GL Logger Families

Product Information
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This document describes the functions of devices of the GL Logger family.

Product information and technical data related to accessories for the GL loggers are provided in a separate document.
1 Introduction to the GL Logger

Loggers of the GL model series are optimal tools for logging CAN/CAN FD, LIN and FlexRay data communication. In addition, the loggers support logging of analog measurement data such as battery voltage, as well as logging of internal ECU parameters via diagnostics and CCP/XCP during a test drive.

Because of their low current consumption in sleep mode, the loggers are excellently suited for vehicle tests and use in test fleets. The robust housing simplifies installation in your vehicles – and the high memory capacities of the memory cards make them suitable for long-duration logging as well.

1.1 Overview of Advantages

- Use as stand-alone tool for challenging logging tasks
- Use in test fleets and for in-vehicle testing
- Supports CAN and LIN bus wake-up and sleep modes
- Data is saved to SD/SDHC memory cards (GL1000/GL2000 families) or CF memory cards, SSD (GL3000/GL4000/GL5000 families)
- Short startup time
- Extensive filter and trigger conditions
- Support of diagnostics via UDS, KWP2000 on CAN and OBD II
- Support of CCP/XCP with Seed & Key
- Quick read-out of the measurement data over USB interface or via commercially available card readers
- Wireless data transmission for the GL2000/GL3000/GL4000/GL5000 families, via cellular radio or Wi-Fi depending on the logger type
- Offline analysis in CANoe, CANalyzer, CANape, vSignalizer
- Easy to configure with graphical configuration program and LTL support (Log Task Language)
- GL1010 and GL2010 can be used as IP65 variant
1.2 Bus Systems and Interfaces

This figure illustrates the supported bus systems of the individual GL Logger families, their memory media and transmission paths.

**Figure 2:** Overview of bus systems and interfaces (for details see also technical data in chapter 0)
2 Functions

GL Loggers are used to log the data communications of CAN, CAN FD, LIN, FlexRay and RS232 bus systems as well as analog and digital measurement data. Internal ECU data can also be requested and logged via diagnostics and CCP/XCP. The Vector Logger Configurator is used to configure the data loggers for different uses. The data is logged according to the configured filter and trigger conditions, and it is transferred to the PC via USB or memory card. Loggers of the GL2000/GL3000/GL4000/GL5000 families also permit wireless data transmission. After automatic conversion of the raw data, you can evaluate the logging data with CANalyzer, CANoe, CANape or vSignalyzer.

The configuration program and its various functions are described below.

2.1 Graphical Configuration Program

The Vector Logger Configurator is the comfortable program for creating configurations for all loggers of the GL families. The program is already included in the scope of delivery.

The Vector Logger Configurator is used to configure hardware settings for the CAN, CAN FD, LIN and FlexRay channels. This includes configuration of the filter and trigger conditions, logging of analog and digital inputs and the CCP/XCP measurements. The diagnostic requests for reading out internal ECU data are also configured with this program. LEDs can be set to indicate individual events. The Vector Logger Configurator supports reading out the logged data and converting it to a variety of logging formats. With Quick View you can get in the Vector Tools CANoe, CANalyzer, vSignalyzer or CANape the preview of logging data directly from the logger or the memory card e.g. to check the data for plausibility.

System requirements: Operating systems Windows 7/8.1 (each 32/64 bit) and Windows 10 (64 bit).

Figure 3: Trigger settings in the Vector Logger Configurator
2.2 Graphical Logging Export Program

The new Vector Logging Exporter is a separate program for readout stations that enables convenient and intuitive conversion of the logged data of all Vector loggers in the necessary target formats for the various target groups. The program is included in the scope of delivery.

The Vector Logging Exporter automatically determines the logger type and the associated analysis package from the logging files. The data is selectively read from the connected logger, card reader, or a directory on a hard disk or server. You can quickly select the export settings for each target group using preset conversion profiles. With the Vector Logging Exporter, you thus provide the logged data promptly in the desired target formats to all target groups. In addition, the logging files can be easily exported from archived raw data (ZIP format) to other formats or with additional options – even later on.

System requirements: Operating systems Windows 7/8.1 (each 32/64 bit) and Windows 10 (64 bit).

![Data export with Vector Logging Exporter](image)

2.3 Logging Modes

The loggers support 3 different selectable logging modes:

- Permanent logging, i.e. automatic logging as soon as the logger is switched on
- Triggered logging with configurable trigger events with pre-trigger and post-trigger times
- Logging with configurable start/stop conditions
2.4 Filter Functions

Filter functions are used to select which data should be logged. Without filters, all data is logged. The use of filters leads to data reduction. This makes it possible to conduct longer test drives.

Possible filters:

- Filtering on CAN, CAN FD and LIN identifiers and on FlexRay frames
- Filtering with symbolic selection of messages from DBC, LDF, FIBEX and AUTOSAR files
- Filtering of entire channels
- Filtering to record only one message per configurable interval (Limit filter)
- Stop or pass filters

2.5 Trigger / Marker Functions

Trigger functions are used as events both for triggered logging and for start/stop conditions for permanent logging.

Markers are available for the GL2000/GL3000/GL4000/GL5000 families and are defined as triggers for certain events. In the case of permanent logging, they mark only a point in time. The markers are displayed on a time bar in the Navigator. For reading out the data, the pre- and post-trigger time can be flexibly set.

