

Datalogger Gealog SG



Gealog SG with Graphic Display

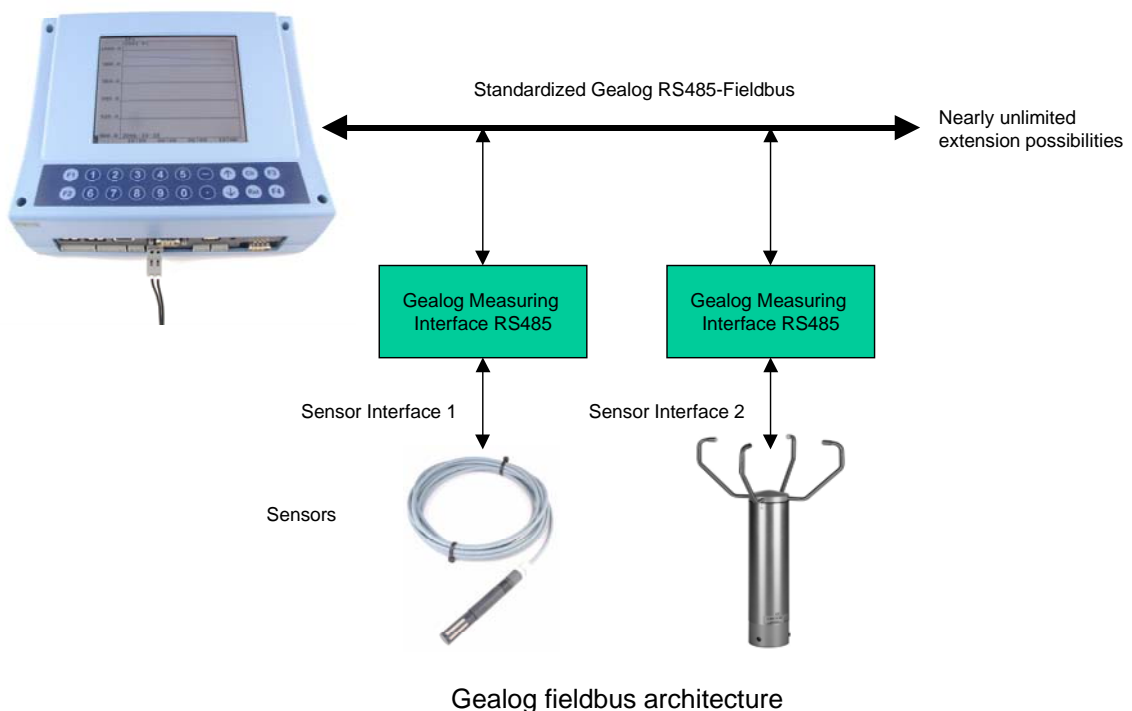
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Datalogger Gealog SG

Special Features

The Gealog SG Datalogger represents a completely new generation of Gealog measuring systems for applications in remote measuring stations. The list of new features is very long. Here are some highlights:

- Unmatched number of hardware interfaces:
 - Two independent Gealog RS485-Fieldbus interfaces
For connection of Gealog Measuring Interfaces, Gealog GPS module, etc. For details of the Gealog fieldbus architecture please refer to the Technical Note "Gealog Measuring Interfaces SNP and Gealog Measuring Interfaces RS485 - Overview".



- SDI-12 interface (V 1.3 and previous)
Actually there are many sensors on the market which are compatible to the SDI-12 standard. The number of SDI-12 compatible sensors is growing from day to day.
- 3 serial interfaces RS232
Mainly for the connection of any type of modems. (GSM, GPRS, PSTN, satellite modems) or for a direct connection to a PC. The serial interfaces are working completely independent and simultaneously. They can be used for i.e. redundant modem data transfer lines with GPRS as main channel and METEOSAT satellite as redundant path.

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- USB interfaces Master and Slave
One very comfortable feature of the USB interfaces is the readout of the data memory to USB-stick.
- Ethernet interface
The datalogger can be connected directly to any 10/100 Mbps Ethernet LAN.
- Image channels for the registration of pictures from cameras.



Image from the Camera on Gealog SG's Graphical Display

- Logotronic's Integrated Quality Control (IQC) functions
Each stored measuring value is accompanied by a quality status information. This quality status can be determined by many different options like hardware diagnostic, mathematical formulas, thresholds etc.
- Graphical data output
 - Standard: Alphanumerical display, LCD, 2 lines each 40 characters
 - Advanced: Graphical display, ¼ VGA monochrome or colour (TFT or LCD)
- Powerful mathematical evaluations
Mathematical formulas can be inputted in plain text. All evaluations of a scientific calculator are available as well as boolean operations.



