



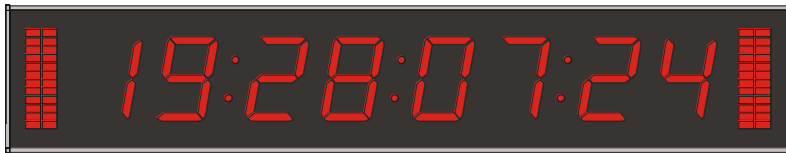
## UD Stage Series Displays



UD178-8T



UD126-8T



UD100-8T

Installation and Operating Manual  
Version: 0.5  
July 17, 2024





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## A1 Revision History

No.	Date	Subject
0.1		Preliminary document, changes without notice.
0.2	June 3, 2024	Added UD100-WM.
0.3	July 3, 2024	Added U bracket.
0.4	July 12, 2024	All UD178 variants support AC power supply.
0.8	July 17, 2024	Fixed some typos.
1.0	t.b.d.	First released document.

Due to constant product development the features of **UD Stage Series Displays** are subject to change. The current functional description always refers to the current firmware and the current configuration tool. You can download the latest version of the standard firmware from

<https://plurainc.com/products/ud-stage/>

Please be sure to use the latest configuration program after having done an update. You can download the latest version from the address above.

## A2 Copyright

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## A3 Warranty

Plura warrants that their products will be free from defects in materials and workmanship for a period of two years from the date of shipment. If this product proves defective during the warranty period, Plura, at its option, will repair or replace the defective product without charge, provided this product is returned to Plura freight prepaid.

In order to obtain service under this warranty, Customer must notify Plura of the defect before expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to Plura, please notice the Shipping Information given below.

This warranty shall not apply to any defect, failure or damage caused by abuse, misuse, improper use, negligence, accident, modification, alteration, or improper or inadequate maintenance and care.

This warranty is given by Plura with respect to this product in lieu of any other warranties, express or implied. Plura and its vendors disclaim any implied warranties of merchantability or fitness for a particular purpose. Plura's responsibility to repair or replace defective products is the sole and exclusive remedy provided to the customer for breach of this warranty. Plura and its vendors will not be liable for any indirect, special, incidental, or consequential damages irrespective of whether Plura or the vendor has advance notice of the possibility of such damages.



## A4 Unpacking/Shipping/Repackaging Information

This product has been carefully inspected, tested and calibrated before shipment to ensure years of stable and trouble-free service.

The shipping carton and pads provide protection for the product during transit. Retain the shipping cartons in case subsequent shipment becomes necessary.

Carefully unpack the product from its transit material and carefully check the product for signs of damage. In the event that the product has been damaged during transit, contact the carrier and your Plura dealer.

Please confirm that all items listed on the packing list have been received. Check the items against your original order to ensure that you have received the correct parts. If any item is missing, please contact your Plura dealer.

Ensure that all packaging material is removed from the product and its associated components before installing the unit.

Products returned to Plura for servicing or repair should have a tag attached showing:

- Name and complete address of the owner and the name of the person that can be contacted.
- Unit's serial number and a description of the service required, or failure detected.

Products returned should be shipped prepaid in the original packaging material if possible. If the original packaging is not available or is unfit for use, supply an adequate packaging which should meet the following criteria:

- Packaging must be able to withstand the product weight.
- Product must be held rigid within the packaging.
- Allow at least two inches of space between the product and the container.
- The corners of the product must be protected.
- Seal the carton with shipping tape or an industrial stapler.

If the product is still within the warranty period, the product will be returned by prepaid shipment after servicing.



## A5 Safety Instructions

The general safety information in this part is for both operating and service personnel. Plura products are only to be used as directed. Specific warnings and cautions will be found throughout the manual where they apply.

Review the following safety instructions to avoid injury and prevent damage to this product or any products connected to it.

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.

### Safety Terms and Symbols

Terms and Symbols in this manual:



**WARNING:** Warning statements identify conditions or practices that could result in injury or loss of life.



**CAUTION:** Caution statements identify conditions or practices that could result in damage to this product or other property.

Terms and Symbols which may be found on the product:



**ATTENTION:** Refer to the manual.



Observe precautions for handling electrostatic-sensitive devices.



Signal Ground.

### Product Damage Precautions

#### PREVENT OVERHEATING



To prevent product overheating, position the unit only where sufficient air circulation can be maintained. Good air circulation is essential to prevent internal heat build-up, do not block any ventilation openings. Do not expose the unit to direct sun light or any other strong lights. Keep the unit away from heat sources.

#### PROVIDE PROPER ENVIRONMENT



Dust, humidity, shocks and strong electromagnetic fields must be avoided. Do not expose this apparatus to dripping or splashing water. Ensure that no objects filled with liquid are placed on the apparatus.





## OBSERVE EMC REGULATIONS



The EMC regulations are observed only under the following condition: use high quality shielded cables at data inputs and outputs.

## SUSPECTED FAILURES



Whenever it is likely that safe operation is impaired, the apparatus must be made inoperative and secured against unintended operation. The appropriate service authority must then be informed. Do not operate with suspected failures. Servicing is required when the apparatus has been damaged in any way, such as power-supply is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

## PREVENTIVE MAINTENANCE: CLEANING



**Qualified Service Personnel Only:** The apparatus should be cleaned often enough to prevent dust or dirt from accumulating. Dust accumulating in the apparatus acts as an insulating blanket, preventing proper cooling, and possibly causing overheating and component breakdown. Under high humidity conditions, accumulated dust can also provide an electrical conduction path. Remove accumulated dust with a soft cloth or small paint brush. Remove hardened dirt with a soft cloth, dampened in a mild detergent and water solution. Do not use polish or abrasive cleaners or any other chemical cleaning agents.

## PREVENTIVE MAINTENANCE: VISUAL INSPECTION



**Qualified Service Personnel Only:** Visually inspect the apparatus for signs of damage, scorched components, and loose or disconnected pin connectors. If you discover heat damaged parts, try to determine the cause of the overheating before replacing the damaged parts; otherwise, the damage may repeat.

## ATTENTION:



Observe precautions for handling electrostatic-sensitive devices. See "Electrostatic Discharge (ESD) Precautions" below for details.



### Electrostatic Discharge (ESD) Precautions



All semiconductor devices are sensitive to ESD. To prevent any damage or degradation on components of the product caused by ESD, observe these precautions when directed to do so (installing, removing sensitive components):

1. Use a Ground Strap. Wear a grounded anti-static wrist or heel strap to discharge the static voltage from your body.
2. Use a Safe Work Area. Avoid handling components in areas that have a floor or work surface covering capable of generating a static charge. Also, nothing capable of generating or holding a static charge should be allowed in the work area.
3. Handle ESD sensitive components carefully. Do not slide components over any surface. Do not touch exposed connector pins. Pick-up components by the body, never by the leads.
4. Transport and store sensitive components or assemblies in a static-protected bag or container.



## A6 Certifications & Compliances

### CE-Declaration

We,  
Plura Europe GmbH  
Binger Weg 12  
D- 55437 Ockenheim

herewith declare under our sole responsibility that the

**UD Stage Series Displays UD100-4N, UD100-4T, UD100-6N, UD100-6T, UD100-8N, UD100-8T, UD126-4N, UD126-4T, UD126-6N, UD126-6T, UD126-8N, UD126-8T, UD178-4N, UD178-4T, UD178-6N, UD178-6T, UD178-8N, UD178-8T**

meet the intent of the following directives, standards and specifications:

2004/108/EC EMC Directive

applying the following standards:

EN 55022:2006 Emission

EN 55024:1998 + A1:2001 + A2:2003 Immunity

### CE-Declaration

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meet the intent of the following directives, standards and specifications:

2006/95/EC Low Voltage Directive

applying the following standard:

EN 60950-1:2006 Electrical and mechanical safety

2004/108/EC EMC Directive

applying the following standards:

EN 55022:2006 Emission

EN 55024:1998 + A1:2001 + A2:2003 Immunity



# 1. Functional Description

## 1.1. Introduction

These are the common features of our UD Stage Series Displays:

- 4, 6 or 8-digits time and date display.
- Available with tally display.
- Selectable colours for the LEDs: red / green / yellow / blue.
- GPI (General Purpose Interface) inputs or outputs to connect external buttons or to program a trigger signal output. Each of the four GPI's is individually programmable.
- Ethernet interface for setup and firmware flash updates.

Various interfaces are available. UD displays:

- can be integrated in the MTD system of type LTC(MTD),
- can read LTC and use it as a reference for a real-time operating mode,
- can read IRIG and use it as a reference for a real-time operating mode,
- can receive display data via serial interface,
- can be integrated in the MTD system of type MTDoE,
- can operate as an NTP Client in a real-time operating mode.

### The MTD system:

Plura has developed a system called the Multiple Time Display (MTD) system. An MTD system consists of a central generator unit, control units, digital displays and/or studio clocks. The central MTD generator (RUB GT or RUB GL module) is the time & date reference and manages stop timers.

The MTD data of the central generator include six independent programmable timers (stop timers, time zones), real-time, date and status data.

The LTC(MTD) system: The MTD generator outputs a specific LTC format which is referred to as **LTC(MTD)** in this document. LTC(MTD) fully complies to the SMPTE 12M specification for Linear Time Code. The time addresses can be decoded by every time code reader, only the binary groups (32 user bits) carry multiplexed data which can be decoded by Plura units only. The LTC(MTD) transfers data to UD Stage displays.

The **MTDoE** system: This system utilizes the Ethernet to transport the MTD data as well as to communicate between control units and central generator. The central generator transmits the MTD data to the **RUB IE** (with **option M**) Ethernet module via the internal *TC\_link* interface of the RUBIDIUM system, the RUB IE module then opens the gates to the local Ethernet. UD Stage displays read these data and communicate via Ethernet. Plura's MTDoE devices have the property to perform an auto-installation within an Ethernet network, i.e. the units find themselves, assign themselves to a group and can be listed, named and configured centrally. Control units communicate with the central generator. As many control units as needed can control the same MTD timer. UD Stage displays can operate as a control unit using the GPI inputs

Please refer to "**The MTD System – Installation and Operation Manual**" to read about installation and basic set-up of UD displays in an MTD system.



