



GL3000/GL4000 Logger Family Manual

Version 3.6 | English

Imprint

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1 Introduction

In this chapter you find the following information:

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1.1 About this User Manual

Conventions

In the two following charts you will find the conventions used in the user manual regarding utilized spellings and symbols.

Style	Utilization
bold	Blocks, surface elements, window and dialog names of the software. Accentuation of warnings and advices. [OK] Push buttons in brackets File Save Notation for menus and menu entries
Source Code	File name and source code.
Hyperlink	Hyperlinks and references.
<CTRL>+<S>	Notation for shortcuts.

Symbol	Utilization
	This symbol calls your attention to warnings.
	Here you can obtain supplemental information.
	Here you can find additional information.
	Here is an example that has been prepared for you.
	Step-by-step instructions provide assistance at these points.
	Instructions on editing files are found at these points.
	This symbol warns you not to edit the specified file.

1.1.1 Warranty

Restriction of warranty

We reserve the right to change the contents of the documentation and the software without notice. Vector Informatik GmbH assumes no liability for correct contents or damages which are resulted from the usage of the documentation. We are grateful for references to mistakes or for suggestions for improvement to be able to offer you even more efficient products in the future.

1.1.2 Registered Trademarks

Registered trademarks

All trademarks mentioned in this documentation and if necessary third party registered are absolutely subject to the conditions of each valid label right and the rights of particular registered proprietor. All trademarks, trade names or company names are or can be trademarks or registered trademarks of their particular proprietors. All rights which are not expressly allowed are reserved. If an explicit label of trademarks, which are used in this documentation, fails, should not mean that a name is free of third party rights.

- ▶ Windows, Windows 7, Windows 8.1, Windows 10, Windows 11 are trademarks of the Microsoft Corporation.

1.2 Important Notes

1.2.1 Safety Instructions and Hazard Warnings

**WARNING!**

In order to avoid personal injuries and damage to property, you have to read and understand the following safety instructions and hazard warnings prior to installation and use of the loggers. Keep this documentation (manual) always near the logger.

1.2.1.1 Proper Use and Intended Purpose

**WARNING!**

The loggers are measuring devices which are used in the automotive and commercial vehicles industries. The loggers are designed for gathering and recording data of the bus communication, for analyzing and possibly controlling electronic control units. This includes, inter alia, bus systems like CAN, LIN, MOST and FlexRay.

The loggers may only be operated in a closed state. In particular, printed circuits must not be visible. The loggers may only be operated according to the instructions and descriptions of this manual. Only suitable accessories should be used, such as the original Vector accessories or accessories approved by Vector.

The loggers are exclusively designed for use by skilled personnel as its operation may result in serious personal injuries and damage to property. Therefore, only those persons may operate the loggers who (i) have understood the possible effects of the actions which may be caused by the loggers; (ii) are specifically trained in the handling with the loggers, bus systems and the system intended to be influenced; and (iii) have sufficient experience in using the loggers safely.

The logger specific information can be acquired via the specific manuals as well as from the Vector KnowledgeBase at www.vector.com. Please consult the Vector KnowledgeBase for updated information prior to the operation of the loggers. The knowledge necessary for the bus systems used, can be acquired in workshops and internal or external seminars offered by Vector.

1.2.1.2 Hazards

**WARNING!**

The loggers may control and/or otherwise influence the behavior of electronic control units. Serious hazards for life, body and property may arise, in particular, without limitation, by interventions in safety relevant systems (e.g. by deactivating or otherwise manipulating the engine management, steering, airbag and/or braking system) and/or if the loggers are operated in public areas (e.g. public traffic). Therefore, you must always ensure that the loggers are used in a safe manner. This includes, inter alia, the ability to put the system in which the loggers are used into a safe state at any time (e.g. by „emergency shutdown“), in particular, without limitation, in the event of errors or hazards.

Comply with all safety standards and public regulations which are relevant for the operation of the system. Before you operate the system in public areas, it should be tested on a site which is not accessible to the public and specifically prepared for performing test drives in order to reduce hazards.

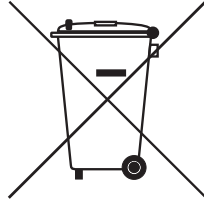
1.2.2 Disclaimer

**WARNING!**

Claims based on defects and liability claims against Vector are excluded to the extent damages or errors are caused by improper use of the loggers or use not according to its intended purpose. The same applies to damages or errors arising from insufficient training or lack of experience of personnel using the loggers.

1.2.3 Disposal of Vector Hardware

Please handle old devices responsibly and observe the environmental laws applicable in your country. Please dispose of the Vector hardware only at the designated places and not with the household waste.



Within the European Community, the Directive on Waste Electrical and Electronic Equipment (WEEE Directive) and the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS Directive) apply.

For Germany and other EU countries, we offer free take-back of old Vector hardware.

Please carefully check the Vector hardware to be disposed of before shipping. Please remove all items that are not part of the original scope of delivery, e.g. storage media. The Vector hardware must also be free of licenses and must no longer contain any personal data. Vector does not perform any checks in this regard. Once the hardware has been shipped, it cannot be returned to you. By shipping the hardware to us, you have relinquished your rights to the hardware. Before shipping, please register your old device via:

<https://www.vector.com/int/en/support-downloads/return-registration-for-the-disposal-of-vector-hardware/>

2 GL3000/GL4000 Logger

In this chapter you find the following information:

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2.1 General Information

2.1.1 Scope of delivery

Included

- ▶ 1x GL logger (depending on the order)
- ▶ 1x D-SUB plug set (2x 25-pin, 1x 50-pin)
- ▶ 1x Switch Box E2T2L (2 pushbuttons, 2 LEDs)
- ▶ 1x USB cable
- ▶ 1x CONSOLE cable
- ▶ 1x eSATAp connection cable (GL3200 and GL4200 only)

2.1.2 Optional Accessories

Optional hardware and software

- ▶ Analog extension card A8I with 8 analog inputs
- ▶ WiFi extension card, glass mount antenna with 3 m connection cable inclusive
- ▶ UMTS
- ▶ SSD with cartridge (GL3200 and GL4200 only). Must be ordered from Vector.
- ▶ "Industrial grade" CF cards with different capacities
- ▶ CCP/XCP license for CAN, FlexRay and Ethernet
- ▶ Online Data Transfer License for data transmission to ML Server via Ethernet
- ▶ License for HostCAM (logger-based or camera-based)



Reference

Information on available accessories can be found in the appendix in section Accessories on page 40.

2.2 Overview

General capabilities

The loggers of the GL3000 and GL4000 family are devices for recording of CAN and LIN bus data. Additionally, loggers of the GL4000 family are also capable of recording FlexRay bus data. Besides, all loggers support recording of analog and digital input signals. The data is stored on a removable storage medium, either a Compact Flash Card or a Solid State Disk.

The configuration of the logger can be done with the **Vector Logger Suite** (see section [Vector Logger Suite](#) on page 35).



