

Master Clock/Signalling Master Clock Type series 920



- installation instructions
- operating instructions

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Introduction

General Remarks

This Master Clock provides a radio controlled time base with either automatic or manual change-over from winter to summer time (daylight saving) and vice versa. DCF77 (extra) or a GPS antenna (option) is connected. The Master Clock is capable of operating and/or controlling secondary devices, such as:

- Analog slave clocks, with or without second hands, also as world time clock system (for operating second hands a Master Clock with minimum 2 slave clock lines is obligatory or 230 VAC/50 Hz for operating **the** second hands, depending on the type of slave clock movement)
- Digital slave clocks, with or without date, also as world time clock system
- Self-adjusting PEWETA **DCFport24** telegram slave clocks, analog or digital
- Signalling devices, lighting systems etc. (Master Clock with switch channels optionally)
- IT systems via RS232 interface (programming software is an extra)

Electronic Memory

Electronic **memory** and automatic update function will, upon return of mains power (e.g. after a mains outage), immediately readjust all connected clocks to current time.

Radio Control (optionally), DCF77 antenna is an extra (item No. 03.925.111)

The CS2 caesium decay device, operated by the German Federal Institute for Physics and Technology, provides the official time base for the **Federal Republic of Germany** (and parts of some neighbouring countries) and transmits it through the time signal transmitter DCF77, operated by Deutsche Telecom and located at Mainflingen, near Frankfurt/M. (50° 1' N, 09° 00' E) at 77.5 kHz (long wave/low frequency). The probable time deviation of the caesium decay device is less than 1 second in 2.6 million years only!

Note: The DCF77 aerial, if provided with the clock (optionally), will receive the time and date signal within a radius of approx. 2,000 km around Mainflingen and thus synchronise this Master Clock within this range only, perfect reception conditions provided. At continuous synchronisation the accuracy of the caesium decay device is therefore transferred to the Master Clock. If the Master Clock will be operated **outside** this DCF77 reception range we recommend the Master Clock's **GPS-version** (option suffix -95).

Accuracy without Radio Control

Without DCF77 (or GPS) radio control signal the Master Clock's accuracy is reduced to ± 0.1 second/24 h (measured at 25°C ambient temperature, tolerance to ambient temperature is 0°...40°C.) Changeover of summer/wintertime (daylight saving) may be programmed manually.

Power Supply/operating voltage

Operating power for the Master Clock is 230 VAC/50 Hz mains.

Protective Devices

The terminal area of the Master Clock is equipped with several protective devices, e.g. over-voltage protection, electronic circuit breakers and a fusible link.

Slave Clock Line Connections

Each Master Clock can be equipped with up to four slave clock lines for operating up to 160 single sided slave clocks (mode: alternating minute pulse 24 V). Power drain for the total of all lines or for individual lines only is 1,000 mA max. at 24 VDC line voltage. Pulse modes available are as follows:

- minute pulse (standard mode)
- half-minute pulse
- second pulse/second pulse with creeping minute
(In second pulse mode total line power is limited to 200 mA max.)
- PEWETA **DCFport24** pulse telegram
(In **DCFport24** mode total line power is limited to 250 mA max.)

If Master Clock is equipped with 2 or 4 slave clock lines a parallel operation of even **different pulse modes** is possible.

When the Master Clock reaches its limits of total power output, PEWETA pulse boosting amplifiers (type series 930) are needed for the **extension** of the master/slave clock system

Power Outage Back-up Batteries

Optional power outage reserve, selectable for each individual slave clock line. A rechargeable NiCd battery, 24 V/0.6 Ah for 24 V lines or 12 V/1.2 Ah for 12 V lines, provides energy for continued (for a limited time period) operation of all connected clocks in case of a mains power outage (for a limited time period).

Switch Channels (optionally), in that case we name it Signalling Master Clock

The Master Clock can be equipped with up to four switch channels/signalling contacts (2 A/250 V), each individually programmable for either a week- or a year-program, available to trigger optical and/or acoustic signal devices which, however, needs separate operating voltage (to be provided at site). Channels may be operated in mono- or bistable mode (600 timed events max). Manual triggering of each switch channel is possible.

Multilingual Navigation

Multilingual navigation by 7 selectable languages: English, French, Spanish, Portuguese, German, Italian and Dutch.

Data Transfer Interface

The Master Clock is equipped with a RS232 data transfer interface, RS485 optionally. Date and time information is disseminated from this interface to IT users (PCs, SPS etc) for synchronisation. Corresponding software (PEWETA item No. 05.920.000, which is an extra) is obligatory. Additionally, Master Clock software-updates may be uploaded through this interface, thus altering the functions of this Master Clock "in situ" (at site).

Types of Master Clocks/Signalling Master Clocks, Item numbers, Extras, Options

Master Clock Item No.	number of slave clock lines	number of switch channels	back-up battery
10.920.010	1	0	no
10.920.110	1	0	yes
10.920.012	1	2	no
10.920.112	1	2	yes
10.920.014	1	4	no
10.920.114	1	4	yes
10.920.020	2	0	no
10.920.120	2	0	yes
10.920.022	2	2	no
10.920.122	2	2	yes
10.920.024	2	4	no
10.920.124	2	4	yes
10.920.040	4	0	no
10.920.140	4	0	yes
10.920.042	4	2	no
10.920.142	4	2	yes
10.920.044	4	4	no
10.920.144	4	4	yes
10.920.002	0	2	no
10.920.102	0	2	yes
10.920.004	0	4	no
10.920.104	0	4	yes

Extras	
Item No.	
03.925.111	DCF77 antenna (IP grade 68)
05.920.000	IT-synchronisation software

Options	
Opt.-No.	
-95	GPS-version incl. GPS antenna (IP grade 65)
-N.N.	RS485 data transfer interface

Safety Rules and Precautions

- Only qualified personnel is authorised to install/to operate the Master Clock and to open it in case of maintenance. Unauthorised opening and unqualified repair attempts may cause serious danger to the user. Guarantee will expire.
- This Master Clock is intended for the control of slave clocks only.
- Is the Master Clock equipped with switch channels the signalling and switch devices must not be charged with security functions.
- The connection to mains power must contain a positive separating device such as fusible links, circuit breakers or switches with a contact separation of 3 mm (1/8") per conductor.
- Maintenance work or wiring changes inside the Master Clock may only be performed after it is separated from mains.
- The Master Clock must only be connected to the mains voltage specified on the type label (230 VAC/50 Hz).
- The mains connection must be solid 3-core copper wire of 1.5 mm² minimum cross section.
- Mains power wiring in the building must comply with VDE 0100 or equivalent national or international standards, according to DIN, ISO or EN.
- During electrical storms cables must neither be connected nor disconnected.
- All voltages connected to the Master Clock from outside must conform to SELV.
- Both primary and rechargeable batteries must only be replaced by original PEWETA-replacement units of the same type. Keep batteries and rechargeable batteries clear of fire! Danger of explosion!
- Batteries and rechargeable batteries must not be opened or damaged. The electrolytic liquid inside is poisonous and may cause damage to skin and eyes.
- Rechargeable batteries may cause injury through electric shock and high currents when short-circuited. Heed the following precautions when changing rechargeable batteries:
 - Do not wear rings, watches or metal bracelets.
 - Use tools with insulated handles only.
- Rechargeable batteries must never be short-circuited.
- Rechargeable batteries are classified waste and must be disposed accordingly.
- The Master Clock must be mounted to a solid surface, no vibrations must be transmitted to the Master Clock.
- The Master Clock must not be exposed to direct sunlight. The Master Clock must always be mounted inside buildings.
- The limits of tolerance to temperature (0°C...40°C) and humidity must not be exceeded.
- The location for mounting the Master Clock must be chosen to avoid infiltration of dust or moisture.
- The Master Clock must be kept clear of sources of electro-magnetic interference, such as motors, electric magnets, choke coils etc.
- The Master Clock is not cleared for use in areas prone to explosions.

