



Storing and transmitting data
OTT netDL 500/1000
IP Data Logger for hydrological
and meteorological applications

OTT netDL 500/1000

IP compatible data logger family with a future

The IP compatible OTT netDL 500 and 1000 data loggers were developed especially for use at hydrology and meteorology stations. As well as their standard task of collecting data, the flexible data loggers are masters of all current methods of remote data transfer and are also equipped to communicate via the Internet. As a result, the new loggers not only meet today's requirements, but are also perfectly equipped to meet the demands of tomorrow.

Based on their modular design, the loggers are individually configured according to customer specifications and are therefore perfectly tailored to their particular application. A powerful GSM/GPRS/3G modem is pre-installed for transmitting data to the headquarters (optional). Ethernet, RS-232 and USB ports and an integrated web server create additional communication possibilities. Those who need a high level of data availability can use different communication routes concurrently. Also short polling cycles may be set, since the loggers may be used in a multitasking environment and are capable to communicate with all connected sensors in parallel. A high storage capacity and efficient power management go without saying in this connection. At the same time, these all-rounders are easy to operate and can even be controlled remotely using standard browsers.

Data Communication and Data Management

OTT netDL 500/1000 – future-proof IP technology

Overview of the most important interfaces

Sensor interfaces and outputs	netDL 1000	netDL 500
SDI-12 V1.3	■	■
SDI-12 via RS-485	■	■
Modbus RTU (master)	■	■
Pulse/status input	4	2
Analogue input ^{1) 2)}	max. 12	max. 6
Analogue output ¹⁾	max. 6	max. 4
Status output (2)	■	■
Switch output (2) switches external devices ON/OFF, e.g. external modems	■	■
RS-232 serial input ¹⁾	1	1
Ethernet (for coupling data loggers or connecting IP cameras)	■	

¹⁾ Available as an extension module; ²⁾ optional isolation

Sensor interfaces

Both loggers feature all interfaces that are commonly used with hydro-meteorological stations. If necessary, we add extension modules to the loggers as specified by customer. Benefit for you: You only purchase the modules you need and get a device that is perfectly matched to the particular application.

Available extension modules (interface boards):

- Analogue input board (for analogue sensors)
- Analogue output board
- Serial input board (for sensors using OTT protocol)
- Barometric input board



Communication interfaces	netDL 1000	netDL 500
RS-232 (for external communication units, e.g. satellite transmitter/modem)	■	■
USB host und device	■	■
Display incl. jog-shuttle	■	■
Internal GSM/GPRS/3G modem (optional)	■	■
Ethernet	■	

Local communication

For local data logger communication, e.g. when using the operating program, your PC or tablet may be connected through the RS-232 or USB device interfaces. The USB host interface is useful to retrieve data and e.g. to save on a flash memory when working on site. The backlit display provides insight into current data at a glance.

Remote data transfer

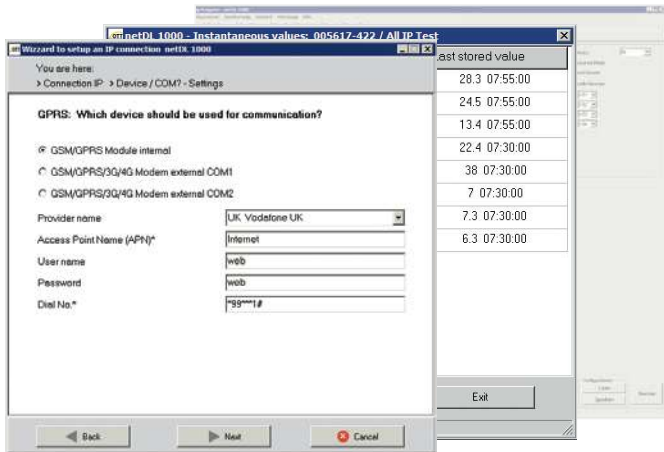
The flexible loggers are real all-rounders when it comes to transferring data remotely. You can transfer data through mobile phones as well as over Ethernet (netDL 1000), a dedicated line, or satellite. In particular, they are well prepared for IP communication.

