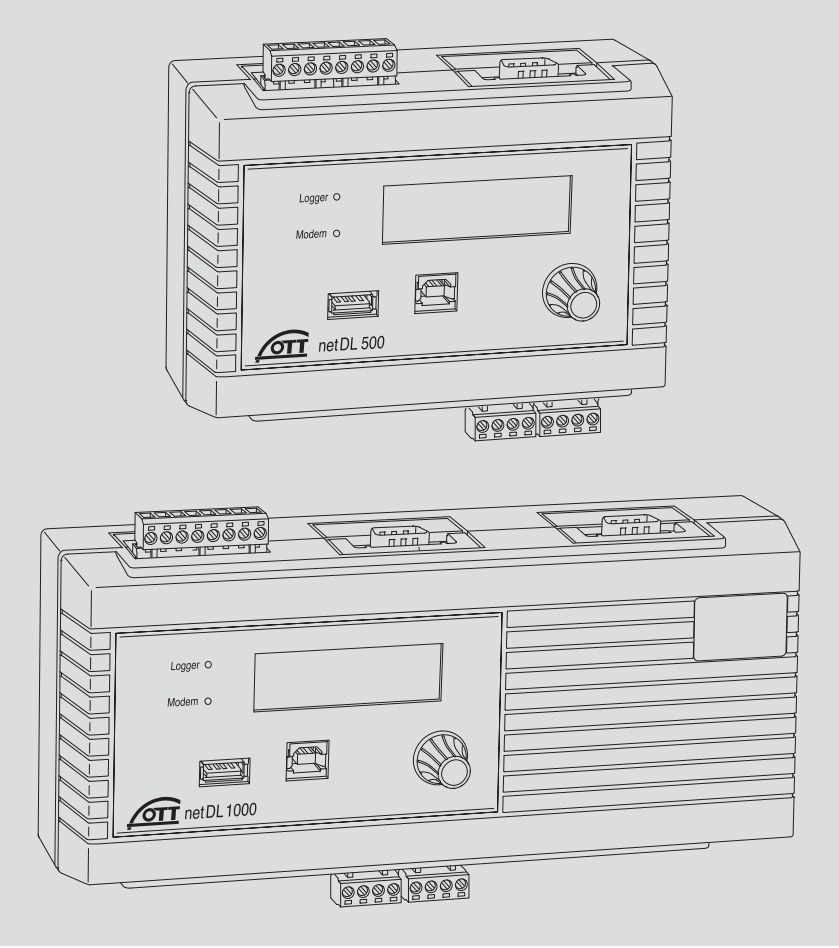
Operating instructions

IP Datalogger
OTT netDL 500
OTT netDL 1000

English



We reserve the right to make technical changes and improvements without notice.

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1 Scope of supply

▶ OTT netDL 500
OTT netDL 1000

- 1 IP datalogger incl. 4 physical input channels (1 x RS-485, 1 x SDI-12, 2 x pulse/status (OTT netDL 1000: 4 x), 2 switching outputs, RS-232 interface (OTT netDL 1000: 2 x), USB host/USB device interface, Ethernet interface (RJ-45) (OTT netDL 1000), power supply/ground connector, 4 MB measurement memory, LCD display, 2 status LEDs and jog shuttle; incl. two (OTT netDL 500) or three (OTT netDL 1000) slots for expansion cards; optional GSM quadband modem (version code "Bxx" or "Cxx")
- 1 universal power supply connector kit
- 1 OTT netDL Software CD-ROM
- 1 operating instructions
- 1 factory acceptance test (FAT) certificate

2 Ordering numbers and version code

▶ OTT netDL 500	**IP datalogger** incl. **two** slots for expansion cards	*55.553.001.9.0*
	– Standard version	Axx
	– Standard version + GSM modem	Bxx
	– Standard version + GSM modem + voice anouncer [1)]	Cxx
▶ OTT netDL 1000	**IP datalogger** incl. **three** slots for expansion cards	*55.552.001.9.0*
	– Standard version	Axxx
	– Standard version + GSM modem	Bxxx
	– Standard version + GSM modem + voice anouncer [1)]	Cxxx
▶ Expansions	**Analog input card** 2 inputs for analog input signals – 0-20 mA / 4-20 mA – 0-50 mV / 0-1.25 V / 0-5 V / 0-10 V – Potentiometer, 5 kOhms – Pt 100	
	Analog input card, galvanically isolated Same input signals as for analog input card (see above)	2
	RS-232 input card for OTT sensors with RS-232 interface	3
	Output card Galvanically isolated output signals – 2 outputs (4-20 mA) – 4 status outputs (4 x 1 bit; 100 mA)	4
	Barometric input card For connecting a maximum of two pressure probes containing Keller absolute pressure cells	*5*

[1)] These device versions are expected to be available in Q2/2012

▶ Version code

OTT netDL 500

Device versions:	A..	B..	C..[1)]		
– without expansion cards:	.00				
– with **one** expansion card:	.10	.20	.30	.40	.50
– with **two** expansion cards:	.11	.22	.33	.44	.55
	.12	.23	.34	.45	
	.13	.24	.35		
	.14	.25			
	.15				

OTT netDL 1000

Device versions:	A...	B...	C...[1)]		
– without expansion cards:	.000				
– with **one** expansion card:	.100	.200	.300	.400	.500
– with **two** expansion cards:	.110	.220	.330	.440	.550
	.120	.230	.340	.450	
	.130	.240	.350		
	.140	.250			
	.150				
– with **three** expansion cards:	.111	.222	.333	.444	.555
	.112	.223	.334	.445	
	.113	.224	.335	.455	
	.114	.225	.244		
	.115	.233	.245		
	.122	.234	.255		
	.123	.235			
	.124	.244			
	.125	.245			
	.133	.255			
	.134				
	.135				
	.144				
	.145				
	.155				

Examples

OTT netDL 1000 standard version;
2 RS-232 input cards, 1 barometric input card
Ordering number: 55.552.001.9.0
Version code: A335

OTT netDL 500 standard version + GSM modem;
1 analog input card, 1 output card
Ordering number: 55.553.001.9.0
Version code: B14

[1)] These device versions are expected to be available in Q2/2012.

▶ Accessories

Modem connection cable – 1.5 meters, 9-pin Sub-D socket/ 9-pin Sub-D plug	97.961.069.9.5
OTT netDL/PC data transfer cable – 1.5 meters, 9-pin Sub-D socket/ 9-pin Sub-D socket	97.961.068.9.5
USB connection cable – USB connector type A to USB connector type B, 3 m	97.970.065.9.5
Flat antenna for GSM modem	97.980.060.9.5

3 General safety information

- Read these operating instructions before using the OTT netDL for the first time! Become completely familiar with the installation and operation of the OTT netDL and its accessories!
- Note any additional information on dangers given within the individual work steps.
- Only use the OTT netDL and its accessories in the manner described in these operating instructions.
- Make sure that the installation site is sufficiently protected against moisture (IP 41 type of protection)!
- Select the installation site so that the ambient temperature never exceeds or falls below the allowable temperature range of –40 °C to +70 °C (for device versions B… and C… : –30 °C to +70 °C)!
- Install the OTT netDL in a closed control cabinet or in a fire protection cabinet! If the power supply of OTT netDL is a low power source (LPS), this is not necessary.
- Do not open the OTT netDL unit! Sensors, communication equipment, power supply, switching contacts, or additional components are connected only through the screw terminal strips/9-pin Sub-D connectors accessible from outside.
- Operate an OTT netDL unit with built-in GSM modem (device versions B… and C…) only with the GSM cellular radio antenna connected.
  Minimum clearance between antenna and unit: 20 cm!
- Before connecting the power supply, check that all wires are properly attached to the screw terminal strips and/or 9-pin Sub D connectors.
- It is essential to comply with the electrical limits given in the "Technical Data" section.
- Connect the OTT netDL only to a power supply providing less than 28 V DC. Protect the feed line of the supply voltage with a safety fuse (10 A / fast)!
- Always use a galvanically isolated safety extra-low voltage (SELV) for mains supply.
- Do not make any changes or retrofits to the OTT netDL!
- Have a defective OTT netDL checked and repaired by the OTT repair center. Under no circumstances carry out any repairs yourself.

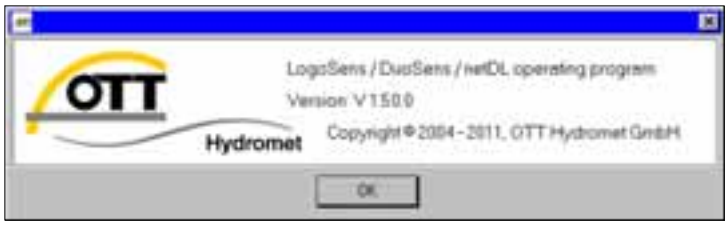
Caution: With a nearly full data memory in the OTT netDL unit, it may take a few minutes after an interruption of the operating voltage until communication is possible again!

4 About these operating instructions

These operating instructions (revision "01-0811") cover the OTT netDL software versions

- OTT netDL firmware (operating system) from **V 2.50.0**
- OTT netDL operating program from **V 1.50.0**

The version of the OTT netDL operating program can be found via the "Info" feature in the "Help" menu.



The version of the OTT netDL firmware is found in the master data window (refer to online help) after the OTT netDL configuration has been read into the operating program.

In Chapter 12 "Updating the OTT netDL firmware" you will find a description on how to update the OTT netDL firmware.

5 Introduction

The OTT netDL unit is a datalogger that is especially designed for hydrometry, meterology and environmental measuring technology.

The standard version of the unit has four physical input channels, an LCD display, and a jog shuttle. (The jog shuttle is a special operating button that can be rotated and pressed.) On request, the OTT netDL is available with various expansion cards and a built-in GSM modem. Additionally, OTT netDL 1000 has an Ethernet interface as well as a second serial interface.

Plug-in screw terminal strips allow easy connection of sensors and power supply without having to open the unit. Two LEDs show the operating states of the datalogger as well as of the GSM modem.

Configuration and parametrization are carried out using the "OTT netDL operating program" PC software. This software allows the system to be conveniently and flexibly tailored to a wide range of measurement requirements of a station.

All inputs are equipped with an internal overvoltage protection. The very low power consumption allows the unit to be operated with solar power without problem.

Using the internal or external GSM modem (cellular radio modem), remote data communication as well as remote parametrization may be done over the GSM cellular radio network (GSM = Global System for Mobile Communications). The remote data communication can be optionally carried out via a dial-up telephone connection, by SMS text messages, or using the packet-based GPRS mobile radio transmission service (General Packet Radio Service). The OTT netDL 1000 unit provides remote data communication through the Ethernet interface. Similarly, remote data communication may be carried out via a satellite transmitter or a cable modem.

Furthermore, the OTT netDL has individually configurable alarm and action management: If particular events occur, OTT netDL independently generates an alarm and sends this via a modem e.g. to a control center. It is also possible to control external devices via switching contacts.

Fig. 1: OTT netDL IP datalogger

Top: OTT netDL 500
Bottom: OTT netDL 1000

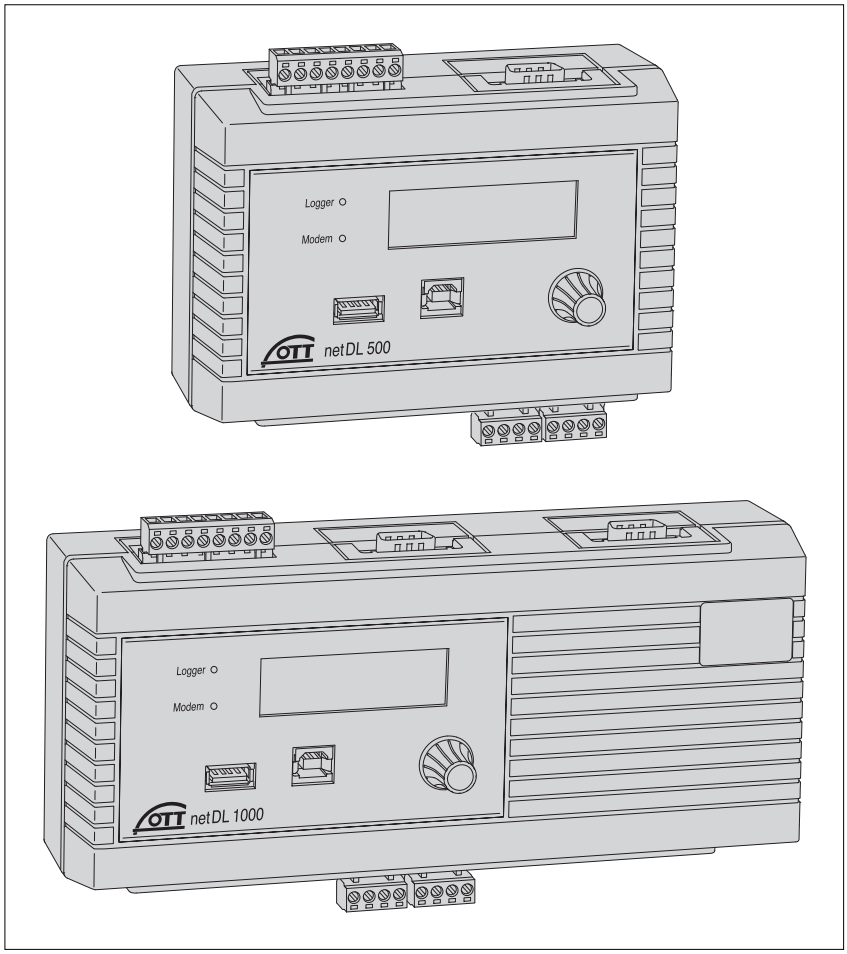


Fig. 2: Front of the OTT netDL unit with the status LEDs, USB interfaces (left: Host; right: Device), and the plug-in screw terminal strips.