Figure 1: GL4200

Logger differences

The following table shows the differences between the logger variants:

Feature	GL3000	GL3100	GL3200	GL4000	GL4200
9x CAN channel	X	X	X	X	X
2x LIN channel	X	X	X	X	X
8x Digital input	X	X	X	X	X
8x Digital output	X	X	X	X	X
6x Analog input	X	X	X	X	X
2x FlexRay channel	-	-	-	X	X
Ethernet	X	X	X	X	X
Display	-	X	X	X	X
Keys	-	X	X	X	X
USB Host	X	X	-	X	-
Storage media	CF	CF	SSD	CF	SSD

2.3 Front Side

Device connectors
GL3200
GL4200

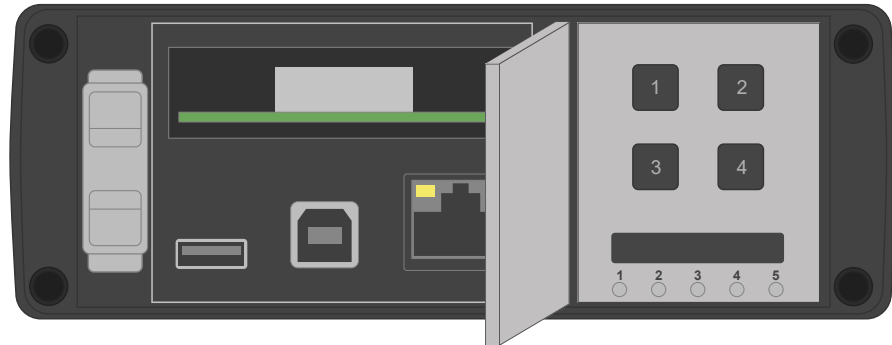


Figure 2: Logger with SSD cartridge

Device connectors
GL3000
GL3100
GL4000

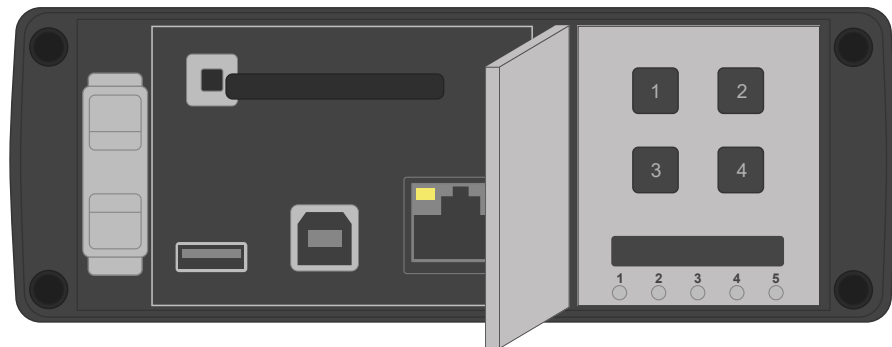


Figure 3: Logger with Compact Flash card

► Slot for removable SSD / Compact Flash card

Depending on the model, the logger supports a removable SSD on a cartridge (64 GB or 512 GB, 2.5 inch SATA Solid State Disk) or a CF card (8 GB, 16 GB, 32 GB). The storage media is available as Vector accessory.

The storage medium slot is located behind the front flap which can be unlocked and opened. Remove the SSD by just pulling the cartridge. Remove the CF card by pressing the button on the left next to the CF slot.

For read out from SSD, an eSATAp port at the computer and an optional eSATAp connection cable are required. If no eSATAp port is available, you can use an USB-eSATAp adapter. The SSD can also be read out via logger's USB connector or via the Disc Reader which is available as accessory (high data rates).

For read out from CF card, any CF card reader can be used.



Note

While the logger is switched on, the storage medium must not be removed until the LED behind the flap is off. While the LED is red, it is not allowed to remove the storage medium as the logger closes the log files and shuts down the operating system properly during this time. The storage media has to be FAT32 formatted. For optimum speed, we recommend a maximum cluster size of 64 Kbyte.

► **USB (Type-A)**

Reserved.

► **USB (Type-B)**

Use this connector to read out the inserted storage medium or to write a new configuration via the computer. Therefore, the logger will be switched to USB mode. To switch into the USB mode, the logger must be connected to an external voltage supply. The USB connection is not sufficient.

In Windows, the logger is shown as a USB drive (similar to USB hard disks). The **Vector Logger Suite** identifies the logger as device and displays additional information in **Device Information**.



Step by Step Procedure

If the logger is in logging mode, connect the logger with the computer as follows:

1. Check if the logger is already in logging mode. The display shows **Record** and the LEDs lit as configured.
2. First, connect the USB cable to the computer (USB connector Type-A).
3. Open the front access panel.
4. Quickly connect the USB cable with the USB device connector (USB connector Type-B).

After opening the front access panel the logger will close the logging and will wait minimum 6 seconds for the USB connection. If logging data are still written to the memory media the waiting time will be extended respectively. During this time the display shows Stop Rec or Save XX% and the LEDs show a running light from the right to the left. If the USB cable is not connected during this waiting time, the logger will switch off.

If you connect the logger with USB, the logger switches to USB mode after about 30 seconds.

If the USB cable is connected during this waiting time, the logger will switch to USB mode and the display shows **USB Mode**. The LEDs still show the running light from right to left, and the LEDs at the storage medium light up green and red (at the CFcard behind the card, at the SSD on the front of the cartridge).



Note

Do not remove the storage medium while the logger is in USB mode!

**Step by Step Procedure**

Please proceed as follows to disconnect USB:

1. Disconnect the logger safely with the function **Safely Remove Hardware** of the Windows task bar.
2. Disconnect the USB cable from the logger and close the front access panel.

The logger will switch off. In case of remaining bus traffic on the CAN busses, the logger awakes immediately.

► **Ethernet**

Reserved.

► **Keypads 1...4**

The loggers (except GL3000) features four programmable event buttons on the front panel. These buttons can be used as triggers, for example.

► **Display**

The logger features an eight-character LCD display for messages. The display is freely programmable and can be used for any text output, e. g. capital and small letters, numbers or some special characters. Further information on the display can be found in section **System Messages** on page 45.

► **LEDs**

The logger has five LEDs which are freely programmable. They can be used to display different states. Further information on the LEDs can be found in section **System Messages** on page 45.