## 1.2. Models

There are various models differing by their housings, power supply, digits heights etc.:

Model	Power Supply			Tally	Display	Digits height
	AC	DC	PoE+			
UD100-4N	no	yes	yes	no	4-digit	100mm / 4.0 in
UD100-4T	yes	yes	yes	yes	4-digit	100mm / 4.0 in
UD100-6N	no	yes	yes	no	6-digit	100mm / 4.0 in
UD100-6T	yes	yes	yes	yes	6-digit	100mm / 4.0 in
UD100-8N	no	yes	yes	no	8-digit	100mm / 4.0 in
UD100-8T	yes	yes	yes	yes	8-digit	100mm / 4.0 in
UD126-4N	no	yes	yes	no	4-digit	126mm / 5.0 in
UD126-4T	yes	yes	yes	yes	4-digit	126mm / 5.0 in
UD126-6N	no	yes	yes	no	6-digit	126mm / 5.0 in
UD126-6T	yes	yes	yes	yes	6-digit	126mm / 5.0 in
UD126-8N	no	yes	yes	no	8-digit	126mm / 5.0 in
UD126-8T	yes	yes	yes	yes	8-digit	126mm / 5.0 in
UD178-4N	yes	yes	yes	no	4-digit	178mm / 7.0 in
UD178-4T	yes	yes	yes	yes	4-digit	178mm / 7.0 in
UD178-6N	yes	yes	yes	no	6-digit	178mm / 7.0 in
UD178-6T	yes	yes	yes	yes	6-digit	178mm / 7.0 in
UD178-8N	yes	yes	yes	no	8-digit	178mm / 7.0 in
UD178-8T	yes	yes	yes	yes	8-digit	178mm / 7.0 in



## 1.3. Accessories and Options

### **EPSX: External AC/DC Power Supply**

This is a 24V/20W AC/DC power adapter. This will be the right external AC/DC adapter for all displays equipped with the 4-pole XLR connector.

Details in chapter:      Technical Data → AC/DC Power Supplies  
                                         → EPSX: External Power Adapter.

Please also observe:    Technical Data → AC/DC Power Supplies → Safety Precautions.

Please also observe:  
                                         Technical Data → AC/DC Power Supplies → Notes on PoE Operation.

### **UD Stage-W: Wall, Table Mount Kit for UD Stage Displays**

The UD Stage mount kit is designed for UD Stage displays. It serves to mount the display at a wall or to a table. See chapter “Installation → UD Stage-W: Wall and Table Mount Kit” for detailed description.

It is included in delivery, except another mount kit is ordered together with the display.

### **UD Stage-Z: Tripod Mount Kit for UD Stage Displays**

The UD Stage-Z mount kit is an option for UD Stage displays. It serves to mount the display to a tripod. See chapter “Installation → UD Stage-Z: Tripod Mount Kit” for detailed description.

It is not included in delivery, please order separately.

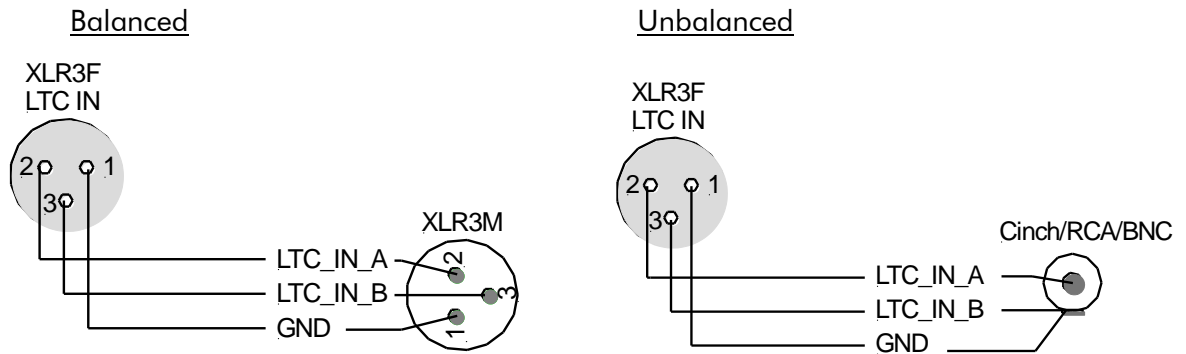


## 1.4. Interfaces

### LTC (MTD)

Devices with this interface accept a standard LTC (SMPTE/EBU) signal. Refer to chapter "Technical Data" for LTC input specifications.

Connect a balanced or unbalanced signal:



Plura has developed a system called the (MTD) Multiple Time Display system. An MTD system consists of a central generator unit, user console(s), digital displays and/or analogue clocks. The central generator unit generates and outputs a special LTC format. This LTC will henceforth be denoted as **LTC(MTD)**. The LTC(MTD) contains real-time, date and various user selectable/configurable timers. Having the LTC(MTD) connected the device can be switched to various operating modes (please refer to chapter "Display Tab").

### IRIG

UD Stage displays accept IRIG signals. Usually, an unbalanced signal with BNC connector is used. It can be connected the same way as the unbalanced LTC signal above.

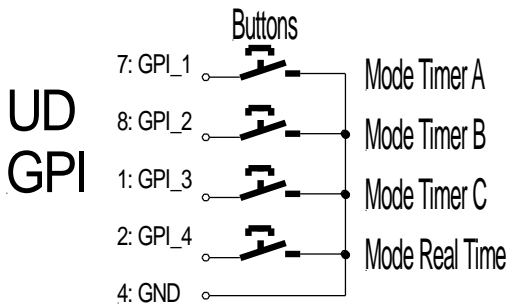


### GPI

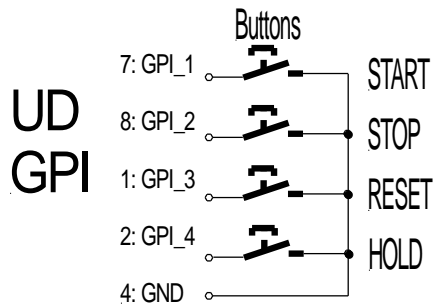
Four GPIs can get a function independently from each other, as an input or as an output. Select the function from the drop-down lists (chapter "GPI" Tab: Programming GPI as Input or Output'). For technical details please refer to the chapter "Specifications". The functionality determines the input or output characteristic of the GPI.

Examples:

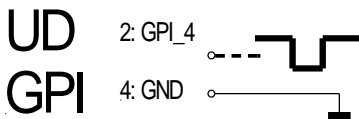
Switching the display mode by external buttons



Controlling the local stop timer or an MTD timer



Impulse output during zero-crossing of a down counter

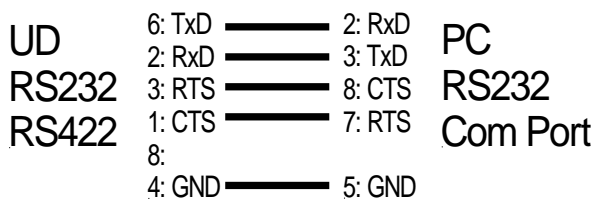


### RS232/RS422

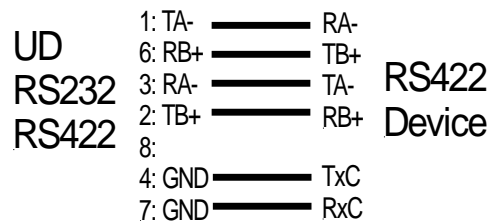
Serial interface, selectable as RS232 or RS422. Devices with this interface decode a time (HH:MM:SS) out of a serial data string. Various data formats can be selected (chapter "Serial" Tab: Set-Up of the Serial Interface').

Examples:

RS232



RS422





## Ethernet

10/100Base-T Ethernet interface. Devices with this interface work either as an **NTP Client** or as a part of the **MTDoE System**.

NTP Client: The “Network Time Protocol” (NTP) is used for time synchronization within networks. NTP servers are queried by NTP clients, which then can synchronize their internal clocks accordingly. UD Stage Series displays operating in this mode can connect to such a server and synchronize to it.

NTP uses UDP port 123.

MTDoE System: Plura has developed a system called the Multiple Time Display (MTD) system. An MTD system consists of a central generator unit, control units, digital displays and/or studio clocks. The central MTD generator (RUB GT or RUB GL module) is the time & date reference and manages the stop timers. The MTDoE system utilizes the Ethernet to transport the MTD data, UD Stage Series displays operating in this mode can receive and display these data. UD displays can operate as a control unit of the MTDoE system using the GPI inputs.

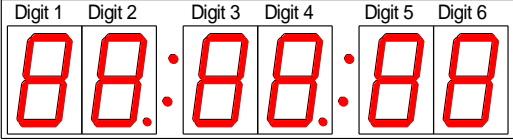
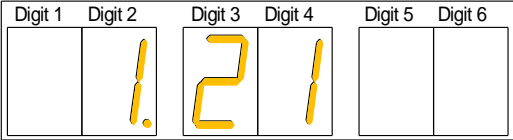
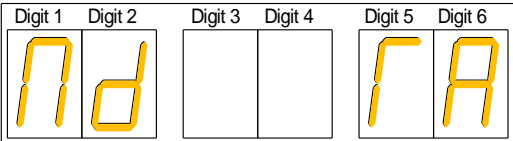
MTDoE uses UDP port 8051. As an alternative UDP port 8052 can be used. UDP broadcasts are used for the “Automatic MTD Master IP Address” feature.



# 1.5. Status after Power-On

## Displays in LTC, IRIG or serial modes

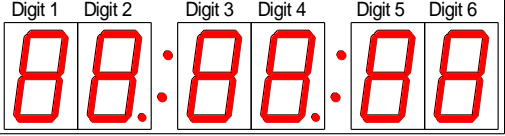
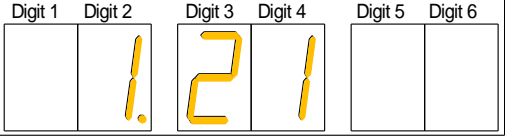
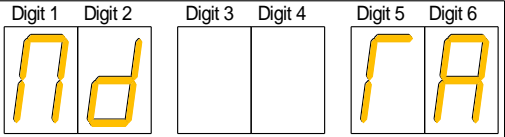
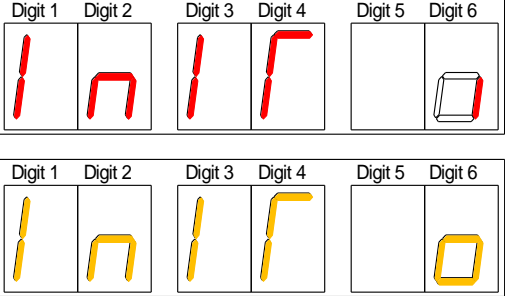
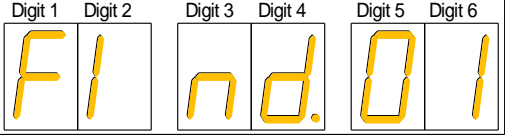
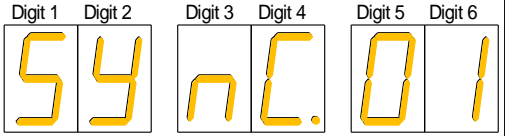
After power-on the device performs a display test and indicates some status information:

Example	Description																																																															
	<p>All LEDs will shortly light up with changing colours.</p>																																																															
	<p>Displaying the revision number, e.g. „1.21“.</p>																																																															
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### Displays in Ethernet mode

After power-on the device performs a display test and indicates some status information:

	<p>All LEDs will shortly light up with changing colours.</p>																																																
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	<p>“Init” indicates that the Ethernet initialization is still in progress. After success “Init o” shortly will be displayed, then or after one minute at the latest the device switches to normal operating mode.</p>																																																
	<p>In case source = MTD: The device tries to find the RUB IE module responsible for the indicated MTD group.</p>																																																
	<p>In case source = MTD: The RUB IE module has been found, now the device synchronizes its internal clock with NTP commands.</p>																																																



## 1.6. Firmware Update

Firmware updates require a (Windows operating system) computer with an Ethernet interface and the **UD SC Config.exe** program.

