.
Sonnenhang 3
85304 Ilmmünster

hereby declares, that the following product:

Name	Article Number
EtherCAN/FD-S	12-20-315-xx

meets the requirements of the following standards:

Electromagnetic Emission

DIN EN 55032:2022-08 VDE 0878-32:2022-08 – Electromagnetic compatibility of multimedia equipment – Emission requirements (CISPR 32:2015 + COR1:2016 + A1:2019); German version EN 55032:2015 + AC:2016 + A11:2020 + A1:2020

Electromagnetic Immunity

DIN EN 55035/A11:2022-06 VDE 0878-35/A11:2022-06 – Electromagnetic compatibility of multimedia equipment – Immunity requirements; German version EN 55035:2017/A11:2020

and therefore conform with the EU requirements on:

Electromagnetic compatibility (2014/30/EG)

In accordance with the above mentioned EU directives, the EC declarations of conformity and the associated documentation are held at the disposal of the competent authorities.

RoHS 3

The RoHS 3 (EU 2015/863) commits manufacturers of „Electrical and Electronic Equipment“ (EEE) to secure compliance with the RoHS Directive before placing a CE mark.

Based on technical documentation and to the best of our knowledge, we hereby confirm that the above mentioned products do not contain any of the restricted substances according to Article 4 of the RoHS Directive in excess of the maximum concentration values tolerated by weight in any of their homogeneous materials.

Ilmmünster, 16.02.26

Dr. Thomas Wünsche