2.4 Back Side

Device connectors

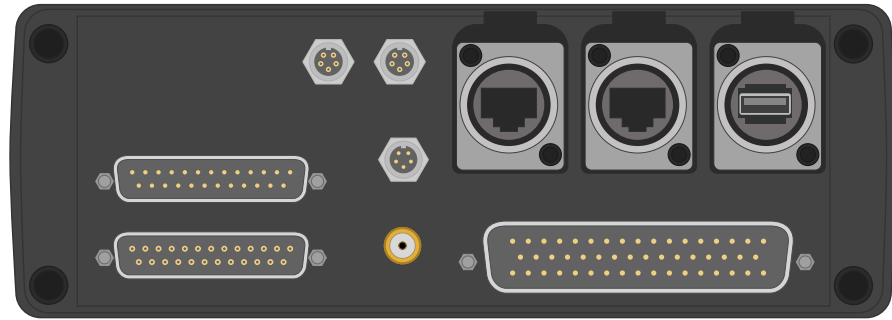


Figure 4: GL3000/GL4000 bus side

► Analog extension (D-SUB25 male)

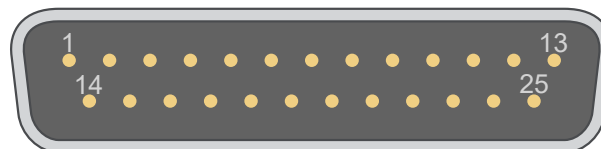
The logger can be expanded by eight independent analog inputs using the analog extension board A8I. The inputs are freely available as channels 7 through 14 and can be configured separately. These channels are differential and provide higher resolution and better precision than the internal analog inputs.

The extension boards are calibrated after production. The calibration data is stored on the board.

After start, the extension board needs 100 ms before data can be measured. The logger starts considerably faster (20 ms after switching on). As the analog values and the values from the digital inputs are latched together with the CAN data in the pre-logger, the measurement values of the first approx. 80 ms are lost.

The expansion board may only be installed by Vector Informatik GmbH. For more information, please contact the Vector Support.

Analog In 7...14
optional via
analog extension
board A8I



Pin	Assignment	Pin	Assignment
1	Analog In 7 +	14	Analog In 7 -
2	Analog In 8 +	15	Analog In 8 -
3	Analog In 9 +	16	Analog In 9 -
4	Analog In 10 +	17	Analog In 10 -
5	Analog In 11 +	18	Analog In 11 -
6	Analog In 12 +	19	Analog In 12 -
7	Analog In 13 +	20	Analog In 13 -
8	Analog In 14 +	21	Analog In 14 -
9	Reserved	22	Reserved
10	5 V (out)	23	UART2 Rx
11	UART2 Tx	24	Vbat (out)
12	RS232LinuxTx	25	RS232LinuxRx
13	GND	-	-

Externally connected devices can be supplied with 5 V through pin 10. The voltage supply at this pin is switched off with a switch if the logger is in sleep mode or standby mode. This output can supply currents up to 1 A.

Pin 24 outputs the voltage at pin Battery (VCC) on the main connector and is protected with 2 A.

During installation, the network settings and the real-time clock are set in the configuration mode via this interface.

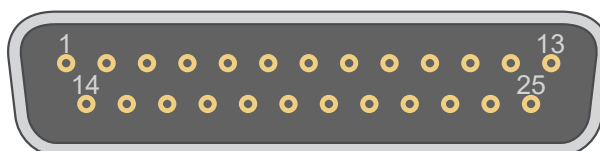
For the connection between logger and computer, use the delivered CONSOLE cable. The pins of the CONSOLE cable are assigned as follows:

D-SUB9 (to computer) Pin	Assignment (Analog Plug)
2	RS232LinuxTx
3	RS232LinuxRx
5	GND

► Digital input/output (D-SUB25 female)

The logger offers eight digital inputs and output. The pin assignment is as follows:

Digital In/Out 1...8



Pin	Assignment	Pin	Assignment
1	Reserved	14	Digital In 1
2	Digital Out 1	15	Digital In 2
3	Digital Out 2	16	Digital In 3
4	Digital Out 3	17	Digital In 4
5	Digital Out 4	18	Digital In 5
6	Digital Out 5	19	Digital In 6
7	Digital Out 6	20	Digital In 7
8	Digital Out 7	21	Digital In 8
9	Digital Out 8	22	Vbat (out, switched)
10	Reserved	23	Digital GND
11	Reserved	24	Digital GND
12	Reserved	25	Sync (reserved)
13	Reserved	-	-

A digital output can be used to operate external hardware, for example. The voltage applied to the digital output is wired to ground via an FET switch.

The two Digital GND pins 23/24 are the common ground of the digital outputs and connected to one another internally. They are used to divert possible high currents that could flow in on digital output Digital Out X. They are bridged internally with GND via a fuse.

It is recommended connecting a good ground if digital outputs are used with high currents. For currents higher than 1 A, the ground Digital GND (preferably both pins 23 and 24) must be connected to the vehicle ground (GND at main plug).

Pin 22 outputs the voltage of Battery via a 1 A electrical fuse if the logger is switched on. This output is used for the operation of small accessory devices which have no own sleep mode and are supposed to operate when the logger is awake. The ground of such device must be connected to the vehicle ground (GND at main plug).

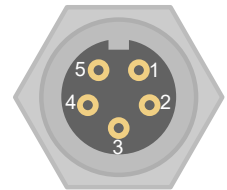
► AUX

The two 5-pin plug connections (Binder type 711) AUX are intended for the connection of the following logger accessories:

- LOGview (external display)
- Switch Box CAS1T3L (with one button, three LEDs and one sound)
- Switch Box CASM2T3L (with two buttons, three LEDs, one sound, and microphone for voice recording)
- VoCAN (for voice recording and output)

The pin assignment on the logger is as follows:

Pin	Description
1	+ 5 V
2	GND
3	CAN High
4	CAN Low
5	Vbat



The AUX connections are internally wired to CAN 9. For this reason, this channel is always equipped with a high-speed transceiver without wake-up capability and can no longer be used freely if an AUX connection is used. If the AUX connections are not used, CAN9 is fully available.

► **Event**

This connector is used for the Switch Box E2T2L, which is included in the scope of delivery. The buttons and the LEDs are freely programmable. The buttons can be used as manual trigger or event.



Figure 5: Switch Box E2T2

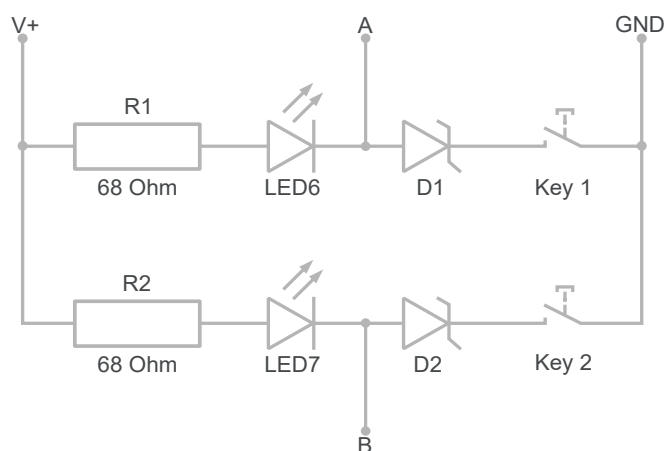
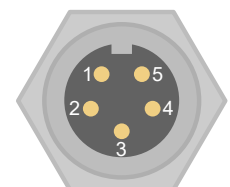


Figure 6: Switch Box E2T2L wiring

The pin assignment on the logger is as follows:

Pin	Description
1	Not connected
2	V+
3	A
4	B
5	GND



► **WiFi (Main)**

Depending on the ordered GL3000 or GL4000 option, the device is equipped with a connector for the WiFi antenna or a plastic plug. The operating frequency of the antenna is approximately 2.4 GHz. Use this port to transfer data to a destination system. This can be configured in **Vector Logger Suite**.