The figure shows the OTT netDL 500 unit including two expansion cards and internal GSM modem and the OTT netDL 1000 standard version without any expansion cards.

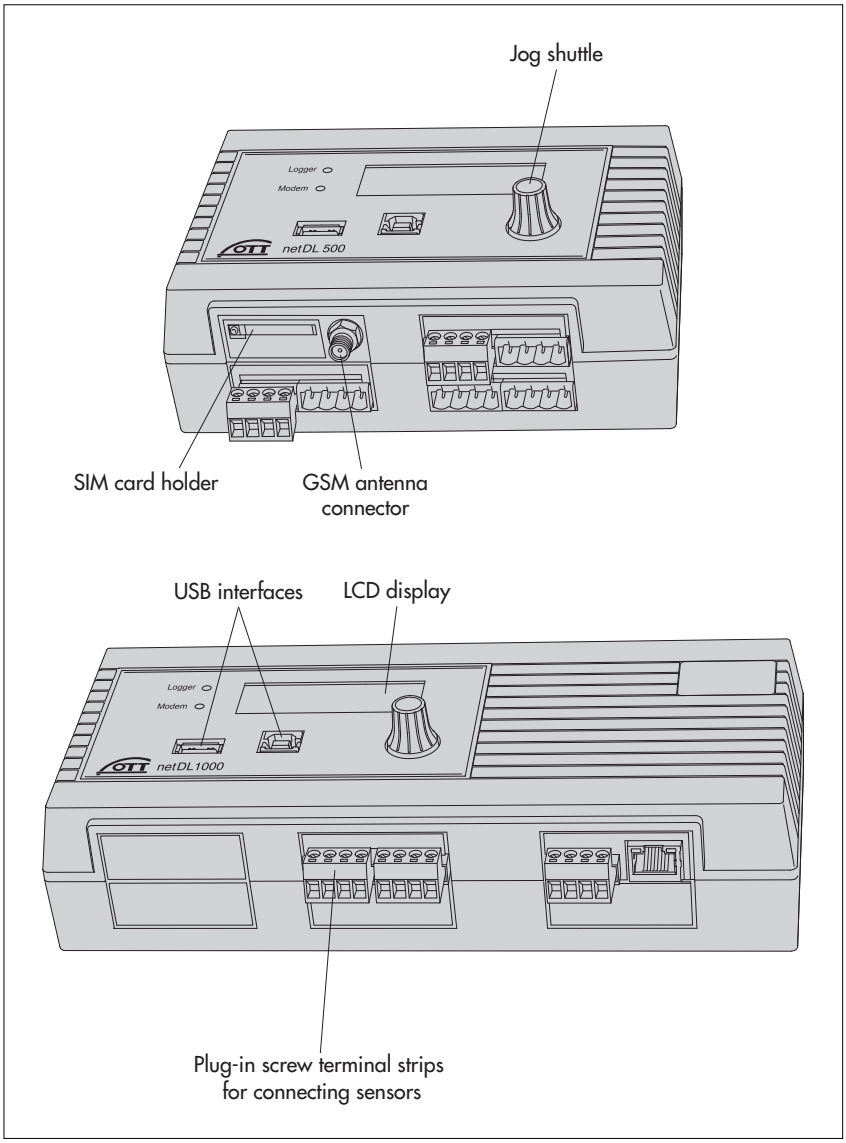
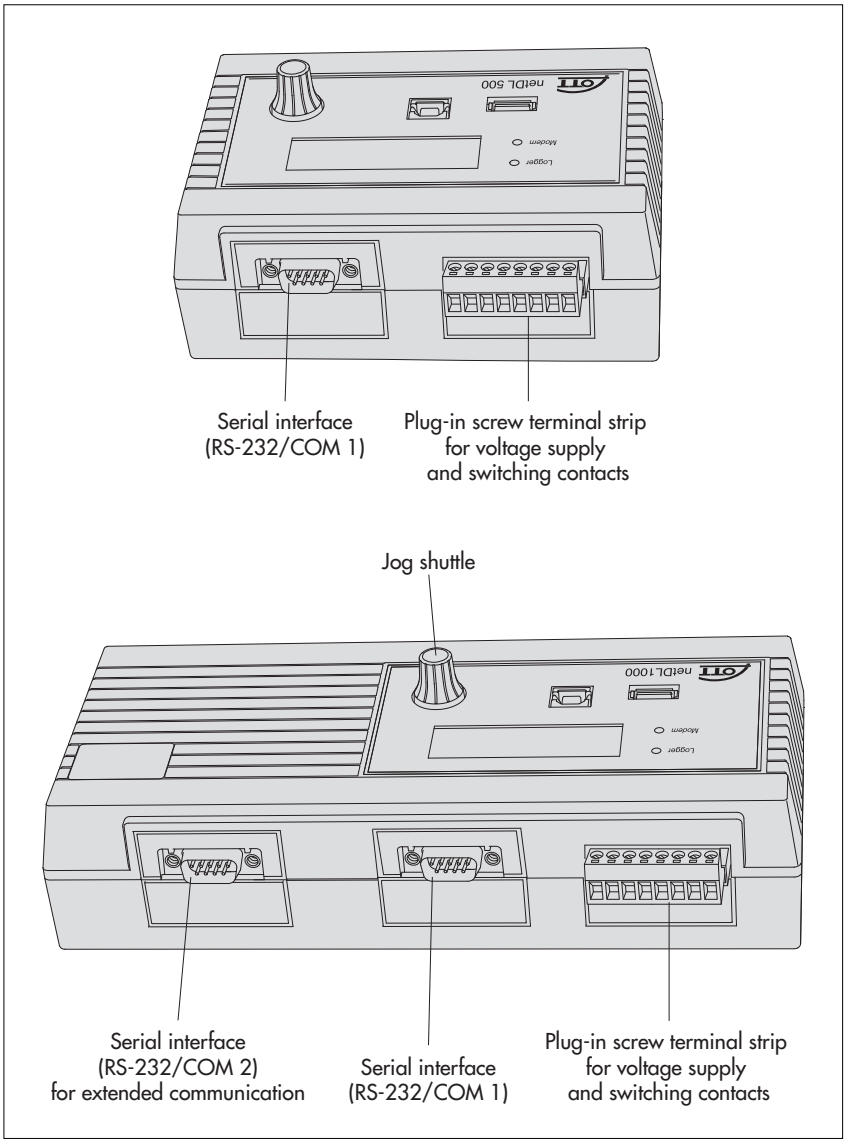


Fig. 3: Rear panels of the OTT netDL units including the screw terminal strips for power supply and switching contacts.



5.1 Overview of the OTT netDL IP datalogger

Sensor inputs

- RS-485 interface (e.g. OTT RLS radar sensor, Sonicflow)
- SDI-12 interface (e.g. Hydrolab DataSonde DS5, Hydrolab MiniSonde MS5)
- Pulse input
- Status input (2 x 1 bit)

- 0-50 mV, 0-1.25 V, 0-5 V, 0-10 V voltage input *
- (0) 4-20 mA input (current loop) *
- Pt 100 (temperature sensor) *
- 5 kOhm potentiometer *
- RS-232 interface (OTT protocol, e.g. Nimbus bubble sensor) *

* only with analog/RS-232 expansion

Communication interfaces

- RS-232 interface
- USB host interface
- USB device interface
- Ethernet interface

Communication protocols

- OTT protocol
- OTT HDR / OTT HDR 1200 (satellite communication)
- CREX code (satellite communication)
- Terminal mode
- SDI-12 transparent mode
- FTP (File Transfer Protocol)
- SMTP (Simple Mail Transfer Protocol)
- HTTP GET / HTTP POST (Hypertext Transfer Protocol)

Outputs

- Potential-free switching output (with output card)
- Voltage output for supply of sensors (switched U_{bat})

The outputs switch e.g. modem, sensor supply, or alarm devices (potential-free switching output via relay).

Measured value processing

- Sample interval
- Mean calculation
- Totals formation
- Scaling "ax + b"
- Two-point scaling
- Delta storage
- Definition of a sensor delay time
- Extreme value collection (minimum/maximum)
- Filter functions
- Extreme value recording
- Virtual terminal/virtual sensor (logical channels)
- Linearization table
- Arithmetic function
- Alarm management: Limit monitoring (threshold/gradient); status alarm

Reading out/data transmission

- Reading out on site via RS-232 and USB interface
- Reading out via modem
- Independent data transmission via modem, terminal adapter, or satellite transmitter
- ISDN D channel data transmission possible (X.31)
- Independent transmission of alarm messages via SMS (e-mail/fax)

Control elements

- LCD display and jog shuttle

6 Overview: Starting up the OTT netDL unit

Starting up a OTT netDL unit is done in a maximum of 10 steps:

		Refer to chapter
1.	Device versions "B…" and "C…": Inserting the SIM card	7.16
2.	Attaching the datalogger	7.1
3.	Connecting sensors	from 7.2
4.	Connecting switching contacts*	7.12
5.	Connecting 4-20 mA outputs*	7.13
6.	Connecting status outputs*	7.14
7.	Connecting the power supply	7.15
8.	Device versions "B…" and "C…": Connecting the GSM cellular radio antenna	7.16
9.	Installing and connecting external communication equipment*	7.17
10.	OTT netDL 1000: Connecting an Ethernet LAN or DSL router*	7.18
11.	Configuring the datalogger and setting operating parameters (also refer to the online help of the OTT netDL operating program)	8

* Only if required

7 Installing the OTT netDL unit

7.1 Attaching the datalogger

Requirements of the intended installation site:

- Sufficient protection from moisture (IP 41 protection type).
- Properly determined space for the electrical cables.
- The following operating temperature ranges are kept:
  Device version A.. : –40 °C up to +70 °C
  Device versions B.. and C.. : –30 °C up to +70 °C
- Standard top hat rail (TS 35) mounted at installation site.
- Closed control cabinet or fire protection cabinet.
  (not required if the power supply of OTT netDL is a low power source)

The dimensions of the OTT netDL can be found in Fig. 5.

Caution: Do not open the OTT netDL unit during installation! There are no adjustment or operating elements or connecting means inside the housing.

- Engage the OTT netDL unit into the top hat rail as shown in Figure 4 (left). Press the underside of the OTT netDL unit against the top hat rail until it clicks into place.

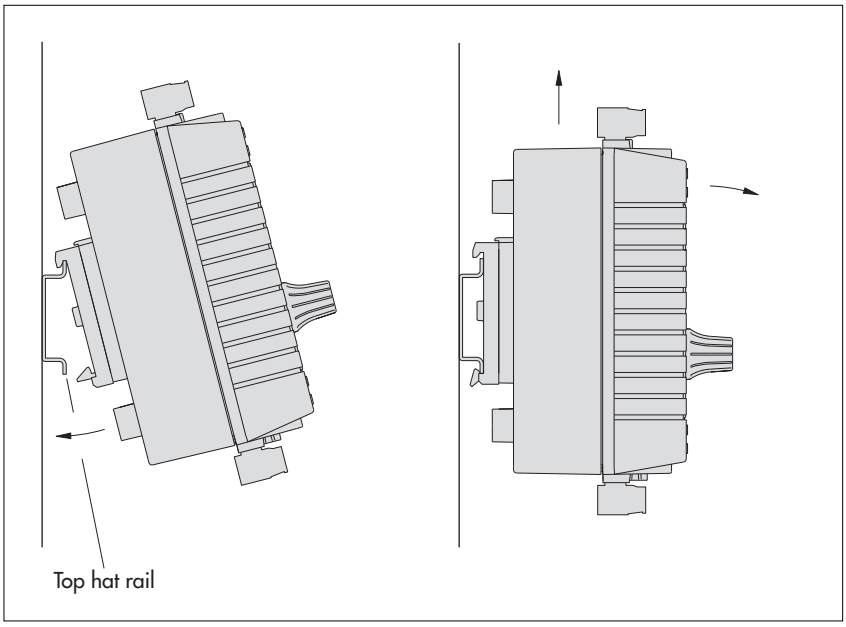
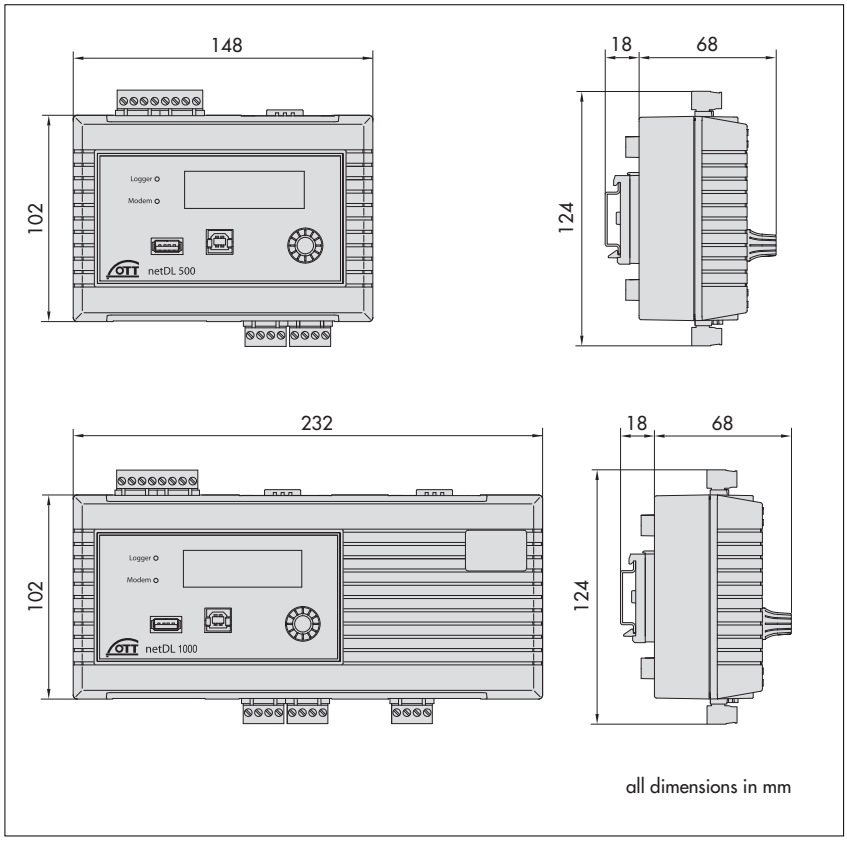