Slave Clock Line Checklist

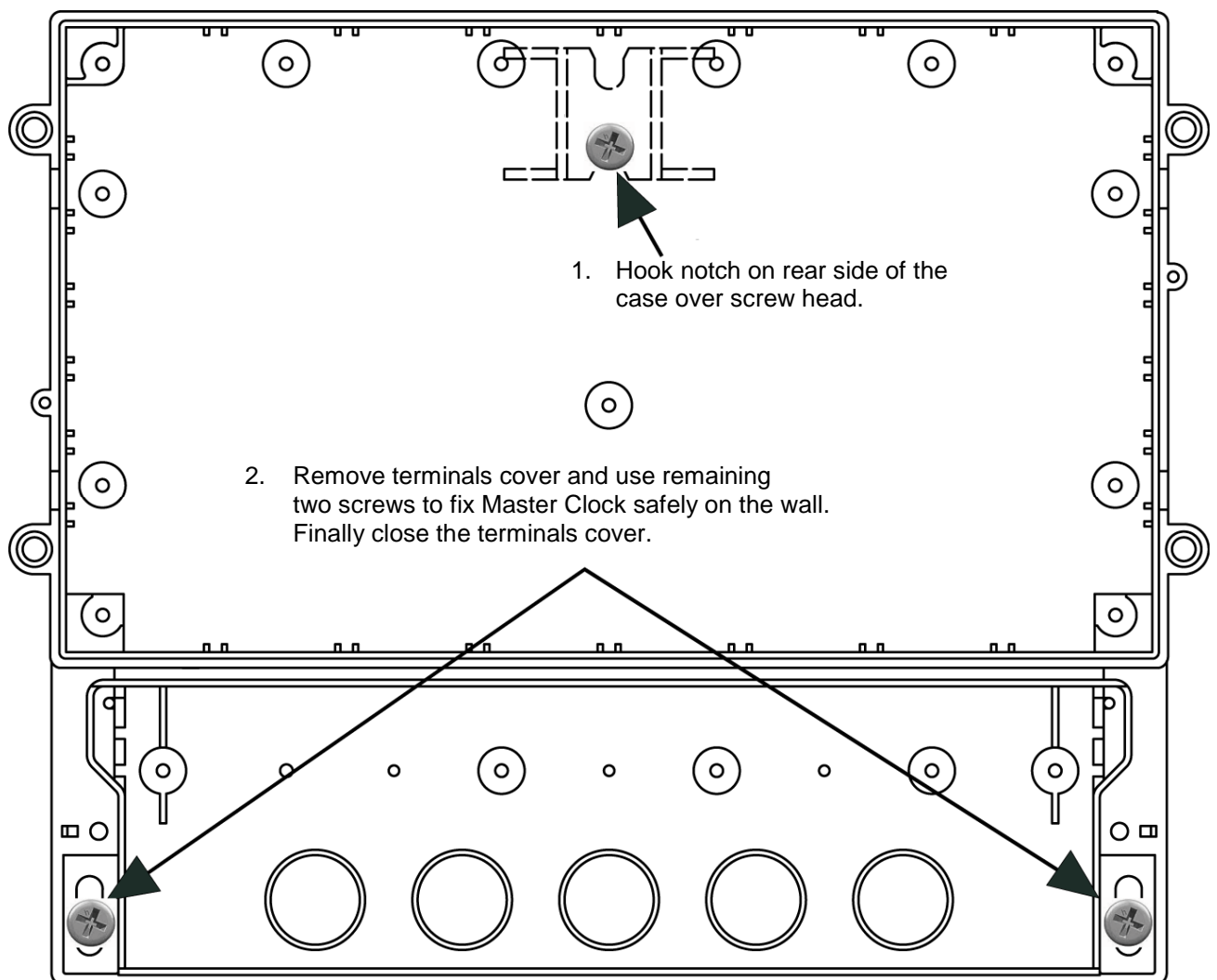
This table may be used to verify the slave clock lines resp. planning your slave clock network. All values "approx" only.

line voltage	rated current	wire cross section	number of clocks	max length of cable
12 V	100 mA	0.6 mm ²	10	226m
	400 mA		40	56m
	1600 mA		160	13m
12 V	100 mA	0.8 mm ²	10	402m
	400 mA		40	100m
	1600 mA		160	24m
12 V	100 mA	1.4 mm ²	10	1234m
	400 mA		40	308m
	1600 mA		160	76m
24 V	60 mA	0.6 mm ²	10	906m
	360 mA		60	150m
	960 mA		160	56m
24 V	60 mA	0.8 mm ²	10	1612m
	360 mA		60	268m
	1000 mA		160	100m
24 V	60 mA	1.4 mm ²	10	1234m
	360 mA		60	802m
	1000 mA		160	308m

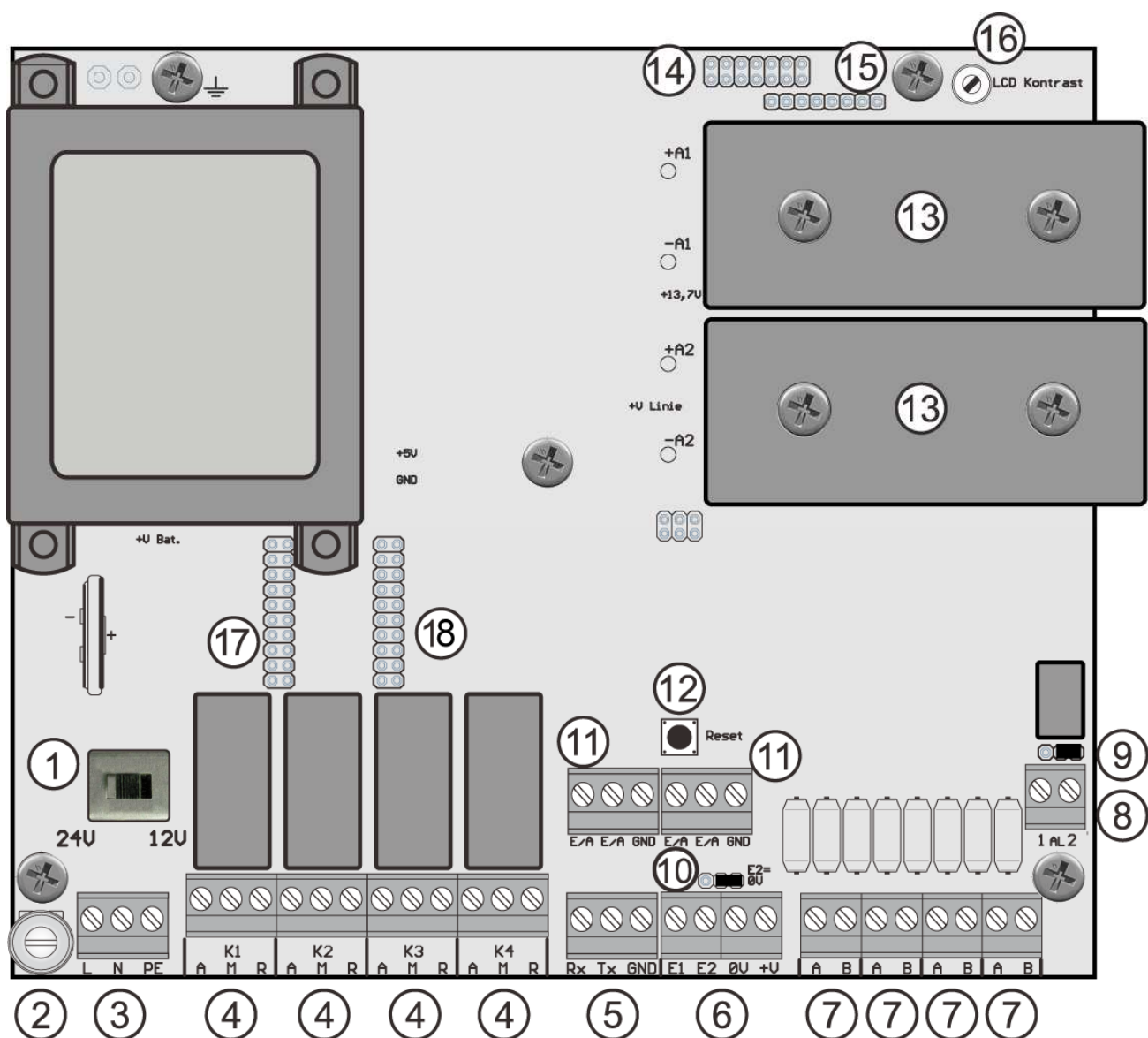
A 12V slave clock movement/clockwork will show an interior resistance of 1,000 Ω and draw 12 mA of current.
A 24V slave clock movement/clockwork will show an interior resistance of 4,000 Ω and draw 6 mA of current.

Mounting the Master Clock

1. It is suggested to make use of the template provided with these instructions, mark drilling spots on the wall.
2. Three 5x40 mm screws and three S8 dowels are supplied with the Master Clock.
3. Using an 8 mm or $\frac{5}{16}$ " bit, drill three holes. Push dowels in until they are flush with the wall surface.
4. Screw the top screw only into its dowel, leaving a 7 mm ($\frac{5}{16}$ ") gap between dowel and screw head. Hook the lower notch in the bracket on the rear side of the Master Clock case over the screw head.
5. Unscrew the terminals cover of Master Clock and fix Master Clock to wall by using the two remaining screws.
6. Push ends of connecting cables through apertures in the case.
7. Finally place and screw terminals cover.