WARNING!

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operations at closer distances than this are not recommended.

Ethernet 2

Configuration of the logger and reading out of the logging files, connector for one network camera HostCAM, an LTE router and for the usage as network interface in CANoe/CANalyzer (since version 7.6 SP3). Further information on the network interface usage can be found in the Vector Logger Suite manual, section "Monitoring Interface". The configuration of the logger and CANoe/CANalyzer is described in tutorial: Usage as interface.

► **Ethernet 3**

Connector for:

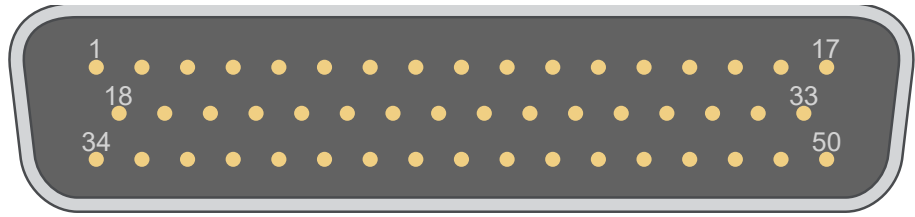
- GLA150 (accessory for MOST150)
- VX modules

► **USB (host)**

USB host connection with USB A socket for connection of a LTE router.

► **Main plug (D-SUB50 male)**

The main plug offers several features. The pin assignment is as follows:



CAN 1...4
optional via
piggyback

Pin	Assignment	Pin	Assignment
6	CAN 1 High	7	CAN 1 Low
22	CAN 1 Vbat	23	CAN 1 GND
8	CAN 2 High	9	CAN 2 Low
24	CAN 2 GND	25	CAN 2 Vbat
10	CAN 3 High	11	CAN 3 Low
26	CAN 3 Vbat	27	CAN 3 GND
12	CAN 4 High	13	CAN 4 Low
28	CAN 4 GND	29	CAN 4 Vbat



Reference

See section **Accessories** on page 40 for available piggybacks and section **Replacing Piggybacks** on page 25 on how to replace piggybacks on the logger.

CAN 5...8
with wake-up

Pin	Assignment	Pin	Assignment
39	CAN 5 High	40	CAN 5 Low
41	CAN 6 High	42	CAN 6 Low
43	CAN 7 High	44	CAN 7 Low
45	CAN 8 High	46	CAN 8 Low

CAN 9
without wake-up

Pin	Assignment	Pin	Assignment
47	CAN 9 High	48	CAN 9 Low

LIN 1/2

Pin	Assignment	Pin	Assignment
14	LIN 1	15	LIN 2
30	LIN 1 Vbat	31	LIN 2 Vbat

LIN frames can be recorded with the internal LIN channels. The sending of LIN frames is not supported on these channels. A LINprobe X is required for this purpose and is available as a logger accessory.

The LIN channels are supplied with maximum 12 V from the supply voltage of the data logger. If the reference voltage for a LIN channel is higher than 12 V, this voltage (e. g. 24 V) must be applied to the LIN1_Vbat or LIN2_Vbat pins. In all other cases, the LIN1/2 Vbat pins are not connected. It is recommended to connect also GND as ground supply beside the LIN pins.

FlexRay 1/2
(GL4000 family only)

Pin	Assignment	Pin	Assignment
1	FlexRay 1+	2	FlexRay 1-
34	FlexRay 2+	35	FlexRay 2-

The logger can be woken up on both FlexRay channels.

With the **Vector Logger Suite**, FlexRay databases in XML format are supported in versions FIBEX 2.0, FIBEX+, FIBEX 3.0, FIBEX 3.1 and ARXML, XCP on FlexRay is also supported with these versions.

Analog input 1...4

Pin	Assignment	Pin	Assignment
18	Analog In 1	19	Analog In 2
20	Analog In 3	21	Analog In 4

Analog inputs 5 and 6 are hard-wired internally and connected to BattSense (pin 36) and KL 15/Wake (pin 16) respectively. They are therefore not accessible through a plug.

GND

Pin	Assignment
3	GNDSense
4	GND
5	GND

The two GND pins 4/5 on the main plug and the GND pin on the analog plug are connected to one another internally. In case of increased current consumption and/or a small cable diameter, it is recommended connecting both pins.

If the cables to the logger are long, the voltage drops off on terminal KL30 line and the GND line due to the operating current. As a result, a minimally lower voltage than the actual wiring system voltage is measured with Analog In 5. To prevent this, the BattSense and GNDSense pins can be connected close to the wiring system voltage. Analog In 5 then measures the voltage at these pins.

UART 2/3

Pin	Assignment	Pin	Assignment
49	UART2 Tx	32	UART3 Tx
50	UART2 Rx	33	UART3 Rx

For recording and transmitting data, the serial interfaces (UART2 and UART3) of the logger can be used. The baudrate of the interface can be set. Received data can be stored as CAN messages. The serial interfaces cannot be used to load a configuration or to read out logging data.

The UART2 Tx/Rx pins are connected internally with the UART2 Tx/Rx pins of the analog plug.

Battery

Pin	Assignment
36	BattSense
37	Battery (VCC)
38	Battery (VCC)

The battery pins 37/38 are connected to one another internally. They are used to supply the logger with power. In case of increased current consumption and/or a small cable diameter, we recommend connecting both pins.

Reverse-polarity protection

For the voltage supply via Battery (pins 37/38) and GND (pins 4/5), a complete reverse-polarity protection is available that in parallel also suppresses negative peaks from the main power supply. A protection against positive peaks is also available. Dependent on the temperature, peaks from 35.88 V up to 42.12 V can be absorbed. Then temporarily up to 1200 A can be discharged.

Miscellaneous

Pin	Assignment	Pin	Assignment
16	KL15/Wake	17	K-Line

The logger is woken up by a positive edge on this pin. KL15/Ignition, for example, can be connected for this purpose.

**WARNING!**

It is recommended to connect the logger to the same voltage supply (e. g. battery of the vehicle) as the vehicle or test equipment, respectively. If two different voltage supplies are used for the logger and the test equipment, the ground (GND) pins of the two voltage supplies must be connected.

2.5 Replacing Piggybacks



WARNING!

The case has to be opened to replace the piggybacks. This must be done very cautiously and carefully, in order to not damage the sensitive lines in the unit.

When performing this operation be sure not to touch the top or bottom of the boards (logger board or piggybacks) to avoid damages due to electrical discharges.

The ribbon cables may not be folded or crushed!



Step by Step Procedure

1. First, loosen the logger housing screws on the back side with the D-SUB connectors. This requires removing the black decorative caps.
2. Carefully remove the back cover with the board from the housing until the piggybacks are accessible. It is sufficient to pull out the board halfway.
3. You will find the plug-in locations at the edge of the PC-board.

