Datalogger Gealog SG

Pic. 1: Gealog SG with graphic display

Product Certificate
Datalogger Gealog SG

General overview

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

- Internet connectivity
  Integrated Web Server for direct connection of the stations to the web. Alert via email.

- Image channels for the registration of pictures from cameras.

- Graphical data output
  - Standard: Alphanumerical display, LCD, 2 lines each 40 characters
  - Advanced: Graphical display, ¼ VGA monochrome or colour (TFT or LCD)

- High data memory capacity
  - Internal data memory - 64 MB FLASH memory
  - Memory capacity: 1000000 values

- Unmatched number of interfacing possibilities:
  - 2 Gealog RS485-Fieldbus interfaces
  - SDI-12 interface
  - 3 serial interfaces RS232
  - Optical infrared interface IrDA standard
  - USB interfaces Master and Slave
  - Ethernet interface

- Voice output (in preparation)

- Logotronic Integrated Quality Management (IQM) functions

Because of its high data processing power the datalogger can be used perfectly for all applications in both areas of hydrometry and meteorology.

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. The Gealog SG is completely compatible with the existing measuring interface units. Using the Gealog-RS485-Fieldbus the number of measuring interfaces can be extended externally nearly without any limits. Because of the high variety of Gealog Measuring Interfaces many parameters can be measured with the same type of instrument.

- The Gealog SG can be configured using the whole variety of Gealog Measuring Interfaces as follows:

  - Hydrography:
    Water level with pressure probe/water temperature, water level with shaft encoder, bubble sensor and radar sensor
  - Water quality parameters:
    Conductivity/temperature, pH, redox, oxygen content, oxygen concentration, turbidity, etc.
    Control of water samplers for event driven water sampling, nitrate, ammonia
  - Meteorology:
    Precipitation, air temperature, air humidity, air pressure, global radiation, wind direction, wind speed, etc
  - Soil investigations:
    Tensiometers, soil temperature, lysimeters
  - 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.

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Technical specifications

User interface

- The operation on site is completely menu driven by display and keyboard.
- Complete operation possible only with keyboard and display. No notebook necessary on site.
- 20 key membrane keyboard
- Available display options:
  - Standard: 2 lines, alphanumeric, LCD, 40 characters per line
  - Advanced: Graphical display ¼ VGA, monochrome version, LCD colour version or TFT colour version
- Using the graphical option the stored data can be visualised in graphical form.

Multilingual

- German, English other languages possible on request

Hardware interfaces

- Gealog RS485-Fieldbus
  - 2 Interfaces for connecting two groups of measuring interfaces.
  - Second RS485 interface can be used as fieldbus for backup sensors.
  - RS485 standard. By implementation of special software drivers the interfaces can be used also for interfacing other external systems with RS485 port. Please note that there is also a family of "Gealog Measuring Interfaces RS485" which can be used to interface any type of sensor with RS485 interface to Gealog systems.

- SDI-12 interface
  - For connection of sensors with SDI-12 interface. (Serial Data Interface supported by the SDI-12 support group)

- COM1, COM2, COM3
  - 3 serial interfaces RS232-C
  - 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, max. transmission speed 460,8 kbps

- IrDA interface
  - Optical interface according to IrDA standard
  - The optical components are located in a small external IrDA Head, which is connected by a cable to the Gealog SG. This means, that the IrDA Head can be placed in a convenient place for easy access by a notebook.
  - Supports data transmissions according to the standards "Slow Infrared-SIR" with 115,2 kbps

and "Fast Infrared-FIR" with 4 Mbps.

- 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.

  - 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.

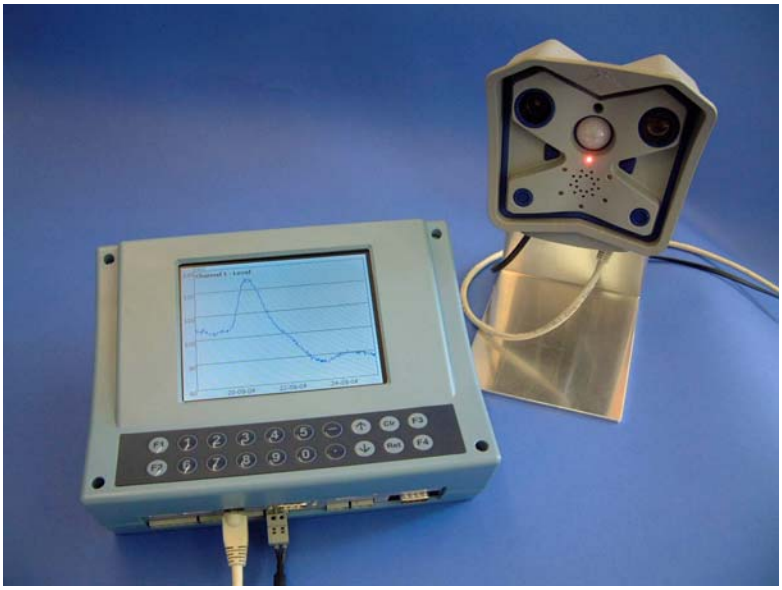
- Ethernet interface
  - Standard Ethernet interface, 10 Base T, RJ45
  - 10/100 Mbps data transfer rate
  - Can be used to create local measurement networks with fast data transmission.