Fig. 4: Fastening the OTT netDL unit to the top hat rail (left)/removing it from the rail (right).

- Removing the OTT netDL unit: Carefully push the unit a few millimeters upward, slightly tilt the underside towards your body, and then remove it from the top hat rail, refer to Figure 4 (right).

Fig. 5: OTT netDL unit dimensions;
Top: OTT netDL 500
Bottom: OTT netDL 1000



7.2 Overview of the locations of the screw terminal strips and RS-232 interfaces

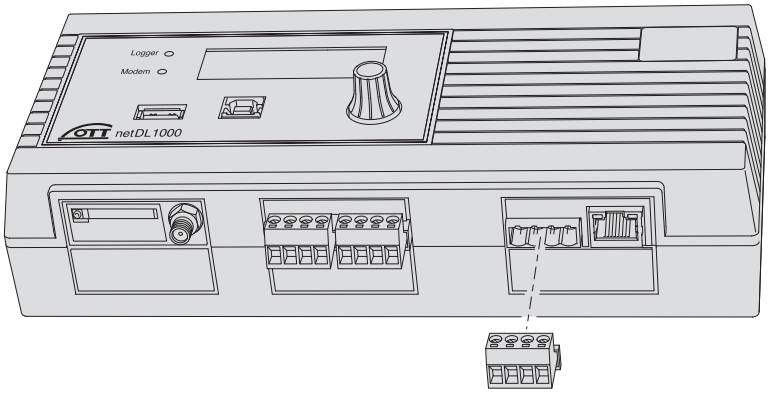
Fig. 6: Available positions for the plug-in screw terminal strips.

The figure shows the OTT netDL 1000 unit without expansion cards.

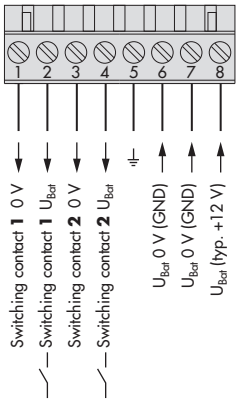
Factory configuration (without expansion cards):
OTT netDL 500: C, D + O-P
OTT netDL 1000: C-E + O-P

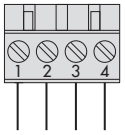
The specific configuration of your unit including expansion cards as well as the positions of the screw terminal strips/ RS-232 interfaces can be obtained from the Factory Acceptance Test (FAT) Certificate attached.

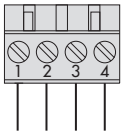
Please note: protect the feed line of the voltage supply (screw terminal strip N, contacts 6, 7 and 8) with a safety fuse (10 A / fast)!

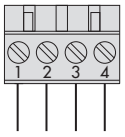


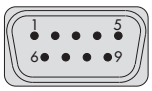
OTT netDL ...	**500**	**1000**
Voltage supply/ switching contacts[1]		
Screw terminal strip	N	N
Connection of sensors		
Screw terminal strip	C, D + G … K[2]	C … E + G … M[2]
4-20 mA outputs		
Screw terminal strip	S-T; U-V	S-T; U-V; W-X
Status outputs		
Screw terminal strip	G-H; J-K	G-H; J-K; L-M
RS-232 interfaces		
Communication COM 1	O-P	O-P
COM 2	–	Q-R
Serial sensor input[3]	G-H; J-K	G-H; J-K; L-M











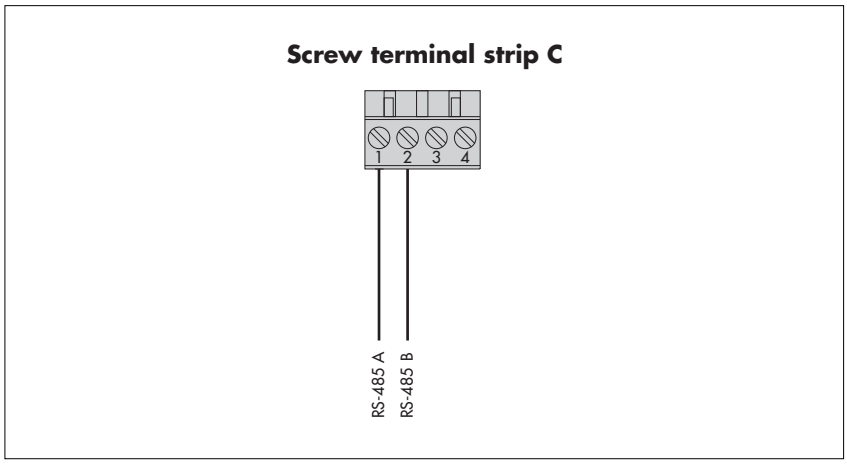
1 DCD 6 DSR
2 RXD 7 RTS
3 TXD 8 CTS
4 DTR 9 RI
5 GND

[1] max. 5 A
[2] G … K + G … M only with expansion cards
[3] only with RS-232 input card

7.3 Connecting sensors having an RS-485 interface (2-wire)

Fig. 7: Connecting sensors with RS-485 interface and SDI-12 via RS-485 interface (OTT protocol) to the OTT netDL unit (e.g. OTT RLS radar sensor or OTT Parsivel Present Weather Sensor). If multiple sensors are to be connected to an OTT netDL unit, it is to be done using an RS-485 bus topology.

Further information can be found in the operating instructions of the respective sensor.

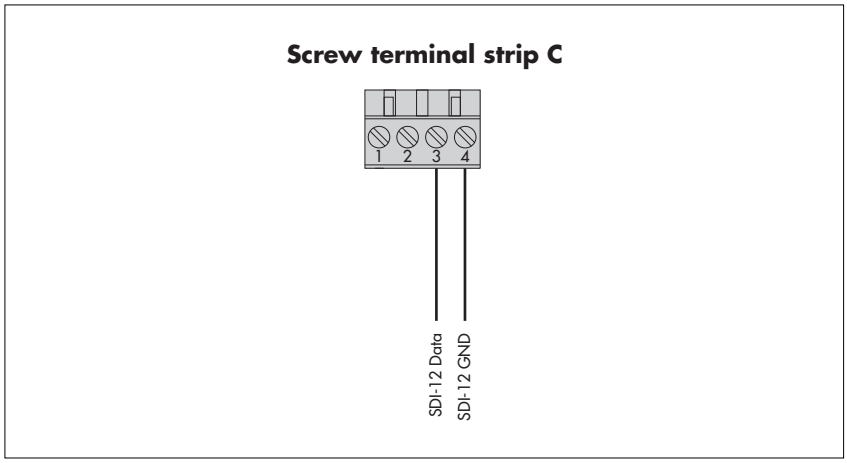


7.4 Connecting sensors having an SDI-12 interface

Fig. 8: Connecting sensors with SDI-12 interface to the OTT netDL unit (e.g. Hydrolab DataSonde DS5/DS5X). If multiple sensors are to be connected to an OTT netDL unit, it is to be done using an SDI-12 bus topology.

Further information can be found in the operating instructions of the respective sensor.

A sensor with SDI-12 protocol via RS-485 interface (e.g. OTT RLS radar sensor) is to be connected as shown in Chapter 7.3!

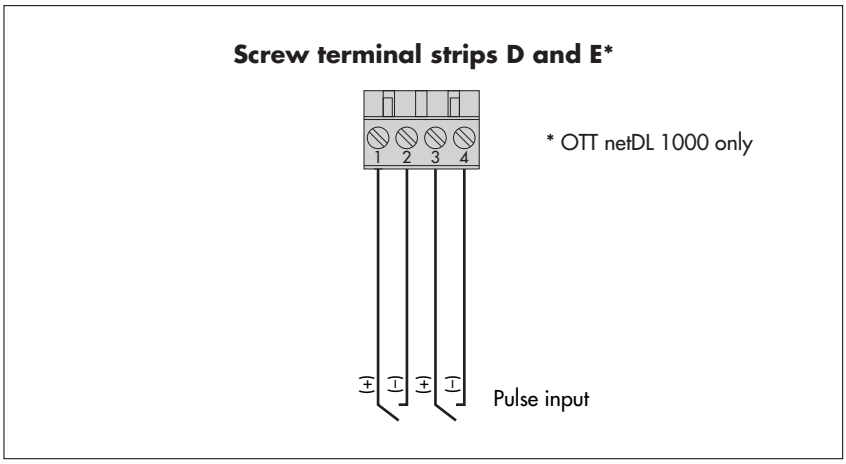


7.5 Connecting sensors having a pulse output

Fig. 9: Connecting sensors with pulse output to the OTT netDL unit (e.g. OTT Pluvio precipitation sensor or OTT Parsivel Present Weather Sensor).

The OTT netDL 500 unit has two (D 1-2, D 3-4) and the OTT netDL 1000 unit has four (D 1-2, D 3-4, E 1-2, E 3-4) pulse inputs that are independent from each other.

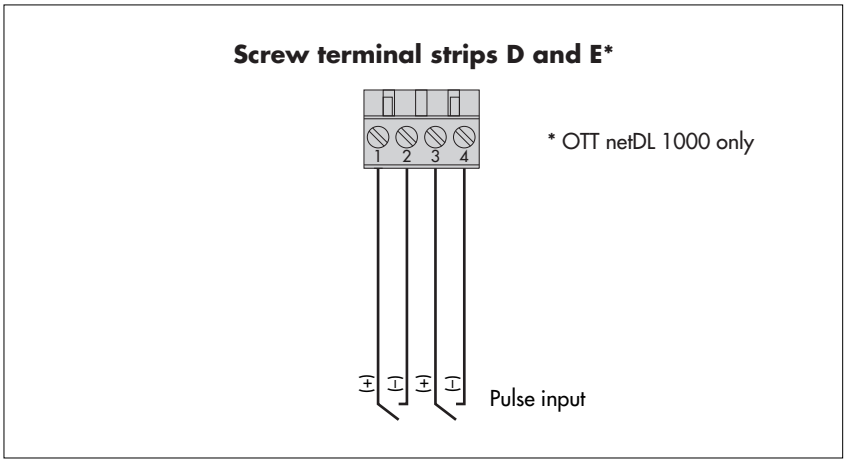
Further information can be found in the operating instructions of the respective sensor.



7.6 Connecting equipment having a status output

Fig. 10: Connecting devices to the OTT netDL unit that have a status output (e.g. door contact).

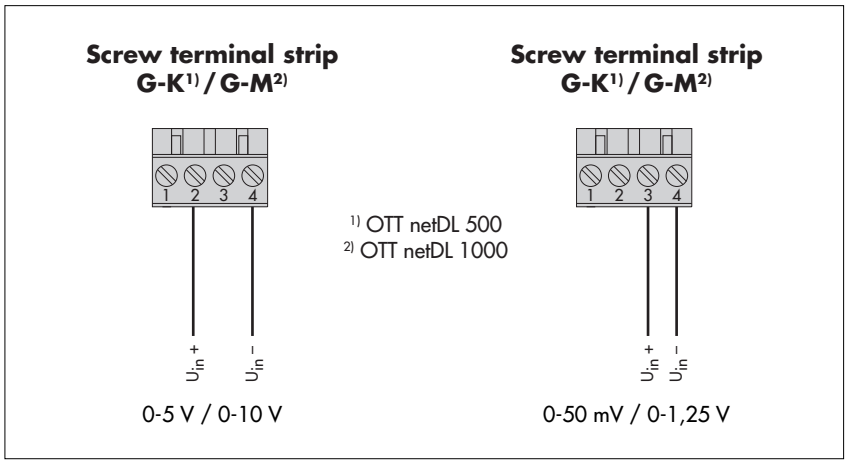
The OTT netDL 500 unit has two (D 1-2, D 3-4) and the OTT netDL 1000 unit has four (D 1-2, D 3-4, E 1-2, E 3-4) status inputs that are independent from each other.