- Configurable events for trigger and marker
- Configurable events for start/stop conditions
- Configurable post-trigger time for triggered logging
- Trigger types:
  - Standard trigger: Trigger is initiated whenever a configured event occurs
  - Single shot trigger: Trigger is initiated just once, regardless of how often the event occurs
  - End measurement trigger: Logging is stopped after this event and is not resumed until the logger is restarted.
- Trigger and marker
  - on CAN/LIN identifiers, data contents and message timeout
  - by symbolic selection of signals and messages from databases (DBC, LDF, FIBEX and AUTOSAR files)
  - on CCP/XCP signals and diagnostic signals
  - on CAN bus statistics (busload, error frames)
  - on buttons from remote control, on digital and analog inputs
- Combination of events via AND/OR conditions
- Logging via ring buffers:
  - GL1000/GL2000 families: Ring buffers on the memory card
  - GL3000/GL4000/GL5000 families: Two separately configurable ring buffers, filter and trigger conditions separately configurable for each ring buffer
2.6 Functions for CAN

These CAN/CAN FD functions are included in the loggers:

- CAN channels:
  - GL1000 family: 2 CAN channels
  - GL2000/GL2010: 4 CAN channels, of which 2 channels optionally electrically decoupled
  - GL2400: 4 CAN/CAN FD channels
  - GL3000/GL4000 families: 9 channels, of which 4 channels optionally electrically decoupled
  - GL5350: 20 channels, of which 4 CAN FD channels and 16 CAN channels
  - GL5370: 24 channels, of which 12 CAN FD channels and 12 CAN channels
- Message filters
- Triggering on messages, signal values, Error Frames and message timeouts
- Logging of error frames on CAN with ECC information (Error Code Information)
- Diagnostics on CAN via UDS, KWP2000 on CAN and OBD II (On-Board Diagnostics)
- Integration of CAN/CAN FD databases (DBC and AUTOSAR format) to select filter and trigger conditions
- Sleep mode and wake-up over CAN/CAN FD
- Sending of messages on CAN/CAN FD
- Gateway functionality on CAN
- Online classing, Rainflow analysis (GL2000/GL3000/GL4000/GL5000 families)
- Tachograph function (GL2000/GL3000/GL4000/GL5000 families)
- Optional: CCP/XCP on CAN/CAN FD with Seed & Key (Seed & Key algorithms can be generated with CANape V8.0 or higher)

2.7 Functions for LIN

In logging tasks on the LIN bus, the loggers support you with the following functions:

- LIN channels
  - GL1000–GL4000 families: 2 channels
  - GL5000 family: 6 channels, of which 4 are user-configurable with GLT piggyback boards
- LINprobe extends the loggers, including channels for sending LIN frames:
  - GL1000/GL2000 families: max. 7 LINprobes (14 additional channels)
  - GL3000/GL4000 families: max. 7 LINprobes (14 additional channels)
  - GL5000 family: max. 5 LINprobes (10 additional channels)
- Recording of the LIN frames with automatic recognition of the protocol version
- LINprobe permits spatially close coupling to the LIN bus
- Message filters
- Triggering on messages, signal values and message timeouts
- Online classing, Rainflow analysis (GL2000/GL3000/GL4000/GL5000 families)
- Gateway functionality
- Integration of LIN databases (LDF and AUTOSAR format) for filter and trigger conditions
- Sleep mode and wake-up over LIN
2.8 Functions for FlexRay (GL4000/GL5000 Families)

The GL4000/GL5000 families offers you the following functions for use on the FlexRay bus:

> Logging of 2 independent FlexRay channels A (without XCP on FlexRay)
> Logging of 1 FlexRay cluster, i.e. channels A and B (with XCP on FlexRay)
> Filters for frames
> Triggering on frames, signal values and frame timeouts
> Online classing, Rainflow analysis
> Evaluation of bus states
> Integration of the system description in FIBEX 2.0/3.0/3.1 and AUTOSAR format for selecting the filter and trigger conditions
> Logging without precise knowledge of bus parameters
> Logging also possible with non-synchronized bus
> Optional: XCP on FlexRay (FIBEX 2.0/3.0/3.1) with Seed & Key (generation of Seed & Key algorithms with CANape V8.0 or higher; license also includes CCP/XCP on CAN)

2.9 Functions for RS232

The serial interface offers the following functions:

> Logging of serial data as CAN message
> Transmission of serial data

2.10 Diagnostic Functions

Logging of diagnostic data over the CAN bus:

> Time-synchronous logging of diagnostic data
> Symbolic selection of diagnostic requests for frame-oriented logging
> Symbolic selection of the diagnostic data directly via the signal name (signal requests) for signal-oriented logging
> Sending of diagnostic requests on configurable events
> Trigger/marker on diagnostic signals and on diagnostic fault memory entries (DTC)
> Parameterization via diagnostic descriptions in CDD, ODX 2.0.1/2.2.0, PDX, MDX 3.0 formats
> Support by UDS, KWP2000 on CAN and OBD II
> Support of On-Board Diagnostics (OBD II), no diagnostic description required
> Support of Service SecurityAccess (0x27) with Seed&Key (see XCP) to unlock diagnostic services
> Support of Service ReadMemoryByAddress (0x23) with A2L support to access ECU internal data
> Support of Service DynamicallyDefineDatadentifier (0x2C) and ReadDataByPeriodicIdentifier (0x2A) to establish a cyclic transmission of relevant data

2.11 CCP/XCP Logging Functions (Optional)

Logging of internal ECU parameters over CCP, XCP on CAN, XCP on CAN FD and XCP on FlexRay:

> Support of CCP 2.1, XCP on CAN 1.x and XCP on FlexRay
> Cyclic time-synchronous measurement via DAQ and polling mode (polling not for XCP on FlexRay)
> More flexible signal value acquisition in terms of time with measurement mode "cyclic"
> Direct assignment of A2L files for CAN, CAN FD and FlexRay and AUTOPDAR files for FlexRay
> Signal selection and parameterization of CCP/XCP measurement directly in the configuration program
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> Statistics view for assessment of the additional bus load and fill level of DAQ lists
> Trigger/marker on CCP/XCP signals
> Easy export of signals from the measurement list to LAB files and SelectX files (CFG)
> Easy import of signals to the measurement list from CSV, LAB or SelectX files
> Supports Seed & Key for protected ECUs, generation of Seed & Key algorithms with CANape 8.0 or higher
> CCP/XCP license required for loggers

2.12 ECU Measurement with VX Modules

Logging of internal ECU parameters with VX modules and serial PODs over XCP on Ethernet:
> Record internal variables and parameters in parallel to bus communication
> XCP on Ethernet allows a higher data rate (up to approx. 1 MByte/s) than XCP on CAN
> Data transmission via DAQ mode
> XCP on Ethernet for VX modules is not protected by Seed & Key

Hardware requirements:
> VX base module (e.g. VX1060, VX1132)
> POD compatible with the ECU architecture (incl. connection cable to the VX module)
> ECU with software prepared for use of the VX module
> Access to the data trace or debug interface of the ECU
> Logger of the GL3000/GL4000/GL5000 family with CCP/XCP license

Configuration programs and description file:
> Configuration program from VXtools V1.92 or higher
> Vector Logger Configurator 2.5 SP3 (GL3000/GL4000) or 2.8 (GL5000) or higher
> Description file of the ECU (A2L file)
  File must correspond to the current version of the ECU firmware and contain the addresses of the ECU signals.

