

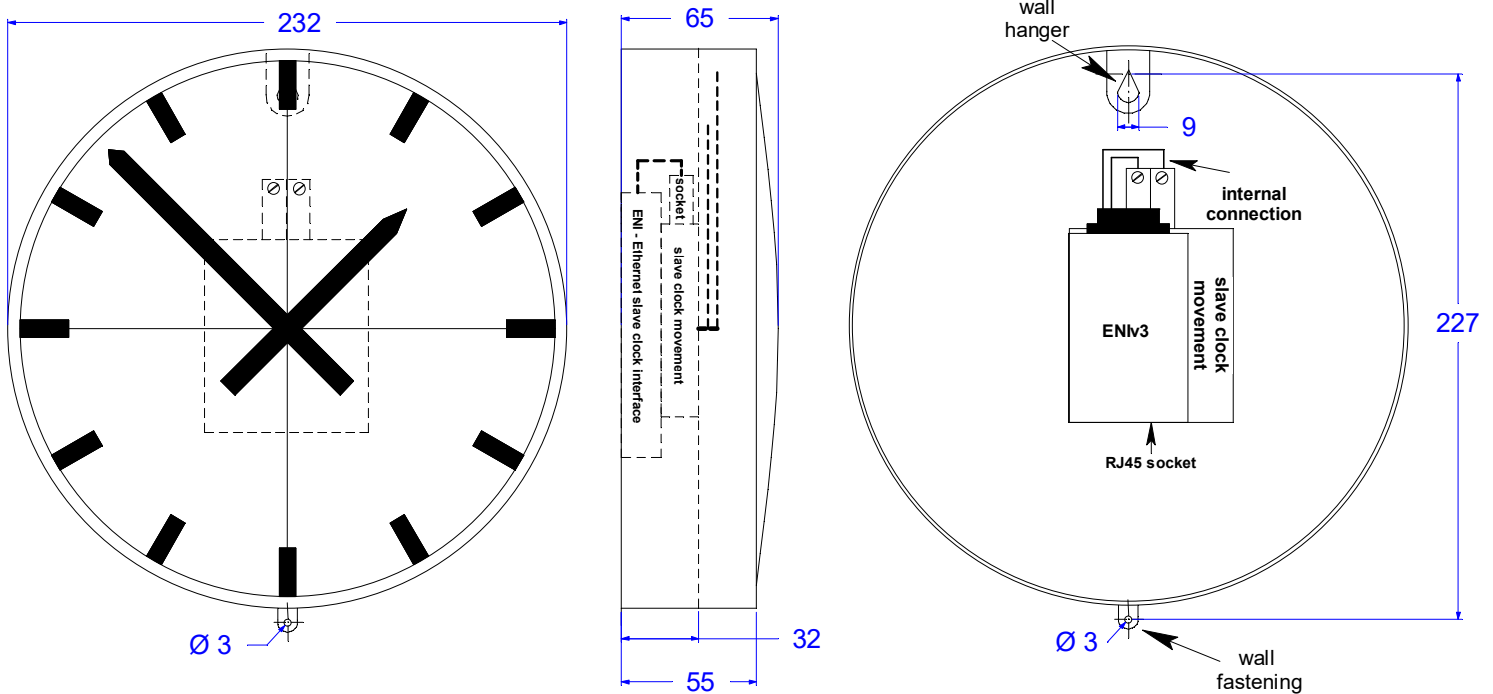


Eine zeitlos schöne Schiffsuhr!  
Die elegante Schiffsuhr wird in einem hochglanzverchromten Messinggehäuse geliefert.

A timeless beauty marine clock!  
The elegant marine clock with high-gloss polished brass case chrome plated and glass frame.

Gehäuse Housing	Messing hochglanz verchromt brass high-gloss chrome plated
Abmessungen (mm) Dimension (mm)	Ø 232 / Höhe 65 Ø 232 / height 65
Zifferblatt (mm) Dial (mm)	Aluminium weiß Ø 230 aluminium white Ø 230
Skala Scale	Ø 200mm schwarz mit Strichziffern Ø 200mm black with markings
Gewicht (kg) ca. Weight (kg)	1