7.7 Connecting sensors having a voltage output *

Fig. 11: Connecting sensors to the OTT netDL unit that have a voltage output (e. g. OTT ODS 4 K).

Further information can be found in the operating instructions of the respective sensor.



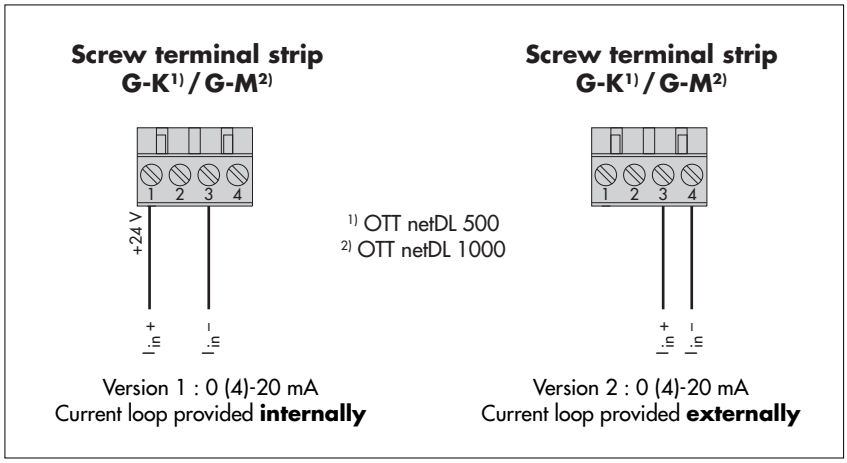
7.8 Connecting sensors having a current output *

Fig. 12: Connecting sensors to the OTT netDL unit that have a current output (e. g. OTT SE 200 shaft encoder or OTT PLS pressure probe).

Further information can be found in the operating instructions of the respective sensor.

Please note:
– For version 1: Do **not** supply the sensor externally!
– For version 2: **Additionally** supply the sensor externally!

With an OTT netDL supply voltage of higher than 24 V (28 V max.): A sensor connected in accordance with version 1 must be suitable for voltages higher than 24 V!



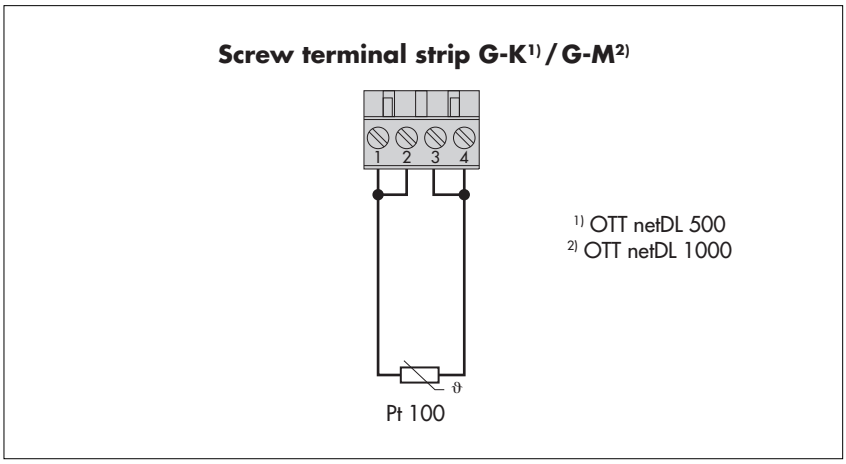
Please note: after each measurement the OTT netDL interrupts the current loop (due to secondary effects, there is still a constant rest current of approx. 9 mA). If other elements (e.g. display) belong to the current loop you have to close the current loop with an external resistance (R_{Load}) and configurate the OTT net DL for a sensor with voltage output.

* OTT netDL with expansion analog input card
(refer to Chapter 2 "Ordering numbers and version code")

7.9 Connecting the Pt 100 temperature sensor *

Fig. 13: Connecting a Pt 100 temperature sensor to the OTT netDL unit.

Further information can be found in the operating instructions of the respective sensor.

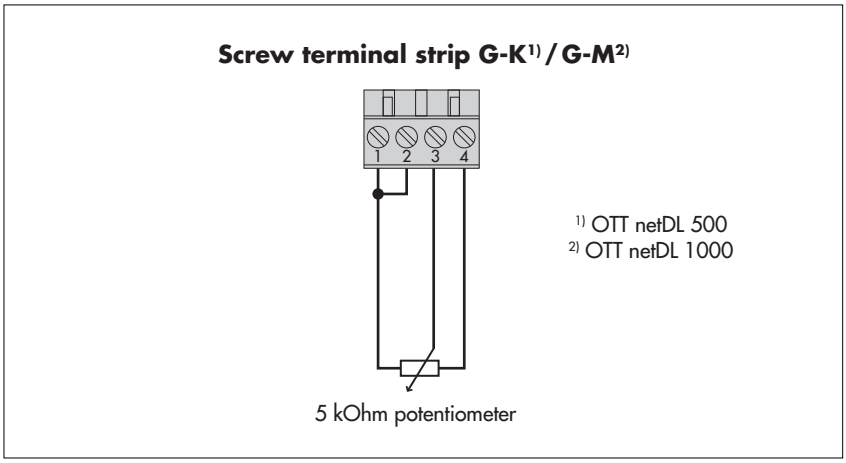


7.10 Connecting sensors having a potentiometer (5 kOhms) *

Fig. 14: Connecting sensors with potentiometer (typ. 5; max. 5.5 kOhms) to the OTT netDL unit.

The measurement value output is performed in values from 0 to 120 % of the nominal value of the potentiometer. This requires a subsequent "2-point-scaling" of the measured value.

Further information can be found in the operating instructions of the respective sensor.



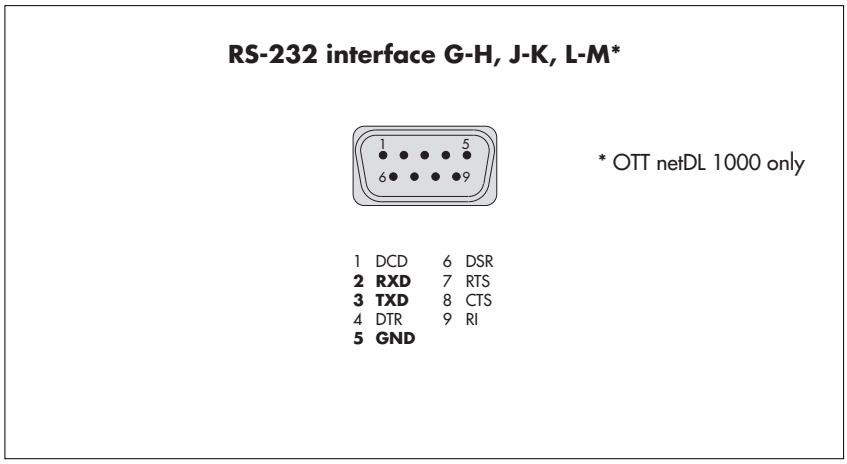
* OTT netDL with expansion analog input card
(refer to Chapter 2 "Ordering numbers and version code")

7.11 Connecting sensors having an RS-232 interface *

Fig. 15: Connecting sensors with RS-232 interface to the OTT netDL unit (e. g. OTT Nimbus bubble sensor).

A variety of sensors with RS-232 interface require a connection using only pins 2, 3, and 5.

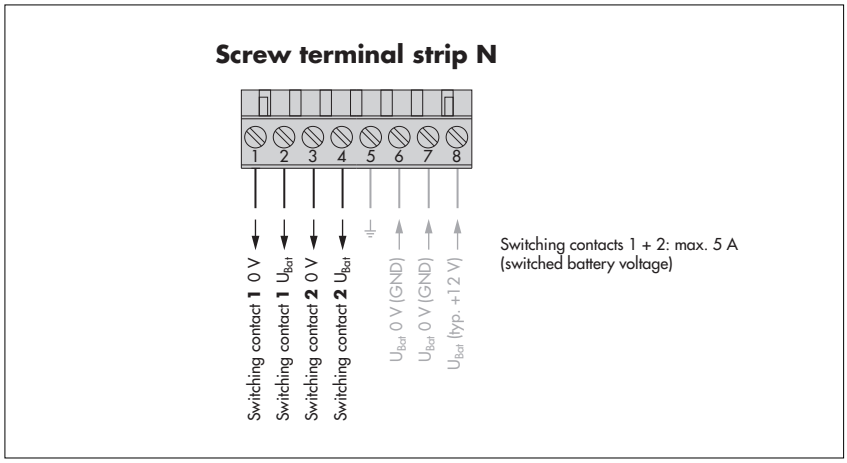
Further information can be found in the operating instructions of the respective sensor.



7.12 Connecting switching contacts

Fig. 16: Connecting the OTT netDL switching contacts.

Please note the maximum current capacity!



* OTT netDL with expansion RS-232 input card
(refer to Chapter 2 "Ordering numbers and version code")

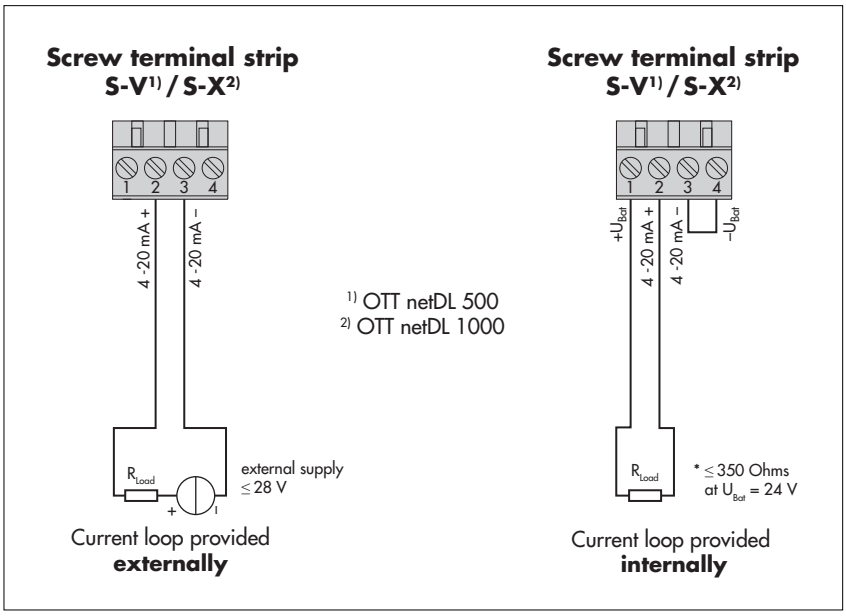
7.13 Connecting 4-20 mA outputs *

Fig. 17: Connecting the OTT netDL 4-20mA outputs.

Left: Connection schematic with **external** supply of the current loop.

Right: Connection schematic with **internal** supply of the current loop. This connecting option requires the OTT netDL unit to be supplied with a rated voltage of 24 V.

Be careful to dimenstion the resistance (R_{Load}) in the current loop correctly!

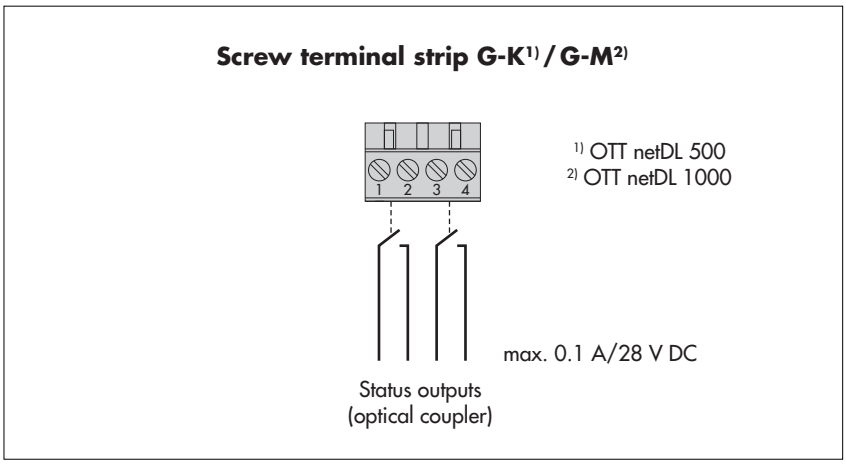


7.14 Connecting status outputs *

Fig. 18: Connecting the OTT netDL status outputs.

Please note the maximum current capacity!

The two outputs are galvanically isolated from each other and from the datalogger.