Selection and setup of the VX measurement hardware:

Which VX measurement hardware you need depends on the ECU architecture, the data trace or debug interfaces of the ECU, and the number and frequency of occurrence (needed bandwidth) of the transmitted data. An overview is available on vector.com under keyword VX1000.

2.13 Inputs/Outputs

The GL loggers are equipped with analog inputs and digital inputs and outputs as standard features. For the loggers of the GL3000/GL4000/GL5000 families the number of analog inputs can be increased using an expansion card.

The loggers support the following functions:
> Logging of analog measured values of external modules in parallel with the bus communication
> Logging of the state of the digital inputs in parallel with the bus communication
> Use of the analog and digital inputs as a condition for markers and triggers
> Control of external modules via the digital outputs (e.g. in order to switch these on or off)
2.14 Extended Measurement Technology with CSM Modules

The measurement modules from CSM extend the built-in measurement channels of the GL Loggers. Depending on the measuring task, different measurement modules are available.

CAN measurement modules:
- Acquisition of temperature, voltage, pressure, current or acceleration
- HV measurement modules for safe acquisition at high-voltage components, e.g. temperature and analog signals
- Connection direct at CAN bus (no license required)
- Alternatively, connection at CSM XCP-Gateway e.g. together with EtherCAT® modules (CCP/XCP license on logger required)

EtherCAT® measurement modules:
- Measuring with higher data throughput, e.g. analog voltages with up to 1 MHz \(^1\)
- Connection via CSM XCP-Gateway at the Ethernet interface of the logger
- Communication to the Logger via XCP on Ethernet (CCP/XCP license on logger required)

An overview is available on vector.com under keyword ‘Measurement Modules CSM’.

<table>
<thead>
<tr>
<th>Modules</th>
<th>GL1000 Family</th>
<th>GL2000 Family</th>
<th>GL3000 Family</th>
<th>GL4000 Family</th>
<th>GL5000 Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN modules</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>EtherCAT® modules(^1)</td>
<td>—</td>
<td>—</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>XCP-Gateway</td>
<td>—</td>
<td>—</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

\(^1\) For measurements > 100 kHz GL5000 family is recommended

Remote configuration (except GL1000 family):
To adjust the modules for new measurement tasks, there is no need to disconnect them from the logger and connected them to the PC. Together with a server service (MLserver, Vector Logger Cloud) the logger and measurement modules can remotely be configured during a test drive.

2.15 Online Classification

Classifications allow you to carry out statistic evaluations of signals already during a test drive.

Advantages:
- Classifications over very long periods of time
- Classifications parallel to bus logging
- Results immediately available after test drive
- Minimal memory requirements, as the results are very compact
- Constant memory requirements independent from the duration of the test drive
Classification types:

- **COUNT**: Number of the configured event
- **FLIPCOUNT**: Number of changes of the configured event
- **CHANGECOUNT**: Number of the signal value changes
- **MINMAX**: Minimum and maximum value of the selected signal
- **TIME**: Duration of the configured event
- **Rainflow analysis**: Investigation of material fatigue and loading processes

### 2.16 Monitoring with GL2000/GL3000/GL4000/GL5000 Families

The loggers can be used alternatively as a monitoring interface for monitoring purposes:

- Display of all incoming data in the logger, such as messages and error frames in CANoe and CANalyzer (from 7.6 SP3 for GL3000/GL4000, from 8.2 for GL2000, from 11.0 SP3 for GL5000)
- Supported bus systems: CAN, LIN and FlexRay
- License required for CAN, LIN or FlexRay in CANoe/CANalyzer
- Logging in the logger interrupted during monitoring
- Logger is connected to the PC over Ethernet

### 2.17 Other Functions

Along with the many different functions already listed, the following additional functions also support you:

- Logging of date and clock time with the help of the battery buffered real-time clock
- Configurable signal tone for indicating trigger events, for example
- Support of logger accessories (see chapter 6, Optional Accessories)

### 2.18 Data Transfer

The following options are available for transferring the logged data to the PC and updating the configuration:

For all GL Loggers:

<table>
<thead>
<tr>
<th>Accessories</th>
<th>GL1000 Family</th>
<th>GL2000 Family</th>
<th>GL3000 Family</th>
<th>GL4000 Family</th>
<th>GL5000 Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB 2.0 on the logger</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Memory card in card reader</td>
<td>✓</td>
<td>✓</td>
<td>(GL3000/ GL3100)</td>
<td>(GL3000/ GL3100)</td>
<td>—</td>
</tr>
<tr>
<td>SSD hard drive via eSATAp</td>
<td>—</td>
<td>—</td>
<td>✓ (GL3200)</td>
<td>✓ (GL4200)</td>
<td>✓</td>
</tr>
<tr>
<td>Wi-Fi 802.11b/g</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cellular radio</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ethernet</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### 2.19 Wireless Data Transmission (optional for GL2000/GL3000/GL4000/GL5000 Families)

For the wireless transmission of logging data from vehicles the options Wi-Fi and cellular radio are available for the GL2000/GL3000/GL4000/GL5000 families (depending on the logger type). If necessary, a new configuration can be loaded from the server to the loggers.