Fast, reliable, and pioneering

- Built-in modem for mobile web communication (optional). Both modem and data logger are perfectly matched to each other; no external modem is required but may be used as an alternative.
- Voice announcements may be used, e.g. for requesting water levels via phone.
- Cellular networks: GSM/GPRS, 3G, and 4G*
- Ethernet interface (netDL 1000) – direct and high-speed connectivity to the web through LAN, DSL, and all IP ports (for all IP ports a router is required).
- Standardised interfaces and support for a number of transfer protocols (HTTP, HTTPS, SMTP, FTP, ...) and data formats (e.g. XML) – easy integration into existing and future systems.
- Redundant communication paths when different protocols are used – provides maximum data availability.
- Parallel processing of data of all channels – minimises transfer times and allows short polling cycles.
- Time sync is through SNTP which provides precisely timed long-term series of measurements to be carried out.
- Internal TCP/IP stack for hardware independent smooth operation.
- Encrypted secure data transfer through HTTPS.
- Comprehensive alarm management.

* Requires external modem.

New options for your measurement network



Guided configuration

An operating program for Windows-based PCs or tablets allows the netDL unit to be configured even by persons who are not specialized in such type of work.

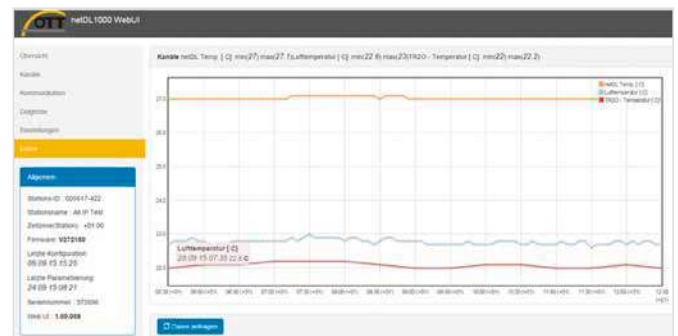
- Setup wizard including step-by-step guidance.
- Online help with information on all important steps
- Meaningful messages and internal plausibility checks
- Templates for the configuration of the individual channels

Quick solution in case of problems

During operation, diagnostics tools providing detailed logging information help identify and quickly troubleshoot any problem.

Web interface – access from anywhere

Thanks to the built-in web server, authorised persons may access the data logger from anywhere using a standard web browser. No special software is required. A static IP address or dynamic DNS is used to establish a connection to the logger for accessing the unit. In this way you may look into data or adjust basic parameters of the logger by PC, tablet, or smartphone. Access rights are used to control read and write access.



Efficient measurement network management using the OTT Hydras 3 net software

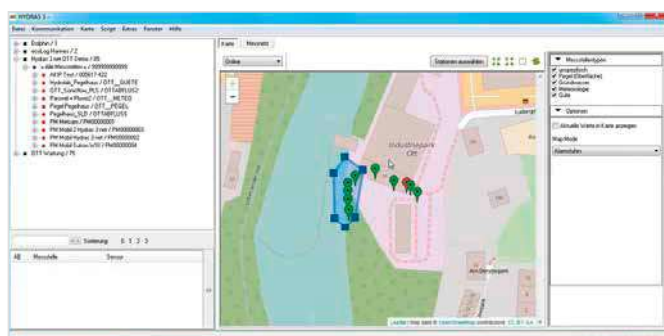
Imagine a firmware update is available and you can update all data loggers of your measurement network at once. The Hydras 3 net software can do this. This software solution generates a central HTTP server from which all netDL data loggers of a measurement network may be managed easily and efficiently. This saves time and helps keeping control over the process.

Only the server needs a static IP address. Users may access it directly or through clients, e.g. to perform a firmware update or to change parameters of individual or several loggers at the same time. All commands are saved on the server. The loggers connect to the server in regular intervals, retrieve the commands relevant to them and return feedback on the success of their execution. To do this, they do not need a static IP address. This is particularly useful for stations without DSL connection, because SIM cards having a static IP address are very rare.

Useful OTT Hydras3 net features

Hydras 3 net facilitates managing the measurement network. A lot of operations is done by one click and configuring operations may be conveniently performed from a PC. Obvious benefit: You need to access stations less often.