* OTT netDL with expansion analog output card
(refer to Chapter 2 "Ordering numbers and version code")

7.15 Connecting the power supply to the OTT netDL unit

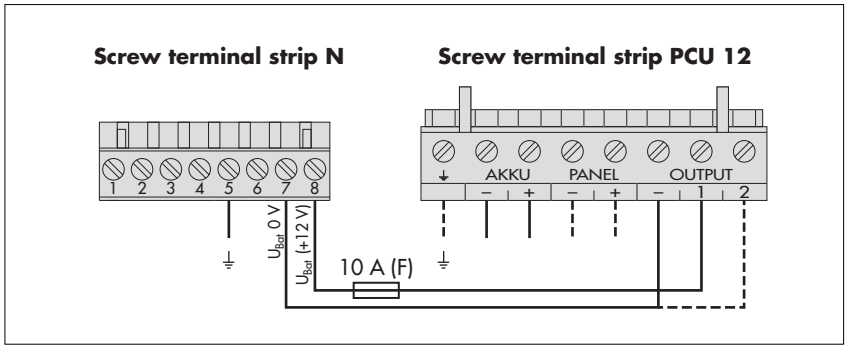


Fig. 19: Connecting voltage supply, e.g. to an OTT PCU 12 power control unit. The OTT PCU 12 is the OTT standard voltage supply.

Alternatively to PCU terminal 1 (load disconnect at a battery voltage of ≤ 7.5 V), terminal 2 can also be used (load disconnect at a battery voltage of < 10.5 V).

Please note: protect the feed line of the voltage supply (screw terminal strip N, contacts 6, 7 and 8) with a safety fuse (10 A / fast)!

7.16 Connecting the GSM cellular radio antenna and inserting the SIM card

(only device versions "B…" and "C…"): For the OTT netDL device versions "B…" and "C…", a GSM cellular radio antenna (accessory) is to be connected to the internal GSM modem and a SIM card obtained from the cellular radio provider to be inserted into the unit.

How to connect a GSM cellular radio antenna:

- Put the SMA plug of the GSM cellular radio antenna (accessory) onto the antenna socket and slightly tighten the lock nut by hand.
- Select an appropriate place for mounting the GSM cellular radio antenna (M16 center bolt, isolating washer and 23 mm across flat width nut).

  Before mounting, please note the following:
  - Minimum clearance between antenna and OTT netDL unit: 0.2 m;
  - Do not mount the antenna inside a metal control cabinet.
  - In case of poor cellular network coverage at the installation site, consider using a mast (including lightning protection equipment).
  - If the accessory antenna is not used, the maximum antenna gain is 2.5 dBi.

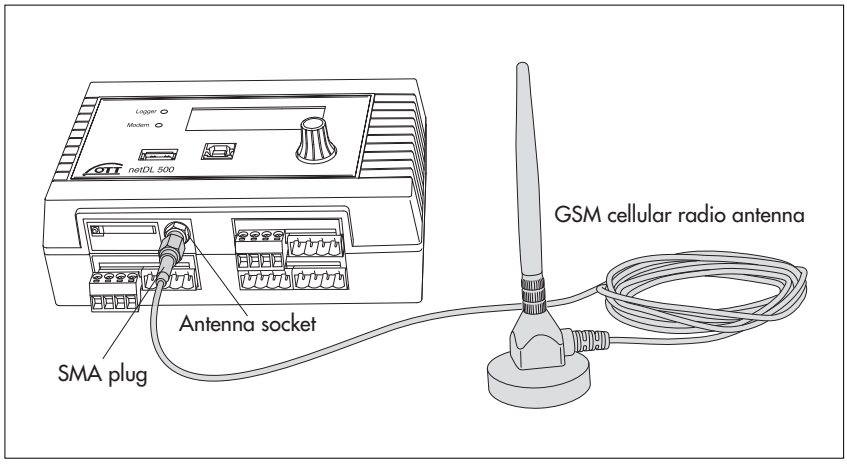
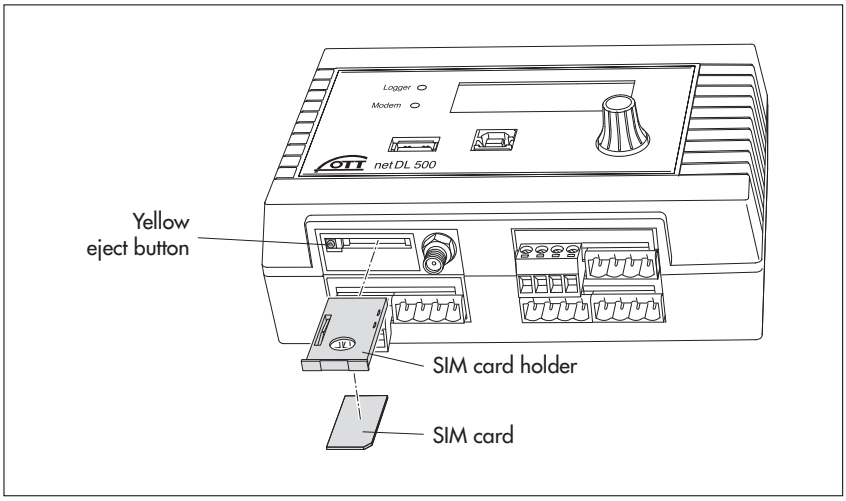


Fig. 20: Connecting the GSM cellular radio antenna to the OTT netDL unit (figure shows the OTT netDL 500 unit, proceed the same way for the OTT netDL 1000 unit).

How to insert an SIM card:

- Using a sharp objec (e. g. a ball pen or a pencil), press the yellow eject button.
- Completely pull out the SIM card holder.
- Insert the SIM card into the SIM card holder.
  While doing so, please note the following:
  – The gold-colored contacts of the SIM card are facing down. The beveled edge of the SIM card is located in the front on the right-hand side!
  – Do not touch the gold-colored contacts!
- With the SIM card inserted, completely push the SIM card holder into the OTT netDL unit, until it engages.

Fig. 21: Inserting an SIM card into OTT netDL unit (figure shows the OTT netDL 500 unit, proceed the same way for the OTT netDL 1000 the unit).



7.17 Connecting external communication equipment

If requested, a serial cable modem, a GSM modem (radio modem), or a satellite communication unit can be connected to the OTT netDL unit.

- Connect the RS-232 interface of the OTT netDL unit to a modem/satellite communication unit using a commercially available modem connection cable (accessory).
- Optional: Connect the supply voltage of the modem using switching contacts 1 or 2 (screw terminal strip N 1-2 or N 3-4). (The modem is not permanently powered → reduces the current consumption of the station. The OTT netDL unit enables power to the modem at specified time windows and/or when data transfer is due.)

Fig. 22: Modem connection cable.

(9-pin Sub-D socket to 9-pin Sub-D connector; PIN 2 and PIN 3 each directly connected; for position(s) of the RS-232 interface(s) on the OTT netDL unit, refer to Fig. 3; for pin assignment of the RS-232 interface, refer to Fig. 6).

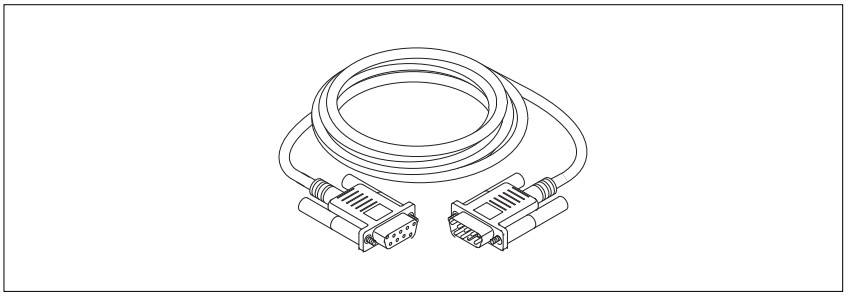
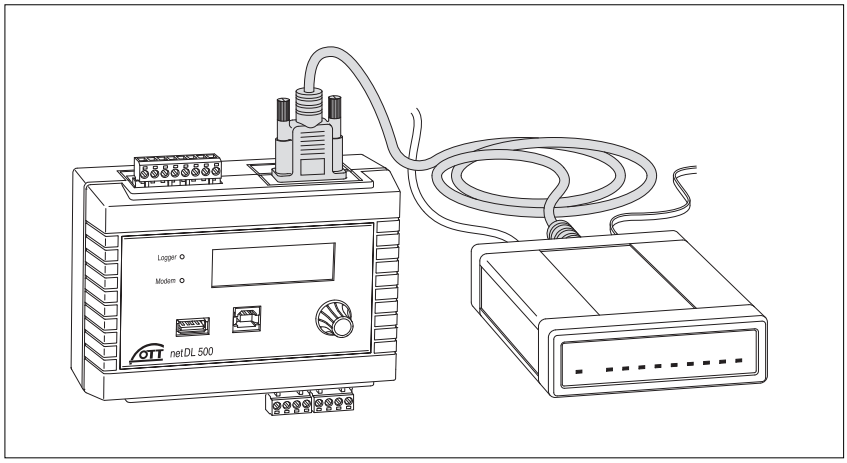


Fig. 23: Connecting serial modem to the OTT netDL unit via modem connection cable (figure shows the OTT netDL 500 unit, proceed the same way for the OTT netDL 1000 the unit).

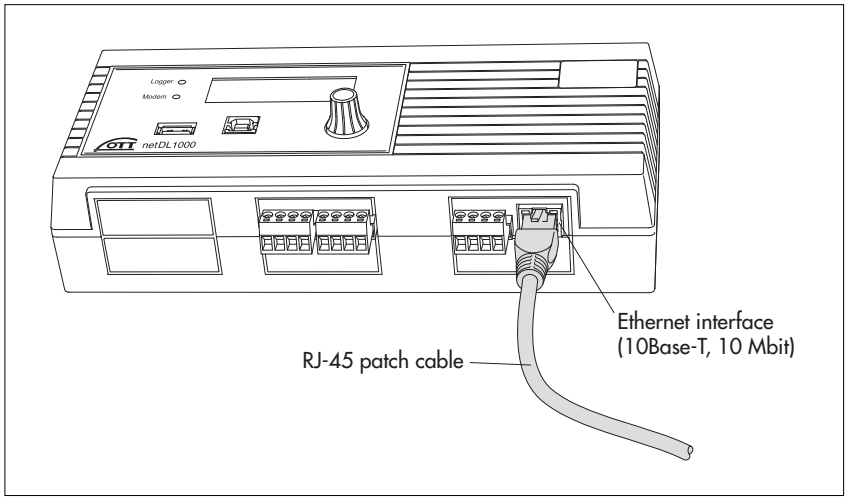


7.18 Connecting an Ethernet LAN or DSL router

Through a built-in Ethernet interface, the OTT netDL 1000 unit may be connected to an Ethernet LAN (web access through a Local Area Network) or to a DSL router (web access using a modem connected to a digital subscriber line (DSL)).

- Connect the built-in Ethernet interface to an Ethernet LAN or DSL router using an RJ-45 patch cable (1-to-1 pin assignment from CAT 3 on).

Fig. 24: Connecting Ethernet LAN or DSL router to the OTT netDL 1000.



8 Setting OTT netDL operating parameters

To set the OTT netDL operating parameters, you need the "OTT netDL operating program" (WBSLA0.exe) PC software. This software is found on the "OTT netDL Software" CD-ROM (accessory).

Hardware and software requirements: Up-to-date standard PC with RS-232 interface or USB interface (desktop/tower or notebook design); operating system: Windows 2000 (SP4) or later.

8.1 Installing the OTT netDL operating program

How to install the OTT netDL operating program

- Insert the CD-ROM → Select "Start" | "Run" | "d:\Software\English\setup.exe" (d = CD-ROM drive; alternatively: Select "\Deutsch" or "\Français" or "\Español" for another language).
- Follow the installation instructions on the screen.

8.2 Establishing the PC/OTT netDL communication link (on site)

In the Chapters 8 and 11 to 18, the establishment of a communication link between the OTT netDL and a PC is a pre-requisite for the following steps. The following description illustrates the setup of this communication link and its variations.

Hardware and software requirements: Up-to-date standard PC with RS-232 interface or USB interface (desktop/tower or notebook design); operating system: Windows 2000 (SP4) or later.

Additional (accessories):

- OTT netDL/PC data transfer cable (see accessories; null modem cable)
- USB connection cable
- RJ-45 crossover cable for direct connection between PC and OTT netDL RJ-45 patch cable for connection via switch or router

How to set up a communication link using a data transfer cable

- Connect the data transfer cable (9-pin Sub-D socket to 9-pin Sub-D socket; pins 2 and 3 each crossed) to a serial interface of the PC (e.g. COM 1).
- Connect the data transfer cable to the serial communication interface of the OTT netDL (COM 1 or COM 2 (OTT netDL 1000 only)).
- Start the OTT netDL operating program.
- In the OTT netDL operating program, select the serial interface (COM1, COM2) and transmission speed used in the "RS232/V.24" communication path.

How to set up a communication link using a USB connection cable

Requirements: USB interface drivers are installed (refer to Chapter 8.3).

- Connect the USB connection cable to a USB socket of the PC (USB connector type A).
- Connect the USB connection cable to the USB device interface of the OTT netDL (USB connector type B).
- Start the OTT netDL operating program.
- In the OTT netDL operating program, select the "USB Connection" communication path.