- Voice output
  - This output is used for the generation of automatic voice outputs or acoustic alerts.

Measuring channels, measuring programs

- The maximum number of measuring channels is 128. The assignment "physical measuring channel" to "logical measuring channel" is done by software. So e.g. 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.
- Event based registration, controlled by measuring values (threshold triggering, delta triggering).
- 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.



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

- Averaging, minimum, maximum, integral, moving average with single measuring channels.
- Artificial measuring channels created by mathematical computations. Any mathematical formula can be defined in plain text.

- Table based conversions (e.g. flow rating table)

Controlling of water samplers

Water samplers can be conneted to the datalogger. The taking of samples is controlled by the datalogger.

- Samples in fixed time periods
- Volume proportional sampling by using mathamatical functions to define the discharge rating curve.
- Event triggered sampling
  Sampling starts at special condition. Criteria can be modelled by mathamatical formula.

Integrated Quality Control - IQC

As a new concept created by Logotronic the IQM 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 IQM functionalities are an integral part of the system's hardware and operating software.

- 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)

- Quality Tag
  A quality tag is assigned to each measuring value. It is computed according to strict rules using all available IQM-information.

- Backup sensors
  - Automatic switching to backup sensor if main sensor fails.

- Plausibility tests
  - Validity periods for the each measuring channel. Expiration of that validity period produces an alert. (e.g. reminder for recalibration)
  - Value below detection limit
  - Variability test, non-variability test
  - Monitoring channel:
    Using dependencies between measuring channels to detect failures

- Activity-Log
  - Separated data memory for registration of Activity-Log information.

- Each operation started by an external source is registered in the Activity-Log memory.
- Up to 100 Activity-Log entries can be stored locally, FIFO storage principle.
- The Activity-Log memory can be transferred to the network centre together with the registered measuring data.

Read out of data

- There are many possibilities to transfer of the data and parameter 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
    - Notebook using the optical IrDA interface
  - Remote data transfer
    - Using the standard Gealog components for data transfer via telephone, GSM, Radio, Satellite system (LEO-system ORBCOMM)
    - Data transfer via Internet (TCP/IP protocol)

Parameter programming

- Programming new parameters
  All parameters can be uploaded by USB Memory Stick, Notebook or via remote data transfer.

Alerts

- High sophisticated alert functionality
- Alerts depending on changes of quality tags, exceeding alert thresholds
- Alert via alert message to network centre, transmission of SMS or emails via internet.
- All alerts are also registered in a separated memory of the datalogger and can be read out also later-on.

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 (FIFO storage principle).

Data memory

- Internal data memory - 32 or 64 MB Flash Memory
- Standard memory capacity 250000 values, can be increased up to 1000000 values
- 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
- Calibration to minimize the error is possible
- Synchronisation:
  - Manually via keyboard and display
  - Automatically in an automated network operation via the communication interface. (Gealog for Windows-software)
  - Automatically via Internet by NTP (Network Time Protocol).
- 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
    - Wake-up condition is acknowledged by low power processor
    - Receipt of character on one of the serial interfaces COM1, COM2 or USB Slave
    - Pressing a key on the keyboard (CLR-key)
    - Wake-up key on IrDA Head
  - Separated on/off switching of power consuming on-board components
    - Ethernet, USB, display, audio, UART, IrDA

- On-board battery charger for 12V lead batteries
  - No need for additional charging units when using solar power supply
  - Max. charge current 5 A
  - For solar panels up to $50W_{peak}$

- 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

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Environmental/mechanical data

- Operating temperature -35 °C to +60 °C
  Special type of LCD display for low temperatures, operable until -20°C.
  (Colour TFT display down to -10°C)
- Protection mode according to IP30, for installation in electronic enclosures.
- Varnish impregnation 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 Monochrome Graphic**

- **Gealog SG TFT Color Graphic**
  o Gealog SG with graphic display
  o Color TFT, 65536 colors
  o 320 x 240 pixel

Options

- **USB Memory Stick**
  o Memory Stick for Gealog SG datalogger

- **Cameras** (please see separated product certificate)

Revision List

No.	Revision	Date	Name	Description of Changes
1	1	19.8.06	Pe	New release

Document: Certificate_Datalogger_Gealog_SG.doc