DANE TECHNICZNE

Prędkość wiatru	• Metoda pomiaru: czujniki ultradźwiękowe 10 Hz • Zakres pomiarowy: 0 … 75 m/s (WS601: 0 … 30 m/s) • Rozdzielczość: 0,1 m/s • Dokładność ±0,3 m/s lub ±3 % • Prędkość startowa 0,3 m/s
Kierunek wiatru	• Metoda pomiaru: 4 czujniki ultradźwiękowe 10 Hz • Zakres pomiarowy: 0 … 359,9° • Rozdzielczość: 0,1° • Dokładność ±3 O (> 1 m/s) • Prędkość startowa 0,3 m/s
Kompas	• Metoda pomiaru: wbudowany kompas elektroniczny • Zakres pomiarowy: 0 … 359° • Rozdzielczość: 1° • Dokładność ±10° • Interwał pomiaru: 5 minut
Interfejsy*	• SDI-12, wersja 1.3 (ustawienie fabryczne) • RS-485,separacja galwaniczna, half-duplex, 19200 – 19800 bps • RS-485 – interfejsy: Binary, ASCII, TLS2002FG3, MODBUS *Przedstawione interfejsy mogą być wybrane za pomocą oprogramowania „Lufft-Config Tool"
Zasilanie	• Napięcie: 4 … 32 V • Zużycie energii: Tryb standard: 85 mA maks. @ 12 VDC (z wentylatorem) • Zużycie energii: Tryb PS1: 25 mA @ 12 VDC (WS200, WS500/501, WS601), 8 mA @ 12 VDC (WS300/301) • Zużycie energii: Tryb PS2: 2 mA @ 12 VDC • Grzałka: 24 VDC/20W
Temperatura powietrza	• Metoda pomiaru: termistor NTC • Zakres pomiarowy: -50 … +60 O C • Rozdzielczość: 0,1 O C (-20 … +50 O C) lub 0,2 O C • Dokładność: 0,2 O C (-20 … +50 O C) lub 0,5 O C • Interwał pomiaru: 5 minut
Temperatura punktu rosy	• Metoda pomiaru: kalkulacja • Zakres pomiarowy: -50 … +60 O C

	• Rozdzielczość: 0,1 O C • Dokładność: ± 0,7 O C
Wilgotność powietrza	• Metoda pomiaru: czujnik pojemnościowy • Zakres pomiarowy: 0 … 100 % RH • Rozdzielczość: 0,1 % RH • Dokładność: ± 2 % RH
Warunki środowiskowe	• Temperatura pracy: -50 … +60 O C • Temperatura przechowywania: • 50 … +70 O C • Wilgotność: 0 … 100 % RH
Wymiary (H x ∅)	194 – 445 mm (model) x 150 mm
Waga	0,8 – 1,7 kg (model)
Mocowanie	∅ 2" lub 60 … 76 mm
Materiał	Plastik (PC) i stal nierdzewnaKolor: Biały
Klasa ochrony	IP66
Ciśnienie atmosferyczne	• Metoda pomiaru: pojemnościowy czujnik w technologii MEMS • Zakres pomiarowy: 300 … 1200 hPa • Rozdzielczość: 0,1 hPa • Dokładność: ± 0,5 hPa (0 … +40 O C)
Nasłonecznienie	• Metoda pomiaru: pyranometr CMP3, klasa 2 • Zakres widma: 300 … 2800 nm • Zakres pomiarowy: 0 … 1400 W/m2 • Rozdzielczość: 1 W/m2 • Błąd temperaturowy: ± 5% (-10 … +40 O C)
Nasłonecznienie	• Metoda pomiarowa: deszczomierz korytkowy • Obszar pomiaru: 200 mm2 • Zakres pomiarowy: 0 … 200 mm/h • Rozdzielczość: 0,2 mm • Dokładność ± 2%
Spełnianie normy	• EMC 2004/108/EC • EN 55011:2009, EN 61000-6-3 • EN 61000-6-6 • EN 61000-4-2/3/4/5/6/8 • RoHS 2011/65/EU

	• IEC/ CISRP 11 • prEN 50147-3

Spełniane normy:	EMC 2004/108/EC; EN 55011:2009, EN 61000-6-3; EN 61000-6-6; EN 61000-4-2/3/4/5/6/8; RoHS 2011/65/EU; IEC/ CISRP 11; prEN 50147-3

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 specifically for use at hydrology and meteorology stations. Along with their standard task of collecting data, the flexible data loggers are masters of all current methods of remote data transfer and are 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. As a true communication all-rounder, transmitting data to a server or database is possible via various communication technologies. Mobile communication utilizing 4G/3G/2G as well as IoT technology 4G LTE-M is available with the OTT netDL data logger. Ethernet, RS 232, Satellite (MeteoSAT, GOES), 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. 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 network management software, Windows operating program or even a standard browser.