How to set up a communication link using an RJ-45 crossover cable

The OTT netDL must be configurated accordingly (IP-address, …); see online help of the operating program.

- Connect the RJ-45 crossover cable to an Ethernet interface of the PC.
- Connect the RJ-45 crossover cable to the Ethernet interface of the OTT netDL unit.
- Start the OTT netDL operating program.
- In the OTT netDL operating program, select the "IP Connection" communication path.

Notes

- Change the language for the OTT netDL operating program as required: Press the F3 function key (multiple times) until the required language appears.
- For more information on setting up a communication link (also from remote), please refer to the online help of the OTT netDL operating program.

Caution: With a nearly full data memory in the OTT netDL unit, it may take a few minutes after an interruption of the operating voltage until communication is possible again!

8.3 If required: Installing the USB interface driver

For establishing a communication link over the USB interface, the PC requires a dedicated USB interface driver. This USB interface driver must be installed, when the communication link is established for the first time.

You may use the USB interface driver on any current standard PC that is fitted with a USB interface and on which a Microsoft Windows 2000 or higher operating system is run.

The procedure described here is based on the Microsoft Windows XP operating system. With minor changes, it applies to the other Windows operating system versions as well.

How to install the USB interface driver:

- Log on to the PC with administrator rights.
- Connect the OTT netDL unit to a USB interface of the PC → the PC detects the new hardware and displays the message*: "Found New Hardware – OTT netDL" → the "Found New Hardware Wizard" opens.
- Select "No, not this time".
- Select "Next".
- Select "Install from a list or specific location (Advanced)".
- Select "Next".
- Insert the "OTT netDL Software" CD-ROM into the PC drive.
- Select "Search for the best driver in these locations" and "Search removable media (floppy, CD-ROM ...)".
- Select "Next".
- The wizard will install the USB interface driver onto the PC.
- After completion of the installation process, the following message will appear: "The wizard has finished installing the software for: OTT netDL".
- Select "Next". Now a communication link via the USB interface may be established.

* In the notification area of the taskbar

Note

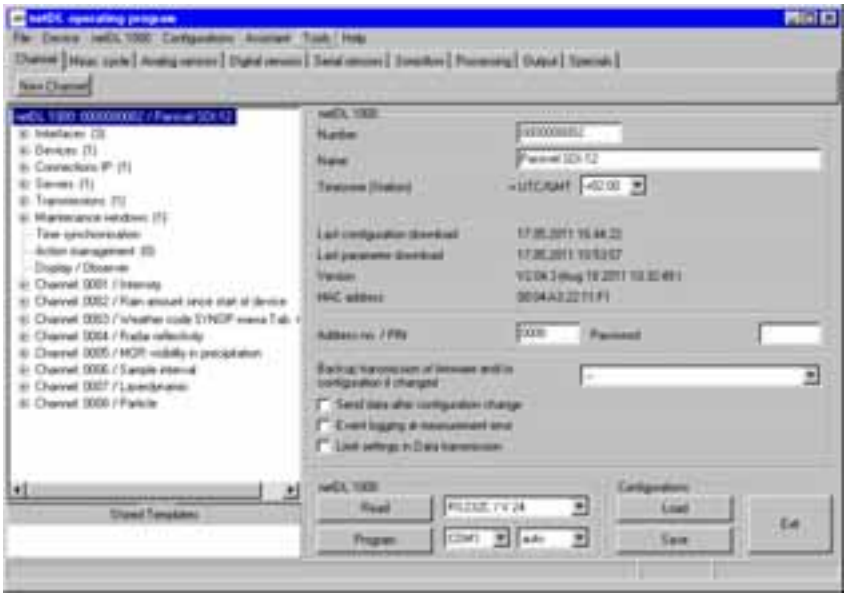
- The USB driver depends on the particular OTT netDL unit. Therefore, the driver must be installed for each new OTT netDL unit once.

8.4 Introduction: Setting OTT netDL operating parameters

How to set the OTT netDL operating parameters using a PC:

- Establish the PC/OTT netDL communication link (refer to Chapter 8.2).
- If you have not already done so: Connect the OTT netDL unit to operating voltage. After a few seconds, the OTT netDL unit is ready to use (the LCD display shows various messages and then turns off).
- Start the OTT netDL operating program.
- In the "Device" menu, select the "netDL 500/1000" option.
- Read the current OTT netDL configuration into the operating program: In the "netDL 500/1000" menu, select the "Read" option or click the "Read" button
  → The operating program reads the current (factory default) OTT netDL configuration and displays it in the operating program main window:

Fig. 25: Main window of the OTT netDL operating program.



- Now make the adjustments according to your specific requirements:
  – Master data
  – Interfaces
  – Devices
  – Connections IP
  – Server
  – Transmissions
  – Maintenance window
  – Time synchronization
  – Action management
  – Display/Observer
  – Channel-related function
- Click on the "Program" button.
- Acknowledge the message "Warning: Reset OTT netDL and delete data memory additionally?" by selecting "Yes" (recommended for initial installations).
  The OTT netDL is now completely configured and parametrized and starts processing the measuring and communicating jobs.

For detailed information on how to set the OTT netDL operating parameters, please refer to the online help of the OTT netDL operating program.

9 Operating/configuring the OTT netDL unit on site

For operating the unit on site, OTT netDL is equipped with a backlighted LCD display (4 rows x 20 characters) and a "jog shuttle". The jog shuttle is a special operating button that can be rotated and pressed.

The following functions can be called with the jog shuttle:

- Determine and display instantaneous values (Observer function)
  – with input of a check value,
  – without input of a check value.
- Enter observer texts (extended Observer function)
- Scale instantaneous values/stored values (set offset)
- Display/set date and time
- Display information on transmissions
- Display information on connections
- Display system information
- Start voice announcer (optional)

Meaning of the function symbols on the LCD display

! "Enter observer text"
→ "continue"
↵ "enter"
|← "cancel" / "exit" / "back"

9.1 Detecting and displaying instantaneous values (Observer function)

Requirements

- The configuration of a channel that is to determine and display an instantaneous value must include the "Instantaneous value" function block (refer to online help).
- If additional check values are to be entered, the "Observer Manual input" option in the "Display/Observer" function block must be activated (refer to online help).

How to determine and display instantaneous values without entering a check value:

- Press jog shuttle twice. (Between the first and second presses, the LCD display shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Press jog shuttle (Observer). The LCD display shows the station name, the station number, the current time and, after 2 seconds, the level of the voltage supply.
- Press jog shuttle (→). The LCD display shows the screw terminal strip used, the sensor name/number and the instantaneous value of the first channel (sensor).
- To show the instantaneous values of additional channels, press jog shuttle once each time (→). After the instantaneous value of the last channel has been shown, the LCD display shows the instantaneous value of the first channel again.
- To end the display of the instantaneous values, rotate jog shuttle to |← and press (twice). If the jog shuttle is not used for three minutes, the LCD display shuts off automatically.

How to determine and display instantaneous values when entering a check value:

- Press jog shuttle twice. (Between the first and second presses, the LCD display shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Press jog shuttle (Observer). The LCD display shows the station name, the station number, the current time and, after 2 seconds, the level of the voltage supply.
- Press jog shuttle (→). The LCD display shows the screw terminal strip used and the sensor name/number of the first channel (sensor). If the "Suppress display of instantaneous value before input" option in the "Display/Observer" function block is activated, the OTT netDL unit suppresses the instantaneous value by means of asterisks.
- Rotate jog shuttle to ↵.
- Press jog shuttle (↵). The check value is now to be entered by character from right to left. The character to be changed in each case is shown inverted (white on black background).
- Rotate jog shuttle until required character appears.
- Press jog shuttle to jump to the next character position, etc.
- Confirm the entry: Press jog shuttle (↵). Cancel: Rotate jog shuttle to ⇤ and press.
- Press jog shuttle (→). The OTT netDL unit now determines the current instantaneous value of the first channel (sensor) and shows it on the LCD display.
- To enter the check value and show the instantaneous values of additional channels, press jog shuttle once each time (→). After the instantaneous value of the last channel has been shown, the LCD display shows the instantaneous value of the first channel again (it is not necessary to enter a check value again).
- To end the display of the instantaneous values, rotate jog shuttle to ⇤ and press (twice). If the jog shuttle is not used for three minutes, the LCD display shuts off automatically.

Notes

- The "Observer" function initiates an instantaneous value measurement. Until this measurement is complete, the display refers to the last stored value (or the instantaneous value last displayed, whichever is the most recent). On the display, this is identified with an "≤" after the channel number (sensor number). After completing the measurement, the new measured value appears without additional identification.
- The OTT netDL stores each call of the "Observer" function in the info channel together with date and time. After "Read" and "Accept", this information can be displayed in the evaluation window of a sensor in the Hydras 3 application software using the "Info Data | Station | Display" option (observer registration general).
- If the "Observer Manual input" option in the "Display/Observer" function block is activated, the OTT netDL also stores the check value entered as well as the currently measured instantaneous value. These two values can be displayed in the evaluation window of a sensor after being "Read" and "Accept" to the Hydras 3 application software using the "Info Data | Sensor | Display" function (observer registration with check value).

9.2 Entering observer texts (extended Observer function)

Requirements

- The "Extended observer (store and transmit number)" option in the "Display/Observer" function block is activated (refer to online help).
- In the "Display/Observer" function block, observer texts are stored (refer to online help).

How to enter observer texts for the station:

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL activates the LCD display and shows the selection menu.
- Press jog shuttle (Observer). The LCD display shows the station name, the station number, the current time and, after 2 seconds, the level of the voltage supply.
- Rotate jog shuttle to !.
- Press jog shuttle in order to begin the entry of the observer texts.
- Rotate jog shuttle until the required number/text appears and then press. (The numbers are not necessarily sorted in ascending order. The row numbers of the table entries of the observer texts are decisive; refer to online help). By selecting the number 0000, freely editable texts can be entered.
- Confirm the entry: Press jog shuttle (↵). Cancel: Rotate jog shuttle to ⇤ and press.
- To end the entry of the observer text, rotate jog shuttle to ⇤ and press. If the jog shuttle is not used for three minutes, the LCD display shuts off automatically.

How to enter observer texts for a channel (sensor):

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Press jog shuttle (Observer). The LCD display shows the station name, the station number, the time and, after 2 seconds, the level of the voltage supply.
- Rotate jog shuttle to !.
- Press jog shuttle (⇥). The LCD display shows the instantaneous value of the first channel (sensor).

Note

- The application software Hydras 3, version 2.00.0, only displays the observer texts in numerical form within the raw data management.

How to enter freely editable text:

- Select number 0000 (see above).
- Press jog shuttle (↵) to begin with text entry.
- Rotate jog shuttle until required alphanumeric character appears.
- Press jog shuttle to jump to the next character position, etc.
- Confirm the entry: Press jog shuttle (↵).

9.3 Scaling instantaneous values/stored values (set offset)

How to change (scale) an instantaneous value:

- To change a value: Rotate jog shuttle clockwise until "↵" is selected (text with black background).
- Press jog shuttle (↵). The value is now entered by character from right to left. The character to be changed in each case is shown inverted (white on black background).
- Rotate jog shuttle until required character appears.
- Press jog shuttle to jump to the next character position, etc.

  Please note: Changing an instantaneous value in the display is only available for channels for which the "Scaling y=ax + b" or "2-point scaling" function block has been created during the configuration (refer to online help). Changing an instantaneous value will affect the scale of this channel (offset). The OTT netDL records instantaneous value changes in the "Info channel" of a sensor (evaluation with Hydras 3).
- Confirm the entry: Press jog shuttle (↵). Cancel: Rotate jog shuttle to |← and press.
- To change an additional instantaneous value: Rotate jog shuttle (⇉) and press.

9.4 Displaying/setting date and time

How to set the date and time:

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Rotate jog shuttle (Settings).
- Press jog shuttle (Date/Time).
- Press jog shuttle.
- Press jog shuttle. The OTT netDL unit shows the current time and date.

How to set the date and time:

- Press jog shuttle (↵).
- Change number (↕): Rotate jog shuttle.
- Jump one number to the right (→): Press jog shuttle. After moving to the seconds, the OTT netDL shows "↵" and "|←".
- Set date/time (store): Press jog shuttle (↵).

Alternatively, the date and time can be set via the "OTT netDL operating program": "OTT netDL menu, „Date / time" function.

9.5 Entering manual values into a manual sensor

Requirements

▶ The configuration of a channel that is to allow the entry of manual values must include the "Manual Sensor" function block (refer to online help).