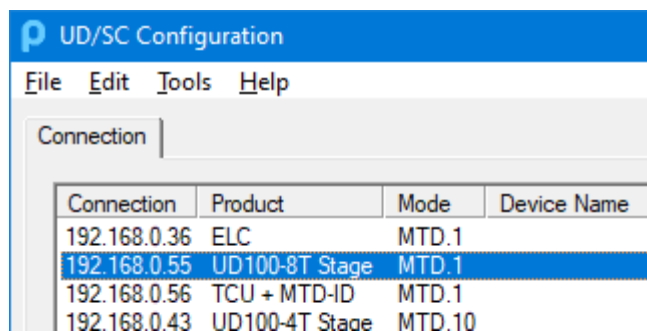
**Important:** Please make sure to always use the latest version of the program. You can download it from:

<https://plurainc.com/products/ud25/>

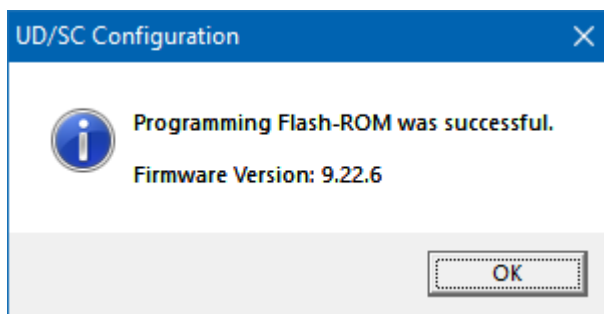
The new firmware should already be stored as a **.tcf** file at your computer.

Please now execute the following steps:

1. Connect the device to the computer through an Ethernet switch or a crossover cable.
2. Execute **UD SC Config.exe** on your computer. The program gives a list of all devices found. Click (not a double click) on the device in the list.



3. Select "Flash Update" in the **File** menu.
4. Open the **.tcf** file. The program checks whether the new firmware matches the correct type of the device. In case there is no match an error message appears: "Incompatible Flash Update File". Update starts automatically if everything is ok. Click the OK button at the end.



5. Update is finished now. We recommend checking the configuration of the device.

*During the flash update the operation of the device stops!*



## 1.7. Configuration

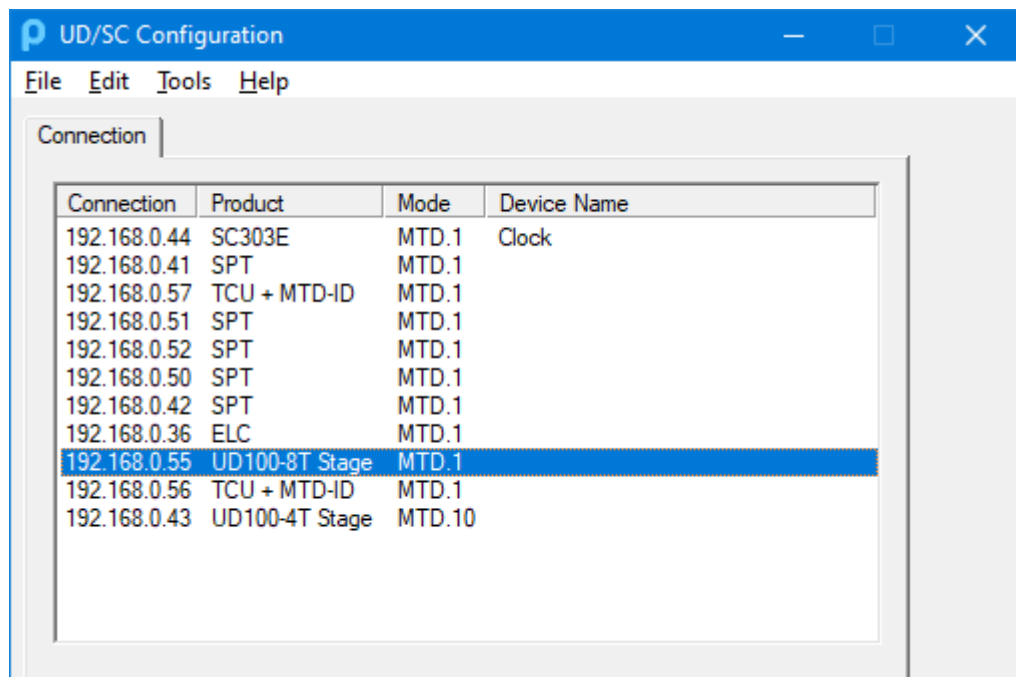
### The UD/SC Configuration Program

Configuration requires the **UD SC Config.exe** program running on a computer (32- or 64-bit Windows operating system). You can download the latest version of the program from:

<https://plurainc.com/products/ud25/>

UD Stage displays can be configured via Ethernet interface. The computer must be connected to the network. Access via Ethernet can be protected by a password (chapter "System Tab"). Firmware update is performed by this program as well.

After program start a list is given of all devices found:



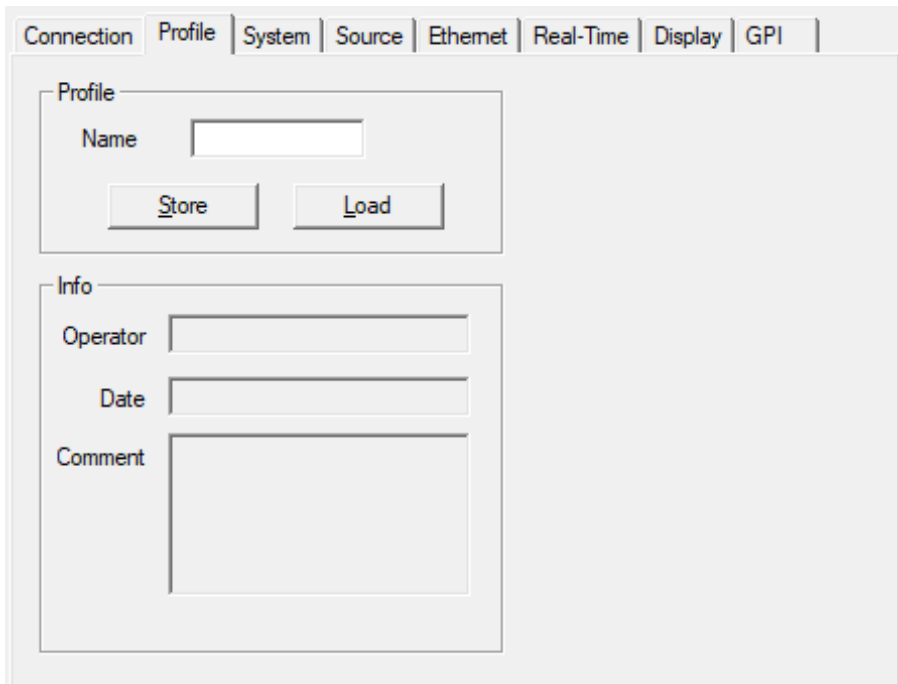
The screenshot shows the 'UD/SC Configuration' application window. It has a menu bar with 'File', 'Edit', 'Tools', and 'Help'. Below the menu bar is a 'Connection' tab. The main area contains a table with the following data:

Connection	Product	Mode	Device Name
192.168.0.44	SC303E	MTD.1	Clock
192.168.0.41	SPT	MTD.1	
192.168.0.57	TCU + MTD-ID	MTD.1	
192.168.0.51	SPT	MTD.1	
192.168.0.52	SPT	MTD.1	
192.168.0.50	SPT	MTD.1	
192.168.0.42	SPT	MTD.1	
192.168.0.36	ELC	MTD.1	
192.168.0.55	UD100-8T Stage	MTD.1	
192.168.0.56	TCU + MTD-ID	MTD.1	
192.168.0.43	UD100-4T Stage	MTD.10	

Open the configuration by marking the device on the list and pressing button "Configure", or by a double click on a device in the list. Additional tabs will be shown. On these tabs you can check or change the configuration of the selected device as described in the following chapters.

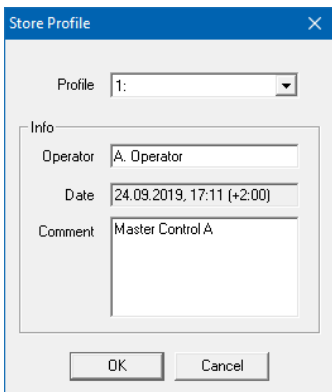


### “Profile“ Tab: Store and Load a Complete Set-Up



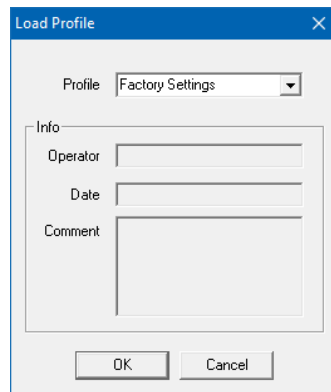
This feature enables to easily change the complete set-up of the unit during normal operation. During installation, the current set-up can be stored as a “profile”. You can enter a name in the “name” entry before storing. Now choose a different set-up and store this as a different profile. Five profiles are available. Programming the GPI inputs with “Load Profile ...” functions (please refer to chapter “GPI Tab: ...”) enables you to change over from one set-up to the other during normal operation.

Five different set-ups can be stored into the non-volatile memory of the unit.  
Click **Store**:



**Profile:** Select 1 – 5.  
**Info** Operator: You may enter a text.  
Comment: You may enter a text.  
Click **OK** to store the current set-up.

Any set-up stored as a profile can replace the current set-up.  
Click **Load**:



**Profile:** Select “Factory Settings” or 1 – 5.  
“Factory Settings” installs the default set-up.  
Click **OK** to replace the current set-up by the selected profile. If no valid set-up has been stored, an error message is given.



## “System“ Tab: View and Change System Parameters

The screenshot shows the 'System' tab of a configuration window. It is divided into three sections: 'Unit', 'Security', and 'Info'. The 'Unit' section contains a 'Name' text input field and a 'Reboot' button. The 'Security' section shows the text 'Password is empty' and a 'Change...' button. The 'Info' section displays two rows of data: 'Device Type' with the value 'UD25' and 'Firmware Version' with the value '9.22.6'. At the top of the window, there are several tabs: 'Connection', 'Profile', 'System' (which is selected), 'Source', 'Ethernet', 'Real-Time', 'Display', and 'GPI'.

### Unit

<b>Name</b>	Give the device a significant name. This name appears wherever UD devices can be found. Enter a text (10 characters) in the <i>Name</i> field. Complete with <i>Enter</i> or <i>Tab</i> key.
<b>Reboot</b>	Warm boot of the unit.