Terminal connections for the full use of all features



- 1 Voltage selector (24 V | 0 V | 12 V) for slave clock line(s)
- 2 Mains power fuse: 5 x 20 mm fusible link, 250 V/500 mA delay (slow blow)
- 3 Mains power terminals 230 VAC/50 Hz (check with type label)
- 4 Switch channel terminals/connectors, none to 4 (optionally)
- 5 RS232 interface
- 6 DCF77-antenna terminal
- 7 Slave clock line terminals/connectors, none to 4 (optionally)
- 8 Alarm terminal
- 9 Jumper for changing alarm contact from "make" to "break" ("make" is standard)
- 10 Jumper to set DCF77-antenna power supply "internal" to "external" ("internal" is standard)
- 11 Terminals/connectors for additional optional features (if these features are enabled, an instruction sheet will be provided separately)
- 12 Reset button
- 13 Rechargeable back-up batteries (optionally) for power outage reserve of slave clock lines
- 14 LCD socket
- 15 Keyboard socket
- 16 LCD contrast adjustment
- 17 Socket for additional optional function circuit boards, for example GPS-version. If this socket is activated a separate instruction manual will be provided. Also see menu 6.1.
- 18 Socket for additional optional function circuit boards, for example RS485. If this socket is activated a separate instruction manual will be provided. Also see menu 6.2.

Starting (setting up) the Master Clock, use of menus

Note: During start-up and initiation of software, use of menus and entering of information will be required. It is advisable to become familiar with the available menus and their use at this time. Please see structure of menu table:

Structure of the menu table

Master Clock	slave clock lines	switch channels	messages	system	option 1	option 2
1.1 Master Clock	2.1 lines	3.1 switch channels	4.1 messages	5.1 system	6.1 option 1	7.1 option 2
1.2 system time	2.2 time zone	3.2 channel	4.2 messages	5.2 change keycode		
1.3 system date	2.3 status	3.3 delete all		5.3 language		
1.4 time zone	2.4 mode	3.4 manual		5.4 time zone (man.)		
1.5 reference	2.5 cycle			5.5 RS232		
1.6 hour mode	2.6 battery			5.6 access		
1.7 date mode	2.7 slave time			5.7 initialize		
	2.8 pulse length			5.8 DCF77 statistics		
				5.9 measured values		

(man.) = manual, by hand

If you are not familiar with the German language you should follow the instructions on page 50 of this manual first, call up menu 5.3 and change the Master Clock language (= system language) to English or 6 other languages, see page 6 (multilingual navigation).

Each individual menu may be accessed in **two different ways**:

1. Navigation by "Direct Dialling"

Example: For menu 1.2 (system time) press "menue" key, then numeral keys #1 and #2.



Press "menue" key, then numeral keys "1" and "2" for the menu 1.2. Please try it now, you can't do something wrong. For menu structure please see above menu table.

2. Navigation with "arrow" keys



Navigating with the arrow keys ◀ ▶ ▲ ▼: By pressing the "right"/"left" and "up"/"down" keys, you can reach any menu by selecting **first its column, then its line**. The procedure will be the same in case of sub-menus. Please try it now, you can't do something wrong! For menu structure please see above menu table.



The "edit" key has 2 functions: it is either used

- to **select** the function shown in the LCD display or
- to **confirm** data entered by preceded key action.



Any key action can, in case of error, be cancelled or interrupted **at any time** by pressing the "menue" key.

Starting Operation

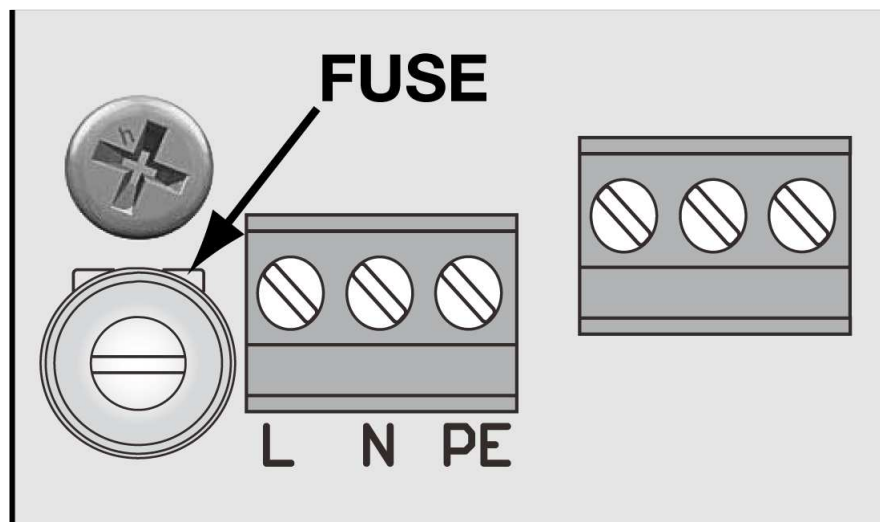
Connecting mains power 230 VAC/50 Hz

Unless otherwise specified on the type label, mains power is 230 VAC/50 Hz. Tension relief on the power cable is to be provided by a conduit as part of the building's installation and responsibility. For safety reasons, connection of the protective earth (PE) conductor is mandatory, **besides, undisturbed DCF77 or GPS radio reception will only be possible when PE is connected!**

The Master Clock is not equipped with a positive mains separation device, this also is part of the building's installation and responsibility.

The fuse (5 x 20 mm fusible link, 250 V/500 mA delay) protects the power source by interrupting the L conductor in case of a short-circuit within the Master Clock. In this case an error flag "power failure" will be displayed in the front LCD display of the Master Clock and the red LED alarm will be "on"!

Connect mains wires to terminals L, N and PE, as shown in the sketch below.



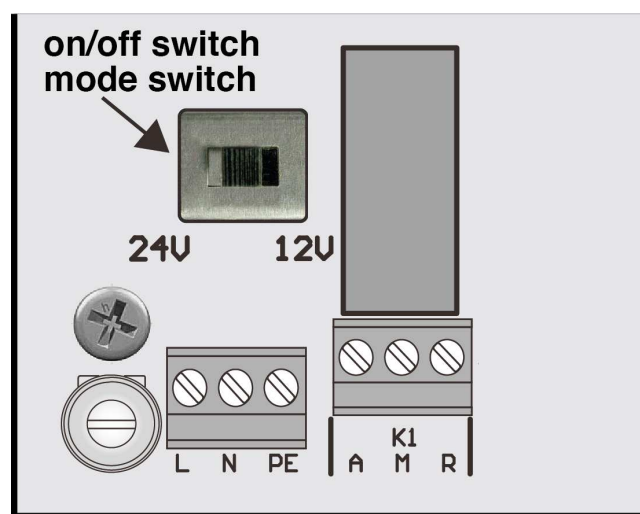
Important! Undisturbed, perfect DCF77 or GPS radio reception will only be possible when protective earth conductor (PE) is connected!

Switching “on” the Master Clock (also see menu 1) and set-up

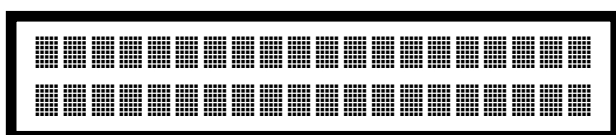
The Master Clock is switched “on” by setting the mode switch. When delivered, this switch is set in the central position (the Master Clock is switched “off”). Switching the Master Clock “on” also selects the slave clock line voltage. Sliding the switch to the left, slave clock line voltage will be set to 24 V (**standard**), sliding the switch to the right, slave clock line voltage will be 12 V. Check voltage directly at your slave clock movements, voltage must be identical! Unless 12 V slave clocks have already been installed, slave clock line voltage should be set to **usual 24 V**.

Switching the Master Clock “on” also activates the rechargeable batteries (optionally), enabling the Master Clock's full capabilities even without mains power (for a certain period of time only, depending on various circumstances, mainly on number of connected slave clocks).

Important! If the Master Clock will be disconnected from mains power for more than 24 hours, the mode switch must be set to the centre (“off”) position. Otherwise the rechargeable batteries will be destroyed by “deep discharge”!



After the mode switch has been set to either 24 V or 12 V position, the LCD-display of the Master Clock will “wake up” and begin to show messages as follows:



Left shown information (blank squares) will be displayed for about 2 seconds only to test the function of the LCD display.



Left shown information will be displayed for about 1 second only, afterwards the Master Clock will shift into “normal mode” and displays time and date information.



Display in “normal mode”, means “in operation”.

The Master Clock is now ready for set-up and/or for the individual adjustments and configurations, see following menus.



Display in English language.

If you have changed the Master Clock language from German to English (menu 5.3), display will be as shown as left, when Master Clock is in operation.

The Master Clock is now operating and ready for configuration to operate the slave clocks and - if Master Clock is equipped accordingly - the switch channels (optionally).