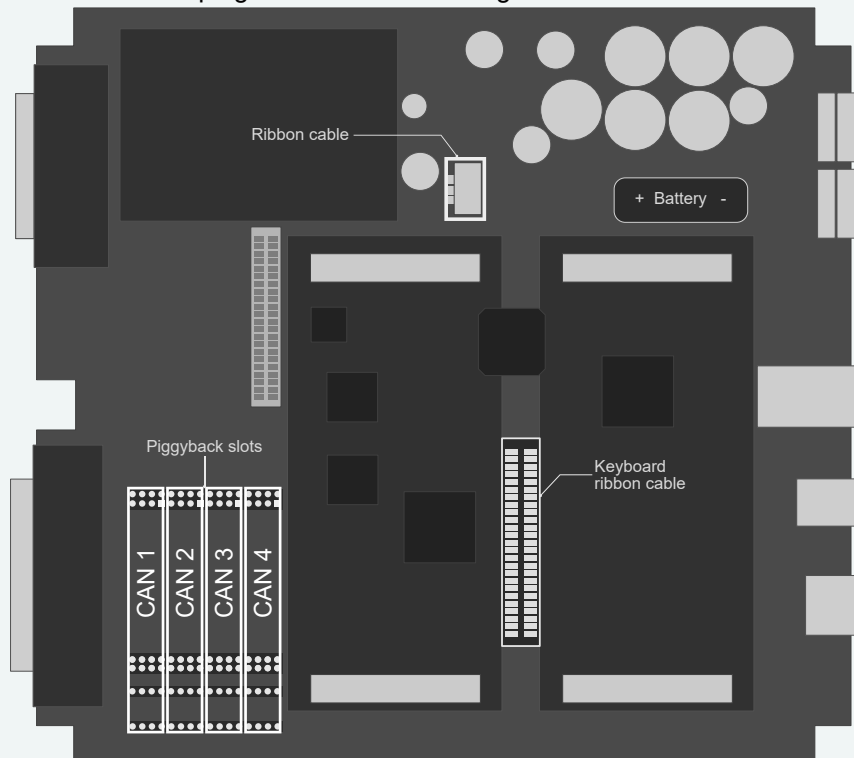


Figure 7: Piggyback plug-in locations

4. Remove the piggyback carefully from the mounting location.

5. Insert the new piggyback. As the piggybacks are designed asymmetrically, it is not possible to use them in a turned position. If some slots are not occupied, you must ensure that each piggyback is inserted exactly in its intended slot on the 16-pin measuring connection strip. Electrically isolated piggybacks contain four further pins.
6. Reassemble the unit in the reverse order. Place the main board back in the housing and ensure that the board has been inserted into the correct guide rail (piggybacks: groove 6, main board: groove 1).
7. It should be possible to slide the main board in the housing up to a few millimeters from the end without forcing it in. Close the housing by applying light pressure, and then secure it with the appropriate screw fasteners. The screws should be secure but not excessively tight.
8. Please also attach the black decorative caps.
9. Switch on the logger. The installed piggybacks are automatically detected ("plug & play").

2.6 Battery for Real-Time Clock

2.6.1 General Information

General information The logger has an internal real-time clock, which is battery supplied, and thus continues running even if the logger is disconnected from power supply. The real-time clock inside the logger is required to store the date and time together with the logged data. It is recommended to set the real-time clock before first logging.

Durability The Lithium battery has a typical durability of approximately 4...7 years under the following conditions:

- ▶ T = +40 °C ... +80 °C for at most 40 hours per week
- ▶ T = -40 °C ... +40 °C in the rest of the time



WARNING!

The case has to be opened to replace the piggybacks. This must be done very cautiously and carefully, in order to not damage the sensitive lines in the unit.

When performing this operation be sure not to touch the top or bottom of the boards (logger board or piggybacks) to avoid damages due to electrical discharges.

The ribbon cables may not be folded or crushed!

2.6.2 Disposal of Battery

**Note**

Please do not replace a flat battery yourself, but contact the Vector support. The logger must be sent in for battery replacement.

**Note**

If the logger is to be disposed of, you must first remove the internal battery and dispose of it separately. Please follow the instructions below.

**Step by Step Procedure**

1. First, loosen the logger housing screws on the back side with the D-SUB connectors. This requires removing the black decorative caps.
2. Carefully remove the back cover with the board from the housing until the piggybacks are accessible.
3. Remove the keyboard ribbon cable (not at GL3000) and the ribbon cable from the board.
4. Now completely remove the board from the housing.
5. Use wire-cutting pliers to cut off the connecting wires of the battery.

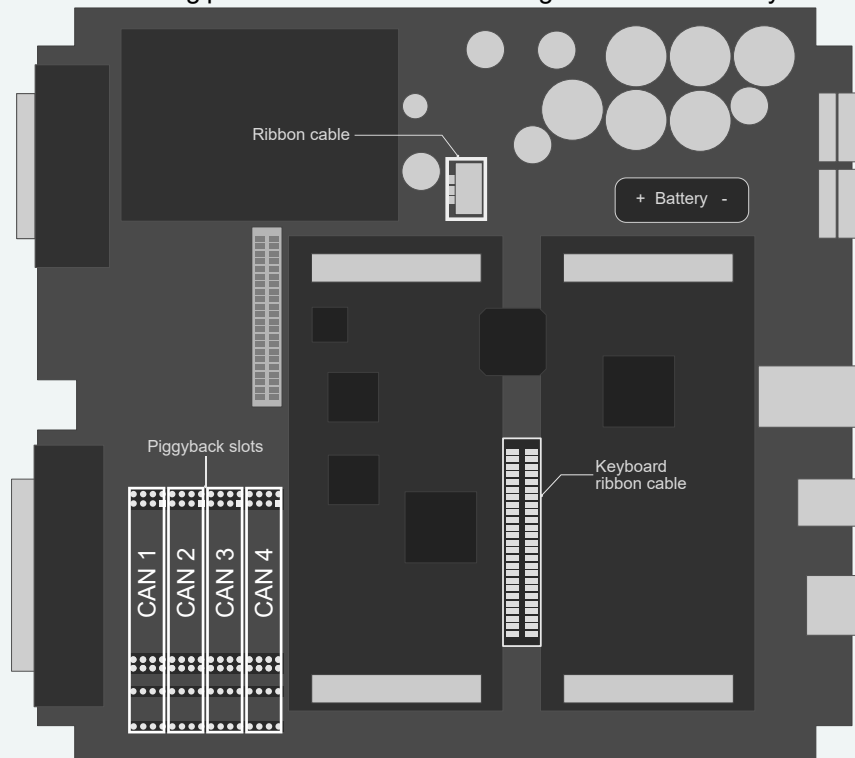


Figure 8: Battery location

6. Dispose the battery according to the Batteries Act register (BattG).

7. Reassemble the unit in the reverse order. Insert the main board halfway into the housing and ensure that the board has been inserted into the correct guide rail (piggybacks: groove 6, main board: groove 1).
8. Insert the keyboard ribbon cable with the wide wire oriented to the middle of the board into the plug and lock it (not in the case of GL3000). Then attach the ribbon cable to the board.
9. Now slide the main board completely into the housing. It should be possible to slide the main board in the housing up to a few millimeters from the end without forcing it in. Close the housing by applying light pressure, and then secure it with the appropriate screw fasteners. The screws should be secure but not excessively tight.
10. Please also attach the black decorative caps.