### Security

It is provided to protect the unit against non permission or unintentional access via Ethernet. With a click on the **Change** button the following entry opens:

The screenshot shows a dialog box titled 'Enter Password'. It contains two text input fields: 'Enter Password:' and 'Re-Enter Password:'. Below these fields is a checkbox labeled 'No Password'. At the bottom of the dialog, there are two buttons: 'OK' and 'Abbrechen'.

Enter the password twice and press the **OK** button.

Clear an existing password by checking **No Password**.

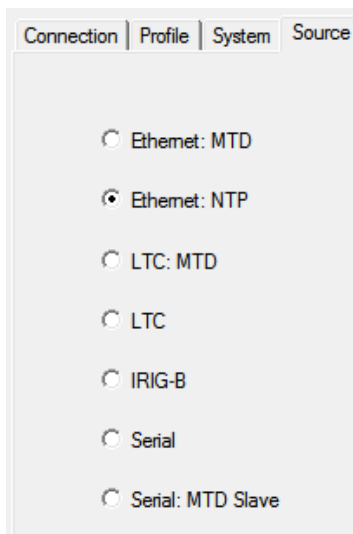
Password forgotten? → Please read chapter “Passwords” of “The MTD System” manual.

### Info

Indicates some device status, e.g. the version of the installed firmware.



## “Source” Tab: Select the Signal Source



**Ethernet: MTD** The unit is able to decode and display all the timers of the MTD data. The MTD data include six independent programmable timers, real-time, date, and a time of a time code. Each timer can show a stop timer, a remaining time, a time difference, a time of a time zone etc. UD displays can operate as a control unit of the MTD<sub>o</sub>E system using the GPI inputs.

**Ethernet: NTP** The unit receives and displays a time & date. The received reference time can get a programmable offset. It is possible to enable a Daylight-Saving Time handling.

**LTC(MTD)** Please refer to chapter “Interfaces – LTC(MTD)” as well. LTC(MTD) denotes a special LTC format which contains real-time, date and various user selectable/-configurable timers. Only this choice enables the device to use the extensive functionality of the Plura MTD system.

**LTC** Please refer to chapter “Interfaces – LTC(MTD)” as well. With this operating mode the device reads a standard LTC signal. The tabs “LTC” and “Real-Time” offer additional set-ups. Typical applications:

- Simple LTC reader.
- Real-time functionality with offset selection for different time zones.

**IRIG** Please refer to chapter “Interfaces – IRIG” as well. With this operating mode the device reads a standard IRIG signal. The tabs “IRIG” and “Real-Time” offer additional set-ups. Typical applications:

- Simple IRIG reader.
- Real-time functionality with offset selection for different time zones.

**Serial** Please refer to chapter “Interfaces – RS232/RS422” as well. This operating mode enables the serial interface. The tabs “Serial” and “Real-Time” offer additional set-ups. Typical applications:

- Decoding a time out of a serial protocol and displaying HH:MM:SS.
- Real-time functionality with offset selection for different time zones.

**Serial: MTD Slave** This selection enables a special Master-Slave operating mode described in chapter “MTD Slave: Local Stop Timer and External Displays”.





**“LTC” Tab: Set-Up of the LTC Reader**

Real-Time		Display		GPI	
Connection	Profile	System	Source	Ethernet	LTC
Framerate	Auto				
User Mode	GT Date + Status				

This tab is available in case of **source = LTC**.

**Framerate** Select the frame rate of the incoming LTC signal:

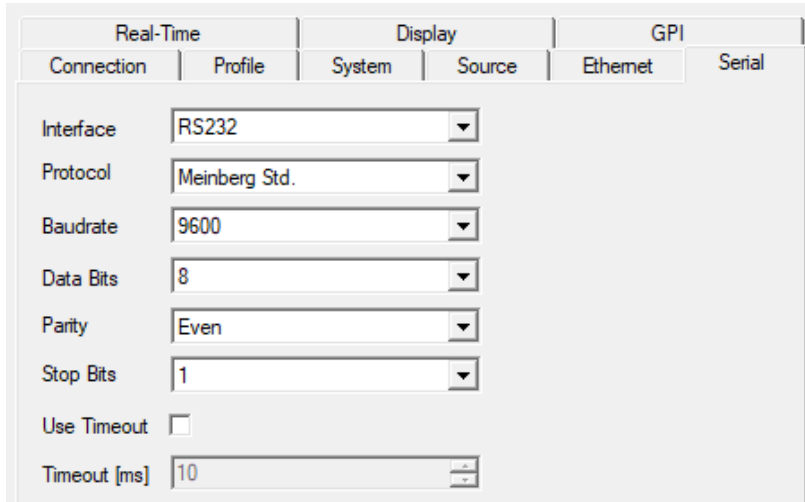
- Auto = automatic detection (24/25/30/30df).
- 24 = 24 frames/second.
- 25 = 25 frames/second.
- 30 = 30 frames/second.
- 30df = 29.97 frames/second with NTSC drop mode.

**User Mode** The real-time operating mode expects time & date from the external reference. Please select the format of the date so that the date can be decoded out of the user bits (binary groups) of the LTC.

The date becomes important e.g. in a real-time operating mode if a Daylight-Saving Time [DST] switching should be done automatically.



### “Serial“ Tab: Set-Up of the Serial Interface



This tab is available in case of **source = Serial**.

<b>Interface</b>	Electrical specification and connector of the interface:		
Off	Interface switched off.		
RS232	RS232 at terminal block	RS232/RS422	
RS422	RS422 at terminal block	RS232/RS422	*1
RS485	RS485 at terminal block	RS232/RS422	*1

**Protocol** Select the data protocol out of the drop-down list.

Data protocols can be divided into “real-time” and “display” protocols. Real-time protocols convey time & date with an always continuously up-counting time, e.g. “Meinberg”, “NMEA”, and “Wharton” protocols. These protocols are suitable for a real-time operation of the device.

Display protocols can convey an up-counting, a down-counting or a “frozen” time. Some display protocols contain an address. The device accepts data only if the address within the data string matches the serial address selection at the “Display” tab.

Please refer to document “**UD Series Displays: Serial Protocols**” for a detailed description. You can download this document from:

<https://plurainc.com/products/ud25/>



**Baud rate** Choose the baud rate:  
2.400 / 4.800 / 9.600 / 19.200 / 38.400 / 57.600 / 115.200

**Data Bits** 7 or 8 data bits.

**Parity** Select the parity mode:  
None Without parity  
Even Even parity bit  
Odd Odd parity bit

**Stop Bits** 1 or 2 stop bits.

**Use Timeout** ASCII based protocols in general use STX/ETX or similar control characters to synchronize the communication. Other protocols may use a timeout for this purpose. In this case, the receiver expects a start of a new data string if for the time of the timeout value [in milliseconds] no data has been received.

Select a suitable **Timeout** value dependent on baud rate and frequency of the data. Recommendation:

Baud rate	Timeout [ms]	Timeout [ms]
	Data string per second	Data string per frame
2400	100	-
4800	100	-
9600	100	6
19200	100	11
≥ 38400	100	14



### “Ethernet“ Tab: IP Addresses ...

“Source = MTD“

“Source = NTP“:

### Current Settings

This box indicates the current network parameters of the device.

A click on **Change...** enables to change parameters:

**Use DHCP** If checked, the device will automatically request its IP parameters (IP address, subnet mask, and gateway) from a DHCP server. In this case the “IP Address”, “Subnet Mask”, and “Gateway” boxes have no relevance.

Please let the device restart (power off – on) if you select this mode.



**MTD** - if "Source = MTD" has been selected

**Automatic MTD Master IP Address** If checked, the device will automatically find the MTD<sub>oE</sub> central unit responsible for the group number below. In a redundant system (two MTD<sub>oE</sub> central units), an automatic changeover can take place in case one central unit fails.

Restriction: The automatic mode requires that this unit and the MTD<sub>oE</sub> central unit are in the same local network. If the units are connected to different local networks, the IP addresses (of 'Primary MTD Master' and – if present – 'Secondary MTD Master') have to be entered manually.

**Primary MTD Master IP Address** If "Automatic MTD Master IP Address" is not checked, the IP address of the MTD<sub>oE</sub> central unit has to be entered manually.

**Secondary MTD Master IP Address** It is possible to have a redundancy of MTD<sub>oE</sub> central units. A second MTD<sub>oE</sub> central unit then is working in the same MTD<sub>oE</sub> system (it operates with the same MTD<sub>oE</sub> group number). If "Automatic MTD Master IP Address" is not checked, the IP address of the second MTD<sub>oE</sub> central unit has to be entered manually.

**Group** Indicates the MTD<sub>oE</sub> group number. Likewise, you can change this number here.

Click **Reload Page** at the bottom of the tab if the „Current Settings“ box does not show the new parameters.

**NTP Client** - if "Source = NTP" has been selected

Enter the IP addresses which the NTP client of the device uses to request time & date information of an NTP server.

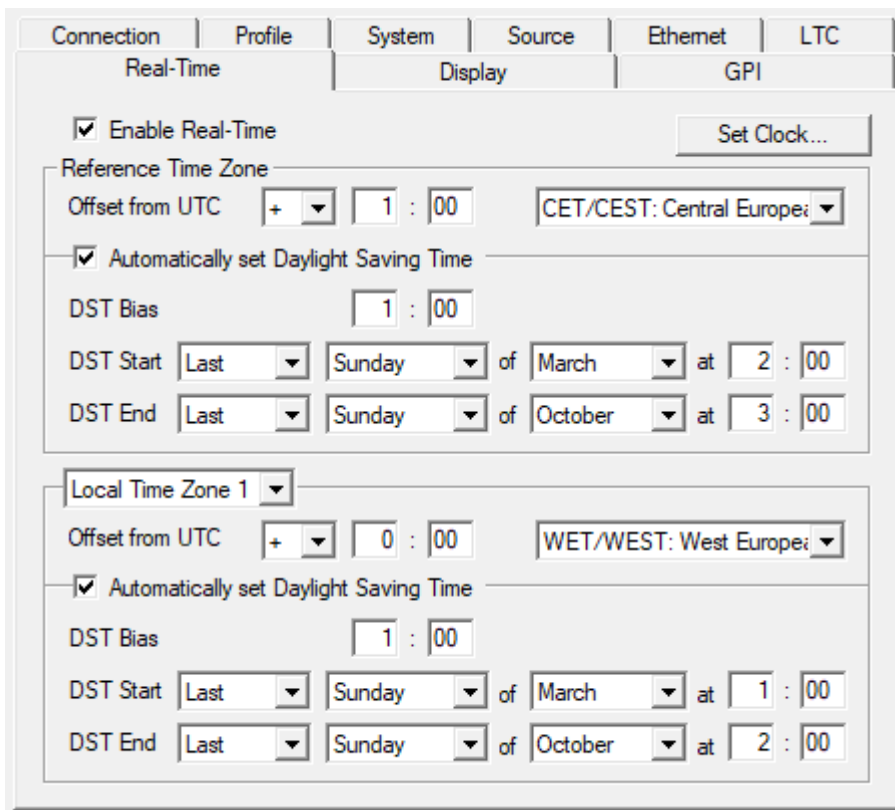
**Primary Server IP Address** Address of the primary (1st) NTP server.