The same concept is applied to the data transmission via Wi-Fi and cellular radio:

- Logger initiates data transmission to the server
- Configurable condition for starting the connection operation
> Transmission of logged data to server
> Transmission of selected data (e.g. Memory 1/2/1+2, classification) configurable
> Raw data is saved on the server well-structured for each logger
> Afterwards, automatic conversion to the desired logging format, e.g. BLF, ASC, MDF
> Update of a new logger configuration (if necessary)

Standard product components allow the simultaneous connection to the loggers to one server and data exchange with the basic server software.

The ML Server fleet management software that is additionally available offers the following functions:
> Convenient server software for transferring data between a data server and any number of loggers
> Monitoring program can be used for vehicle management and to display connections and statistics
> Synchronization of logging data between several servers

Vector offers the wireless data transmission via Vector Logger Cloud as a service as an alternative to an own server. The recorded data is transferred in this case to the Vector Logger Cloud. The loggers are configured remotely via the cloud.

### 2.19.1 Data Transmission via Wireless LAN (GL3000/GL4000/GL5000 Families)

This Wi-Fi solution can be used for wireless transmission of the logging data from vehicles that are parked at stationary locations. Access points are needed at these locations for the transmission. After the connection is successfully established, data is transferred, logging stops during data transmission.

The option includes:
> Built-in Wi-Fi card
> Transmission via Wi-Fi according to IEEE 802.11b/g (54 Mbit/s)
> Security mechanisms:
  > WEP or WPA/WPA2 (with Pre-Shared Key or certificates)
  > EAP/TLS, TKIP, RADIUS support
  > MAC address filtering
> Connection to several servers in different locations possible

Scope of delivery:
> Wi-Fi card (installed)
> Glass-mounted antenna with 3 m connection cable
> Basic server software
> Wi-Fi access points are not included with the product

### 2.19.2 Data Transmission via 4G/LTE (GL2000/GL3000/GL4000/GL5000 Family)

For data transfer via cellular radio an LTE router is used which is connected to the Ethernet port of the logger. The router is either permanently supplied externally or via the GLA600 adapter. In the latter case, the router is switched on by the logger only for the duration of the transmission. The Online Data Transfer license must be installed on the logger.

Support of 4G/LTE:
> LTE/LTE-Advanced with fallback to 3G HSPA/HSPA+

Three variants available with the following certifications:
> Variant 1: in the EU Member States and North America
> Variant 2: in Japan, Australia and Brazil
> Variant 3: in China
Scope of delivery:

- Compact and robust LTE router
- 2 antennas (short rod antennas) with SMA connector
- Basic Server Software
- LTE contract and SIM card are not included with the product

Additionally required:

- Transfer license for the logger
- GLA600 switch-on adapter

2.20 Pack & Go

With Pack&Go, you can export your logger project, consisting of the configuration (GLC) and all its referenced project files (e.g. databases), as a Pack&Go file and then load it together with the compiled configuration (COD) to the logger during configuring. Thus, on a test drive you will have with you on the logger all the files that are needed to view the configuration, change the configuration, or analyze the log data with the appropriate databases. You can also save the Pack&Go file on your hard disk in order to forward your logger project along with its associated files in a compact form to a colleague.

To protect the data on the logger from unauthorized access, you can assign a password to the Pack&Go file. Likewise, you can exclude certain file types from the export if their export is not desired for safety reasons. For example, it is possible to save only the configuration (GLC) and not the databases on the logger. Please note for changing the configuration all files must be available.

2.21 Navigator versus Classic View

The logged data are displayed in the Vector Logger Configurator in two views:

The Classic View displays the raw files. For converting, all logging files are always transferred from the memory medium to the PC and then converted to the selected format. The logging files can be additionally saved as a raw file (CLF) on the PC. This gives you the option of converting data from the CLF format to other formats at a later time.

Besides the raw files, information on the recorded markers, triggers, and voice recordings in the logging file are displayed with the Navigator (except the GL1000 family). This is also displayed on a time bar. You thus get a quick overview of the number of measurements that were recorded over a particular time period. You can also replay the voice recordings directly.

In addition, you can use the Navigator to select specific data to be read out and thus restrict the converting to areas of interest. Markers will help you to quickly locate the time ranges of interest. By including less data, the readout and conversion are completed much faster.

2.22 Analysis Package

All databases and information of a project that are needed for interpretation and conversion of the recorded data are stored compactly in an analysis package. The analysis package is automatically stored in the project directory and reloaded from there for the conversion. Optionally, it can be stored on the memory card so that it is available for the conversion in the readout station right next to the logging data. It can be protected from unauthorized access using a password.

2.23 Data Export

The recorded data are stored in the logger as raw format. The Vector Logger Configurator can be used to export the data into various logging formats in order to then evaluate them in the analysis programs.

For the export of the logging files numerous options are available:

- Conversion of the raw data into ASC, BLF, MDF, MAT (MATLAB© V7.3), H5/HES/HDF5, ADTF, CSV, TXT, CLF format
- Flexible formation of the file name, selectively with
  - Date and time of the logging
  - Name and index of the triggers/markers
  - Type and serial number of the loggers
GL Logger Families

- Vehicle name
- VIN (Vehicle Identification Number)
- Start/Finish odometer
- Memory index
- Decimal/hexadecimal notation for identifier and signal values
- Relative/absolute time stamp
- Database management for signal-oriented export of logging files, independent of the selected databases in the configuration
- Channel mapping for changing the channel number of the CAN, LIN, and FlexRay channels
- Split options to split big logging files into multiple small files.
- Use of compact ZIP archives as source data (GL2000/GL3000/GL4000/GL5000 families)

The conversion settings for the logging files can be stored in conversion profiles. This allows fast and easy access to different sets of settings.

