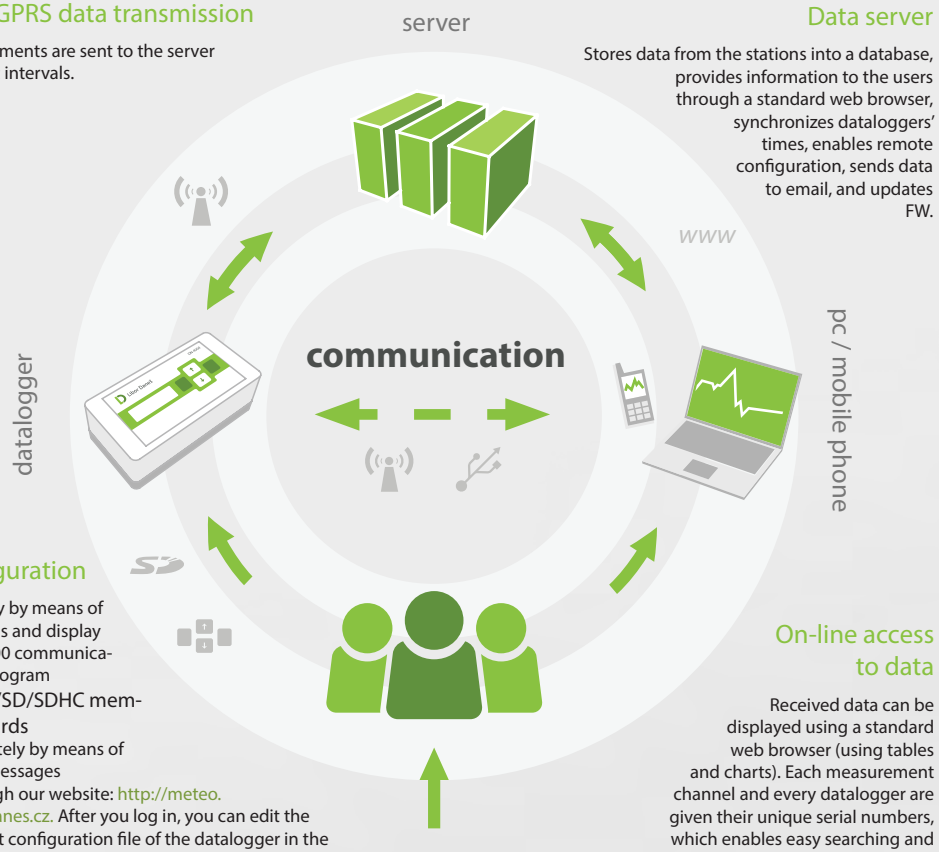
GSM/GPRS data transmission

Measurements are sent to the server at preset intervals.



Data server

Stores data from the stations into a database, provides information to the users through a standard web browser, synchronizes dataloggers' times, enables remote configuration, sends data to email, and updates FW.

Configuration

1) Locally by means of
- Buttons and display
- DN4000 communication program
- MMC/SD/SDHC memory cards

2) Remotely by means of
- SMS messages
- Through our website: http://meteo.libordanes.cz. After you log in, you can edit the current configuration file of the datalogger in the DN4000 application and send it back to the server, which arranges for its sending to the datalogger.

On-line access to data

Received data can be displayed using a standard web browser (using tables and charts). Each measurement channel and every datalogger are given their unique serial numbers, which enables easy searching and sending of data to customers, but also provides better security from attacks. User access is password protected.

Technical parameters

Inputs and outputs:

- 8x analogue input, range 0~100 mV / 0~5 mA, or wider: 4x differential for ultra-precise voltage / current measurement, 4x non-differential for voltage / current measurement; 4x current supply for ultra-precise temperature measurements (Pt100,200,1000)
- 8x digital input (usable as binary input or counter)
- 6x digital output (also usable as sensor power supply)
- 1x analogue output (control of continuous controllers)
- 1x USB port for communication with a PC
- 1x fully-fledged RS-232 (usable for connection to a PC, collection terminal, or modem)
- 1x RS-485 connects to intelligent sensors communicating using the HART protocol, RS-485 is also usable for direct communication with a PC
- 1x I2C bus connects to expansion modules, external displays and other devices

Data logger power supply:

The datalogger can be powered from the modern 3.7 V LiPo cells, 6 V and 12 V accumulators, but also from a 24 V industrial grid. It is also equipped with a circuit for the connection to a solar panel.

Other parameters:

- Logging interval: from 1 second to 24 hours (also suitable for pumping and slug tests)
- 8 MB Flash memory (holds at least 50,000 logged values)
- MMC/SD/SDHC memory card up to 32 GB
- Operating temperature: -40 to +60 ° C
- Plastic housing; dimensions: 160 x 80 x 60 mm
- The data logger is supplied with a whip antenna (which uses an FME connector), and mounts for a DIN rail.

Libor Daneš

DN4000

Datalogger DN4000

A device intended for the measurement of physical quantities, collection and storage of measured data, and wireless transmission of the data to the server.