- Map view – clear overview over the measurement network; individual stations may be selected by simply clicking on them.
- Network status – immediate information whether all components are running smoothly.
- Firmware management – time-saving updates for all or selected netDL data loggers
- Sensors and channels – only a few clicks are required for configuring selected/all data loggers.
- Configuration management – used to retrieve, deploy, and save configurations.
- Maintenance window – direct access to individual data loggers as needed.
- Diagnostics – identify errors and troubleshoot them more quickly.
- IP cam images – used to provide station pictures.



Hydras 3 net runs on Windows and may be used independent of any other existing data management software.

At any time, the user interface map view provides a good overview over the entire measurement network and the status of the individual stations.

Technology that fits

Already in 1965, the "OTT punched tape level recorder" opened up the digital era in level measurement. Since that time, we have been passionately developing data loggers for hydro-meteorological measurement networks. As hydrometric experts, we know what matters in rough measurement environments. Therefore, we rely on progressive technologies that may be used in real-world applications.

The powerful OTT netDL 500/1000 IP data loggers have proved in several thousand applications worldwide. They feature extremely energy-efficient operation and are reliable even in extreme temperatures. Their large data storage capacity allows comprehensive measurements without loss of data. Various types of communication and simultaneous processing of multiple channels ensure maximum data availability and prompt delivery of dependable data. Also, new IP-based options such as coupling multiple netDL units or using IP cameras may be easily implemented thanks to the Ethernet-interface (netDL 1000).

Solutions for industrial communication

The OTT netDL unit provides flexible solutions for connectivity to PLC or process control systems.

- Modbus – via interface converter (netDL unit operating as a Modbus slave) or via RS-485 (netDL operating as a Modbus master).
- Profinet/Profibus – via interface converter.
- S7-Link – software option for direct connectivity to Simatic S7 via Ethernet; netDL 1000 required.
- Analogue output boards – for connectivity to analogue inputs of control systems.
- OPC DA 2.0 – for connectivity to control systems (SCADA); via software gateway in OTT Hydras 3 (data management software)

Technical Data

Communications interfaces

- Ethernet RJ-45 10 Base-T (netDL 1000: 1)
- USB Host and USB Device
- RS-232 (netDL 1000: 2; netDL 500: 1)

Sensor interfaces (standard version)

- SDI-12 V1.3
- RS-485 (SDI-12/Modbus RTU)
- Pulse/status input (netDL 1000: 4; netDL 500: 2)
- Status output (2)
- Switch output (2)

Input/output modules

- Analogue inputs (configurable)
- Analogue outputs (configurable)
- Analogue inputs, isolated (configurable)
- Serial input module for OTT Sensors
- Barometric input board

Measuring channels

Standard: 40; optionally 120

IP communication

- Integrated TCP/IP stack (HTTP, HTTPS, FTP, SMTP, Socket...)
- GSM/GPRS/3G, Ethernet/DSL, PPP over landline
- Integrated web server
- Encrypted data transmission HTTPS SSL 3.0/TLS 1.0/1.1/1.2

Integrated modem (optional)

GSM/GPRS
900/1800, 850/1900 MHz
GSM/GPRS; 3G (UMTS/HSPA+)
900/1800, 850/1900 MHz;
800/850, 900, AWS 1700, 1900,
2100 MHz

Operating system

RTOS with power management for minimal power consumption

Time synchronisation

SNTP (Simple Network Time Protocol)

Power supply

9 ... 28 V DC (typ. 12 V DC)

Power consumption at 12 V DC

- Sleep mode: < 250 µA;
Sleep mode, impulse active: < 10 mA
- Active mode:
approx. 25 mA ... max. 400 mA
(depending on configuration)

RAM / NOR / NAND Flash

4 MB / 8 MB / 256 MB

Data memory

- Up to 1,100,000 values
- OTT Parsivel spectral data

Display

- Graphical dot matrix (122 x 32 pixels)
- LED backlight
- Controlled by jog shuttle

Status display

2 x LED (variant with integrated modem)

Temperature range

- Operation: -40 °C ... +70 °C
- Storage: -50 °C ... +85 °C
- Internal modem: -30 °C ... +70 °C
- Display (display on): -20 °C ... +70 °C

Relative humidity

5 ... 95 % (non condensing)

Dimensions (L x W x H)

- netDL 1000: 232 mm x 124 mm x 86 mm
- netDL 500: 148 mm x 124 mm x 86 mm

Housing

ABS

Protection class

IP 41