**Secondary Server IP Address** Address of a secondary (back-up) NTP Server.

Click **Reload Page** at the bottom of the tab if the „Current Settings“ box does not show a changed address.



### “Real-Time“ Tab: Set the Time Zone Parameters



Working in a real-time operating mode the device receives an external time & date reference and calculates the UTC (Universal Time Coordinated = world time reference without a Daylight-Saving Time [DST]), to set the internal clock. Having the UTC as a time base any local time zone can be calculated and displayed. At this tab all the necessary settings for these calculations have to be done.

The **Reference Time Zone** and the **Local Time Zone** settings use the same principle: the time zone will be defined with respect to the UTC. You can preset all parameters choosing a time zone from a drop-down list. Devices with more than one display can be set to different local time zones, in this case settings for more than one local time zone are provided.

**Enable Real-Time** Enables or disables the time zone handling. If activated the real-time display switches to internal clock if the source fails.

**Set Clock ...** Pressing this button, the internal clock receives a hard set to the time of the PC clock. If no external reference source is available and the device should work in a free-running mode, we recommend the following set-up:  
Select **Serial** at the “Source” tab.  
Select **Interface = Off** at the “Serial” tab.  
Activate **Enable Real-Time** at the “Real-Time” tab.



Time zone parameters separately for **Reference Time Zone** and **Local Time Zone**

CET/CEST: Central Europe ▼

You can choose a time zone from this drop-down list. This will preset all parameters.

**Offset from UTC**      Standard time (wintertime) = UTC ± offset (HH:MM).

**Automatically set Daylight Saving Time**  
Check this box if the reference input has a DST period.

If the time zone has a DST period, the following parameters should be selected:

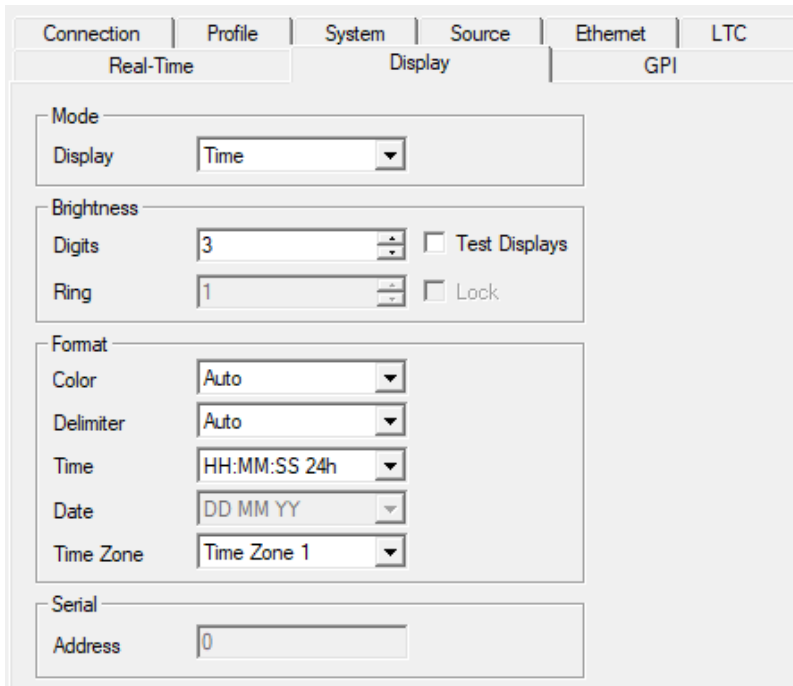
**DST Bias**    Enter the DST correction value. Most of the cases the correction value will be (+) one hour.

**DST Start**    Using these inputs (e.g. last Sunday of March at 2 o'clock) the device calculates the start of DST for the current year.

**DST End**      Using these inputs (e.g. last Sunday of October at 3 o'clock) the device calculates the end of DST for the current year.



“Display“ Tab: Display Mode, Brightness, ...



This tab enables to specify in detail which data will be displayed and how.

**Mode** Operating modes of the display – dependent on “Source” selection:

Mode	Description	available for „Source =...“
Local	Local (internal) stop timer, controlled via GPI functions. No other external signal is required.	LTC(MTD) LTC, IRIG, Serial, MTD, NTP
(MTD) Time (MTD) Date	Unit displays real-time or date – decoded out of the MTD data.	LTC(MTD) MTD
(NTP) Time	Time display with selectable 12-hour or 24-hour format (see below). This mode can be extended to a “real-time” mode – see description of the <b>Time Zone</b> setting below.	LTC, IRIG, Serial, NTP
(NTP) Date	Date display with selectable Day/Month/Year format (see below).	LTC, IRIG, Serial, NTP
Timer A ... F	Display of time A (... time F) decoded out of the LTC(MTD), e.g. stop timer A (... F).	LTC(MTD) MTD
Main 1 ... 3	“Main Time 1” (... 3) decoded out of the LTC(MTD).	LTC(MTD) MTD
TC/LTC	Time addresses of the time code of the central MTD generator.	LTC(MTD) MTD
User	Binary groups (BG8/7, BG6/5, BG4/3) of the LTC signal.	LTC
Status	Display of status data – if available for the selected protocol.	Serial
MTD Slave	Master – Slave operating mode.	MTD Slave





**Brightness**

<b>Digits</b>	Brightness of the display: 7 steps, 7 = maximum brightness.
<b>Ring</b>	Units with a seconds ring only: brightness of the seconds ring. With <b>lock</b> clicked the brightness of the seconds ring follows the brightness of the digits.
<b>Test Displays</b>	All LEDs will light-up for test purposes.

**Format**

<b>Color</b>	LED colour:	
	Auto	If "Source = LTC(MTD)" or "Source = MTD": The display decodes the colour out of the MTD data.
	Red/Yellow/Green	
<b>Delimiter</b>	Separating sign between pairs of digits:	
	Auto	If "Source = LTC(MTD)" or "Source = MTD": The display decodes the separating sign out of the MTD data.
	Off	No separating sign.
	Decimal Points	
	Colon	
<b>Time</b>	HH:MM:SS 24h	Time display in a 24-hour format.
	HH:MM:SS 12h	Time display in a 12-hour format.
<b>Date</b>	YY MM DD	Year / Month / Day.
	MM DD YY	Month / Day / Year.
	DD MM YY	Day / Month / Year.
	MM YYYY	Month / Year 4-digits format.

**Time Zone** This set-up defines your real-time operating mode together with the set-up at the **Real-Time** tab.

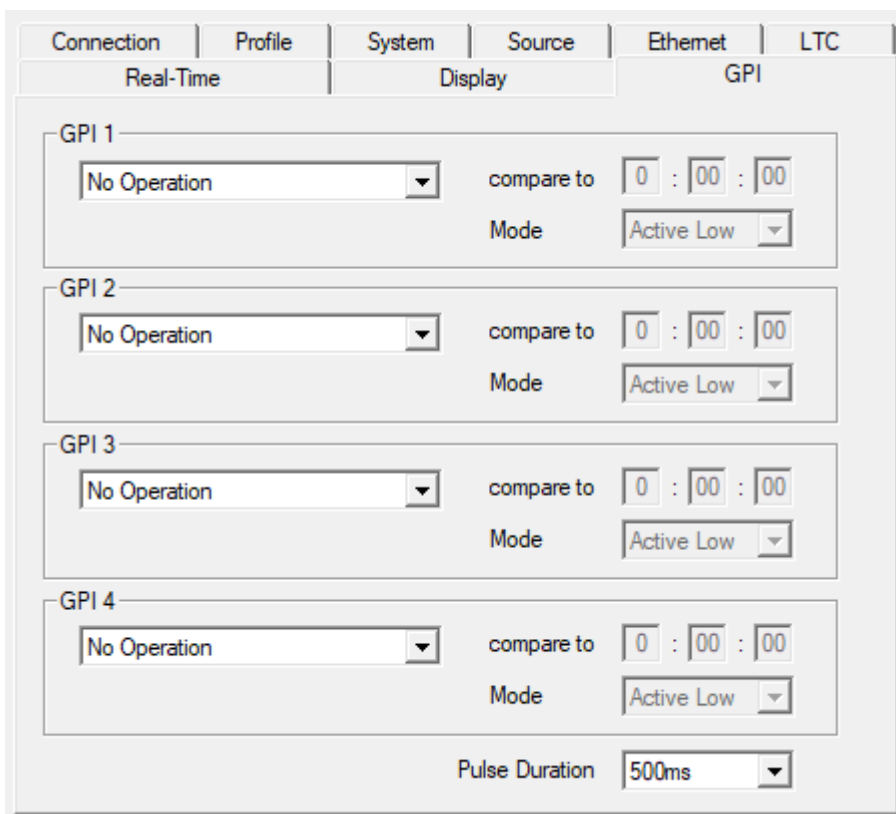
Time Zone	Enable Real-Time at the Real-Time tab	Description
Off	Not checked	Displays the time of the source without offset calculation. Time display stops if the source fails.
Off	Checked	Displays the time of the source +/- offset according to "Reference Time Zone" set-up. Time display continues if the source fails.
Time Zone 1 Time Zone 2	Checked	The time of the source will be corrected with the offset according to "Reference Time Zone" set-up. This time base +/- offset according to „Local Time Zone“ will be the time displayed. Time display continues if the source fails.

**Serial**

<b>Address</b>	Some serial data protocols may contain an address. The device accepts the data only if the address matches the serial address selection at this tab. If the device has more than one display each gets its own address.
----------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



### “GPI” Tab: Programming GPI as Input or Output



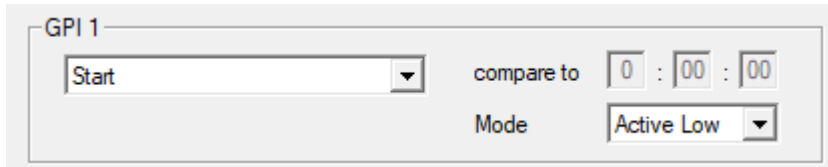
Four GPIs can get a function independently from each other, as an input or as an output. Select the function from the drop-down lists. For technical details please refer to chapter “Specifications”. The input or output mode of the GPI will be determined by the selected function.

<b>No Operation</b>	GPI has no function.
---------------------	----------------------

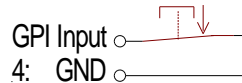


**GPI Inputs**

Selecting any input function will activate the “mode” box:

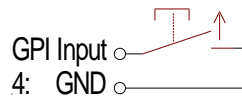


**Mode:** “Active Low” (please refer to chapter “Specifications” for technical details).



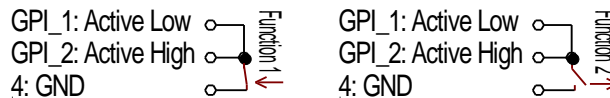
Example: Function becomes active if input state changes from “open” to “closure to GND”.