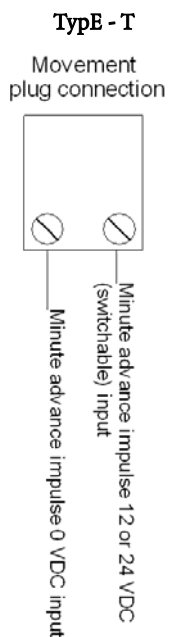
Maßzeichnung / Dimension drawing (mm)



Verfügbare Uhrwerktechnologien  
Available clock movement technologies

Modell Model	Zeiger Hands	Uhrwerktechnologie Movement technology
20804/IP	2 (Std./Min.) 2 (h/m)	Ethernet Nebenuhr selbststrichend PoE (Power over Ethernet) Ethernet secondary clock self-setting PoE (Power over Ethernet)

Klemmleiste / Terminal block



Type - IP

ENI v3  
(WEMPE Ethernet  
Secondary clock interface)

Connector RJ45

Ethernet 10Base-T

IPv4

network cable

twisted pair

category 3  
and  
higher

Ersatzteile / spare parts

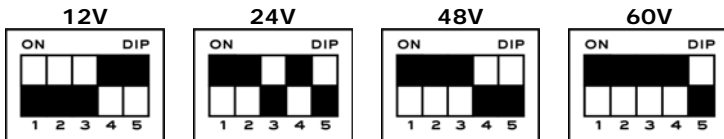
Art.-No.	Beschreibung / description
CW910008	Gehäuse Chrom Ø 232mm / case chrome Ø 232mm
CW950108	Zifferblatt we/schw Strichz. / dial wh/bl markings
CW910008G	Mineralglas gewölbt / mineral glass curved
CW940007	Uhrwerk TN / clock movement TN
CW970014G	Zeigerpaar 104/139mm für TN / pair of hands 104/139mm for TN
CW940158	Netzwerk-Nebeuhreninterface ENIv3 Ethernet slave clock interface ENIv3

**Montage- und Inbetriebnahmeanleitung  
für Nebenuhrwerke Typ: T**

Dieses nach neustem Stand der Technik entwickelte Nebenuhrwerk kann mit 12, 24, 48 oder 60V DC polarisierten Minutenimpulsen betreiben werden. Es ist sowohl für Innen- als auch für Außenuhren mit geschützten Zeigern bis zu einem Durchmesser von 80cm geeignet und vollkommen wartungsfrei.

**1. Betriebsspannung**

Werksseitig ist die Betriebsspannung auf 24V DC eingestellt. Eine andere Spannung kann mittels des DIPO-Schalters gemäß Schema auf der Rückseite des Werkes eingestellt werden.



**2 Uhren mit Metall-/ Kunststoff-Zifferblatt**

Befestigen Sie das Werk über eine 3-Punkte Befestigung und den beiliegenden Stiften am Zifferblatt (Dicke max. 3,5mm). Eine besondere Gebrauchslage ist für das Nebenuhrwerk nicht vorgeschrieben. Normalerweise sollte der DIP-Schalter nach unten zeigen.

**2.1 Uhren mit transparentem Zifferblatt**

Für transparente Uhren mit Acryl-/Glas-Zifferblatt (Dicke max. 12mm) muss die Werktype TN-Lang mit 36mm langem Zeigerwerk verwendet werden. Setzen Sie das Werk mit oder ohne Distanzscheiben (je nach Zifferblattstärke), der Hartpapierscheibe und einer Gummischeibe von hinten in das Mitteloch des Zifferblattes ein. Von vorne eine weitere Gummischeibe auflegen und das Werk mittels der Zentralbefestigungsschraube befestigen.

**3. Zeigermontage**

Setzen Sie den Stundenzeiger auf die Stundenwelle. Erforderlichenfalls muss die Buchse am Zeiger etwas zusammengedrückt werden. Setzen Sie danach den Minutenzeiger auf die Minutenachse und ziehen Sie die Stiftschraube M2 der Buchse fest an. Es ist darauf zu achten, dass zwischen den Zeigern genügend Abstand vorhanden ist. Zur Überprüfung drehen Sie bitte den Minutenzeiger bis die Uhr auf 12 steht. Sind die Zeiger richtig befestigt und justiert stehen Sie jetzt übereinander. Andernfalls müssen Sie die Zeiger noch einmal nach justieren.

**4. Elektrischer Anschluss**

Befestigen Sie die Kabel der Hauptuhr an dem 2-poligen Stecker. Sollte nach Inbetriebnahme zwischen Haupt- und Nebenuhrzeit eine Minute Differenz auftreten, so ist der 2-polige Stecker um 180° dreht aufzustecken.