### 2.24 Analysis Programs

The logged data can be analyzed in the different logging formats offline in CANoe, CANalyzer, CANape, vSignalyzer and third party tools:

<table>
<thead>
<tr>
<th>Logging Format</th>
<th>CANoe</th>
<th>CANalyzer</th>
<th>CANape</th>
<th>vSignalyzer</th>
<th>Third Party Tools</th>
<th>Signal-oriented</th>
<th>Message-oriented</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASC</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>ASCII (for Vector tools)</td>
</tr>
<tr>
<td>BLF</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>Binary</td>
</tr>
<tr>
<td>MDF</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>✓</td>
<td>Binary, MDF versions 2.0 to 4.1, message-oriented with version 4</td>
</tr>
<tr>
<td>MAT</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>MATLAB® V7.3 (for third party tools)</td>
</tr>
<tr>
<td>HDF5</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>HS, HE5, HDF5 (for third party tools, e.g. Mathematica)</td>
</tr>
<tr>
<td>ADTF</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>—</td>
<td>✓</td>
<td>—</td>
<td>✓</td>
<td>For third party tools</td>
</tr>
<tr>
<td>CSV, TXT</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Text format (e.g. for MS Excel)</td>
</tr>
<tr>
<td>CLF</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Raw format of GL Loggers</td>
</tr>
</tbody>
</table>

The Vector programs CANoe, CANalyzer, CANape and vSignalyzer also support direct import of the recorded logging data in CLF raw format. In CANape and vSignalyzer, the associated databases are needed for signal-oriented display.

The Vector Logger Configurator provides a Quick View of the logging data as preview in the Vector Tools. The logging data is directly displayed from the logger or the memory card in the Vector tools, e.g. to check the data for plausibility. The GPS positions and the analog measurement data can be stored selectively in a system channel (except for the GL1000 family). For the analysis in CANoe, CANalyzer, CANape, and vSignalyzer, a database (DBC) is therefore no longer needed.
3 Logger Variants

3.1 GL1000 Family

The compact form of the GL1000 family simplifies installation in your vehicles. The GL1010 is the IP65 variant for use under harsh environmental conditions.

Figure 6: GL1000 and GL1010 compact loggers

The GL1010 differs from the GL1000 as follows:

- Memory card installed internally, i.e. inaccessible from outside (data transfer only over USB)
- Watertight USB connector with cap
- Watertight D-Sub 25 connector, therefore temperature range is -20 °C to +80°C
- No hole for signal tone
- Approx. 20 mm longer housing

Other hardware and logging functions are identical to those of the GL1000.

Figure 7: Comparison of housings: GL1010 (top) and GL1000 (bottom)
3.2 GL2000 Family

The GL2000 also has a compact form, which makes it easy to handle. The GL2010 is the IP65 variant for use under harsh environmental conditions. The GL2400 supports CAN FD.

Figure 8: GL2000 V2.0 and GL2010 and GL2400 data logger

The GL2000 V2.0 is the improved version of the established GL2000:

- Compact housing (same height as GL2010)
- Separate event connector on top cover for the direct connection of the remote control E2T2L
- Support of 24V LIN buses
- Shutdown button and LED for the safe removal of the memory card during logging

The GL2400 offers the functions of the GL2000 V2.0 and additionally supports CAN FD.

The GL2010 differs from the GL2000 as follows:

- Memory card installed internally, i.e. inaccessible from outside (data transfer only over USB)
- Watertight connectors for USB, Ethernet and AUX, each with cap
- Watertight D-Sub 25 and D-Sub 15 connectors, therefore temperature range is -20 °C to + 80°C
- No hole for signal tone

Other hardware and logging functions are identical to those of the GL2000.
3.3 GL3000/GL4000 Families

The loggers of the GL3000 family are multi-bus logger for CAN and LIN. Additionally, the GL4000 family supports FlexRay. The GL3000/GL3100/GL3200 loggers differ in the availability of display and pushbuttons and supported memory media. The GL4000/GL4200 loggers only differ in the memory media they support.

Figure 9: GL3100 (left) for logging CAN and LIN buses; GL4200 (right) for supplemental logging of FlexRay buses

Overview of hardware functions of the individual variants:

<table>
<thead>
<tr>
<th>Hardware Functions</th>
<th>GL3000</th>
<th>GL3100</th>
<th>GL3200</th>
<th>GL4000</th>
<th>GL4200</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN channels</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>LIN channels</td>
<td>2 ... 16’</td>
<td>2 ... 16’</td>
<td>2 ... 16’</td>
<td>2 ... 16’</td>
<td>2 ... 16’</td>
</tr>
<tr>
<td>FlexRay channels</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>RS232</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>LEDs</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Display</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Buttons</td>
<td>—</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Digital inputs and outputs</td>
<td>8/8</td>
<td>8/8</td>
<td>8/8</td>
<td>8/8</td>
<td>8/8</td>
</tr>
<tr>
<td>Analog inputs</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Analog inputs on expansion card</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Ethernet</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Cellular radio</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Memory media</td>
<td>CF card</td>
<td>CF card</td>
<td>SSD</td>
<td>CF card</td>
<td>SSD</td>
</tr>
</tbody>
</table>

'LINprobe required for extension to 16 LIN channels.
3.4 GL5000 Family

GL5350 and GL5370 are multi-bus logger for CAN, LIN and FlexRay with powerful hardware for complex tasks and additionally supports CAN FD. With the high number of CAN/CAN FD and LIN channels, you can record extensive networks with only one logger.

The GL5370 offers up to 24 CAN channels, including 12 CAN FD channels.

The GL5350 offers up to 20 CAN channels, including 4 CAN FD channels.