“Active High” (please refer to chapter “Specifications” for technical details).



Example: Function becomes active if input state changes from “closure to GND” to “open”.

If one GPI input has “Mode = Active Low” and another “Mode = Active High”, both functions can be executed alternatively with only one signal:



Function	Description
<b>Start</b>	These commands come in effect only if the device displays any timer: local timer (independent on “Source” selection) or any MTD timer A ... F.
<b>Stop</b>	
<b>Reset</b>	
<b>Hold</b>	
<b>Start/Stop</b>	
<b>Reset+Start</b>	
<b>Reset+Continue</b>	
<b>Reset if stopped</b>	Start/Stop Alternating commands. Reset+Start Reset command followed by a Start command. Reset+Continue “Reset” if selected timer stays in stop mode. “Reset+Start” if selected timer is running. Reset if stopped Timer will be set to zero, but only if the timer was stopped.
<b>Toggle Display</b>	Switches the display on/off alternating.  In “off” state, one decimal point will light up weakly to indicate that the unit is operating.



<p><b>Local + Start</b>  <b>Local + Stop</b>  <b>Reset + Real-Time</b></p>	<p>Control the timer as with Start, Stop and Reset (see above), but also switches display mode.                  Local + Start            Switch to local timer and start it.                  Local + Stop            Switch to local timer and stop it.                  Reset + Real-Time    Reset the timer and switch to Real-Time.</p>
<p><b>Switch Display Off</b></p>	<p>Switches the display on/off by use of an external switch.                  If "Mode = Active Low", a closure to ground or a "Low" state will turn the display "off" (one decimal point will light up weakly to indicate that the unit is operating); switch open or a "High" state will turn the display "on".</p>
<p><b>Next Display Mode</b></p>	<p>Switches the display to the next mode - according to the "Mode" drop-down list at the "Display" tab. The available modes are depended on the source selection. After switching, the display shortly indicates the selected mode.</p>
<p><b>Previous Display Mode</b></p>	<p>Switches the display to the previous mode - according to the "Mode" drop-down list at the "Display" tab. The available modes are depended on the source selection. After switching, the display shortly indicates the selected mode.</p>
<p><b>--- Main Timer ---</b>                  Main 1 = Time                  Main 1 = Date                  Main 1 = Timer A                  Main 1 = Timer B                  Main 1 = Timer C                  Main 1 = Timer D                  Main 1 = Timer E                  Main 1 = Timer F                    Main 2 = Time                  ...                  Main 3 = Time                  ...</p>	<p>Switches the „Main“ timers: Main 1, Main 2, Main 3.                    Conditions:                  LTC(MTD): "Source = LTC(MTD)", connected to the central MTD generator.                  Ethernet: "Source = MTD".                    Features of the "Main" timers are described in:                      <b>"The MTD System – Installation and Operation Manual".</b></p>
<p><b>PPS Input</b></p>	<p>If "Source = Serial" only: GPI will be configured as a pulse-per-second input.</p>
<p><b>Display Mode ...</b></p>	<p>Selecting display modes directly. The available modes are depended on the source selection. The new display mode will not be stored internally, i.e. after powering on the unit the display selects that mode which has been set by the configuration program (at "Display" tab).</p>



**Profiles**

- Load Profile 1
- Load Profile 2
- Load Profile 3
- Load Profile 4
- Load Profile 5

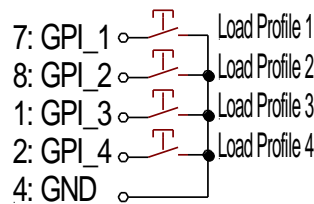
The "Load Profile" function enables to change the complete set-up in a comfortable way.

Please notice chapter "Profile Tab: ..." as well.

Please remember to program all GPI functions correctly before you execute a "Store Profile".

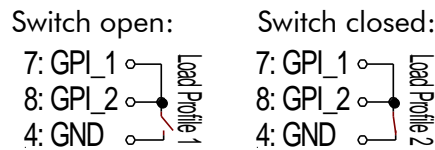
Example 1: Four different signals/buttons recall four different set-ups. Each set-up has all GPIs configured as follows:

- GPI 1 = Load Profile 1, "Mode = Active Low";
- GPI 2 = Load Profile 2, "Mode = Active Low";
- GPI 3 = Load Profile 3, "Mode = Active Low";
- GPI 4 = Load Profile 4, "Mode = Active Low".



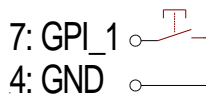
Example 2: One signal/switch changes over from first set-up to second. Both set-ups have GPIs configured as follows:

- GPI 1 = Load Profile 1, "Mode = Active High";
- GPI 2 = Load Profile 2, "Mode = Active Low".



Example 3: One signal/button recalls five different set-ups one after another. The set-ups have GPIs configured as follows:

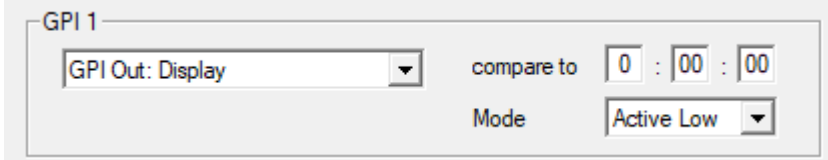
- Profile 1: GPI 1 = Load Profile 2, "Mode = Active Low".
- Profile 2: GPI 1 = Load Profile 3, "Mode = Active Low".
- Profile 3: GPI 1 = Load Profile 4, "Mode = Active Low".
- Profile 4: GPI 1 = Load Profile 5, "Mode = Active Low".
- Profile 5: GPI 1 = Load Profile 1, "Mode = Active Low".



**GPI Outputs**

GPI OUT functions work as a time comparator. A fixed time value entered at the **compare to** entries will be compared with the time of the display or the time of a selected timer. A match leads to an impulse output. The pulse duration is adjustable.

Selecting any output function will activate the “compare to” and “mode” boxes:



**compare to:** Select hours (0–23) : minutes (0–59) : seconds (0–59).

**Mode:** “Active Low” or “Active High” mode, please refer to chapter “Specifications”.

The GPI OUT drop-down list offers different functions depending on the selection at “Source”. The “Display” function compares the current time shown at the display. All other functions compare the selected timer or the selected time – no matter of the display mode.

Functions – dependent on “Source” selection:

Function	Description	available for “Source = ...”
<b>Display</b>	Comparison with the time currently shown at the display.	LTC(MTD) LTC, IRIG, Serial, MTD Slave, MTD, NTP
<b>Local</b>	Comparison with the local (internal) stop timer.	LTC(MTD) LTC, IRIG, Serial, MTD Slave, MTD, NTP
<b>Real-Time</b>	Comparison with the real-time decoded out of the MTD data.	LTC(MTD) MTD
<b>Time</b>	Comparison with the received time.	LTC, IRIG, Serial MTD Slave NTP
<b>Time Zone 1 Time Zone 2</b>	If a real-time operating mode has been selected: Comparison with the time of the selected time zone.	LTC, IRIG, Serial NTP
<b>Timer A ... F</b>	Comparison with the selected MTD timer A ... F.	LTC(MTD) MTD
<b>Main 1 ... 3</b>	Comparison with the selected MTD “main time” 1 ... 3.	LTC(MTD) MTD
<b>MTD TC</b>	Comparison with the time addresses of the time code of the central MTD generator.	LTC(MTD) MTD

**Pulse Duration**

GPI output: Pulse duration 100/200/500 ms, 1 second, or 2 seconds.



## 1.8. Special Features

### Colour Changing Modes

Configuration "**Color = Auto**" at the **Display** tab.

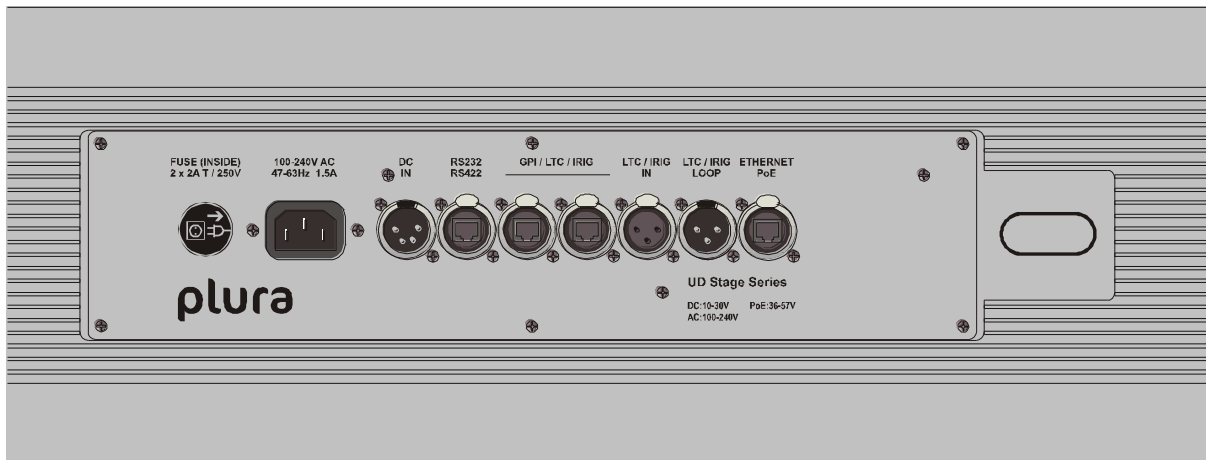
If "Source = LTC(MTD)" or "Source = MTD" has been selected: The display decodes the colour of the LED's out of the **MTD Data**. These data contain status data which set the LED colour. At the central MTD time code generator the colour can be selected and a dynamic change of colour at special events can be realized. For example, the following features can be programmed at the MTD time code generator:

- Select the basic colour: red, yellow or green.
- Activate a colour changing mode:
  - No colour changing mode.
  - Change colour in case of a minus sign, new colour can be red, yellow or green.
  - Change colour in case of time  $\geq 12$  o'clock (PM time), new colour can be red, yellow or green.