**5. Zeigereinstellung**

Diese erfolgt entweder direkt von Hand über den Minutenzeiger oder den rückseitig angebrachten und versenkten Stellknopf (mittels Schraubendreher).



**Technische Daten**

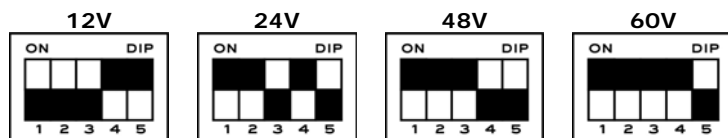
<b>Minuten-Nebenuhrwerk Typ: T bis 30cm Zifferblattdurchmesser für nichttransparente Zifferblätter</b>	
<b>Planungshinweis:</b> Elektrische Anschlüsse Zum Betrieb des Nebenuhrwerkes ist eine Zweidrahtleitung für die Minutenimpulse erforderlich.	
<b>Gehäuse</b>	
Breite	79,2 mm
Höhe	92 mm
Höhe mit Nebenuhrkuppelung	114 mm
Tiefe	21,5 mm
Material	Kunststoff
<b>Minutenwelle</b>	
Länge ab Zifferblattauflage	14 mm
Ansatzlänge	4,4 mm
Durchmesser	4 mm
Material	Kunststoff
<b>Stundenwelle</b>	
Länge ab Zifferblattauflage	9 mm
Durchmesser	6 mm
Material	Kunststoff
<b>Elektrische Werte</b>	
Impulsennenspannung	12, 24, 36, 48 ,60 Volt
Impulsstrom	12 mA bei 12 V, sonst 6 mA
Isolierwiderstand	800 Volt
Drehmoment bei Nennspannung	150 cmp
<b>Befestigungsart</b>	
Dreiloch	Spreizniet, Kunststoff
<b>Umgebungswerte</b>	
Schutzart	IP 51
Umgebungstemperatur	-25 °C bis +70 °C
Gewicht	ca. 0,2 kg

## Assembly and commissioning instructions for secondary clock movements' type: T

This state-of-the-art secondary clock movement can run on polarizing minute impulses of 12, 24, 48 or 60V DC. It is suitable for indoor clocks as well as for outdoor clocks with protected hands with a diameter of 80cm at maximum. The movement is maintenance-free.

### 1. Operation voltage

The factory setting for the operation voltage is 24V DC. Any other voltage can be set on the back of the movement by means of a DIP-switch.



### 2. Clocks with a metal or plastic dial

Fix the movement to the dial with a 3-points fixation and the enclosed pins (maximum thickness 3.5mm). There is no particular operation position prescribed for the secondary clock movement. Normally, the DIP-switch should point downwards.

#### 2.1 Clocks with transparent dials

The movement type TN-Lang has to be used for watches with a dial made of acrylic glass (maximum thickness 12mm). The motion-work of this movement type is 36mm long. Place the movement from the backside into the centre hole of the dial with or without distance washers (depending on the dial thickness), with the paperboard washer and the rubber washer. Then place another rubber washer from the front side on it and fix the movement by means of the centre fixation screw.

### 3. Assembly of the hands

Place the hour hand on the hour arbour. If necessary, the liner of the hand has to be slightly squeezed. Then place the minute hand on the minute arbour and tighten the pin screw M2 of the liner. Please pay attention that there is enough space between the hands. To check this, turn the minute hand until the clock is set to 12 o'clock. If the hands are correctly fixed and adjusted, they are now one on top of the other. If not, you have to adjust the hands once again.

### 4. Connection to the power supply

Fix the master clock cables to the 2-poles plug. Should there be a difference of one minute between the master and secondary clock after putting the clocks into operation, turn the 2-poles plug by 180°.

### 5. Setting of the hands

This can be done either manually by turning the minute hand or by means of the setting bottom placed in a countersink on the backside (using a screwdriver).