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 RS485	■	■
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	■	■
Ethernet (for coupling data loggers or connecting IP cameras)	■	

[1] Available as an extension module; [2] optional isolation

Communication interfaces	netDL 1000	netDL 500
4G/3G/2G via modem (RS232)	■	■
IoT 4G LTE-M via modem (RS232)	■	■
Ethernet 10 BASE-T	■	
Satellite (GOES & MeteoSat)	■	■
USB host and device	■	■
Display controlled via Jog-Shuttle	■	■

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 the customer. Benefit for you: only purchase the modules you need and get a device that is perfectly matched to your particular application.

Available extension modules (interface boards):
— Analogue input board (for analogue sensors)
— Analogue output board
— Barometric input board

Remote data transfer

The flexible loggers are real all-rounders when it comes to transfer-ring 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
— Cellular networks: 4G, 3G and GSM/GPRS as well as 4G LTE-M - m2m communication IoT - via modem (RS232).
— Ethernet interface for the netDL 1000 enables the datalogger with various options e.g. connection to an IP Router (ALLIP network), Fiber Optic converter, Ethernet switch, IP-Cameras, IP satellite communication etc.
— Standardized interfaces and support for a number of transfer protocols (HTTP, HTTPS, FTP, FTPS, MQTT, MQTTS, SMTP,...) and data formats (XML, ASCII, csv, zrxp,...) – 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/FTPS/MQTTS
— Comprehensive alarm management.

New options for your measurement network
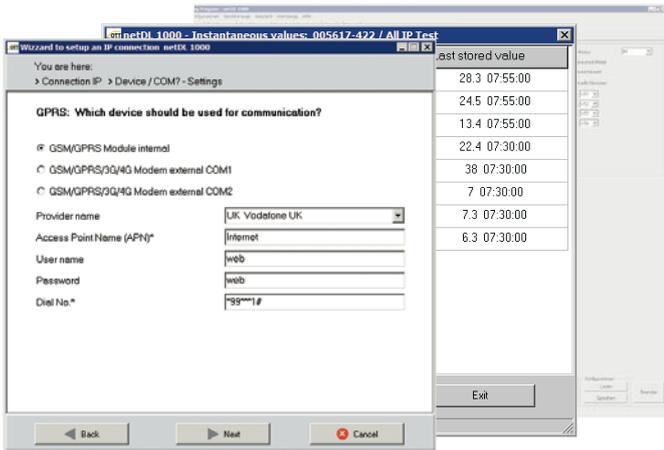
Guided configuration

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.
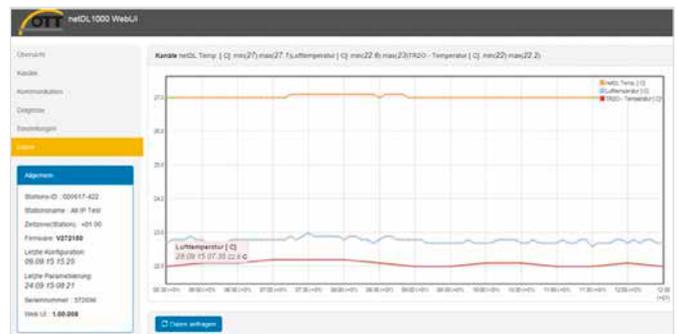
Efficient measurement network management using the OTT Hydras 3 net software

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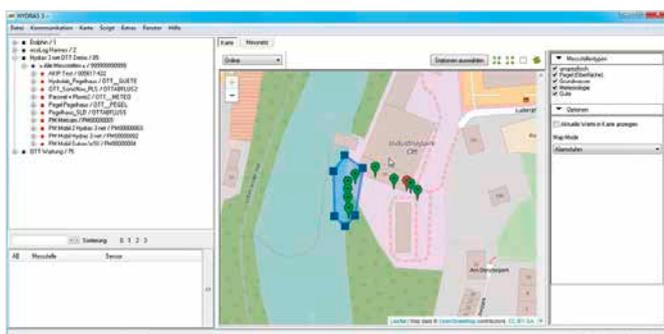
Hydras 3 net runs on Windows and may be used independent of any other existing data management software.

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

OTT netDL – flexible data loggers for all situations

Technology that fits

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.
— 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
- HTTP/HTTPS (TLS 1.2), FTP/FTPS (PROT C), MQTT/MQTTS, SMTP, Socket
- Integrated webserver and integrated IP stack
- Cell communication 4G/3G/2G or 4G LTE-M via modem (RS232)
- Cell communication 3G/2G via optional internal modem

Integrated modem (optional)
2G/GSM

3G/2G/GSM

External modem (optional as accessories)
4G/3G/2G EU version

4G LTE-M global

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 (up to 30 days)

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 40

CE/FCC/IC
RoHS compliant