The device can be connected to sensors with analogue or digital outputs, or to intelligent sensors which use the RS-485 communication interface.

Alphanumeric display
Together with membrane keypad enables easy control, parameter setting, and monitoring of current values

Online access to data
Display of received data (using tables and charts) in a web browser

Small size
160 x 80 x 60 mm, easy mounting using DIN rail, removable screw connectors

GSM/GPRS
Data transmission; display on the web; warning, query, or setting SMS

Increased environmental protection
Operating temperature: -40 to +60 °C; high resistance to overvoltage

Local data querying
USB communication with a PC; MMC/SD/SDHC memory card slot

Low power consumption
Quiescent power consumption: 90 µA; wide range of power supplies: 3.7 V LiPo cells, 6 V or 12 V lead-acid batteries, 24 V DC for industry

Sensors and probes
Can be connected via RS-485 or analogue and digital inputs. Outputs usable as sensor power supply. Analog output, connection to a solar panel.

Libor Daneš

DN4000

DN4000 is intended primarily for:

- Stations monitoring physical quantities (level, flow, rainfall etc.)
- Alarm and warning systems of flood protection
- Measurement of water levels and flows in river profiles, boreholes, water engineering networks and sewerage networks
- Small weather stations
- Environmental monitoring, measurement of variables in plant-breeding, horticultural and agricultural sectors
- Small measurement and control systems
- Measurement and regulation of irrigation and heating systems
- Measurement and collection of data; warning messages in industrial fields requiring low power consumption and lasting, reliable operation during power failures

SMS

Text messages can be used to check the status of the measured variables and set the configuration parameters of the datalogger. By setting the alarm messages (up to 4 priorities) warnings can be sent to up to 16 telephone numbers when set values are exceeded (or not reached). If you dislike the preset message format, you can create your own.

Measurement channels

Each channel can be named as needed; data can be recorded at varying intervals (1 second to 24 hours); measurement (analogue value, counter, binary status, equipment hours) and/or logging modes. You can create virtual channels for every measured channel (i.e. channels whose values are obtained by calculation) and set alarms to indicate up to four limit states.

Data is recorded in the datalogger memory as daily files in an easily readable text form, which enables fast searching. The data file contains an identification header (serial number, name, measuring channels). The datalogger also records operational logs recording parameter changes and system failure.

Examples: difference between two channels, flow calculation, averages, maxima, minima, moving average, moving sum, gradient alarm (up to four degrees), hysteresis, concentration of measurement period in case of excess, output switching or measurement of another channel in case of alarm, recording values within specified range; calibration of operational constants.

Sensors and Probes

A great advantage is the ability to connect intelligent sensors that communicate via RS-485 using the HART protocol and have more advanced features than simple analogue probes. It is very easy to work with a connected probe after automatic loading; it is possible to connect several of these intelligent probes and devices to the RS-485 loop at the same time. Analogue and digital inputs are provided for connection to all commonly used sensors. Probe wires are connected to the screw terminals, which facilitates their mounting or replacement.

SIM card and tariff

For the GSM operation both flat and prepaid SIM cards can be used. The remaining credit and the status of the GSM network in the field can be found on the datalogger display, via SMS query, or from the server.

USB port for PC

For direct communication with a PC, the datalogger is equipped with a USB connector. Communication is protected by several levels of passwords, each of them providing a different set of permissions for accessing values and making configuration changes.

Other features in preparation

Wireless 868 MHz communication module for communication with sensors without the need for wiring; at the same time, detachable display also equipped with this module.

Recording images with an external camera; recording images to the memory card.

MMC/SD/SDHC memory card

Install a replaceable memory card to extend the internal memory to store more than 50,000 values between data uploads, or record for longer (a year or more). The memory card can also be used for data transfer and complete datalogger configuration without the need for a PC in the field.

GSM / GPRS data transmission

The built-in quad-band GSM / GPRS modem transmits measurement data over TCP/IP to the server and communicate via SMS messages. The pre-installed GSM antenna may be replaced with another type depending on the signal strength at the site.
The operation mode of the measuring stations enables the data to be recorded and, depending on the configuration, to be sent to the server either immediately after the measurement, or at specific intervals (daily, weekly, etc.).

Because of the measuring stations send data by themselves and they are not activated by the server, their power consumption is thus so low that you can use LiPo primary cells or maintenance-free lead-acid batteries, which usually need to be recharged due to their own self-discharge, to send data at specified intervals for a year or more.
GSM operation costs of these stations are also very low and enable use of rechargeable SIM cards.
The mode of periodical transmission can be supplemented by alarms whereby data is immediately sent to the server even outside specified intervals. Sent data are processed on the server and available to the user immediately.
GSM mode also enables comfortable setting of measuring stations by sending a configuration file created for the measuring station on our web site.
Data transmission may be encrypted in order to increase data security.

Device design

Polyurethane case, LCD display and four push buttons enable easy control of the device and its measuring sensors. Parameter setting can be changed in the field without the need for a PC. Its small size of 160 x 80 x 60 mm and removable screw connectors allow an easy mounting on a DIN rail using supplied mounts.