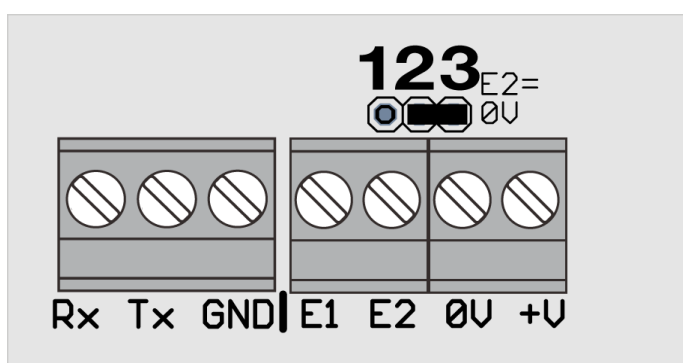
Connecting a PEWETA DCF77 receiving aerial/antenna

Connecting a GPS antenna to the Master Clock proceed to page 15.

Remember: DCF77 radio controlled time code telegrams can only be received in a radius of approx. 2,000 km round Frankfurt/Main! Outside this radius or at insufficient reception conditions we recommend GPS based version, option suffix -95.

The Master Clock is prepared for connecting a DCF77 receiving aerial, which is an extra (PEWETA item No. 03.925.111). If this receiving aerial is supplied with the Master Clock it has to be connected according to the sketch and table shown hereafter. The DCF77 antenna comes with a 5 m connecting wire. If no suitable position for mounting the receiving aerial can be found within this range, e.g. in heavily reinforced concrete buildings or buildings with a façade of corrugated metal sheets, the wire (type LIYCY 4 x 0,25 sqmm) may be extended to 100...150 m.

If DCF77 receiving aerial is connected and orientated properly the Master Clock will automatically recognise the incoming DCF77 signal. Make sure that the jumper in the Master Clock above the DCF77 connecting terminals is to be set on pins **2/3** to make $E\ 2 = 0\ V$.



type of wire: LIYCY 4 x 0.25 sqmm

color of wire at DCF77 antenna	connected to ...at DCF77 antenna	connect to terminal in Master Clock
white	+UB (7 - 30 volt)	+V
green	DCF clock (Low active)	E1
brown	GND (0 volt)	0V

Mounting and aligning the DCF77 receiving aerial/antenna

The light grey plastic case (protection grade IP 68 for in- and outdoors use) of the DCF77 antenna is attached to one half of a frame-type stainless steel bracket which is flexibly connected to the other half by two screws. The opposite half of the bracket should be mounted to a wall by two 5x40 mm screws and S 8 dowels supplied with the antenna kit.

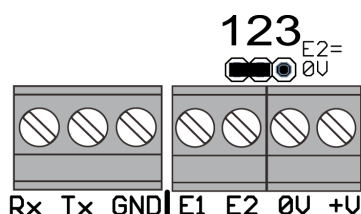
For best possible reception the DCF77 antenna should be mounted in an area free of electromagnetic interference. Reception is best if either the lid or the bottom surface of the antenna case faces towards Frankfurt/Main (50° 1' N, 09° 0' E). Reception of the DCF77 signal is indicated by a red LED inside the case.

This LED should blink on and off once per second in a steady, stable second-rhythm/cycle, not flicker! At each 59th second, no signal is transmitted (for reference reasons), so there should be a "one-second-off-interval" in the blinking sequence once a minute, which is correct.

Find the best mounting position for the DCF77 antenna where this "one-to-one-second" blink cycle is steady. Align the DCF77 antenna case by turning it on its bracket. If unsuccessful, try a different position. Once you have found a final position with good reception conditions, fix the antenna and do not move it anymore!

External power supply for the DCF77 receiving aerial (in very minor applications only)

If the DCF77 antenna has to be mounted **more than 150 m** from the Master Clock, the antenna may be connected to an external power supply of 7...30 V DC, fed from the building's installation. In this case only the green and brown wires of the antenna cable are to be connected to terminals E1 and GND, respectively, at the Master Clock. The jumper above the terminals must be changed from pins 2/3 to pins 1/2. The external power supply is to be connected to +V and 0V at the antenna unit, as shown in the table below.



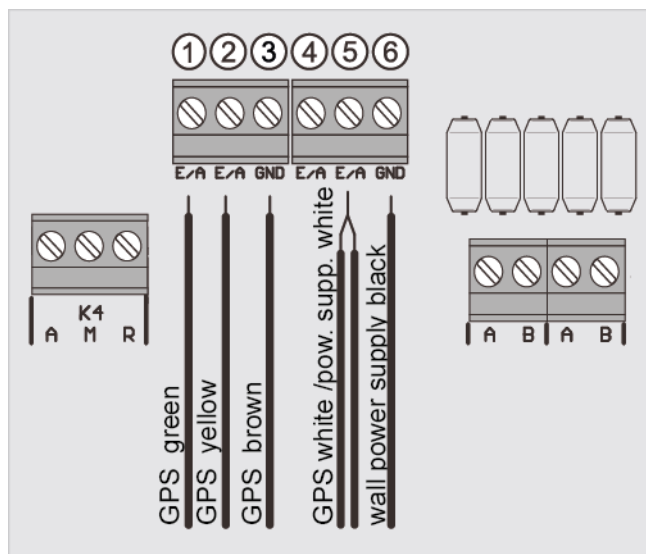
color of wire at DCF antenna	connected to ...at DCF77 antenna	connect to terminal at Master Clock	connect to ...at external power supply
white	+UB (7 - 30 Volt)		+ V (7 - 30 V)
green	DCF Takt (Low aktiv)	E1	
brown	GND (0 Volt)	E2	0 V

Connecting a PEWETA GPS receiving aerial (optionally)

If the PEWETA Master Clock is supplied in GPS-version (PEWETA item No. 10.920.xxx or 11.920.xxx with option suffix -95) the Master clock is already provided for the connection of the GPS receiving aerial by an integrated interface card, which has already been installed (see page 10, socket 17) and must not be removed (see menu 6.1).

The GPS receiving aerial itself will be supplied with a wall-plug adapter 230 VAC/50 Hz which has to be connected as shown in below table. The wire of the GPS receiving aerial has a length of approx. 10 m. If necessary it can be extended at site up to max. 20 m (wire type LIYCY 4 x 0,25 sqmm). From 20 m to approx. 500 m additional converters for RS232/RS485 interfaces and vice versa are necessary and are to be provided at site.

connection scheme at Master Clock:



wire color GPS antenna	function of GPS antenna	connection to Master Clock
yellow	TxD	E/A ②
green	RxD	E/A ①
white	+4,5 Volt	E/A ⑤
brown	GND (0 Volt)	GND ③
wire color wall plug adapter	function of GPS antenna	connection to Master Clock
white	+ 4,5 V	E/A ⑤
black	GND (0 Volt)	GND ⑥

Mounting, positioning and aligning the GPS receiving aerial/antenna

The GPS antenna must in any case be mounted outdoors or next to windows, "**free sight to the sky**", to find the satellites. If sufficient mounting place has been found – see menu 1.5, see page 16 – GPS antenna should not be moved anymore.

Note: Menu 1.5 of the PEWETA Master Clock can be used for testing the GPS radio control reception quality.

Important: The PEWETA Master Clock in standard will be supplied with time zone based on **UTC**, not on local time! Will this Master Clock be operated in a different time zone than UTC the corresponding **local** time zone must be selected in menu 1.4 **and** menu 2.2 by the operator. Will the corresponding time zone not be offered in menu 1.4 **and** 2.2 it can be defined in menu 5.4.

Information about the time base

Menu 1.5 Test of a continuous GPS radio reception

If the PEWETA Master Clock is supplied as GPS-version (option suffix -95) the Master Clock will be synchronized by the worldwide GPS radio signal. The information about the synchronization between Master Clock and the GPS radio receiving aerial/antenna and the quality of the radio reception is represented in this menu.

Select **menu 1.5** by either using the arrow keys ◀▲▼▶ or by directly dialling the key combination "menue, 1, 5". A black square blinks alternately in place of the character you want to enter.

When "menue, 1, 5" is entered display shows:

```
1.5# Master Clock
reference GPS  ✓  +
```

A hook (✓) shows that the Master Clock has been **successfully synchronized** by the GPS radio signals within the last 24 hours.

A question mark (?) instead of the hook represents that the Master Clock has **not** been successfully synchronized within the last 24 hours. The current time and date runs on quartz basis only. (If the Master Clock is a non GPS-version, means Master Clock operates on "quartz basis" only, the sign of the question mark is correct). The course difference in the quartz mode is approx. +/- 0.1 seconds/24 h. In case of summer/wintertime changeover in the country where the Master Clock is located the corresponding dates (start, ending) may be manually programmed (menu: 1.4, 2.2 and 5.4) by the local operator/user.