### Technical data

<b>Minutes slave clock movement type: T</b> <b>up to 30 cm of dial diameter</b> <b>for non-transparency dials</b>	
<b>Planning information:</b> Electrical connection For the operation and the transmitting of the minute impulse is a two-wire line necessary.	
<b>Case</b>  Width Height Height with SC in-series adapter Depth Material	79,2 mm 92 mm 114 mm 21,5 mm Synthetic material
<b>Minute pointer shaft</b>  Length from dial layer Socket length Diameter Material	14 mm 4,4 mm 4 mm Synthetic material
<b>Hour pointer shaft</b>  Length from dial layer Diameter Material	9 mm 6 mm Synthetic material
<b>Electrical values</b>  Impulse-nominal voltage Impulse current Insulating resistance Torque at Impulse-nominal voltage	12, 24, 36, 48 ,60 Volt 12 mA at 12 V, otherwise 6 mA 800 Volt 150 cmp
<b>Way of fastening</b>  Three hole	Spreading rivet, synthetic material
<b>Surrounding values</b>  Protective system Environmental temperature Weight	IP 51 -25 °C to +70 °C ca. 0,2 kg



# ENI

## Ethernet Secondary Clocks Interface

### Quick Start Guide

valid for:  
Hardware: Rev 3.0 (03.10.2016)  
Firmware: V3.05 (05.12.2016) ... V3.06 (22.12.2016)



**Secondary Clock Ethernet Interface**  
(Compatible with Wempe Master Clock 20100, 20101 and 20102)



## Installation

### 1.1 Configuration

The Wempe Ethernet Slaveclock consists of two parts: The mechanical clock and the electronic Ethernet Network Interface (ENI). The arms of the slave clock are self adjusting and pre setted already. Normally no further administration or commissioning is necessary. If other than the default pre settings are desired, the ENI can be administrated using the ENI web interface.

Please use a browser to enter the web interface: <http://ENI-IP-ADDRESS> . Now you have access to all the adjustments. The standard login data you can find in the owners manual or ask your IT office.

The manufacturer pre-set IP address is shown on the ENI's label. (172.16.n.n / 255.255.0.0)

Be sure to select the correct compatibility mode. Possible settings are: Master Clock 20100, 20101 or 20102:

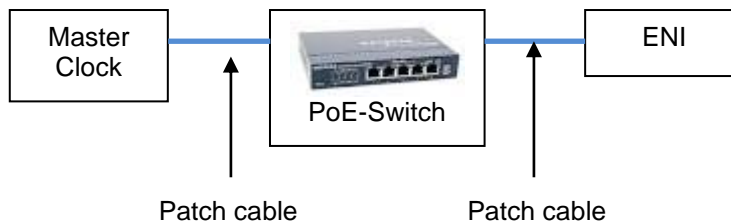


Supported LAN parameters: IP address, subnet mask, gateway address, primary and secondary NTP server (not at ENI V1 legacy mode).

The allocation of IP addresses is static by default. This can be changed to obtain addresses from a DHCP server. The DHCP query asks for addresses of NTP servers, too. If the DHCP server provides them, up to two addresses will be mentioned by the ENI configuration.

### 1.2 Ethernet network connection

The ENI is designed for operation via a PoE switch. This means that the power supply and data communication is provided by the same device. Alternatively, 24VDC power can also be supplied to the ENI via the terminal block.



**Attention: Do NOT connect at the same time Power over Ethernet AND the external 24 DC power supply.**

### 1.3 Setting up the Master Clock connection

The network configuration depends on the type of time source / master clock.

The first steps are common for all connection types:

- Open a web browser and navigate to the URL shown on the ENI's label as IP address.
- Proceed to the Configuration page, give username and password (see chapter 3).
- If desired, change the individual static IP address or enable the DHCP client and figure out the P address the ENI obtained from the DHCP server.
- Set a location name to identificate the ENI in the Master Clock database easily.

### 1.3.1 NTP Server

- Select Master clock Connection Type "WEMPE Master clock 20102, NTP server"
- Enter the static IP address of a primary NTP server and, if desired, a secondary NTP server. This step can be omitted, if the addresses are supplied by a DHCP server.
- Specify the Fixed Offset between UTC (which the NTP server sends) and LT.
- By applying the changes the network stack will restart and you will have to reconnect the web browser after a few seconds.

### 1.3.2 Wempe Master Clock 20100 or 20101

- Select Master Clock Connection Type "WEMPE Master Clock 20100, 20101".
- Select ENI V1 protocol depending on the Master Clock hardware and software. Refer to table 4, ENI V1 protocol compatibility, to pick the right version.
- Select the time to display (UTC, LT or Worldtimeclock). The latter displays a fixed offset to UTC, which has to be specified in the field "Fixed Offset".
- By applying the changes the network stack will restart and you will have to reconnect the web browser after a few seconds.
- Further ENI configuration can be done on the Master Clock's web interface, see it's manual.