## 2. Technical Data

### 2.1. Connections at the Rear



#### Pin assignments


GPI / LTC / IRIG	RJ45	RS232 RS422	RJ45
GPI 3	1	4: GND	
GPI 4	2	7: GND	
LTC IN A	3	5: Vout	
LTC IN B	6	RS232 RS422 RS485	
GND	4	1: CTS In	TA- Out TRA- In/Out
VCC5G	5	2: RxD In	TB+ Out TRB+ In/Out
GPI 1	7	3: RTS Out	RA- In
GPI 2	8	6: TxD Out	RB+ In

	LTC / IRIG IN XLR3F	LTC / IRIG LOOP XLR3M	DC IN XLR3M
GND	1	1	GND 1
LTC IN A	2	2	2
LTC IN B	3	3	3
			DC IN 4





Signal descriptions

GND	Signal ground.
GPI 1, GPI 2 GPI 3, GPI 4	Programmable General-Purpose Interfaces: Inputs or Outputs.
Vout	DC voltage output.
	ATTENTION: Using "Vout" please make sure not to exceed the total power rating of the connected Power Supply adapter.
CTS, RTS, RxD, TxD	Inputs and outputs of the serial interface in the RS232 operating mode: "Interface = RS232" has been selected at the <b>Serial</b> configuration.
TB+, RA-, RB+, TA-	Inputs and outputs of the serial interface in the RS422 operating mode: "Interface = RS422" has been selected at the <b>Serial</b> configuration.
TRB+, TRA-	Inputs and outputs of the serial interface in the RS485 operating mode: "Interface = RS485" has been selected at the <b>Serial</b> configuration.
LTC IN A, LTC IN B	Balanced LTC (Linear Time Code) or IRIG input. The LTC OUT signals at the XLR connector are just hard-wired to LTC input signals.
V-, V+	Power supply input: V- = GND V+ = DC voltage input



## 2.2. Specifications

### LTC input

Format	According to ANSI/SMPTE 12M-1-2008, balanced
Input impedance	18 k $\Omega$
Signal level	50 mV <sub>p-p</sub> to 5 V <sub>p-p</sub> , auto-ranging
Frequency	21–33 frames/s

### IRIG input

Format	Modulated 1 kHz carrier signal, unbalanced IRIG-B 123 or IRIG-B 127 according to IRIG STANDARD 200-04 AFNOR time code according to AFNOR NF S 87-500
Input impedance	18 k $\Omega$
Signal level	200 mV <sub>p-p</sub> to 4 V <sub>p-p</sub> , auto-ranging (“Mark” amplitude)

### Ethernet

Medium	10Base-T or 100Base-T, automatic detection
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### CTS/RXD inputs at RS232/RS422 connector

Voltage range	-15 to +15 V
Threshold “Low”	+0.8 V minimum
Threshold “High”	+2.4 V maximum
Impedance	≈ 5 k $\Omega$ typical

### GPI

Input specification	Voltage range: -20 to +20 V Threshold “Low”: +0.7 V minimum Threshold “High”: +2.0 V maximum Impedance: ≈ 24 k $\Omega$ typical Frequency: 0–10 kHz
Output specification	Open Collector output of an NPN Darlington transistor. Internal 33 k pull-up resistor. Max. power dissipation: 250 mW. “High” state: 2.4 V (no load). For higher switching levels an external pull-up to a positive power source of less than or equal to 24 VDC is needed, typically 1 k $\Omega$ when connected to an external +5 VDC power source. “Low” state: output switched to GND. Max. collector current: 200 mA DC, not fused. Collector-emitter saturation voltage: @ 20 mA: typical 0.72 V ( $\leq$ 0.85 V) @ 100 mA: typical 0.9 V ( $\leq$ 1.1 V) Frequency: 0–1 kHz

### Vout

Output of the DC	Reversible fused. A continuous current of up to 120 mA can be
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power supply	applied over the whole specified operating temperature range. At an ambient temperature of e.g. 22 °C the output switches to a high-resistance state after a few seconds if a current of 400 mA is applied.
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Free-run accuracy

Real-time operating modes	≈ 3 ppm (deviation ± 260 ms each day)
Local timer operating mode	≈ 50 ppm (deviation ± 1 second within 5½ hours)

Other common specifications

Environmental characteristics, operating	Temperature: +5 °C to +40 °C Relative humidity: 30 % to 85 %, non-condensing
Environmental characteristics, non-operating	Temperature: -10 °C to +60 °C Relative humidity: 5 % to 95 %, non-condensing

Operating voltage and power consumption

Model	Operating voltage DC	Operating voltage AC	Power consumption
UD100 Stage...	V+: 10–30 VDC (* )	88–264 VAC/47–63 Hz	4T: ≈ 6 W 4T: ≈ 6 W 6N: ≈ 6 W 6T: ≈ 6 W 8N: ≈ 6 W 8T: ≈ 6 W
UD126 Stage...	V+: 10–30 VDC (* )	88–264 VAC/47–63 Hz	4T: ≈ 6 W 4T: ≈ 6 W 6N: ≈ 6 W 6T: ≈ 6 W 8N: ≈ 6 W 8T: ≈ 6 W
UD178 Stage...	V+: 10–30 VDC (* )	88–264 VAC/47–63 Hz	4T: ≈ 6 W 4T: ≈ 6 W 6N: ≈ 6 W 6T: ≈ 6 W 8N: ≈ 6 W 8T: ≈ 6 W

\* If power is supplied via PoE and DC simultaneously, DC should be in the range of 24–30 V.

Readability of the display up to a distance of ...

Version	maximum distance
UD100...	40 m
UD126...	50 m
UD178...	70 m



## Dimensions and Weight

UD100 Stage	<p>Case H x D: 177 x 63 mm</p> <p>Width: 936 mm (8T), 802 mm (8N) 738 mm (6T), 604 mm (6N) 540 mm (4T), 406 mm (4N)</p> <p>Weight: ≈ 7.5 kg (8T), 7.0 kg (8N) ≈ 6.5 kg (6T), 6.0 kg (6N) ≈ 5.5 kg (4T), 5.0 kg (4N)</p>
UD126 Stage	<p>Case H x D: 177 x 63 mm</p> <p>Width: 1064 mm (8T), 933 mm (8N) 833 mm (6T), 702 mm (6N) 602 mm (4T), 441 mm (4N)</p> <p>Weight: ≈ 9 kg (8T), 8 kg (8N) ≈ 7 kg (6T), 7 kg (6N) ≈ 5 kg (4T), 5 kg (4N)</p>
UD178 Stage	<p>Case H x D: 217 x 78 mm</p> <p>Width: 1493 mm (8T), 1318 mm (8N) 1166 mm (6T), 991 mm (6N) 839 mm (4T), 664 mm (4N)</p> <p>Weight: ≈ 12 kg (8T), 11 kg (8N) ≈ 10 kg (6T), 8 kg (6N) ≈ 6 kg (4T), 6 kg (4N)</p>



## 2.3. AC/DC Power Supplies

### EPSX: External Power Adapter

The “EPSW” AC/DC adapter is an accessory for the Plura *UD Series Displays*.

It has a fully enclosed plastic case, a three pole AC inlet according to IEC/EN 60320-1/C14 protection class 1, and a DC output cable with XLR jack suitable to connect to the DC input of the UD display. A CEE 7/4 power supply cord is part of the delivery.



Please notice the following specifications:

Input	100–240 VAC / 0.6 A / 47–63 Hz
Output	24 VDC, 850 mA, 20 W max.
Length of output cable	115 cm / 45.3 in
Dimension (W x H x D)	50 x 30 x 110 mm / 1.97 x 1.18 x 4.33 in
Weight	165 g (incl. output cable)
Environment	Operating: Temp. +0 °C to +40 °C, humidity 20 % to 80 % Storage: Temp. –20 °C to +85 °C, humidity 10 % to 95 %
Safety standards	EN60950, UL listed



### PI: Ethernet Power Injector

The “PI” AC/DC adapter is an accessory for the Plura UD Stage Series Displays.

**Features:**

- Fully enclosed plastic case.
- IEEE802.3af (PoE) and IEEE802.3at (PoE+) compliant.
- Gigabit compatible.
- Short circuit protection and overload protection.
- Three pole AC inlet according to IEC/EN 60320-1/C14 protection class 1.
- RJ45 connector **IN** for data I/O, RJ45 connector **OUT** for data I/O + power output.
- Three diagnostic LEDs (see description below).



**Input:**

Inlet socket	According to IEC/EN 60320-1/C14, protection class 1
Line voltage range	90–264 VAC, auto-ranging
Power line frequency	47–63 Hz
Input current	1000 mA @ 90 VAC, 550 mA @ 240 VAC
Efficiency	78 % typical

**Output:**

Total output power	33.6 W
DC output voltage	56 V
Minimum load	0 A
Maximum load	0.60 A
Ripple & Noise	≤ 100 mV <sub>p-p</sub>

**Others:**

Weight	≈ 290 g
Mechanical	W x H x D: 65 x 36 x 140 mm; 2.56 x 1.42 x 5.51 in
Environmental characteristics, operating	Ambient temperature: -20 °C to +50 °C Relative humidity: 5 % to 90 %, non-condensing
Environmental characteristics, non-operating	Temperature: -20 °C to +65 °C Relative humidity: 5 % to 95 %, non-condensing
Safety standards	UL60950-1, EN60950-1



**Diagnostic LEDs: ON, PoEPLUS, CONNECT**

- Power-up sequence: All LEDs will light up for two seconds. After two seconds, LED **ON** illuminates green indicating that DC output voltage is available.
- PoE detection sequence: Once a compliant load is attached to RJ45 OUT, LED **CONNECT** will illuminate green. LED **PoEPLUS** will illuminate green if the load is classified as class 4 PD, otherwise this LED will stay off. In case of a non-compliant load the LEDs will blink:
  1. Incorrect resistive signature: **CONNECT** and **PoEPLUS** will blink three times.
  2. Incorrect capacitive signature: **ON** will blink three times.
  3. Incorrect offset voltage: **CONNECT** and **ON** will blink three times.
  4. Unstable current measurement: **CONNECT** will blink three times.
  5. Low voltage sensed (overload): **PoEPLUS** will blink three times.Blinking continues until a correct load is applied.
- Fault sequence: In case of an overload or short circuit condition, all three LEDs will blink five times within two seconds and then go off. The power supply again will try to detect a valid load.

**Notes on PoE Operation**

PoE is built-in with all UD Stage displays.

- UD displays will detect the PoE standard of the power supply: PoE or PoE+. If PoE is detected while PoE+ is needed, the display will reduce LED brightness.
- Our recommended power supply “**PI**” conforms to the PoE+ standard (please refer to chapter “PI: Ethernet Power Injector for UD-PoE”).
- UD displays are able to receive power via DC input and via PoE/PoE+ simultaneously. In this case, the DC power gains priority. In this case, the DC voltage should be in the range of 24–30V, otherwise the unit may be damaged caused by overload. For example, the EPSX DC power supply can be used (please refer to chapter “EPSX: External Power Adapter”).



## Safety Precautions

The general safety information in this part is for both operating and service personnel. Plura products and accessories are only to be used as directed. Review the following safety instructions to avoid injury and prevent damage to the product or any products connected to it.

### RECOMMENDED INSTALLATION



1. EPSW: Make sure that the power cord is not inserted when you plug the DC output connector to the terminal block of your device. Make use of the strain relief plate to avoid stressing the conductors.
2. Insert the power cord into the three pole AC inlet.  
If available, please use the locking mechanism to avoid stressing the power cord.
3. Plug the power cord into the wall outlet.

### WARNING



Use a power supply cord that matches the power supply voltage of the AC power outlet. The power supply cord you use must have been approved by and comply with the safety standards of your country.

Never modify the power cord or excessively bend, twist, or pull it. Do not place any heavy objects on the power cord or expose it to heat. Damage to the cord may cause shock or fire.