How to enter manual values:

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Press jog shuttle (Observer). The LCD display shows the station name, the station number, the current time and, after 2 seconds, the level of the voltage supply.
- Rotate jog shuttle to ! and press.
- The LCD display shows a selection menu. This menu is only visible if the Observer feature is activated ("Display/Observer" function block, "General" tab, "☑ Observer Manual input").
- Rotate jog shuttle to Manual Sensor and press.
- The LCD display shows the first sensor for manual input. For manual input of additional channels, press jog shuttle (→|) or rotate to ↵.
- To start manual input, press jog shuttle (↵).
- The manual value is now entered by character from right to left. The character to be changed in each case is shown inverted (white on black background).
- Rotate jog shuttle until required character appears.
- Press jog shuttle to jump to the next character position, etc.
- After entering the manual value, the time applicable to it is entered from right to left. The character to be changed in each case is shown inverted (white on black background): The OTT netDL shows the current time as the default.
- Rotate jog shuttle until required character appears.
- Press jog shuttle to jump to the next character position, etc.
- Confirm the entry: Press jog shuttle (↵). Cancel: Rotate jog shuttle to |← and press.
- To show the manual input of additional channels, press jog shuttle once each time (→|). After the manual input of the last channel has been shown, the LCD display shows the manual value entry made for the first channel again.
- To end the display of the manual input, rotate jog shuttle to |← and press (twice). If the jog shuttle is not used for three minutes, the LCD display shuts off automatically.

Note

▶ The OTT netDL unit saves a manual sensor in the same way as a normal aperiodic sensor, together with measured value, date and time.

9.6 Displaying information on transmissions

A transmission is a remote data transfer that is configured in the OTT netDL operating program and which the OTT netDL unit independently executes over a specified communication path.

How to display information on transmissions:

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Rotate jog shuttle to Information and press.
- Press jog shuttle (Transmissions).
- The LCD display shows information on the first transmission:
  Line 1: Name of the transmission;
  Line 2: Unit through which the data transmission takes place:
  Line 3: Date and time of the last transmission through this communication path.
- Show other transmissions: Rotate jog shuttle to ⇾ and press.
- Exit display: Rotate jog shuttle to ⇤ and press.
  Then rotate Jog shuttle twice to End and press.

9.7 Displaying information on connections

A connection is a communication path that is specified in the OTT netDL operating program and used for remote data transfer (GPRS data transfer over cellular radio modem or Ethernet or internet connection).

How to display information on connections:

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Rotate jog shuttle to Information and press.
- Rotate jog shuttle to Connections and press.
- Optionally press
  – jog shuttle (Modem) or
  – rotate jog shuttle (LAN) and press.
- Press jog shuttle (Saved state).
- The LCD display shows information on the connection:
  Line 1: Menu item Modem → Network operator: Signal strength;
  Menu item LAN → Transmission speed of the Ethernet interface;
  Line 2: IP address;
  Line 3: Date and time of the last status logging.
- Show current status: Rotate jog shuttle to ⇤ and press.
- Rotate jog shuttle to Saved state and press → the OTT netDL unit determines the current connection status and displays the information (see above).
- Press jog shuttle (End).
- Show other connections: Rotate jog shuttle to ⇾ and press.
- Exit display: Rotate jog shuttle to ⇤ and press.
  Then rotate Jog shuttle twice to End and press.

Note

▶ If the OTT netDL is unable to establish a connection, the LCD display shows "– – – – – – –" and "–––.–––.–––.–––".

9.8 Displaying system information

Upon request, the OTT netDL shows the last 10 events recorded (event log) as well as the particular device version (Systeminfo).

How to display the event log:

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Rotate jog shuttle to Information and press.
- Rotate jog shuttle to System and press.
- Press jog shuttle (Event Log).
- The LCD display shows information on the first event:
  Line 1: Function, instance
  Line 2: Type, code
  Line 3: Date and time of the event
- Show information on the event in clear text → Rotate and jog shuttle to select the line 1 or 2, and press.
- Exit clear text display: Press jog shuttle (End).
- Display information on next event: Rotate jog shuttle to ⇥ and press.
- Show other events: Rotate jog shuttle to ⇥ and press.
- Exit display: Rotate jog shuttle to ⇤ and press.
  Then rotate Jog shuttle three times to End and press.

How to display the device version:

- Press jog shuttle twice. (Between the first and second presses, the LCD display momentarily shows the OTT netDL firmware version.) The OTT netDL unit activates the LCD display and shows the selection menu (if password protection for the LCD display is active → enter the four-digit password first; refer to online help).
- Rotate jog shuttle to Information and press.
- Rotate jog shuttle to System and press.
- Rotate jog shuttle to Systeminfo and press.
- The LCD display shows information on the system:
  Line 1: Type and position of the expansion card/display/mainboard/modem
  Line 2: Hardware revision
  Line 3: Software revision.
- Display other system information: Rotate jog shuttle to ⇥ and press.
- Exit display: Rotate jog shuttle to ⇤ and press.
  Then rotate Jog shuttle three times to End and press.

10 LED indicators

For indicating different operating states, the OTT netDL unit front panel has two multi-color LEDs:

- "Logger" LED
  - Flashes green; frequency: once every 2 seconds
    → datalogger active.
  - Flashes green; frequency: once per second
    → IP data communication active.
  - Flashes red; frequency: once per second
    → IP data communication failed.
  - Off
    → datalogger in sleep mode.
- "Modem" LED
  - Continuously illuminates green
    → internal modem active.
  - Continuously illuminates orange
    → GPRS data communication available.
  - Off
    → internal modem inactive.

11 Reading out measured data on site

To retrieve measured data from an OTT netDL unit, a PC with the "Hydras 3 Application Software (Basic)" is required.

How to retrieve measured data on site:

- Connect the RS-232C interface of the OTT netDL to a serial interface of your PC (also refer to Chapter 8.2).
- Start Hydras 3 (Basic).
- In the tree view of HYDRAS 3, select the station; in the "Communication" menu, select the "Read / Operate" option.
- In "Communication" window, type "OTT netDL, "Read", do the following: select "Standard". The protocol type is preset to "OTT protocol (Hydrosens)". For the communication path, select "RS232C/V.24, COM1 (or COM2), 115200Bd, 8N1". Click on "Start".
- The measured values are copied from the PC and are available in the raw data pool for further use.

Fig. 26: Reading out measured data on site.

Moreover, you may retrieve the measured data through remote data transfer using a modem. For detailed information, refer to the online help of the OTT netDL operating program.

12 Updating the OTT netDL firmware

The "OTT netDL, operating program" provides the option of updating the OTT netDL firmware (operating system). By continuously developing the operating system, you will thus be provided with the extended functionality for the OTT netDL, even with the same hardware.

By accessing the OTT website (www.ott.com; "myOTT" section) from time to time, stay informed on the current version of the OTT netDL firmware.

How to update the firmware:

- Download the new version of the firmware (file: e.g. "SLI_netDL_V2.50.1.bin") from the website.
- Copy the file "SLI_netDL_Vx.xx.x.bin" to the directory, in which the OTT netDL operating program is located.
- Establish the PC/OTT netDL communication link (refer to Chapter 8.2).
- In the "OTT netDL ..." menu, select the "New program code" option.
- Acknowledge the confirmation by selecting "Yes" → The operating program copies the new firmware to the OTT netDL unit (LCD display: "Update in progress"). Then the OTT netDL will restart and automatically resume processing its measuring and communicating jobs.

Caution: During update, make sure that the communication link is not aborted (e.g. by accidentally answering calls on the data transfer cable). If the communication link is aborted, the firmware will no longer be executable! In the same way, no other programs should be started or files opened during the copying process!

Note

- If there are multiple ".bin" files in the directory, you will have to select the required file manually.
- The measured values saved in the OTT netDL are not lost after an update.

13 Overview: Alarm and action management

The OTT netDL is capable of automatically generating an alarm or performing an action, if certain events occur. These alarms or actions may be triggered by different conditions:

- Threshold of a limit: A predefined value is underrun or exceeded.
- Gradient limit: Fast rise or drop of a defined value within a certain period of time.
- Change in status: The input signal at a status input has changed.

The following actions and alarm messages are available:

- Control external devices through the power supply switching contact (switched U_{bat}).
- Send an SMS message containing an alarm message. If the cellular radio network operators provide respective services, the SMS messages may be sent as an e-mail or telefax as well.
- Send an alarm message via OTT protocol to the OTT Hydras 3 application software.
- Send an alarm message to an HTTP/FTP/SMTP server.
- Temporarily change the transmitting interval of a configured data transfer. For this, there are five additional time intervals available that are controlled by limits.
- (Temporarily) change the sampling and storage interval of a channel.

If required, individual actions may be grouped. Thus, an event may trigger several actions/alarms.

For detailed information on the alarm and action management, refer to the online help of the OTT netDL operating program.

14 Protecting the OTT netDL unit using a password

To protect an OTT netDL against unauthorized configuration or entry of operating parameters, you may lock the OTT netDL unit using a password.
This only applies to the interaction with the OTT netDL operating program.

How to protect the OTT netDL against unauthorized operation:

- Establish the PC/OTT netDL communication link (refer to Chapter 8.2).
- Read the current OTT netDL configuration into the operating program: In the "netDL 500/1000" menu, select the "Read" option or click on the "Read" button.
- In the tree view, select "netDL 500/1000".
- Enter an eight-digit (max.) password into the "Password" input box. Allowable characters: 0-9, A-Z.
- Click on the "Program" button.
- Acknowledge the message "Warning: Reset the netDL and delete data memory additionally?" by selecting "No" → The OTT netDL unit is now protected against unauthorized operation.

Caution: Keep the password in a safe place. If the password is lost, you can no longer configure or parametrize the OTT netDL unit. In such a case, please contact OTT HydroService.

How to unlock the OTT netDL for operating:

- In the "netDL 500/1000" menu, select the "Enter password" option.
- Enter password.
- Click on the "OK" button.
- Acknowledge the " Password accepted! OTT netDL unlocked" message by selecting "OK".
- Click the "Read" button → The operating program reads the current OTT netDL configuration.

15 Setting date and time

The internal clock of the OTT netDL is a highly accurate realtime clock. If the supply voltage is interrupted, the installed lithium battery provides the voltage supply for the realtime clock. Date and time are set using the OTT netDL operating program (or through the LCD display and jog shuttle, refer to Chapter 9 "Operating/configuring the OTT netDL unit on site").

How to set the date and time

- Establish the PC/OTT netDL communication link (refer to Chapter 8.2).
- In the " netDL 500/1000" menu, select the "Date/time" option → The operating program opens the "netDL 500/1000 – date/time" window and retrieves both date and time of the OTT netDL unit.
- Click the "Set date/time" button → The operating program sets the OTT netDL date and/or the OTT netDL time according to the PC time/the PC date and/or according to the date/time set in the selection box.
- If necessary: Click the "Refresh" button → The operating program retrieves the OTT netDL date and time again.
- Click the "Exit" button.

Caution: If the PC is in Daylight Saving Time mode (identified by "DST" on the PC), the operating program will automatically use the standard time without taking into account the daylight saving time (standard time). To obtain continuous time series, it is reasonable not to use the daylight saving time on the OTT netDL unit. (The OTT netDL does not have an automatic daylight saving time feature.)

16 Deleting the data memory

Caution: The measured values stored in the OTT netDL are permanently lost when deleting the data memory! Where necessary, retrieve the measured values before deleting (refer to Chapter 11).

How to delete the data memory

- Establish the PC/OTT netDL communication link (refer to Chapter 8.2).
- In the "netDL 500/1000" menu, select the "Delete data memory" option.
- Acknowledge the message "Warning: Are you sure you want to delete data memory?" by selecting "Yes → The operating program deletes the entire data memory of the OTT netDL (all measured value channels including the info channel). Deleting the data memory takes about 30 seconds.

Then the OTT netDL unit resumes determining and storing the measured values of all channels available, using the individually set sample interval.

17 Printing the terminal connection diagram

For documentation purposes, the OTT netDL operating program provides the option of printing a terminal connection diagram. This terminal connection diagram is based on the configuration that is saved in the tree view of the OTT netDL.

How to print a terminal connection diagram:

- Establish the PC/OTT netDL communication link (refer to Chapter 8.2).
- Read the current OTT netDL configuration into the operating program: In the "netDL 500/1000" menu, select the "Read" option or click on the "Read" button.
- In the "File" menu, select the "Print Connection diagram" option → The print preview window opens.
- Click the printer icon  → The operating program prints the terminal connection diagram.

Buttons in the print preview window:

 Optimum size; show whole page of connection diagram

 Show connection diagram at 100% scale

 Scale connection diagram to screen width

 Go to first page of the connection diagram

 Go to previous page of the connection diagram

 Go to next page of the connection diagram

 Go to last page of the connection diagram

 Printer setup (standard Windows dialog)

 Print the connection diagram

 Save connection diagram as "QuickReport" file (*.QRP)

 Open saved connection diagram ("QuickReport" file)

 Close print preview window

18 SDI-12 Transparent mode

For maintenance or calibration operations on a sensor with SDI-12 interface, the OTT netDL unit has a so-called "Transparent mode". Using a mode in the OTT netDL operating program that is similar to terminal emulation, it is possible to directly communicate with the sensor via the OTT netDL. For this, there are the so-called "extended commands" available in the SDI-12 specification. In this case, the OTT netDL transfers the commands to the sensor, activates it, and returns the responses of the sensor to the terminal window.

Further information on the "extended commands" of an SDI-12 sensor can be found in the operating instructions of the sensor.