Master Clock	Rev	Master Clock Software Version <sup>1</sup>	Select ENI V1 Protocol
20100			V1.02
20101	0	< 1.11	V1.1x
20101	0	>= 1.11, < 2.0	V1.3x
20101	1	>= 2.0, < 2.4.13	V1.1x
20101	1	>= 2.4.13	V1.3x

table 1, ENI V1 protocol compatibility

<sup>1</sup> Obtain the Master Clock software version from BEMO information screen or web interface.

## 1.4 Needed Ethernet ports / protocols for your firewall configuration

#### ENI Receive

Family	Port	Service	Purpose
UDP	68	DHCP	DHCP Server sends an offer / ack
TCP	80	HTTP	Access to the web interface
UDP	161	SNMP	Access to the SNMP Agent
UDP	6234	Bootloader	Firmware update (only available in firmware update mode!)
UDP	50403	Proprietary	Master Clock time and configuration protocol

#### ENI Transmit

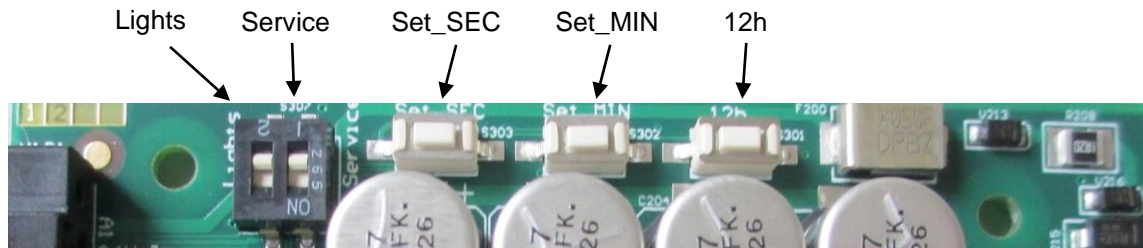
Family	Port	Service	Purpose
UDP	67	DHCP	Sending DHCP discover / request
UDP	123	SNTP	Query the configured NTP server
UDP	162	SNMP Trap	Sending SNMP Trap PDUs to the configured target / manager
UDP	30303	Announce	Sending an announce message at startup and address change
UDP	50404	Proprietary	Master Clock time and configuration protocol



## 2 Operating controls

During normal clock operation, there is no need to access to the operating controls. In case of troubleshooting the controls can be accessed after opening the ENI's housing.

### 2.1 Switches



#### Lights

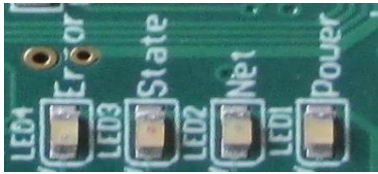
During normal clock operation, there is no need to let the LEDs (see next chapter) flicker all the time. For installation and maintenance the LEDs can be activated by setting the "Lights" switch to "ON".

Power up (Start options)	
<b>Set_SEC</b>	Force the network initialization to use the DHCP client. This is an emergency option to set a usable IP address even if the ENI is configured to use a static address that can not be reached in its subnet.  This option requires a working DHCP server on the same subnet that the ENI is connected to.
<b>Set_MIN</b>	Force the network initialization to use the static IP address 172.16.0.100, which is the factory setting. This is an emergency option to set an IP address even if the ENI is configured to use a DHCP server that can not be reached in its subnet.  This option may require reconfiguring the maintenance PC to use the same subnet.
<b>12h</b>	Start the bootloader even if a working firmware is present. This is an emergency option for firmware updates while all other access methods fail.
<b>Set_SEC+ Set_MIN 10 sec.</b>	Restore the ENI's factory settings. During the 10 seconds the State- and the Error LED flash alternating. When finished the LEDs stay off until the buttons are released and the ENI restarts.

For more functions refer to the ENI user manual.



## 2.2 Lights



All lights are activated only if the so named switch (see above) is set to "ON"!

 Blue LED: "Power"





Shows, that the internal power regulation is up. Whether the ENI is powered from an ethernet switch (PoE) or an external 24V DC supply, the power is good.