Test of the latest GPS radio synchronization – "date"

```
1.5# Master Clock
L. sync.      16.07.10  +
```

If now arrow key ▶ is pressed, the submenu radio synchronization "date" is activated. The display shows the **date** at which the master clock has been synchronized latest. **Note: The indicated value corresponds to UTC-time, not necessarily to local time!**

Test of the latest GPS radio synchronization – "time"

```
1.5# Master Clock
L. sync.      23:59:45  +
```

By pressing the arrow key ▶ again the display shows the **time** at which the master clock has been synchronized latest. **Note: The indicated value corresponds to UTC-time, not necessarily to local time!**

Test of GPS radio reception quality

By pressing the arrow key ▶ again the submenu "radio reception quality" is activated. Black squares in the display show the quality of present GPS reception.

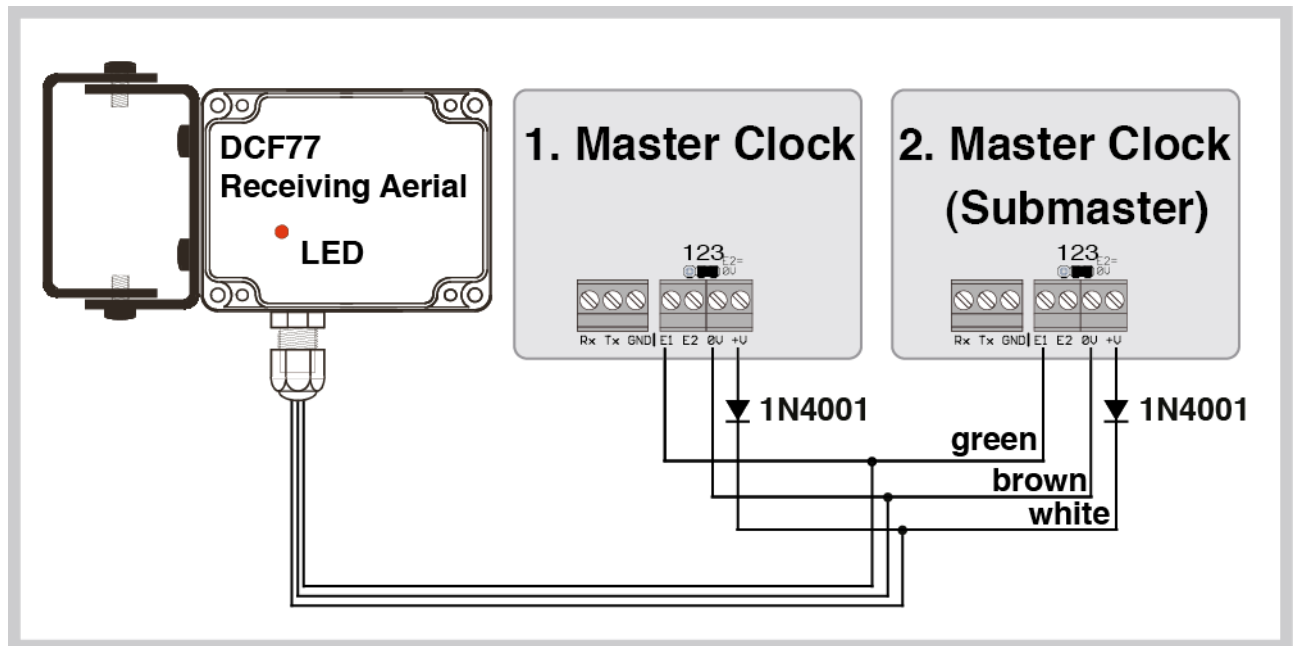
```
1.5# master clock
receipt  -■■■■+  +
```

-■■■■+ = good radio reception
 -■■■ + = sufficient radio reception
 -■■ + = bad radio reception, maybe no synchronization
 --- + = GPS antenna not connected

Leave the menu by key combination "menue, 1, 1" or by arrow keys ◀▲▼▶.

Connecting one DCF77 receiving aerial (antenna) to two Master Clocks (Master/Submaster)

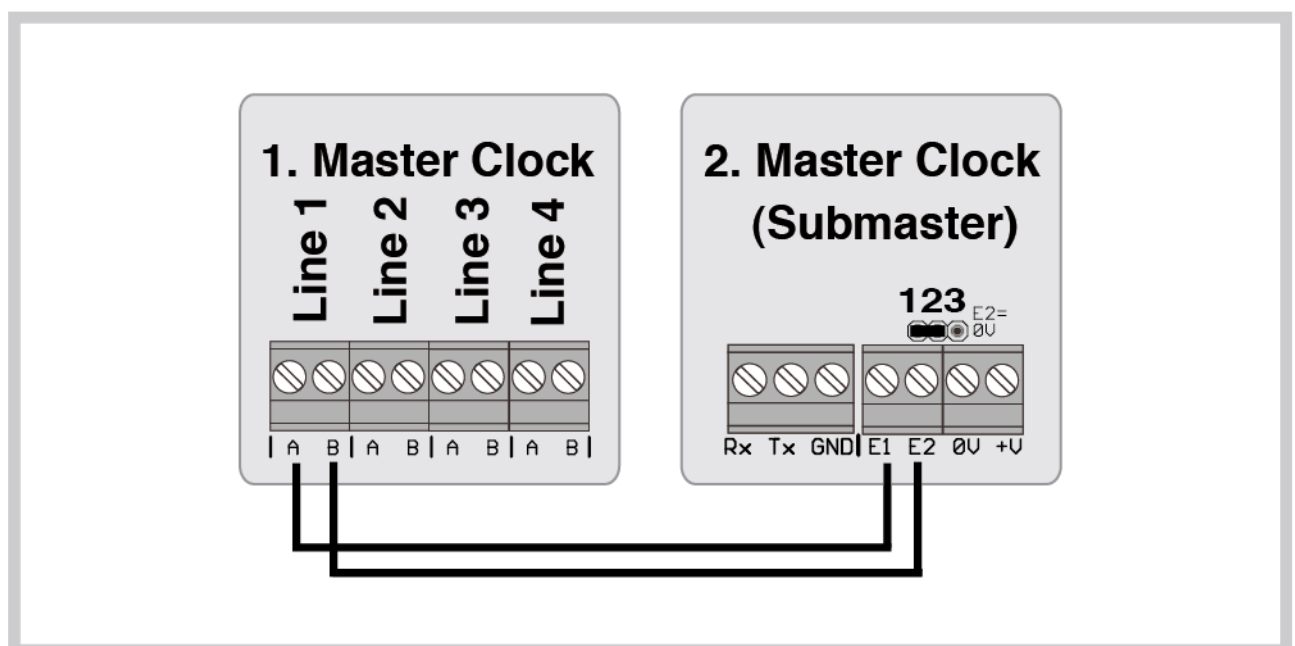
If two PEWETA Master Clocks are connected to one DCF77 antenna, their power supplies need to be decoupled by means of two 1N4001 diodes, as shown below.



Synchronising a PEWETA Submaster (2. Master Clock) by using the PEWETA DCFport24 pulse telegram

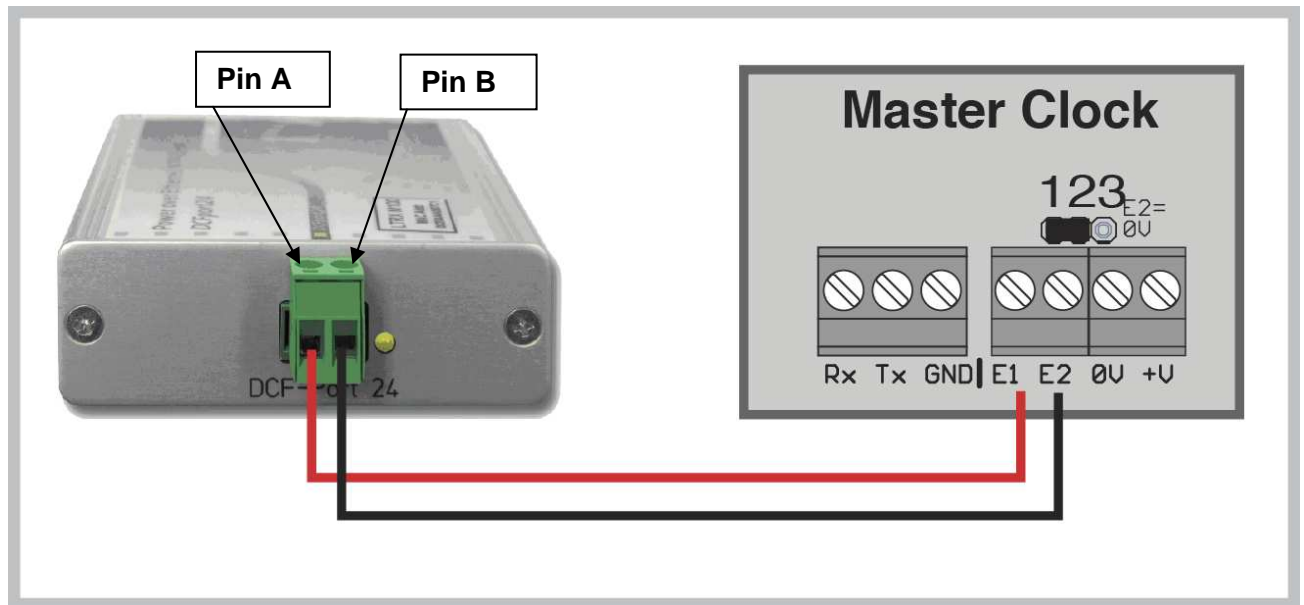
A second PEWETA Master Clock (Submaster) may be synchronised by using the **DCFport24** slave clock line of the first PEWETA Master Clock. One slave clock line, e. g. line 1 of first Master Clock must be set to **DCFport24**, see menu 2.4. Terminal A of line 1 in first Master Clock must be wired to "E1" of second Master Clock and terminal B of line 1 to "E2" of the second Master Clock. The jumper above the DCF77 terminals in the Submaster must be set from position "2/3" to "1/2", see scheme below.