2.7 Technical Data

CAN channels	Max. 9 - 4x CAN High-Speed (TJA1043), wake-up capable - 1x CAN High-Speed (TJA1042), not wake-up capability - 4x optional
LIN channels	2x - Transceiver: TJA1021 - Wake-up capability
FlexRay channels (GL4000 family only)	2x - Channels A and B of a cluster for Rx/Tx with XCP on FlexRay or - Channels A independent for Rx only, without XCP on FlexRay - Data transmission: 10 Mbit/s - Wake-up capability
Analog inputs	6x (single-ended) - Input 1...4: freely available - Input 5: connected with BattSense - Input 6: connected with KL15/Wake - Voltage range: 0 V ... 18 V - Resolution: 10 bit - Precision: 1 % - Sampling rate: Max. 1 kHz - Type: Single-ended to GND - Input resistance: 155.6 kOhm - Reverse-polarity protection: -50 V ... +50 V
Analog expansion card (optional)	8x input (differential, unipolar) - Input 7...14: freely available - Voltage range: 0 V ... 18 V - Resolution: 12 bit (5 mV) - Precision 0.2 % - Sampling rate: Max. 1 kHz for each channel - Reverse-polarity protection: -50 V ... +50 V
Digital inputs	8x - Voltage range: -0.8 V ... 50 V - Sampling rate: 1 kHz - Low level: < 0.5 V - High level: > 1.9 V - State unwired input: High (TRUE) - Input resistance: >200 kOhm - Pull-up resistance: 100 kOhm
Digital outputs	4x - Voltage range: -0.3 V ... 40 V - Nominal output current (all channels on): - Typ. 500 mA for each output - Max. 1000 mA for each output - Current limitation: - Min. 1.0 A for each output - Typ. 1.5 A for each output - Max. 2.0 A for each output

	- Input resistance (On-resistance): 0.8 Ohm - Amount of load current of all channels: Max. 4 A - Circuit time: typ. 1 ms
USB	2.0
Ethernet	3x 10/100 Mbit/s interface
Wi-Fi (optional)	- WiFi card with WEP and WPA/WPA2 - IEEE 802.11g / 54 Mbit/s - Encoding algorithm: WEP and WPA/WPA2 - Security protocol: EAP/TLS, TKIP, RADIUS - Operating frequency of the antenna approx. 2.4 GHz
Cellular radio	Optional: - LTE router
Start-up time	Max. 20 ms (without Fast Wake-up). Recording the first message with Fast Wake-up.
Battery	Lithium battery, CR 2/3 AA type
Power supply	6 V...36 V (reverse-polarity protected), typ. 12 V
Power consumption	Typ. 8.5 W (without SSD) Typ. 10 W (with SSD)
Current consumption	Operation: - typ. 700 mA (without SSD) - typ. 800 mA (with SSD) Start: - typ. 1100 mA Sleep mode: - typ. 1 mA (without Fast Wake-up) Standby mode: - typ. 300 mA (with Fast Wake-up) All data in each case with 12 V.
Temperature range	-40 °C...+70 °C (restricted with WiFi and 3G)
Dimensions (LxWxH)	Approx. 213 mm x 78 mm x 235 mm
Housing	Aluminium housing Alubos 2070
Operating system requirements	Windows 10 (64 bit) Windows 11 (64 bit)

2.8 Miscellaneous Features

2.8.1 Wireless Data Transfer

The logger supports data transmission via WiFi/LTE via the software Multi-Logger ML Server. A basic version called **MLtools** is included in the scope of delivery. The full version **MLcenter** with extended functionality, in particular for use on professional servers, can be purchased for a fee. The software is described in the MLServer manual.

In the **Vector Logger Suite**, you can set the events which should trigger a WiFi/LTE connection and which logged data should be transferred from the logger to the destination system.

For data transmission to ML Server, the recording will be interrupted (LTL: ConnectionRequest). If the recording should be continued during the transmission (LTL: TransferRequest), the **Online Data Transfer license** must be installed on the logger.

You can find the MAC addresses on the label on the top of the logger.

For LTE, a SIM card is not included. A contract must be concluded separately with a provider.

3 First Steps

In this chapter you find the following information:

3.1 Switching the Logger On/Off	34
3.2 Vector Logger Suite	35

3.1 Switching the Logger On/Off

3.1.1 Automatic Switching

- Power management** For permanent use in vehicles, the loggers are permanently connected to the vehicle battery. Due to the sleep-/wake functionality, the logger will be switched on and off automatically by bus activity. This implements an effective power management with very quick start times without stressing the vehicle battery in idle times (e. g. during night).
- Sleep mode** The loggers can be configured to switch to sleep mode automatically if no CAN, LIN or FlexRay message was received within a defined time and no voltage is applied to the KL15/Wake-Pin at the same time. This time can be defined in the configuration program (maximum 18,000 s = 5 hours). The sleep mode has a very low current consumption of typ. 1 mA.
- Wake-up** The logger wakes up from sleep mode:
- ▶ after reception of a CAN message
 - ▶ after reception of a LIN message
 - ▶ after reception of a FlexRay message (GL4000 family only)
 - ▶ positive edge on the wake-up line (clamp 15)
 - ▶ wake-up timer via real-time clock
- After wake-up, messages will be recorded after maximum 40 ms. The fast wake-up from standby mode allows the recording of the very first message waking up the logger. However, with typ. 300 mA the standby mode has a higher current consumption than the sleep mode.

3.1.2 Manual Switching

- ▶ The logger is switched on by applying the supply voltage.
- ▶ The logger is shut down and switched off by opening the front access panel. After opening the front access panel the display shows first **Stop Rec** (end of recording). After that the display shows **Save XX%** while saving the logging data from RAM to storage medium. When this procedure is finished, **Shut-down** is displayed while the logger shuts down. During all the steps a running light from right to left is displayed by the LEDs. If the running light and the display are off, the logger is shut down completely.
- ▶ The SSD/CF card can be removed after the red LED is off.
- ▶ Depending on the configuration, bus activity after the shutdown can wake up the logger immediately.

**Note**

The logger must not be switched off by disconnecting the voltage. By interrupting the voltage supply, files are closed and the operating system shuts down properly. The logging data in the RAM gets lost.