Figure 10: GL5350 and GL5370
## Technical Data

### GL1000 Family

#### 4.1 General Technical Data

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN channels</td>
<td>2 CAN channels, user-configurable by piggyback boards</td>
</tr>
<tr>
<td>LIN channels</td>
<td>2 LIN channels</td>
</tr>
<tr>
<td>RS232</td>
<td>1 serial logging interface</td>
</tr>
<tr>
<td>Bus errors</td>
<td>Logging of CAN Error Frames, Remote Frames and LIN bus errors</td>
</tr>
<tr>
<td>PC interface</td>
<td>USB 2.0</td>
</tr>
<tr>
<td>Memory</td>
<td>SD memory cards up to 2 GB</td>
</tr>
<tr>
<td>Logger capacity</td>
<td>Approx. 100 million CAN messages (with DLC 8)</td>
</tr>
<tr>
<td>Display</td>
<td>4 programmable LEDs</td>
</tr>
<tr>
<td>Inputs, outputs</td>
<td>4 analog inputs, 2 digital inputs/outputs</td>
</tr>
<tr>
<td>Beep</td>
<td>Programmable signal tone</td>
</tr>
<tr>
<td>Real-time clock</td>
<td>Logging of date and clock time (battery buffered)</td>
</tr>
<tr>
<td>Startup time</td>
<td>Typ. 150 ms with 2 GB Xmore SD memory card, time varies with memory card’s capacity and type</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>5 V ... 30 V</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Sleep mode: typ. 160 μA</td>
</tr>
<tr>
<td></td>
<td>Operating: typ. 65 mA</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C ... +85 °C (GL1000)</td>
</tr>
<tr>
<td></td>
<td>-20 °C ... +80 °C (GL1010)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Approx. 107 mm x 85 mm x 35 mm (GL1000)</td>
</tr>
<tr>
<td></td>
<td>Approx. 130 mm x 85 mm x 35 mm (GL1010)</td>
</tr>
<tr>
<td>IP degree of protection</td>
<td>IP65 in accordance with ISO 20653 (only GL1010)</td>
</tr>
</tbody>
</table>

#### 4.1.2 Technical Data of Inputs/Outputs

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal analog inputs</td>
<td>4 analog inputs, freely available</td>
</tr>
<tr>
<td></td>
<td>Measurement range 0 V ... 16 V</td>
</tr>
<tr>
<td></td>
<td>Resolution 10 bit</td>
</tr>
<tr>
<td></td>
<td>Precision 1 %</td>
</tr>
<tr>
<td></td>
<td>Sampling rate 1 kHz</td>
</tr>
<tr>
<td>Internal digital inputs/outputs</td>
<td>Voltage range 0 V ... 36 V</td>
</tr>
</tbody>
</table>

### 4.2 Technical Data of Inputs/Outputs
4.2 GL2000 Family

4.2.1 General Technical Data

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN channels</td>
<td>GL2000/GL2010:</td>
</tr>
<tr>
<td></td>
<td>&gt; CAN1 ... CAN2: 2 x fixed (High-Speed, wake-up capable)</td>
</tr>
<tr>
<td></td>
<td>&gt; CAN3 ... CAN4: 2 x user-configurable by piggyback boards, also electrically decoupled GL2400:</td>
</tr>
<tr>
<td></td>
<td>&gt; CAN(FD)1 ... CAN(FD)4: 4 x user-configurable by piggyback boards</td>
</tr>
<tr>
<td>LIN channels</td>
<td>2 LIN channels</td>
</tr>
<tr>
<td>RS232</td>
<td>1 serial logging interface</td>
</tr>
<tr>
<td>Bus errors</td>
<td>Logging of CAN Error Frames, Remote Frames and LIN bus errors</td>
</tr>
<tr>
<td>PC interface</td>
<td>USB 2.0</td>
</tr>
<tr>
<td>Memory</td>
<td>SD memory cards up to 2 GB</td>
</tr>
<tr>
<td></td>
<td>SDHC memory cards up to 32 GB</td>
</tr>
<tr>
<td>Logger capacity</td>
<td>2 GB Approx. 100 million CAN messages (with DLC 8)</td>
</tr>
<tr>
<td>Display</td>
<td>4 programmable LEDs</td>
</tr>
<tr>
<td>Inputs, outputs</td>
<td>4 analog inputs, 4 digital inputs/outputs</td>
</tr>
<tr>
<td>Beep</td>
<td>Programmable signal tone</td>
</tr>
<tr>
<td>Real-time clock</td>
<td>Logging of date and clock time (battery buffered)</td>
</tr>
<tr>
<td>Startup time</td>
<td>Sleep mode: typ. 170 ms with 2 GB resp. 8GB Xmore SD/SDHC memory card, time varies with memory card's capacity and type. Standby mode: immediately</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>6 V ... 30 V</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Sleep mode: typ. &lt; 1 mA Standby mode: typ. 60 mA</td>
</tr>
<tr>
<td>(at 12 V)</td>
<td>Operating: typ. 170 mA (GL2000, GL2010) typ. 190 mA (GL2400)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C ... +80 °C (GL2000, GL2400)</td>
</tr>
<tr>
<td></td>
<td>-20 °C ... +80 °C (GL2010)</td>
</tr>
<tr>
<td>Dimensions (w x h x d)</td>
<td>Approx. 175 mm × 137 mm × 35 mm (GL2010, GL2000 V2.0, GL2400)</td>
</tr>
<tr>
<td>IP degree of protection</td>
<td>IP65 (only GL2010)</td>
</tr>
</tbody>
</table>

4.2.2 Technical Data of Inputs/Outputs

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal analog inputs</td>
<td>4 analog inputs, freely available Measurement range 0 V ... 18 V Resolution 10 bit Precision 1 % Sampling rate 1 kHz</td>
</tr>
<tr>
<td>Internal digital inputs/outputs</td>
<td>Voltage range -0.3 V ... 36 V</td>
</tr>
</tbody>
</table>
### 4.3 GL3000/GL4000 Families