It is even possible to connect several Submaster-Clocks to the same slave clock line of the first Master Clock.



Synchronising a PEWETA Master Clock by using the PEWETA Power over Ethernet NTP Client

The DCFport24 output of the “PEWETA Power over Ethernet NTP Client” has to be set to “DCFport” via telnet, see manual of the “PEWETA Power over Ethernet NTP Client”. The jumper above the DCF77 terminals in the master clock must be set from position “2/3” to “1/2”, if not already done, see scheme below. Connect pin “A” to E1 and pin “B” to E2 of the master clock, see scheme below.



Connecting the slave clocks to the slave clock lines

Note: After having set the Master Clock to its operating status (see page 13) you will find following standard parameters in the corresponding menus:

menu 2.2	time zone:	CET/CEST
menu 2.3	status:	Status off
menu 2.4	mode:	minute
menu 2.5	cycle:	12 hours
menu 2.6	battery:	on (if equipped with back-up batteries for the slave clock lines)
menu 2.7	slave time:	arbitrary, random time
menu 2.8	pulse length:	1 second (1.0 s)

Please decide whether you want to accept this parameter status, (especially menu 2.2 time zone!!), otherwise you have to change it, please see the corresponding menus on following pages.

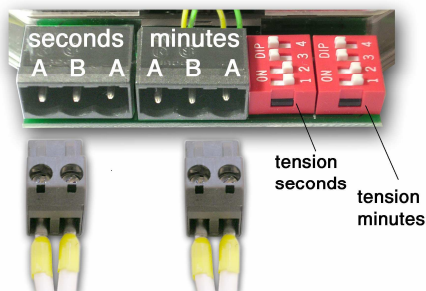
Connecting slave clocks with 12/24 V minute pulse movements (mode: minute pulse)

1. Wire (=connect) all minute pulse slave clocks you want to "address" to one slave clock line in parallel to the corresponding slave clock line terminals in the Master Clock. Decide whether all slave clocks of your master/slave clock system shall be connected (=addressed) to 1 slave clock line only or to 2, 3 or 4 slave clock lines (if Master Clock is equipped accordingly).
1. Set each of your slave clocks of each line manually (by hand) to an arbitrarily selected but **uniform (!) time**, for example all slave clocks **exactly** on 12:00 hours position.
3. Provided pulse mode in menu 2.4 is set to "minutes"...
4. ..now **exactly** enter your arbitrarily selected slave clock time (in our example 12:00) in menu 2.7 (12:00:--).
5. Check again all parameters of above mentioned menus 2.2 to 2.8 are set according to your individual requirements.
6. Now set the line(s) to "status on" in menu 2.3. All correctly connected slave clocks of the corresponding line(s) will now move automatically to the present local time, provided you have selected one of the offered time zones/city names or manually entered the local time as well in menu 1.4 for the Master Clock **and** in menu 2.2 "manually" for your slave clock line(s).
7. If the one or other slave clock (or one side of a double sided clock) lags **exactly 1 minute** behind the set time after the move-up is completed, reverse polarity at the corresponding slave clock movement by inverting the two-pin connector and carefully manually (by hand) advance the slave clock by this 1 missing minute, see page 20. Also see installation instruction sheet for slave clock movement (coming with each PEWETA slave clock), item No. PEWETA B 602100-811, -821, -822, 825 and -826.

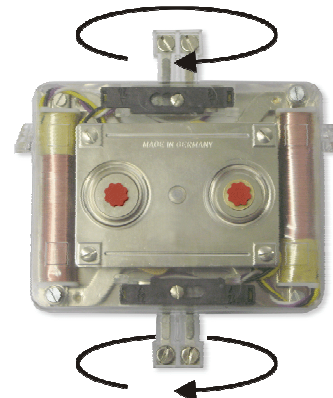
Connecting slave clocks with 24 V minute/second pulse movements (mode: minute/second)

1. A Master Clock with minimum 2 slave clock line terminals is obligatory.
2. One line (for example line 1) has to be defined as "minutes" pulse mode in menu 2.4.
3. A second line (for example line 2) has to be defined as "seconds" pulse mode in menu 2.4.
4. **Important:** "60 seconds" has to be entered/selected for the required cycle of line 2 in menu 2.5.
5. Wire (=connect) all "minute" pulse mode connectors of the slave clock movements in parallel to the slave clock line terminals defined as "minute" pulse (in our example line 1).
- 6.) Wire/connect all "second" pulse mode connectors of the slave clock movements in parallel to the slave clock line terminals defined as "second" pulse mode (in our example line 2).
7. Set each of your slave clocks of this line manually (by hand) to an arbitrarily but **uniform (!) time**, for example all slave clocks **exactly** on 12:00:00 hours position. Again, make sure that all 3 hands (h/m/s) are exactly positioned on 12:00:00.

8. Provided pulse mode of line 1 is set to “minutes”, pulse mode of line 2 is set to “seconds” in menu 2.4 and “60 seconds” for line 2 is set in menu 2.5...
9. ...now **exactly** enter your arbitrarily selected slave clock time (in our example 12:00:00) in menu 2.7: 12:00:-- for hour and minute **in line 1**, --:--:00 for the seconds **in line 2**.
10. Check again, all parameters of above mentioned menus 2.2 to 2.8 are set according to your individual requirements.
11. Now set the lines (in our example first line 1, then line 2) to “status on” in menu 2.3 status. All correctly connected slave clocks of the corresponding line(s) will now move automatically to the present local time, provided you have selected one of the offered time zones/city names or manually entered the local time as well in menu 1.4 for the Master Clock **and** in menu 2.2 “manually” for your slave clock line(s).
12. If at the one or other slave clock (or one side of a double sided clock) the **minute hand lags exactly 1 minute** and/or the **second hand lags exactly 1 second** behind the set time after the move-up is completed, reverse polarity at the corresponding slave clock movement(s) either
 - by inverting the corresponding “minute” or “second” two-pin connector or
 - by drawing the corresponding minute or second connector from position AB to BA (or vice-versa), see below pictures. Manually (by hand) advance the slave clock by this missing 1 minute resp. 1 second. For additional information please also see corresponding installation instruction sheet PEWETA for slave clock movement (coming with each slave clock), for example PEWETA item No. 183.042, 183.224.



changing the polarity



changing the polarity

Connecting slave clocks with 24 V second pulse with “creeping” minute (mode: seconds)