3.2 Vector Logger Suite

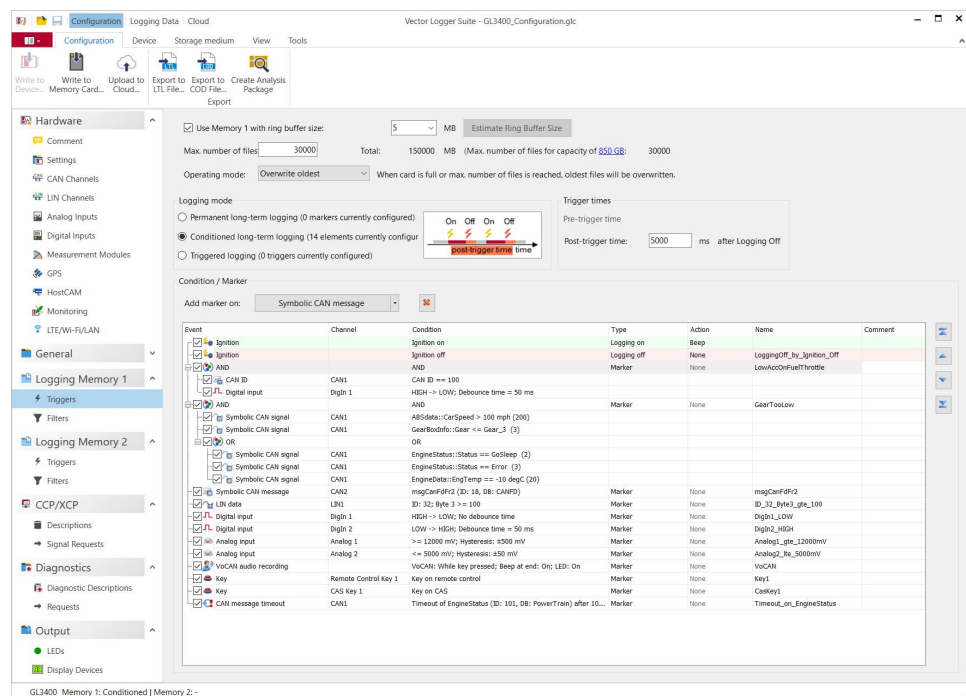
3.2.1 General Information

Overview

Vector Logger Suite enables the configuration of all loggers of the GL Logger family and offers a wide range of settings. You may set baud rates for CAN and LIN, define triggers and filters, set LEDs and manage logging files on the storage media. Furthermore for the CAN bus diagnostics and CCP/XCP can be configured. For CCP/XCP the logger needs an installed license. For Seed & Key CANape is required. Vector Logger Suite also supports trigger and filter access by symbolic names defined in CAN, LIN and FlexRay databases.

Main features are:

- ▶ Customizable filters for CAN and LIN messages and FlexRay frames/PDUs
- ▶ Customizable triggers
- ▶ Support of CAN databases (DBC) and LIN databases (LDF)
- ▶ Support of FlexRay databases (FIBEX 2.0, FIBEX+, FIBEX 3.0 and FIBEX 3.1 each with XCP)
- ▶ Support of AUTOSAR description files (ARXML), version 3.0 to 4.4
- ▶ Diagnostic support
- ▶ File management
- ▶ CCP/XCP (optional)



Requirements

The following software requirements must be fulfilled to run the Vector Logger Suite: Windows 10 (64 bit) or Windows 11 (64 bit)

**Reference**

The Vector Logger Suite is described in detail in the user manual of this configuration program. The user manual is available as PDF and can be opened in the Vector Logger Suite via **Backstage | Documentation**.

3.2.2 Quick Start

3.2.2.1 Installation

**Step by Step Procedure**

The Vector Logger Suite can be installed as a 64 bit program as follows:

1. Execute the setup, which is found on the installation DVD:
`.\VLSuite\Setup_VLSuite_64Bit.exe.`
2. Please, follow the instructions in the setup program to complete the installation.
3. After successful installation, the Vector Logger Suite can be found in the start menu (if selected during installation).
4. Also install the basic software e. g. for wireless transmission. The software can be found on the installation DVD under
`.\MLtools\setup.exe.`

3.2.2.2 Configuring the Logger



Step by Step Procedure

Follow the instructions below to configure the logger with an SSD, start long-term logging and read out logging data.

1. Start the program.
2. Create a new project in the backstage via **New Project....** In the displayed dialog, select the logger type.
3. Select suitable baud rates for CAN and/or LIN (**Hardware | CAN Channels** and/or **Hardware | LIN Channels**), respectively.
4. Select the timeout to sleep mode (value > 0) in **Hardware | Settings**.
5. Connect the SSD to the computer with the eSATA 5 V cable (possibly with a USB eSATA adapter) or use a CF card reader for a CF card.
6. Save the configuration on the storage medium via **Configuration | Write to Memory Card....**
7. Open the front flap of the logger, insert the storage medium into the logger and then close the front flap again.
8. Connect the logger e. g. to your test system (CAN bus). Switch power on via connecting cable on D-SUB50.
9. Start logging. LED1 flashes permanently (standard setting for new configurations, can be configured).
10. Stop logging by switching off CAN. Wait until the logger goes to sleep mode (CAN transceiver with wake-up capability necessary), i. e. LED1 must be off.
11. Open the module **Logging Data**.
12. Remove the storage medium from the logger. Connect it to the computer.
13. Click on **Backstage**  and select the drive of the CF card from the **Attached Hardware** list. All measurements on the CF cards are displayed afterwards.
14. Click on **Destination Format** and select the file format (e. g. BLF logging file) and further settings.
15. Click on **File Storage** and select the target directory and further settings.
16. Click on **Export** to initiate the readout of the logging data and the automatic conversion to the selected file format. The files will be stored in a new sub-folder (Destination Subdirectory) of the target directory.



Note

During update, the logger must not be disconnected from the power supply. Please allow up to 5 minutes for extensive firmware updates (e. g. including Linux update).

3.2.2.3 Setting the Real-Time Clock



Step by Step Procedure

The following example describes how to set the date and the time of the logger.

1. If it is not switched on yet, start the logger by supplying power via the connection cable on the D-SUB50. The logger must be switched on during the whole procedure.
2. Open the front flap of the logger and connect it to the computer via USB. Wait until the logger is in USB mode.
3. Start the Vector Logger Suite. Make sure a configuration for GL3000 or GL4000 is active.
4. Select **Device | Set Real-Time Clock...**
5. In the **Connection** setting, select the USB.
6. Click on **[Set]** to set the current computer date and time in the logger. After a short period of time the Vector Logger Suite reports success of the action and that the device had to be disconnected from the computer.



Note

Alternatively, you can also set the real-time clock via the CONSOLE cable that is connected to a COM port of your computer. This also enables to read-out the current date and time of the logger and manual setting.

To read the current time from the logger, select **Logger** from the **Clock** setting. Date and time of the logger is continuously displayed.

4 Appendix

In this chapter you find the following information:

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4.1 Accessories

4.1.1 Piggybacks

A piggyback is a plug-in PC-board which implements the interconnection of the logger to a specific CAN bus by the use of various transceivers. The piggybacks are also used in other loggers. See section [Replacing Piggybacks](#) on page 25 on how to replace piggybacks on the logger.