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- Integrated Web-Server
Communication with measuring stations using standard Web-browsers.
- Powerful data transfer options
GSM, GPRS, Radio, Satellite (GOES/METEOSAT),

Applications

Because of its high data processing power the datalogger can be used perfectly for all applications in all areas of hydrometry, meteorology, water quality monitoring and also other environmental monitoring applications..

- The Gealog SG is based on a highly sophisticated new electronic processor board, especially developed for the application at remote measuring stations.
 - Lowest possible power consumption, carefully elaborated on-board power management system
 - Extended operating temperature range
 - Easy installation - all interfaces, inputs and outputs are available from outside via connectors.
- Compatible to the existing Gealog S and Gealog Compact dataloggers:
The Gealog SG uses the same architecture as all other Gealog dataloggers, namely the Gealog RS485-Fieldbus architecture for connecting Gealog measuring interfaces to the datalogger.
- Range of measuring parameters
 - For measurement of water quality parameters we recommend to use YSI multiparameter sondes, which can be connected directly to the datalogger using the SDI-12 interface.
 - For flow measurement applications we recommend the use of SonTek ultrasonic flow sensors, which can be connected also directly by the SDI-12 interface
 - Hydrography - water level:
Water level with pressure sensor, shaft encoder, bubble sensor and Radar sensor
 - Hydrography: 2D and 3D water flow by ultrasonic sensors
 - Water quality monitoring:
Conductivity, water temperature, pH, Redox, Oxygen content, Oxygen concentration, turbidity, Nitrate, Ammonia, Chlorophyl, Blue-Green Algae concentration, etc
 - Meteorology:
Precipitation, air temperature, air humidity, dew point, air pressure, global radiation, wind direction, wind speed, evaporation, sunshine duration, etc.
 - Soil investigations:
Soil moisture, soil temperature



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- Process control:
20mA inputs, current and voltage measurement, digital inputs, 20mA output
- Relay output for switching of external power supply, controlling of water samplers, local alert.

Technical Specifications

User Interface

- The operation on-site is completely menu driven using display and keyboard.
- Complete operation possible using only keyboard and display. No notebook necessary on-site.
- 20 key membrane keyboard
- Available display options:
 - Alphanumeric: 2 lines, alphanumeric, LCD, 40 characters per line
 - Graphic TFT: Graphical display ¼ VGA, TFT color
- If using the graphical option the stored data can be visualised also in graphical form.

Multilinguality

- German, English
- Other languages possible on request

Hardware Interfaces

- Two independent Gealog RS485-Fieldbus interfaces
 - Connection of two groups of measuring interfaces.
 - The second RS485 interface can be used as fieldbus for backup sensors or for the connection of the Gealog GPS Receiver (measurement of own position and Gealog SG's real time clock synchronization)
 - By implementation of special software drivers the interfaces can be used also for interfacing other external systems with RS485 port.
- SDI-12 interface
 - For connection of sensors with SDI-12 interface V 1.3 (Serial Data Interface supported by the SDI-12 support group)
- Three serial interfaces RS232-C: COM1, COM2, COM3
 - COM1: Main communication port, max. transmission speed 230 kbps
 - COM2: Second RS232 port, max. transmission speed 921 kbps.
Can be used e.g. for connection of a second modem
 - COM3 port as spare channel for connecting external devices or special applications,

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max. transmission speed 460,8 kbps

All COM ports can work in parallel.

Direct connection of PC, telephone modem, GSM modem, GPRS modem, radio modem, satellite transmitter

- USB interfaces
 - Two interfaces configured as USB Master
 - One interface configured as USB Slave
 - The USB Master interfaces can be used for connection of an USB Memory Stick. Future extensions of the operating software will use this interface for connection of any type of USB device like USB harddiscs, USB modems, etc.



Using USB Memory Stick

- The slave USB port can be used for future applications such as the connection of two Gealog SG units or the connection of a PC to the Gealog SG datalogger.
- Ethernet interface
 - Standard Ethernet interface, 10 Base T, RJ45
 - 10/100 Mbps data transfer rate
 - Can be used to create local measurement networks with fast data transmission.
(data readout, download of parameters, terminalemulation, integrated Web-server)