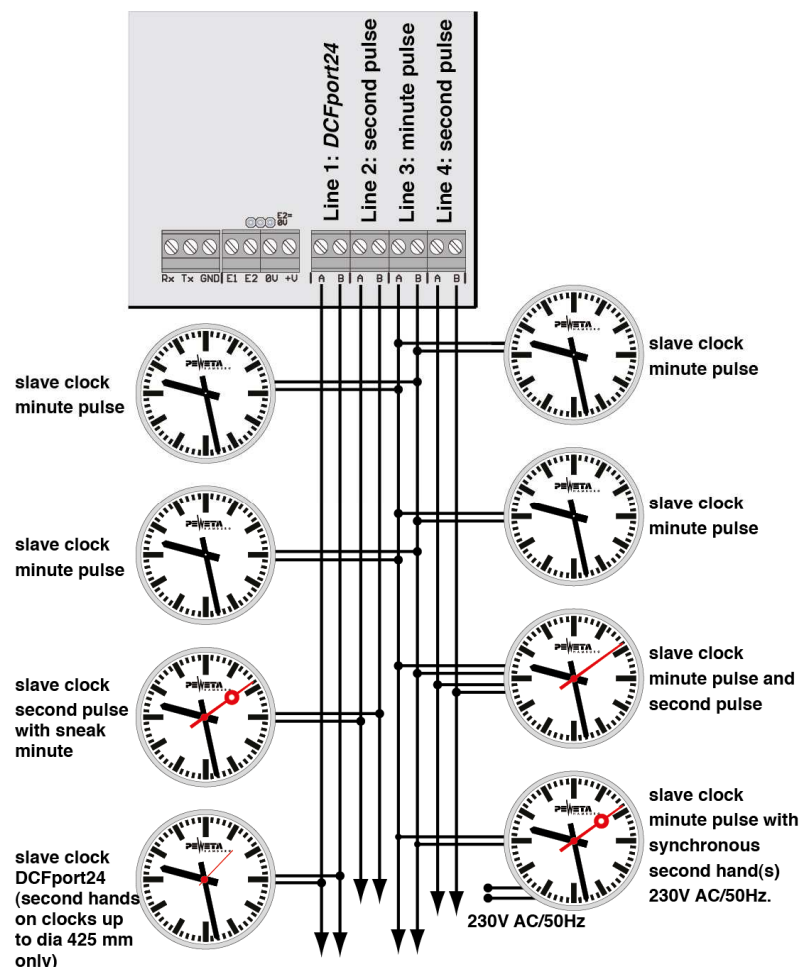
1. One slave clock line of your choice has to be defined as “seconds” pulse mode in menu 2.4.
2. In menu 2.5 cycles “12 hrs.” has to be entered/selected for this selected line.
3. Wire (=connect) all “seconds” pulse mode connectors of the slave clock movement to this slave clock line.
4. Set each of your slave clocks of this line manually (by hand) to an arbitrarily selected but **uniform (!) time**.
Note: Ideally the selected slave clock time should be **shortly before** the actual/present time (= time of the Master Clock), as with a too big (=long) time difference it may happen that due to construction this type of slave clock movements will “wait” for a period of approx. 22 hours before clocks will be adjusted!
5. Now **exactly** enter your arbitrarily selected slave clock time (hh:mm:ss) in menu 2.7.
6. Set the line to “status on” in menu 2.3 status. All correctly connected slave clocks of this line will now move automatically to the present local time (=time of the Master Clock), provided you have selected one of the offered time zones/city names or manually entered the local time as well in menu 1.4 for the Master Clock **and** in menu 2.2 “manually” for this slave clock line.

7. If the one or other slave clock (or one side of a double sided clock) lags **exactly 1 second** behind the set time after the move-up is completed, reverse polarity at the corresponding slave clock movement either by inverting the corresponding connector (or according to movement construction of other movement brands manufacturers) and manually (by hand) advance the slave clock by this missing 1 second. For additional information please also see installation instruction sheet for slave clock movement (coming with each PEWETA slave clock).

Connecting PEWETA slave clocks with DCFport24 pulse telegram movements PW 761 (mode: DCFport24)

Important: Position of hands (h/m/s) of **all** PEWETA DCFport24 pulse telegram slave clocks, whether connected or not, have to be ignored! They will be adjusted automatically!

1. Wire (=connect) all DCFport24 pulse telegram slave clocks you want to “address” to one slave clock line in parallel to the corresponding slave clock line terminals in the Master Clock, for example line 1.
2. **Do not manipulate arbitrary position of hands of the slave clocks!**
3. Provided pulse mode in menu 2.4 is set to “DCFport24”...
4. ...now set the line to “status on” in menu 2.3.
5. All hands (h/m/s) of correctly connected DCFport24 slave clocks will first move automatically to 12:00:00 position, then automatically to the present local time, provided you have selected one of the offered time zones/city names or manually entered the local time as well in menu 1.4 for the Master Clock **and** in menu 2.2 “manually” for this slave clock line.



Note: Above shown connecting scheme is just an example. Each of above indicated pulse mode can be selected in menu 2.4 for each individual slave clock line. **Remember:** Only one pulse mode per each slave clock line.

Connecting the Switch Circuits

Up to four (optional) switch circuits can be utilised to trigger visual and/or acoustic signalling devices or to switch on and/or off various equipment such as ventilation, heating, lighting, sirens etc..

All switch points are free-floating. Each (on/off) switch point can carry up to 250 VAC/2 A.

Devices to be switched by these contacts must have their own power supplies.

Table of abbreviations:

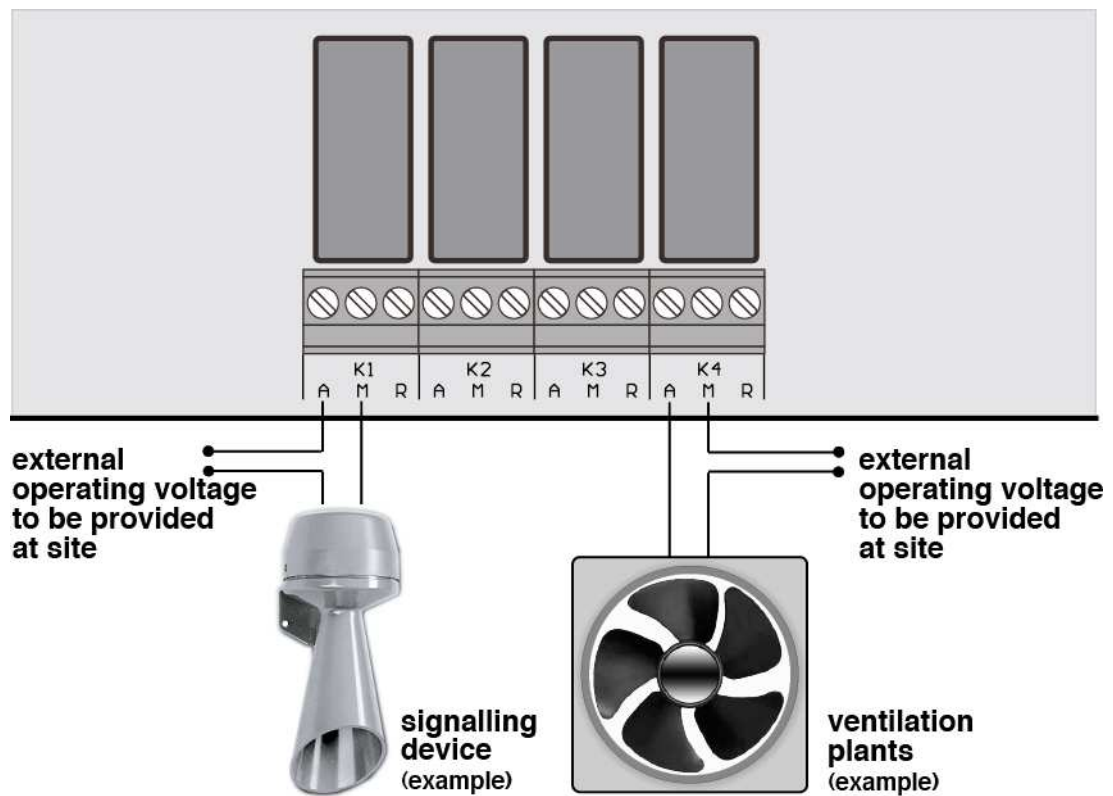
K 1 = switch circuit 1; K 2 = switch circuit 2; K 3 = switch circuit 3; K 4 = switch circuit 4.

A = normally open (NO) contact

M = common (C) contact

R = normally closed (NC) contact

- A and M form a making contact;
- M and R form a breaking contact.



Connecting the RS232 Interface

The RS232 interface of the Master Clock may be connected to customer's data processing device equipped with a similar interface port.

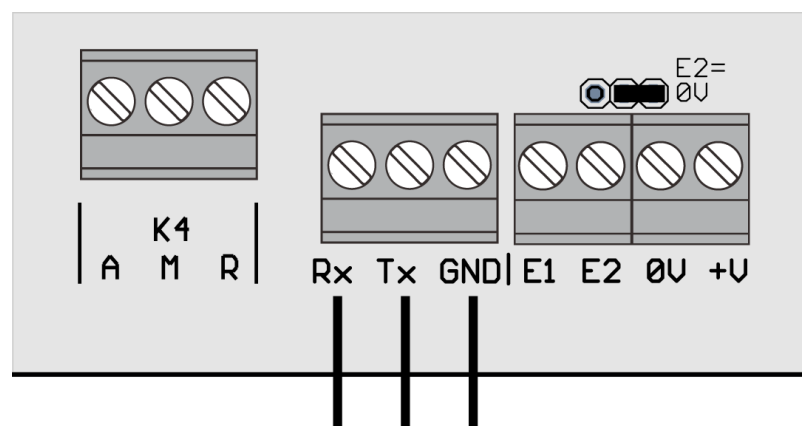
Note: "RS232 on" must be set in menu 5.5 system.