 Yellow LED: "Net"

Shows the ethernet connection and activity. If the light is on, the device is connected to a working ethernet port (hub, switch, router). Flickering shows ethernet activity. In some cases (e. g. connected to a hub) this activities do not necessary regard the ENI itself but can show any network traffic in that subnet.





 Green LED: "State"

Shows the ENI's operational state through blink codes. Generally the LED blinks at 4 Hz and the code is the flash count in 1 second.

Blink Code per second	State	Meaning
(off)	INIT	Can't finish initialization, most likely the device is damaged
	MAC	No physical network connection
	LINK	Network up, but doesn't respond to IP requests
	CONN	Network up, but no IP address, possibly waiting for DHCP
 (= continuous blink)	WAIT	Network connection configured, waiting for time source
(on)	RUN	Normal synchronized clock operation mode

 Red LED: "Error"

Shows the ENI's error state through blink codes. Generally the LED blinks at 4 Hz and the code is the flash count in 1 second.

Blink Code per second	Error	Meaning
(off)	OK	No error
	PROTO	Ethernet packet error in connection to time source
	TOUT	No update from time source within 2x update interval
	BRIDGE	Clock line output overload / shortcut / disconnection Alarm can be reset by pushing the 12h while the "Service" switch is "OFF" after the cause is solved
 (= continuous blink)	TEMP	Temperature out of configured thresholds
(on)	INIT	Can't start initialization, most likely the device is damaged
(real slow)	BOOT	Firmware update mode, no clock operation

### 3 Web interface

The graphical user interface (GUI) provides status information and configuration items. It's built in as a web interface (aka HTTP server). It can be accessed from a PC running any operating system connected to the same network via almost any (recent) web browser.

The URL is it's IP address, the manufacturer supplied IP address ist printed on the ENI's label.

Just type in the address bar the IP address of the running ENI device and you will be re-directed to the information page. The menu box on the left lets you select one of the following pages:

- Information page (Spectator's Account, no password required)
- Configuration page (password for configuration account required)
- Movement configuration page (password for manufacturer's account required)
- Movemant adjust page (password for configuration account required)
- Tools page (password for configuration account required)

#### 3.1 User accounts and passwords

You can (and should) change the factory default settings to your personal settings at installation time. Every account consists of one user name and one password. There is no way to add or delete account names.

There is no limit in the count of failed logins due to wrong passwords. To protect the web interface access against brute-force password attacks the deny message is delayed by 1 second. Every further failed login increases the delay by 1 second.

#### 3.2 Technical data

#### 3.3 General data

Case	Plastic, IP40, WxHxD: 92,2 x 58,0 x 23 mm without connectors	
Storage temperature	-55 to +85 °C (-67 to 185 °F)	
Operating temperature	0 to +85 °C (32 to 185 °F)	
Weight	72 g (without mounting material)	
Heat dissipation	6,85 BTU/h	
Interfaces	Ethernet 10/100 MBit/s, PoE class 2 RS-422 for digital secondary clocks, NMEA GPZDA / ZCZDA, 4800, 9600, 19200, 38400 Baud, 8N1	
Outputs	2 pulse outputs for a double movement (minutes and seconds) or single movement (minutes only)	
Operation	2 slide switches and 3 pushbuttons for maintenance purposes; configuration via web interface and SNMP software	
Firmware Update	Remote update tool via ethernet connection (UDP)	

#### 3.4 Electrical data

Power supply	PoE: 48 V DC, 50 mA, 2 W (PoE Class 2) Auxiliary: 24 V DC, stabilised, 70 mA	<b>But never both at the same time!</b>
Output current (H-Bridges)	30 mA each output, shortcut protected, overload signalling	
RS-422	3,3 V differential, 20 mA, built-in termination resistor 120Ω	

## 4 Troubleshooting

This requires physical access to the ENI device. Open the housing and set the "Lights" switch to "ON".