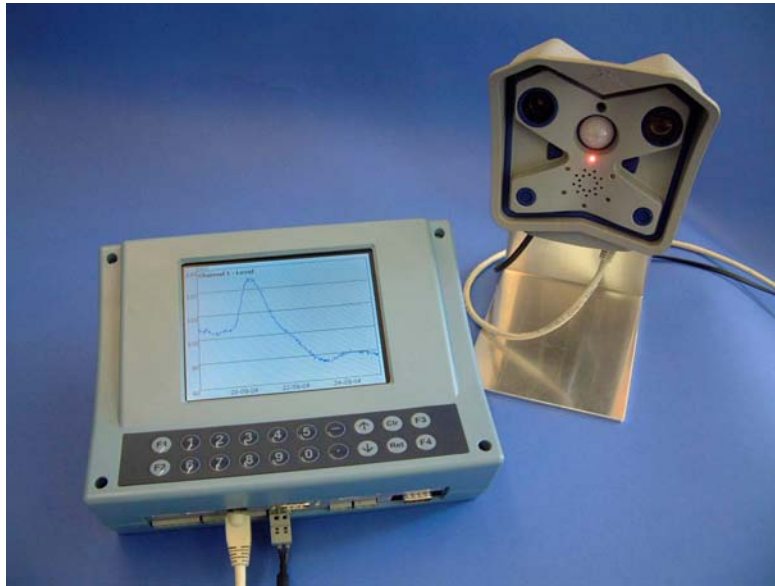
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Connection of Sensors, Measuring Channels, Measuring Programs

- Sensors can be connected to the Gealog SG in different ways:
 - Normally sensors are connected to the Galog RS485-Fieldbus by using Gealog Measuring Interfaces. There are many types of Gealog Measuring Interfaces each especially developed for the specific sensor. There are also many Gealog Measuring Interfaces for intelligent sensors with serial interfaces like RS232 or RS485. These measuring interfaces act as protocol converters and convert the sensor specific protocol to the Gealog RS485-Fieldbus protocol.
 - SDI-12: Sensors with SDI-12 interface can be directly connected to the Gealog SG's SDI-12 interface.
 - Sensors compatible to the Gealog RS485-Fieldbus can be connected directly to the fieldbus. Normally these sensors come from Logotronic production like the Gealog Water Level Sensor or the Gealog Shaft Encoder.
- The maximum number of measuring channels is 200. The assignment "physical measuring channel" to "logical measuring channel" is done by software. So i.e. one sensor input can be used in more than one different logical measuring channels with different registration parameters or different alert thresholds.
- All measuring parameters can be defined separately for each measuring channel (measuring rate, storage rate, channel names, physical units).
- Sample rates and storage rates can be defined between 1 second and 24 hours. Please note, that most Gealog Measuring Interfaces support only sampling rates of 5 seconds. So the 1 second rate can be used only for special applications. Please contact Logotronic for fast recording applications.
- Registration of all values in physical units. All parameters are automatically converted into physical units using the according calibration functions for each measuring channel separately.
- "Image Channels" for registration of pictures coming from a video camera connected via Ethernet interface. A special video camera is used which is fully approved for outdoor applications.

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Gealog SG and Gealog SG Camera

Integrated Calibration Functions

- Self learning calibration procedure.
- Offset correction by simple input of the offset value.

Event Triggered Registration

- Threshold triggering: Switching to a second storage rate when a threshold value is exceeded.
- Delta triggering: Storage only when difference between last stored value and actual value exceeds threshold.

Mathematical Data Processing

- Data compressions: averaging, minimum, maximum, integral based on single measuring channels.
- Mathematical measuring channels created by mathematical computations. Any mathematical formula can be defined in plain text. The measuring channels can be used as variables in the formula.
 - Computation of flow from water level
 - Dew point calculation



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- etc

Integrated Quality Control - IQC

As a new concept created by Logotronic the IQC provides highest quality standards regarding measuring values and system functionality. All possibilities for monitoring of error sources are used to recognise errors in advance before they affect the measuring values. If errors occur the system provides possibilities to avoid the influence of the errors on the system. These IQC functionalities are an integral part of the system's hardware and operating software.

- **Quality Tag**
A quality tag is assigned to each measuring value. It is computed according to strict rules using all available IQC-information.
- The datalogger continuously monitors the battery voltage and produces an alert at low voltage. The Intelligent Power Management is activated by that monitoring input.
- **Internal measuring channels (on-board)**
 - Temperature (NTC)
 - Battery voltage/voltage of the external power supply (voltage from solar panel)
 - Voltage buffer battery
 - Counter input
 - Digital input 1 Bit (e.g. Door-open contact)
- **Backup sensors**
 - Automatic switching to backup sensor if main sensor fails.
- **Plausibility tests**
 - Validity range check
 - Variability test, non-variability test
 - Monitoring channel:
Using dependencies between measuring channels to detect failures

Readout of Data

- There are many possibilities to transfer the measured data and parameters to the network centre:
 - **Readout at site**
 - Manual data transfer using USB Memory Stick
 - Notebook connected by cable to the Gealog SG using RS232 or USB Slave
 - **Remote data transfer**
 - Using the standard Gealog components for data transfer via telephone, GSM, GPRS, radio, satellite system (Meteosat, GOES)
 - Data transfer via Ethernet
 - **Pull mode**



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The standard software package "Gealog for Windows" in the network center can be used to actively read the data from the measuring stations.