Please note:

- Note case sensitivity.
- Upon incorrect entries, the sensor returns an **< Error >**.
- If communication is faulty, end terminal mode (ESC button), wait 5 seconds, then restart terminal mode.
- If the OTT netDL is in measuring mode (e.g. the sample interval of a sensor is active), the response from the sensor is delayed.

How to start the SDI-12 transparent mode:

- Connect the RS-232 interface of the OTT netDL to a serial interface of a PC (e.g. COM 1).
- Start the OTT netDL operating program.
- Set communication parameters in the operating program main window:
  – RS232C/V.24
  – COM1
  – 15200 (alternatively "auto")
- Start the terminal mode: In the "netDL 500/1000" menu, select the "Terminal mode" option.
- Wake the OTT netDL unit up: **A** <Enter key>, return value: **?08**
- Start the SDI mode: **CL/SDI/TRANSP/A** <Enter key>
  "**A**" stands for the terminal to which the SDI-12 sensor is attached.
  Prompt for SDI-12 commands appears: SDI-12>
- Example - Switch off sensors: **SDI-12>0X0!** Return value: **0X0<crlf>**

Fig. 27: Terminal mode.

- Exit terminal mode: Press ESC key.

19 Error messages

19.1 Internal error messages

Display: **Lxx**
Internal errors arise when recording and processing measured values in the entire measurement route from the sensor to storing in memory or on the display.

00 – Measured value is ok
01 – AD conversion faulty
02 – Communication error
03 – Over/underflow
05 – Wire break
06 – Sensor type dependent
07 – Expansion card not available

19.2 External error messages

Display: **Sxx**
External errors occur in "intelligent sensors" and are sent to the OTT netDL.

19.3 Sensor error messages

0-10 V

Internal errors:	01 Analog-digital conversion faulty 03 Over-/underflow: U_{in} < –1.0 V or U_{in} > 12.0 V
External errors:	None

0-5 V

Internal errors:	01 Analog-digital conversion faulty 03 Over-/underflow: U_{in} < –0.4 V or U_{in} > 5.625 V
External errors:	None

0-50 mV

Internal errors:	01 Analog-digital conversion faulty 03 Over-/underflow: U_{in} < –2.25 mV or U_{in} > 52.25 mV
External errors:	None

0-20 mA

Internal errors:	01 Analog-digital conversion faulty 03 Over-/underflow: I_{in} < –2 mA or I_{in} > 22 mA
External errors:	None

4-20 mA

Internal errors:	01 Analog-digital conversion faulty 03 Over-/underflow: I_{in} < –2 mA or I_{in} > 22 mA 05 Wire break.
External errors:	None

Pt 100

Internal errors:	01 Analog-digital conversion faulty 03 Over-/underflow: t < –100 °C or t > 140 °C
External errors:	None

Pulse input

Internal errors: None
External errors: None

Kalesto

Internal errors:
- 01 Set minimum signal level underrun
- 02 Communication error
- 05 Wire break

External errors:
- 01 Reflexion level too low
- 02 Multiple-target situation. No measured value can be determined
- 04 Measurement range exceeded, measured value < 1.50 m or > 30.00 m
- 08 A constant measured value cannot be determined

Parsivel

Internal errors:
- 02 Communication error
- 05 Wire break

External errors: None

SDI sensor and SDI sensor via RS-485

Internal errors:
- 02 Communication error
- 05 Wire break: Sensor not responding

External errors:
- 01 Communication error: Sensor sending fewer (or no) measured values than indicated
- 02 Communication error: Sensor sending more measured values than indicated
- 03 Over-/underflow: SDI sensor sending "99999"
- 04 Incorrect SDI-12 address

19.4 Error messages of the processing modules

Averaging

Internal errors: None
External errors: None

Min/Max filter

Internal errors: 03 Filter limits underrun/exceeded
External errors: None

Store

Internal errors: 03 Measured value does not fit into 24 bits of the database.
External errors: None.

20 Maintenance

The OTT netDL has a battery-backed realtime clock. Thus the clock continues to run with high accuracy, even if power supply fails. The backup battery has a service live of approximately 10 years. To some extent, its service life depends on the time of storage without power supply connected as well as on the existing ambient temperatures.

To ensure correct time under all conditions, we suggest having the backup battery replaced in factory every 5 years.

For battery replacement, please contact the OTT repair center, refer to Chapter 21.

The OTT netDL unit does not require any other maintenance.

Never open the housing of the OTT netDL! There are no adjustment or control elements inside the housing!

21 Repair

- In case of device failure, please contact the repair center of OTT:

  OTT Hydromet GmbH
  Repaircenter
  Ludwigstrasse 16
  87437 Kempten · Germany
  Phone +49 831 5617-433
  Fax +49 831 5617-439
  repair@ott.com

Caution: Have a faulty OTT netDL unit checked and/or repaired only by the OTT repair center. Never attempt to repair the unit yourself! Any repairs or attempted repairs carried out by the customer will void any warranty.

22 Notes about the disposal of used units

Within the member countries of the European Union
In accordance with the European Union guideline 2002/96/EC, OTT takes back old devices within the member countries of the European Union and disposes of them in an appropriate way. The devices concerned by this are marked with the symbol shown aside.

- For further information on the return procedure, please contact your local sales contact. You will find the addresses of all sales partners in the internet on "www.ott.com". Please take into consideration also the national implementation of the EU guideline 2002/96/EC of your country.

For all other countries
- Dispose of the OTT netDL properly after taking out of service.
- Observe the regulations applicable in your country for the disposal of electronic devices.
- Never put the OTT netDL into the normal household waste.

Materials used
Refer to Chapter 23 "Technical data".

23 Technical data

Supply voltage	+9 to +28 V_{DC}; typ. +12 V_{DC}
Power consumption (at 12 V_{DC})	
active	approx. 25 mA to 400 mA (depending on configuration) Examples: – Modem inactive, measuring mode: < 30 mA (OTT netDL 500, Pt100) – Modem active, measuring mode: < 60 mA (OTT netDL 500, Pt100: maintenance window active) – Modem + LAN active, measuring mode: < 400 mA (OTT netDL 1000; 2 x 4-20 mA internal supply, galvanically isolated; 2 x Pt100; output card; maintenance window active)
Sleep mode, pulse active	< 10 mA
Sleep mode	< 250 µA
Input protection levels	36 V [1]
Display	Graphic DOT matrix, 122 x 32 pixels, monochrome, background lighting, operating temperature: –20 °C - +70 °C
Clock	
Type	Battery-backed realtime clock
Accuracy	±8 seconds/month (at +25 °C)
Backup battery type	CR 2032; 3 V
Life of backup battery	10 years (replacement after 5 years recommended)
Communication interfaces	– 1 x RS-232-C; OTT netDL 1000: 2 x – USB host + USB device – OTT netDL 1000: Ethernet 10 Mbit (RJ-45)
IP communication	– Internal TCP/IP stack (HTTP, FTP, SMTP, SNTP, …) – Internal web server – TCP/IP communication over GPRS,
Ethernet/DSL and PPP over PSTN	– Encrypted data transfer using SSL/TLS (HTTPS)
Internal GSM/GPRS modem	
Type	Motorola G30, quadband (900/1800, 850/1900 MHz); MP3 audio codec
Antenna	External, with SMA connector, allowable antenna gain (including cable): 2.5 dBi max.; minimum clearance between antenna and unit > 20 cm

Inputs (depending on configuration)

Pulse input	
Frequency	0-50 Hz
Debouncing	8-100 ms (adjustable)
Min. pulse duration	> 8 ms
Max. contact resistance	10 kOhms
Voltage	5-28 V
Max. contact load	< 500 µA (per contact)
Status input	
Frequency	0-50 Hz
Max. contact resistance	10 kOhms
Voltage	5-28 V
Max. contact load	< 500 µA (per contact)

[1] Protection against externally applied voltage (static) on the inputs

Analog input

Input ranges	0-50 mV; 0-1.25 / 5 / 10 V
R_i with reference to ground	4 MOhms typ. / 100 kOhms typ.
R_i with floating voltages	> 100 MOhms
Accuracy	0.1 % of full scale
Resolution	0-50 mV: 50 µV; rest: 1 mV
Measuring time	350 msec
Galvanic isolation (optional)	500 V
Input range	0-20 mA; 4-20 mA
R_i	50 Ohms typ. / 400 Ohms max.
Accuracy	0.1 % typ. / max. 0.3 % of full scale
Resolution	1 µA
Measuring time	< 350 msec
Supply voltage for external sensors	typ. 24 V; max. 28 V at supply voltage > 24 V
Max. output current	25 mA
Galvanic isolation (optional)	500 V
Potentiometer input range	0-5.5 kOhms
Accuracy	1000 ppm of full scale
Resolution	100 ppm
Measured value output	0 … 120 % (of nominal value of potentiometer)
Measuring time	1000 msec
Wire break detection at	typ. >13 kOhms
Pt 100 input range	–40 - +85 °C
Accuracy	±0.1 K (–40 - +70 °C; w/o cable)
Resolution	0.01 K
Measuring time	850 msec
Galvanic isolation (optional)	500 V

RS-232 input

Protocol: OTT protocol (instantaneous value, last saved value, time synchronization; pins 2, 3 + 5)

Pin assignments

Pin	Signal		Direction
1	Carrier Detect	DCD	In
2	Receive Data	RxD	In
3	Sent Data	TxD	Out
4	Data Terminal Ready	DTR	Out
5	Ground	GND	GND
6	Data Set Ready	DSR	In
7	Request To Send	RTS	Out
8	Clear To Send	CTS	In
9	Ring Indicate	RI	In

Worst case timeout per measured value: 55 sec

Outputs (depending on configuration)

Switching output

Voltage	max. 16 V_{DC}
Leakage current	< 1µA/28 V_{DC}
Current capacity	max. 5 A (no fuse provided, external fuse required)

Status output:

Voltage	max. 28 V_{DC}
Leakage current	< 1 µA /28 V DC
Current capacity	max. 100 mA
Load disconnect (short-circuit disconnect)	at 200 mA

4 ... 20 mA output (galvanically isolated)	
External supply	9-28 V_{DC}
Accuracy	< ±0.1 % of full-scale at 25 °C +10 ppm/K
Resolution	16 bit
Burden	<350 Ohms (referenced to 9 V DC supply)
Ripple (20 mA)	<100 µA RMS
Burden dependency	< 1 ‰
Potential	Floating (galvanically isolated)
Isolation	500 V
Loop monitoring	Configurable

Data memory

Storage capacity available for measured values	4,096,000 bytes
Number of measured values that can be stored	500,000 on average
Storage space required	
Per measured value	8 bytes
Per channel and day block	max. 24 bytes
Info channel, per entry	8 bytes
Data storage type	Ring buffer (FIFO)
Operating system	RTOS, modified for minimum current consumption

EMC limits

Resistance to electrostatic discharge (ESD)	Complies with EN 61000-4-2, Test Level 3 (8kV air gap, 6 kV contact discharge ESD)
Resistance to electromagnetic fields	Complies with EN 61000-4-3, Ambient Class 3 (10V/m)
Resistance to transient fields (burst)	Complies with EN 61000-4-4, Installation Class 4 (4 kV)
Resistance to surge	Complies with EN 61000-4-5, Installation Class 5 (4 kV)
Resistance to surge	Complies with EN 61000-4-6, Installation Class 3 (10 V_{RMS})
Resistance to electromagnetic fields	Complies with EN 61000-4-8, Ambient Class 4 (30 A/m)
Electromagnetic interference field strength	Complies with EN 55022, Class B (30-1000 MHz)

Mechanical limits

Overall dimensions (L x W x H)	
OTT netDL 500	232 mm x 124 mm x 68 mm
OTT netDL 1000	148 mm x 124 mm x 68 mm
Weight	
OTT netDL 500	Approx. 0.400 kg (depending on configuration)
OTT netDL 1000	Approx. 0.650 kg (depending on configuration)
Housing material	ABS
Protection class	IP 41
Temperature range	
Operating temperature	–40 °C to +70 °C (internal modem: –30 °C to +70 °C)
Storage temperature	–50 °C to +85 °C
Relative humidity	5 % - 95 % (non-condensing)

Appendix A: OTT netDL 1000 IP Datalogger Declaration of Conformity

CE

Konformitätserklärung
Declaration of Conformity
Declaration de Conformité

Wir/ We/ Nous Anschrift/ Address/ Adresse	OTT Messtechnik GmbH & Co. KG Ludwigstraße 16 D-87437 Kempten

erklären, dass das Produkt/ declare that the product/ declarons que le produit

Bezeichnung/ Name/ Nom	**OTT netDL1000**
Artikel- Nr./ Article No./ No. d' Article	**55.552.001.9.0**

mit den Anforderungen der Normen übereinstimmt./ fulfills the requirements of the standard./ satisfait aux exigences des normes.

EG (2004/108/EG):

national:	international:
EN 61326	IEC 61326

Ort und Datum der Ausstellung/
Place and Date of Issue/
Lieu et date d' établissement

Kempten, den 21/05/2010

Name und Unterschrift des Befugten/
Name and Signature of authorized person/
Nom et signature de la personne autorisée

Dr. Anton Felder
(CEO)

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