problem	possible cause/solution
The blue LED "Power" is off.	<p>Check the physical connection between ENI and PoE switch, all cables and plugs.</p> <p>Check the PoE settings on the port of PoE switch, the ENI is connected to, voltage and current.</p> <p>If other PoE devices work on the ethernet plug, the ENI was connected to, then the device seems to be damaged. Contact the manufacturer.</p>
The red LED "Error" is always on or the green LED "State" is always off.	The device is damaged. Contact the manufacturer.
The yellow LED "Net" is on or flickering, but the web interface is not reachable.	<p>Communication failure to NTP server.</p> <ul style="list-style-type: none"> <li>• If DHCP is disabled, check the configured static IP address (see label) is reachable in your IP subnet.</li> <li>• If DHCP is enabled, check the logs of the offering DHCP server to see if the MAC address of the ENI appears.</li> <li>• Check IP routes from PC to ENI and back. The ping tool on the Tools page of the web interface (see ENI user manual) can assist.</li> <li>• Check any blocking features (firewall etc.) at every routing device between ENI and PC.</li> <li>• Try using the factory default address or forcing to obtain a DHCP address lease with the buttons.</li> <li>• If you can not figure out, which IP address the ENI is actually trying to use, request a diagnostic output at startup.</li> </ul>
The green LED "State" shows "Single flashing" (Blink code 1, see chapter 2.2). The yellow LED "Net" is off.	Check the speed and flow control settings on the corresponding port of the PoE switch, the ENI is connected to. Should be Auto or 100M full duplex with flow control enabled.
The green LED "State" shows "Double flashing" (Blink code 2, see chapter 2.2).	Check the speed and flow control settings on the port of PoE switch, the ENI is connected to. Should be Auto or 100M full duplex with flow control enabled.
The green LED "State" shows "Triple flashing" (Blink code 3, see chapter 2.2). DHCP is activated.	Check the route of packets between ENI and the supposed DHCP server. Temporarily set a static IP address to the ENI and use the "Ping" tool (see ENI user manual) to check the route.

problem	possible cause/solution
<p>The green LED "State" blinks continuously (Blink code 4, see chapter 2.2).</p> <p>OR</p> <p>The red LED "Error" shows "Single flashing" or "Double flashing" (Blink code 1 or 2)</p> <p>Clock hands keep showing 12:00, Connection type is "WEMPE Masterclock 20102, NTP server.</p>	<p>Communication failure to NTP server.</p> <ul style="list-style-type: none"> <li>• Check configured IP addresses of NTP server(s).</li> <li>• If DHCP is enabled, check obtaining IP addresses of NTP server(s) from the offering DHCP server.</li> <li>• Check IP routes from ENI to configured NTP server and back. The ping tool on the Tools page of the web interface (see ENI user manual) can assist.</li> <li>• In case of redundant masterclocks check all of the possible routes.</li> <li>• Check any blocking features (firewall etc.) at every routing device between ENI and NTP server(s).</li> <li>• Check the NTP server at the configured IP address(es) are up and running.</li> </ul>
<p>The green LED "State" blinks continuously (Blink code 4, see chapter 2.2).</p> <p>OR</p> <p>The red LED "Error" shows "Single flashing" or "Double flashing" (Blink code 1 or 2, see chapter 2.2).</p> <p>Clock hands keep showing 12:00, Connection type is "WEMPE Masterclock 20100, 20101.</p>	<p>Communication failure to masterclock.</p> <ul style="list-style-type: none"> <li>• Check configured ENI V1 compatibility. See chapter 1.3.2 to set the correct protocol version.</li> <li>• Check the IP addresses of ENI and masterclock are in the same IP subnet or VLAN. The ping tool on the Tools page of the web interface (see ENI user manual) can assist.</li> <li>• In case of dynamic VLAN: check the Announce protocol is switched on (Configuration page of ENI's web interface).</li> <li>• Check any blocking features (firewall etc.) at every routing device between ENI and masterclock.</li> <li>• Check the route of packets between ENI and the supposed masterclock device.</li> <li>• Check the web interface of the masterclock, are there any errors regarding the slaveclock?</li> <li>• Check the time broadcast for the right LAN port at the masterclock is active.</li> </ul>
<p>Movement doesn't step, the red LED "Error" shows "Triple flashing" (Blink code 3, see chapter 2.2).</p>	<p>Movement wires are shortcut or interrupted. Sometimes a failure of a movement coil itself. Check the wires from ENI to the movement. After resolving the cause the movement control will not recover automatically. To restart the H-Bridge power supply press the "12h" button while the "Service" switch is set to "OFF". Most likely the clock hands will then show an incorrect time. In this case you need to adjust the hands via the web interface (see ENI user manual).</p>
<p>The red LED "Error" blinks continuously (see chapter 2.2)</p>	<p>Temperature alarm. Check the ENI's environment does not exceed the configured alarm threshold (default: 0...70°C).</p>

For more hints refer to the ENI user manual.