- Push mode:
The Gealog SG actively sends data to a ftp-server. This is the standard data transfer method for GPRS communication. Also other options are available:
 - Direct communication with database using SQL commands
 - Creation of files in XML format
- SMS
The operator can query the instant measuring values by SMS communication.

Remote User Interface

Beside the local user interface using local display and keyboard the Gealog SG has two options for operation:

- "Terminalemulation"
This functionality allows the operation of the Gealog SG remotely using the standard PC-software "Gealog for Windows". It is a standard terminal-emulation operation and offers exactly the same functionalities as local operation at-site.
- Integrated Web-Server
The integrated Web-server can be used, if the measuring station is connected to the Internet. (i.e. GPRS). All operations can be done using a standard Web-browser including upload and download of parameters and download of measured data.

Parameter Programming

- Programming new parameters
All parameters can be uploaded by USB Memory Stick, Notebook or via remote data transfer.
- High sophisticated management of default parameter sets for different sensors and measuring channel applications.

Alarms

- High sophisticated alarming functionality
- Alarming depending on changes of quality tags.
- Building of complex alarming criterias using the mathematical functions.
- Alarm via alarm message to network centre or SMS to mobile phones.



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Messages

- Operator at-site can send plain-text messages to the network centre using the existing communication units.
- Network centre can send messages to the Gealog SG.
- Up to 20 incoming messages can be stored locally.

Data Memory

- Internal data memory 64 MB Flash Memory
- No buffer battery necessary for keeping the stored measuring values and parameters.
- Standard memory capacity for measured data 1.000.000 values
- Additional memory for 40 camera images
- FIFO storage principle, overwrite of oldest values on memory full

Real Time Clock

- Battery-buffered clock with calendar function
- Resolution: 1 second
- Max. error 5 minutes per year
- Synchronisation:
 - Manually via keyboard and display
 - Automatically in an automated network operation from the central PC (Gealog for Windows-software)
 - Optionally the Gealog-GPS-Module can be connected via the Gealog-RS485-Fieldbus. In that case the clock can be synchronised from the GPS signal.

Power Supply

- Power supply by external lead battery 12V
- Intelligent power down mode
 - System switch-off on battery low condition
 - Automatic start after battery voltage returns
- Intelligent on-board power management
 - Stand-by mode, only low power processor is active
 - Wake-up sources



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- Wake-up condition is acknowledged by special low power processor
- Receipt of characters on a serial interface
- Pressing a key on the keyboard
- Separated on/off switching of power consuming on-board components
- Ethernet

- On-board battery charger for 12V lead batteries.
 - No need for an extra charging unit
 - Max. charge current 5 A
 - For mains power supply (extra mains transformer necessary) or for solar panels up to 60W_{peak}

- Switchable power supply outputs for external components, especially communication units
 - FET switched outputs
 - Max. 1A
 - Protected by electronic fuse (Polyfuse)
 - Switched outputs for:
 - Modem
 - Power supply fieldbus 1 and 2
 - Power supply SDI-12

Environmental/Mechanical Data

- Operating temperature -35 °C to +60 °C
- Protection mode according to IP30, for installation in electronic enclosures.
- Impregnation of the electronic PCBs for protection against condensed water
- Housing made of plastic, dimensions: 230 mm x 176 mm x 90 mm
- Mounting on DIN rails
- Weight: 1,5 kg

Origin

- Manufacturer: Logotronic GmbH, Vienna, Austria

- Country of origin: European Community

Fulfilled standards

- CE Conformity

Production quality standard

- Production according to ISO9001



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Ordering Information

- **Gealog SG Alphanumeric**
 - o Gealog SG with alphanumeric display
 - o 2 Lines each 40 characters
- **Gealog SG Graphic TFT**
 - o Gealog SG with graphic display
 - o Color TFT, 65536 colors
 - o 320 x 240 pixel

Options/Accessories

- Please see Logotronic Web-page for accessories
 - Cameras
 - Gealog measuring interfaces
 - Data transfer equipment
 - Power supply components
 - Enclosures
 - Hydrological, meteorological and water quality sensors
 - PC-software

Revision List

No.	Revision	Date	Name	Description of Changes
1	1	19.8.06	Pe	New release
2	2	1.1.2009	Pe	Web-server

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