#### 4.3.1 General Technical Data

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
<th>GL3000</th>
<th>GL3100</th>
<th>GL3200</th>
<th>GL4000</th>
<th>GL4200</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN channels</td>
<td>CAN1 … CAN4: 4 x user-configurable by piggyback boards, also electrically decoupled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAN5 … CAN8: 4 x fixed (High-Speed, wake-up capable)</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additional CAN9 (AUX) for accessories</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIN channels</td>
<td>2 LIN channels</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>FlexRay channels</td>
<td>1 FlexRay cluster (channel A and B; with XCP on FlexRay)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>or 2 independent FlexRay channels A (only Rx; not XCP on FlexRay)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>RS232</td>
<td>2 serial logging interfaces</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus errors</td>
<td>Logging of CAN Error Frames, Remote Frames and LIN bus errors</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data transfer</td>
<td>USB 2.0, Ethernet (10/100 Mbit/s)</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wi-Fi, cellular radio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td>Compact flash cards (internal), USB memory media (external)</td>
<td></td>
<td>GL3000</td>
<td>GL3100</td>
<td>GL3200</td>
<td>GL4000</td>
</tr>
<tr>
<td></td>
<td>Hard drive cassette with 512 GB eSATA solid-state drive (SSD)</td>
<td></td>
<td></td>
<td></td>
<td>GL3200</td>
<td>GL4200</td>
</tr>
<tr>
<td>Keypad/display</td>
<td>5 programmable LEDs</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 programmable buttons, display with 1 line à 8 characters</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Inputs/outputs</td>
<td>8 digital inputs, 8 digital outputs</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 analog inputs (single-ended to GND)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 analog inputs (differential)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Beep</td>
<td>Programmable signal tone</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real-time clock</td>
<td>Logging of date and clock time (battery buffered)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Startup Time</td>
<td>Sleep: 40 ms</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standby: immediately</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>For CAN, LIN, FlexRay: Sleep: typ. 1 mA</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(at 12 V)</td>
<td>Standby: typ. 300 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operating: typ. 700 mA (without hard drive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Startup time</td>
<td>Sleep: max. 20 ms, Standby: immediate</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>6 V … 36 V</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C … +70 °C (operating, without Wi-Fi, cellular radio)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (w x h x d)</td>
<td>Approx. 213 mm x 78 mm x 235 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 4.3.2 Technical Data of Inputs/Outputs

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal analog inputs</td>
<td>4 analog inputs, freely available</td>
</tr>
<tr>
<td></td>
<td>2 analog inputs, fixed: Terminal 30 and Terminal 15</td>
</tr>
<tr>
<td></td>
<td>Measurement range 0 V … 18 V</td>
</tr>
<tr>
<td></td>
<td>Resolution 10 Bit</td>
</tr>
<tr>
<td></td>
<td>Precision 1.0 %</td>
</tr>
<tr>
<td></td>
<td>Sampling rate 1 kHz</td>
</tr>
<tr>
<td>Analog extension ABI</td>
<td>8 analog inputs</td>
</tr>
<tr>
<td></td>
<td>Measurement range 0 V … 18 V</td>
</tr>
<tr>
<td></td>
<td>Resolution 12 bit</td>
</tr>
<tr>
<td></td>
<td>Precision 0.2 %</td>
</tr>
<tr>
<td></td>
<td>Sampling rate 1 kHz</td>
</tr>
<tr>
<td>Internal digital inputs</td>
<td>Voltage range -0.8 V … 50 V</td>
</tr>
<tr>
<td>Internal digital outputs</td>
<td>Voltage range -0.3 V … 40 V</td>
</tr>
</tbody>
</table>
## 4.4 GL5000 Family

### 4.4.1 General Technical Data

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
</table>
| CAN/CAN FD channels        | GL5350: 20 CAN channels, including 4 CAN FD channels  
12 x CAN fixed, 4 x CAN and 4 x CAN FD by piggyback boards  
GL5370: 24 CAN channels, including 12 CAN FD channels  
12 x CAN fixed, 12 x CAN FD by piggyback boards  
Additional CAN (AUX) for accessories |
| LIN channels               | LIN1 ... LIN2: 2 x fixed  
LIN3 ... LIN6: 4 x user-configurable by piggyback boards |
| FlexRay channels           | 1 FlexRay cluster (channel A and B; with XCP on FlexRay) or 2 independent FlexRay channels A (only Rx; not XCP on FlexRay) |
| RS232                      | 4 serial logging interfaces |
| Bus error                  | Logging CAN Error Frames, Remote Frames and LIN bus errors |
| Data transfer              | USB 2.0, Ethernet (1Gbit/s)  
Wi-Fi, cellular radio |
| Memory                     | Hard drive cassette with 512 GB or 1 TB eSATA solid-state drive (SSD) |
| Keypad/display             | 5 programmable LEDs  
4 programmable buttons,  
display wit 3 lines à 16 characters |
| Inputs/outputs             | 4 digital inputs, 4 digital outputs  
6 analog inputs (single-ended to GND)  
8 analog inputs (differential), optional |
| Beep                       | Programmable signal tone |
| Real-time clock            | Logging of date and clock time (battery buffered) |
| Sleep mode                 | For bus quiet on CAN/CAN FD, LIN, FlexRay  
Planned standby mode |
| Current consumption        | Sleep mode: typ. < 2 mA (For CAN, LIN, FlexRay)  
Standby mode: typ. 260 mA  
Operating: typ. 860 mA |
| (at 12 V)                  | |
| Startup time               | Sleep: max. 40 ms  
Standby: immediately |
| Supply voltage             | 7 V ... 50 V |
| Temperature range          | -40 °C ... +70 °C |
| Dimensions (w x h x d)     | Approx. 290 mm x 74 mm x 212 mm |

### 4.4.2 Technical Data of Inputs/Outputs

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
</table>
| Internal analog inputs      | 4 analog inputs, freely available  
2 analog inputs, fixed for Terminal 30 and Terminal 15  
Measurement range 0 V ... 32 V  
Resolution: AnalogIn1 to 4: 10 Bit  
AnalogIn5 and 6: 12 Bit (KL30, KL15)  
Precision 1,0 %  
Sampling rate 1 kHz |
| Analog extension ABI        | 8 analog inputs  
Measurement range 0 V ... 18 V  
Resolution 12 Bit  
Precision 0,2 %  
Sampling rate 1 kHz |
| Internal digital inputs     | Voltage range -0,8 ... 50 V |
| Internal digital outputs    | Voltage range -0,3 ... 40 V |
4.5 Accessories for Cellular Radio