Use only the AC adapter specified for the Plura product. Never use a voltage other than that for which the AC adapter is rated.

Do not place any objects onto the AC adapter and do not use the AC adapter outdoors. Keep the AC adapter away from heat sources.

Never touch the AC adapter while your hands are wet. To avoid injury or fire hazard, do not operate in an explosive atmosphere.

Immediately unplug the power cord from the wall outlet or extension cord and refer servicing to qualified servicing personnel, when the power cord or plug is damaged, split or broken.

### CAUTION



Do not expose the AC adapter to dripping or splashing water.

Make sure that the power cord is fully inserted into the wall outlet or extension cord.

Make sure that you unplug the AC adapter from an outlet before attempting to move it to another location.

Always carefully disconnect the plug by pulling on the plug and not on the cord.

### PREVENTIVE MAINTENANCE, QUALIFIED SERVICE PERSONNEL ONLY



Visually inspect the AC adapter for signs of damage. If you discover heat damage, try to determine the cause of the overheating before replacing the AC adapter; otherwise, the damage may repeat.

At least once a year, unplug the AC adapter from the power outlet and clean the area around the prongs of the plug. Dust accumulated around the prongs - especially under high humidity conditions - can result in fire.





## 3. Applications

### 3.1. Real-Time Display with a GPS16/GPS24 Reference

The external GPS receiver transmits a serial data string and a PPS signal (pulse-per-second) every second. The device decodes these data and is able to show the time, the date or some status information. Please also refer to the manual of the GPS receiver.

For these types of GPS receivers, the device has to get the following configuration:

- **Source = Serial.**
- Configuration at the **Serial** tab:

The screenshot shows the 'Serial' configuration tab. The 'Interface' is set to 'RS232', 'Protocol' to 'NMEA 0183 (GPRMC)', 'Baudrate' to '4800', 'Data Bits' to '8', 'Parity' to 'None', and 'Stop Bits' to '1'. The 'Use Timeout' checkbox is unchecked, and the 'Timeout [ms]' is set to '10'.

- The GPS receiver transmits UTC. Configuration at the **Real Time** tab enables to convert the UTC to any local time zone. The "Enable Real-Time" checkbox has to be checked. Example for converting UTC → CET/CEST:

The screenshot shows the 'Real-Time' configuration tab. The 'Enable Real-Time' checkbox is checked. Under 'Reference Time Zone', 'Offset from UTC' is set to '+ 0 : 0'. 'Automatically set Daylight Saving Time' is unchecked. 'DST Bias' is '+ 0 : 0'. 'DST Start' is 'Last Sunday of March at 2 : 0' and 'DST End' is 'Last Sunday of October at 3 : 0'. Under 'Local Timezone 1', 'Offset from UTC' is set to '+ 1 : 0'. 'Automatically set Daylight Saving Time' is checked. 'DST Bias' is '+ 1 : 0'. 'DST Start' is 'Last Sunday of March at 2 : 0' and 'DST End' is 'Last Sunday of October at 3 : 0'.

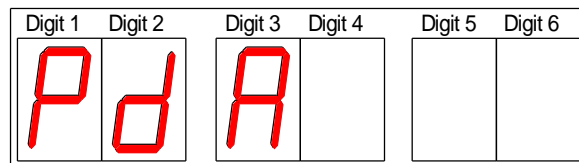


- At the **Display** tab you can select the kind of data to be displayed:

**Mode = Time** Time of the GPS receiver, if the "Real-Time" mode has been disabled. Local (converted) time, if the "Real-Time" mode has been enabled.

**Mode = Date** Date of the GPS receiver, if the "Real-Time" mode has been disabled. Local (converted) date, if the "Real-Time" mode has been enabled.

**Mode = Status** Some information about the GPS receiver state – this may help on fault finding. After power-on the GPS receiver needs some minutes – dependent on receiving conditions – until valid data and a PPS will be transmitted. As soon as the PPS is present the GPS receiver transmits a reliable time.



Digit 3: **A** = Data are valid.

**u** = Data are invalid (GPS has not synchronized).

Digit 2: **d** = Serial data are present.

**-** = Serial data are not present.

Digit 1: **P** = PPS (pulse-per-second) is present.

**-** = PPS is not present.

For placing the antenna please refer to the manual of the GPS receiver!



## 3.2. Real-Time Display with a RUB GNS 10 MHz Reference

The external GPS receiver transmits a serial data string and a PPS signal (pulse-per-second) every second. The device decodes these data and is able to show the time, the date or some status information. Please also refer to the manual of the GPS receiver.

For these types of GPS receivers, the device has to get the following configuration:

- **Source = Serial.**
- Configuration at the **Serial** tab:

The screenshot shows the 'Serial' configuration tab. The 'Interface' is set to 'RS232', 'Protocol' to 'Meinberg Std.', 'Baudrate' to '2400', 'Data Bits' to '7', 'Parity' to 'Even', and 'Stop Bits' to '1'. The 'Use Timeout' checkbox is unchecked, and the 'Timeout [ms]' is set to '10'.

- The GPS receiver transmits UTC. Configuration at the **Real Time** tab enables to convert the UTC to any local time zone. The "Enable Real-Time" checkbox has to be checked. Example for converting UTC → CET/CEST:

The screenshot shows the 'Real-Time' configuration tab. The 'Enable Real-Time' checkbox is checked. Under 'Reference Time Zone', 'Offset from UTC' is set to '+ 0 : 0'. The 'Automatically set Daylight Saving Time' checkbox is unchecked. 'DST Bias' is '+ 0 : 0'. 'DST Start' is 'Last Sunday of March at 2 : 0' and 'DST End' is 'Last Sunday of October at 3 : 0'. Under 'Local Timezone 1', 'Offset from UTC' is '+ 1 : 0'. The 'Automatically set Daylight Saving Time' checkbox is checked. 'DST Bias' is '+ 1 : 0'. 'DST Start' is 'Last Sunday of March at 2 : 0' and 'DST End' is 'Last Sunday of October at 3 : 0'.

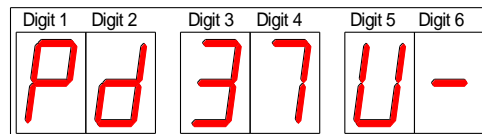


- At the **Display** tab you can select the kind of data to be displayed:

**Mode = Time** Time of the GPS receiver, if the "Real-Time" mode has been disabled. Local (converted) time, if the "Real-Time" mode has been enabled.

**Mode = Date** Date of the GPS receiver, if the "Real-Time" mode has been disabled. Local (converted) date, if the "Real-Time" mode has been enabled.

**Mode = Status** Some information about the GPS receiver state – this may help on fault finding. After power-on the GPS receiver needs some minutes – dependent on receiving conditions – until valid data and a PPS will be transmitted. As soon as the PPS is present the GPS receiver transmits a reliable time.



Digit 1: **P** = PPS (pulse-per-second) is present.  
 – = PPS is not present.

Digit 2: **d** = Serial data are present.  
 – = Serial data are not present.

Digit 3: – = GPS receiver has not synchronized.  
**1** = GPS receiver has synchronized, but its position is still not defined.  
**3** = GPS receiver has synchronized and determined its position.

Digit 4: **1 ... 7** = day-of-week, 1 = Monday.  
 – = No valid day-of-week present.

Digit 5: **U** = GPS receiver transmits UTC.  
**S** = GPS receiver transmits DST (daylight saving time).  
 – = GPS receiver transmits standard time (no DST).

Digit 6: **A** = Announcement of a DST switching.  
**L** = Announcement of a leap second.  
 – = No announcement.

For placing the antenna, please refer to the manual of the GPS receiver!



## 4. Installation

### 4.1. U Bracket

The UD Stage is shipped with a U bracket. It's shipped disassembled, please assemble it following these photos.



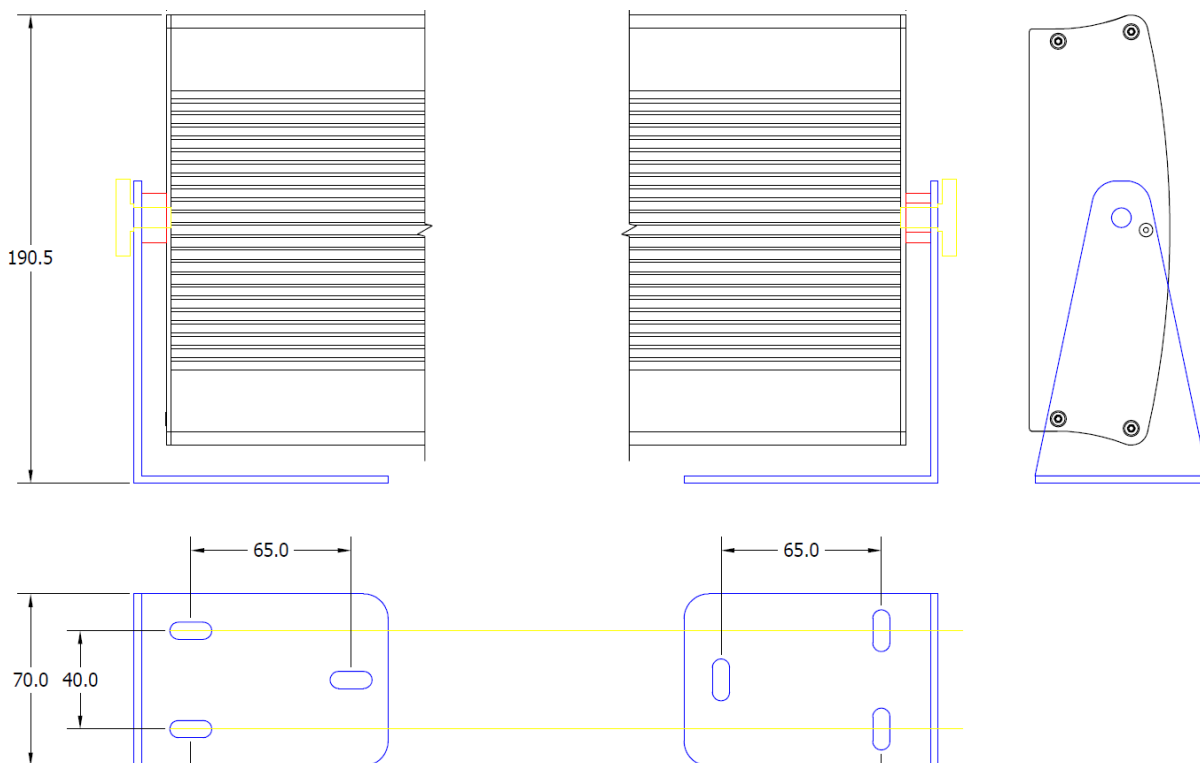
## 4.2. Tripod Mount Kit

The UD100 Stage-X tripod mount kit is an option for UD Stage displays. Please order separately.



## 4.3. Wall Mount Kit

The UD Stage WM wall mount kit is an option for UD Stage displays. Please order separately.





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