Available piggybacks for the GL3000/GL4000 family:

Piggyback	Transceiver	Description	Wake-up	Electr. Isolation
1043	TJA1043	CAN High-Speed	X	-
1043mag	TJA1043	CAN High-Speed	X	X
1042	TJA1042	CAN High-Speed	-	-
1050	TJA1050	CAN High-Speed	-	-
1055	TJA1055	CAN Low-Speed	X	-
1055mag	TJA1055	CAN Low-Speed	X	X
Single Wire	TLE6255G	CAN Single Wire	X	-
Truck Trailer	WABCO	Truck & Trailer	X	-



Note

Piggybacks 1043mag and 1055mag are magnetically decoupled. Due to the decoupling, the power supply and ground for these piggybacks must be connected at the main plug. Therefore, use the according Vbat and GND pins, please. For proper electrical isolation, the piggybacks must be powered from a different source than the logger.

4.1.2 Storage Media

GL3000
GL3100
GL4000

The GL3000, GL3100 and GL4000 support industrial grade CompactFlash cards. For the proper use, only the industrial grade cards released by Vector may be used.

Support cases with problems related to non-released storage media cannot be handled by our support team.

4.1.3 HostCAM Cameras

Overview

The loggers support the logging of color pictures via the network camera HostCAM. The camera must be connected via the Eth2 Ethernet port on the back of the logger. A switch is required to connect a second HostCAM.

You can find further information on configuring and connecting the camera in the HostCAM user manual.

For the logging of the color pictures, a camera license must be installed either on the logger or the camera. Please note that the licenses cannot be transferred.



Note

- ▶ The simultaneous operation of more than two HostCAMs is not recommended due to performance reasons.
- ▶ If multiple cameras are triggered simultaneously, it may result that during the image transmission, the storage of recorded bus data to the storage media is delayed. That may lead to a temporary impossibility to record any bus data.
- ▶ A **Factory Reset** at the HostCAM removes the camera license. Afterwards the license must be reinstalled. Please perform a Factory Reset (if required) by using the HostCAM Setup from the Vector Logger Suite. A previously installed license file is retained

4.1.4 GLA150 (MOST)



Note

This product is no longer available.

General information

For MOST150 the accessory GLA150 is required. It will be connected to the logger via Ethernet. With the GLA150 selectively the following MOST events can be logged:

- ▶ Status Events (bus state, system state, register, allocatable ...)
- ▶ Control Message Events
- ▶ MOST Data Packet Events (MDP)
- ▶ MOST Ethernet Frame Packet Events (MEP)

Normally, the status event is logged only at the occurrence of changes. Additionally it can be configured that the status event is written automatically to the logging file cyclically once per second. This ensures that also at a triggered logging with only a few occurred state changes the current state will be logged.

The configuration of the GLA150 is handled via the Vector Logger Suite.

Logging of MOST events

The logging of the MOST events will start a few seconds after the logger's wake up.

After the logger switched to sleep mode, the GLA150 remains active and thereby holds the MOST ring closed until the first time Light off will be detected at the input. Afterwards the GLA150 will be woken up by the logger.

The time stamps of the MOST events are synchronized automatically with events of other bus systems, e.g. CAN or LIN.

Connectors

At the GLA150, the following connectors are available:

- ▶ **MOST150**
Connection for fiber optic cable.
- ▶ **Network**
Connection for Ethernet cable. The cable is connected to connector Eth 3 at the logger's backside.
- ▶ **Power/Sync**
Connection for GLA150 adapter cable PWR-SYNC. The cable is connected to the logger's AUX+ connector, to supply the GLA150 with power.

LEDs

▶ **Power**

LED which indicates the power state.

Color	Description
Green	Device is running.

▶ **Communication**

LED which indicates the communication state.

Color	Description
Green	Data connection to the logger is ready.

▶ **MOST Activity**

LED which indicates the MOST state.

Color	Description
Yellow	Ethernet packets, data packets or control messages received.

▶ **Error**

LED which indicates the error state.

Color	Description
Red	Connection problem to the logger or data overflow.

▶ **Info**

Unused.

▶ **MOST Lock**

LED which indicates the MOST Lock state.

Color	Description
Yellow	Stable Lock.

4.1.5 Miscellaneous Accessories

- ▶ LTE router for cellular radio
- ▶ CANgps/CANgps 5 Hz for recording the vehicle position via GPS
- ▶ LINprobe as extension of the LIN channels
- ▶ VoCAN for voice recording and voice output (1 button, 4 LEDs and signal tone)
- ▶ CASM2T3L for voice recording (2 buttons, 3 LEDs and signal tone)
- ▶ CAS1T3L (1 button, 3 LEDs and signal tone)
- ▶ LOGview for displaying signal and status information
- ▶ VX1060 for read-out of ECU-internal signals via XCP on Ethernet

4.2 System Messages

General messages

Display	LEDs	Description
Startup	Off	Start of the logger.
Record*	Off*	Execution of the configuration.
FLASHING	Running light (alternating)	Update of the firmware, configuration, Linux files etc. FLASHING will be displayed several times and the running light will be restarted. Duration: approx. 60 sec
Off	Off	Between configurations update and re-start.
Stop Rec	Off	Configuration is stopped.
Save XX%	Running light (cyclic right to left)	Configuration is stopped. The data storage progress is displayed (data > 100 KB).
Off	All LEDs cyclically blink 2x in quick succession	Fault at logger CPU.
No Card	Off*	No storage medium (CF card, SSD) available. Logger will switch off afterwards.
MediaErr	Off	CF card/SSD cannot be mounted resp. plugged late.
USB Mode	red/green/red (in the card reader slot resp. cartridge)	USB cable is connected. Logger is in USB mode.
Shutdown	Running light (cyclic right to left)	Logger goes to sleep/standby mode or is switched off (duration approx. 1...2 sec.).
(one dot)	Off	Logger goes to sleep mode (duration approx. 2 sec.).
(two dots)	Off	Logger goes to Standby mode (duration approx. 2 sec.).

WiFi connection

Display	LEDs	Description
Record*	Off*	Execution of the configuration.
CONNECT	Running light (cyclic right to left)	Establishment of the WiFi connection before shutdown. Configuration is stopped. Duration: max. 80 sec.
CTimeXX CStatXXX	Running light (cyclic right to left)	Configuration is stopped. Establishment of the WiFi connection with display of the elapsed time in seconds and the last error status.
LoadInit	Off	WiFi connection established.
Download	Running light (cyclic right to left)	Configuration is stopped. WiFi data transfer of the logging files to the computer is started.
Load:XX% XXX KB/s	Running light (cyclic right to left)	During the WiFi data transfer alternately the progress and the throughput is displayed.
RtUpdate	Running light (cyclic right to left) End of transfer: Off	Transfer of a new configuration (*.COD) to the logger.
CTimeout	Running light (right to left)	Error: Communication Timeout.
APreject	Running light (cyclic right to left)	Error: The connection to the Access Point was refused.

WiFi connection

Display	LEDs	Description
Rejected/ byServer	Running light (cyclic right to left)	Error: MLserver refuses the connection, e. g. the registration of the logger is missed.
NetFail	Running light (cyclic right to left)	General communication error, e. g. a cable was unplugged.

* The display and the LEDs can be overwritten by user-defined settings.



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