4.5.1 Technical Data of the LTE Router

Available for GL2000/GL3000/GL4000/GL5000 families

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTE</td>
<td>LTE/LTE-Advanced with fallback to 3G HSPA/HSPA+</td>
</tr>
<tr>
<td>LTE category</td>
<td>Category 6:</td>
</tr>
<tr>
<td></td>
<td>- up to 300 Mbps downlink</td>
</tr>
<tr>
<td></td>
<td>- up to 50 Mbps uplink</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>7V ... 36 V</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C ... +70 °C (operating)</td>
</tr>
<tr>
<td>Dimensions (w x h x d)</td>
<td>Approx. 119 mm x 94 mm x 34 mm</td>
</tr>
</tbody>
</table>

4.5.2 Technical Data of the GLA600 Switch-on Adapter

Available for GL2000/GL3000/GL4000/GL5000 families

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>8V ... 28 V</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C ... +85 °C (operating)</td>
</tr>
<tr>
<td>Dimensions (w x h x d)</td>
<td>Approx. 80 mm x 40 mm x 20 mm</td>
</tr>
</tbody>
</table>

4.6 Overview of CAN Piggyback Boards for GL Loggers

Piggyback boards for CAN:

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Transceiver Type</th>
<th>Wake-up capable</th>
<th>GL1000 Family</th>
<th>GL2000 Family</th>
<th>GL3000 Family</th>
<th>GL4000 Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Speed</td>
<td>TJA1043¹</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>TJA1043mag¹ (electrically decoupled)</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>TJA1042²</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>TJA1050</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Low-Speed</td>
<td>TJA1055³</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>TJA1055mag³ (electrically decoupled)</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Single Wire</td>
<td>TLE6255G</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Truck &amp; Trailer</td>
<td>WABCO</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

¹ TJA1043 as successor of TJA1041
² TJA1042 as successor of 82C251
³ TJA1055 as successor of TJA1054

GLT Piggyback boards for CAN/CAN FD/LIN:

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Transceiver Type</th>
<th>Wake-up capable</th>
<th>GL2400</th>
<th>GL5000 Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN/CAN FD High-Speed</td>
<td>TJA1043TK</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>CAN Low-Speed</td>
<td>TJA1055</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>LIN</td>
<td>TJA1021</td>
<td>✓</td>
<td>—</td>
<td>✓</td>
</tr>
</tbody>
</table>
5 Product Components

5.1 GL1000 Family
> GL1000 or GL1010 data logger
> Fast automotive-capable 2 GB SD memory card
> Connection cable with open ends for supply voltage, CAN, LIN and for inputs and outputs (not IP65)
> USB cable
> Mounting bracket (GL1000 only)

5.2 GL2000 Family
> GL2000 or GL2010 or GL2400 data logger
> Fast automotive-capable SD/SDHC memory card (GL2000: 2 GB, GL2010: 8 GB)
> Remote Control E2T2L (2 pushbuttons, 2 LEDs)
> Connection cable Vehicle for D-Sub 25 for supply voltage, CAN, LIN and for inputs and outputs
> USB cable
> Mounting bracket (GL2000 and GL2400 only)
Handheld device and connection cables are not IP65.

5.3 GL3000/GL4000 Families
> GL3000 or GL3100 or GL3200 or GL4000 or GL4200 data logger
> Remote Control E2T2L (2 pushbuttons, 2 LEDs)
> Connector set 2x25 pin and 1x 50-pin with contacts and shells from the automotive field
> USB cable
> Ethernet cable
> CONSOLE cable
> eSATAp connection cable (only GL3200 and GL4200)

5.4 GL5000 Family
> GL5350 or GL5370 data logger
> Remote Control E2T2L (2 pushbuttons, 2 LEDs)
> Power supply socket with metal hoods and contacts
> Vehicle and Extension connector set with contacts
> USB cable

5.5 GL Logger DVD
The DVD is included in scope of delivery of each GL Logger:
> Vector Logger Configurator (Windows 7/8.1/10)
> Vector Logging Exporter (Windows 7/8.1/10)
> Configuration program for LTL
> Basic version of the MultiLogger ML Server software
> Manuals
6 Optional Accessories

Product information and technical data for accessories of the GL Logger are provided in a separate document.

The following accessories are available for GL Loggers:

Extension for additional CAN/LIN channels:
- Various CAN bus transceivers on piggyback boards
- LINprobe R, LINprobe X, LINprobe G for additional LIN channels

Wi-Fi and cellular radio:
- Wi-Fi board
- LTE Router for GL2000 to GL5000 families
- GLA600 switch on adapter for LTE Router
- GL2010 Ethernet cable IP65/IP20 to connect the LTE Router

Recording of environmental data:
- CANgps 1 Hz / 5 Hz for logging GPS data
- Compact serial GPS receiver for logging GPS data
- Cameras (HostCAM, F44) for logging digital color images

Measurement technology extension:
- Analog extension A81 to record voltages
- VX modules with POD (plug-on-device) to record internal ECU parameters in parallel to bus communication
- CSM CAN-/EtherCAT®-measurement modules to record e.g. temperatures m voltages, pressure, current, HV components as well as modules for higher data rates available

Modules for interaction:
- LOGview for viewing data in the display
- VoCAN for logging and replaying speech, device with 1 pushbutton, 4 LEDs, 1 signal tone and microphone (VoCAN at GL2000 family without replaying speech)
- CASM2T3L for logging speech with 2 pushbuttons, 3 LEDs, 1 signal tone and microphone
- CAS1T3L with 1 pushbutton, 3 LEDs, 1 signal tone
- Remote control E2T2L with 2 pushbuttons and 2 LEDs (for GL2000 - GL5000 families included in scope of delivery)

Memory media:
- Fast automotive-capable memory cards (SD/SDHC, CF) or SSDs to record logging data
- SSD readout station for fast readout of logging data
7 Services

In the framework of our support and services program, we can offer you customized solutions for GL Loggers as special customer projects.

Please contact us at: logger@vector.com
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