The adapter cable is to be connected as follows:

Rx = receive data → wire to pin 3 of a female 9-pin-sub-D connector

Tx = transmit data → wire to pin 2 of a female 9-pin-sub-D connector

GND = ground → wire to pin 5 of a female 9-pin-sub-D connector



Transmitting format/transmission protocol

The RS232 interface transmitting format is defined as follows:

8 bits per character
no parity
1 stop bit
9,600 baud

The transmission protocol (time protocol) is transmitted once per second and contains the complete time and date data including day-of-the-week as ASCII code in the following format:

time protocol transmitted: hh:mm:ss w dd.mm.yyCR
for example: 16:47:04 1 03.10.04¶

hh, mm, ss are place holders for current time (always transmitted in 24-hour format)

hh = hour from 00 to 23

mm = minute from 00 to 59

ss = second from 00 to 59

hour, minute and second are separated by colons (:)

one space (binary value "32")

w is place holder for day-of-the-week, 1 = Monday to 7 = Sunday

one space (binary value "32")

dd, mm, yy are place holders for day-in month, month and year

dd = day-in-month from 01 to 31

mm = month from 01 = January to 12 = December

yy = year-in-century from 00 to 99

Day, month and year are separated by periods (.)

CR = carriage return (¶) (binary value 13) is transmitted to signify end of message.

(This character may not be displayed by some terminal programs!)

Connecting the Alarm Contact

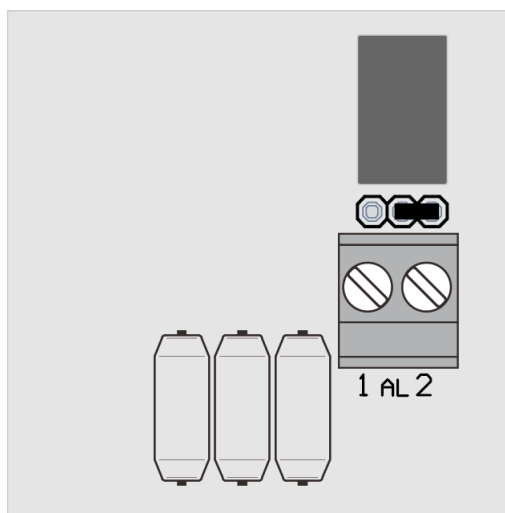
The Master Clock is equipped with an alarm contact for onward transmission of malfunction reports.

Above the "AL" terminal there is a three-pin "jumper" terminal:

With the jumper in the right-hand (= $\overline{2\ 3}$) position, the "AL" terminal is a "making" contact (**$\overline{2\ 3}$ is standard**).

Moving the jumper to the left-hand (= $\overline{1\ 2}$) position the "AL" terminal is a "breaking" contact.

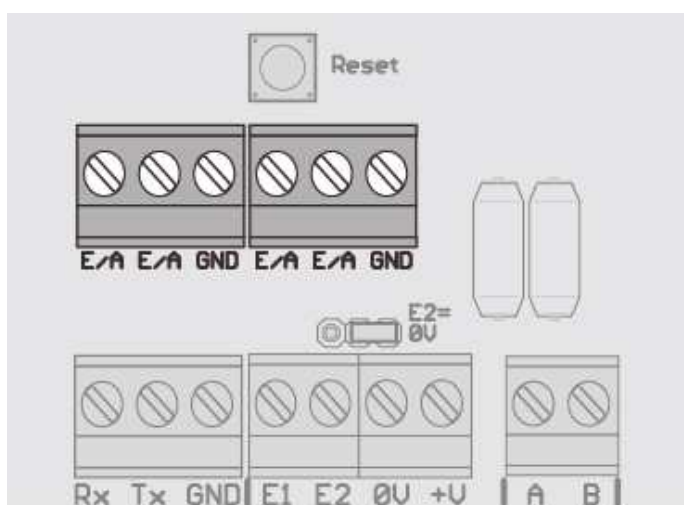
The "AL" terminal's contact points are free-floating, maximum permissible load is 30 V/0.5 A .



Connecting Option 1 and Option 2

Option 1 may be configured as GPS-version, option 2 may be configured as RS485 interface version.

If assigned (special version) please see corresponding menus, for example 6.1 and/or 7.1 and separate installation manual, coming with the Master Clock.



Initiate the Operating System, Start-up Menu

Menu 1: Master Clock

When power supply 230 VAC/50 Hz is connected and the mode selection switch is either set to 12 or 24 V slave clock line voltage (see pages 10, 13) **menu 1.1** will appear, on the display "1. 1 Hauptuhr" (or "1.1 Master Clock") is shown, indicating the Master Clock time and date (=system time and date) in normal mode, means "in operation". The display will start counting the seconds.

Important: If the Master Clock is supplied including a separate DCF77 receiver (see page 14) or as GPS-version (see page 15) for radio controlled time basis the exact current (=local) time will **automatically** set up, provided the DCF77 or GPS receiver has been correctly connected and orientated! In this case please allow approx. 5 minutes for the Master Clock to assume exact current time after final orientation of DCF77 resp. GPS receiver.

When DCF77 or GPS radio controlled time has been established successfully, you may skip directly to **menu 2.1** in this set-up routine.

Note: If DCF77 (approx. 2,000 km around Frankfurt/Main!) resp. GPS (worldwide) radio reception is disturbed or receipt is presently impossible follow **menus 1.2 and 1.3** to set system time to current (= local) time **manually**.

Menu 1.1 Master Clock

Master Clock in normal mode (in operation), time and date of the (clock) system

Whilst Master Clock is in operation **menu 1.1** will be displayed at any time. In this menu 1.1 system time and date can **only be read**, not changed.



The arrows ▼► indicate in which direction access to other menus may be gained.

Menu 1.2 System Time

Setting the time of the clock system manually

Select **menu 1.2** by either using the arrow keys ◀▲▼► or by directly dialling key combination "menue, 1, 2". A black square blinks alternately in place of the character you want to enter.

After input by key combination "menue, 1, 2" display shows:



Press "edit"...



...to manually enter the current **time** in the blinking black square by pressing number keys "0...9" as appropriate.

Should "edit" have inadvertently been pressed and the first digit blinks, press key combination "menue, 1, 1" to cancel without change.


When satisfactory entered the current time, press "edit" to confirm. The Master Clock will start keeping time with quartz accuracy (+/- 0.1 s/24 h).

Menu 1.3 System Date

Setting the system date manually

Select **menu 1.3** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination “menue, 1, 3”. A black square blinks alternately in place of the character you want to enter.

When “menue, 1, 3” is entered display shows:

The LCD display shows two lines of text. The first line is "1.3# master clock" and the second line is "date Fr 16.07.10". A small black square is positioned between the '#' and 'master' in the first line, and between 'Fr' and '16' in the second line.

Press “edit”...

The LCD display shows two lines of text. The first line is "1.3 master clock" and the second line is "date Fr 16.07.10". A small black square is positioned between the '#' and 'master' in the first line, and between 'Fr' and '16' in the second line.

...to enter the current **date** in the blinking black square by pressing number keys “0...9” as appropriate.

Should “edit” have inadvertently been pressed and the first digit blinks, press “menue, 1, 1” to cancel without change.

When satisfactory entered the current date, press “edit” to confirm. Date will be kept current from now on.

Menu 1.4 Setting the time zone

In this menu the **time zone** of the Master Clock can be selected. **CET/CEST is standard.**

Select **menu 1.4** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination “menue, 1, 4.”
A black square blinks alternately in place of the character you want to enter.

When “menue, 1, 4” is entered display shows:

```
1.4# Master Clock
time zone CET/CEST
```

Press “edit” and display will change to various city names...

```
1.4 Master Clock
time zone#LONDON
```

Use arrow keys ▲▼ to select your desired time zone, represented by the corresponding city names, and confirm with “edit”.

In addition to CET/CEST*, CET*, CEST* and UTC/ZULU* time, **22 time zones**, represented by city names, are already pre-set in the Master Clock with their corresponding UTC offsets (from West to East): Anchorage, Los Angeles, Denver, Chicago, San Salvador, New York, Panama, Caracas, Buenos Aires, Trinidad, London, Athens, Riad, Moscow, Abu Dhabi, Tashkent, New Delhi, Dhaka, Bangkok, Manila, Tokyo and Sydney.

Example 1: Will the Master Clock be installed in France: select "CET/CEST".

Example 2: Will the Master Clock be installed in England: select "London".

Example 3: Will the Master Clock be installed in Tunisia (presently no summer/wintertime change-over): select "CET".

Important: Should the Master Clock be installed in a country outside any of the pre-set time zones, enter “**manually**” here in menu 1.4 and define your individual time zone in menu 5.4 (see page 52). In menu 2.4 “manually” has to be defined for each slave clock line (see page 32).

- **CET/CEST*** = **C**entral **E**uropean **T**ime/**C**entral **E**uropean **S**ummer **T**ime
Offset: CET = UTC: +1:00 hour;
Offset: CEST = UTC: +2:00 hour;
Change-over from winter to summer time: beginning: = last Sunday in March, every year.
end: = last Sunday in October, every year.

Summer time is local time + 1:00 hour.
- **UTC*** = **U**niversal **T**ime **C**oordinated is the local time of longitude 0°. It is equivalent to astronomical winter time in Britain and differs slightly (~ 0,9 sec.) from TAI (International Atomic Time), corrected by the “leap second”. UTC has replaced GMT as international standard.

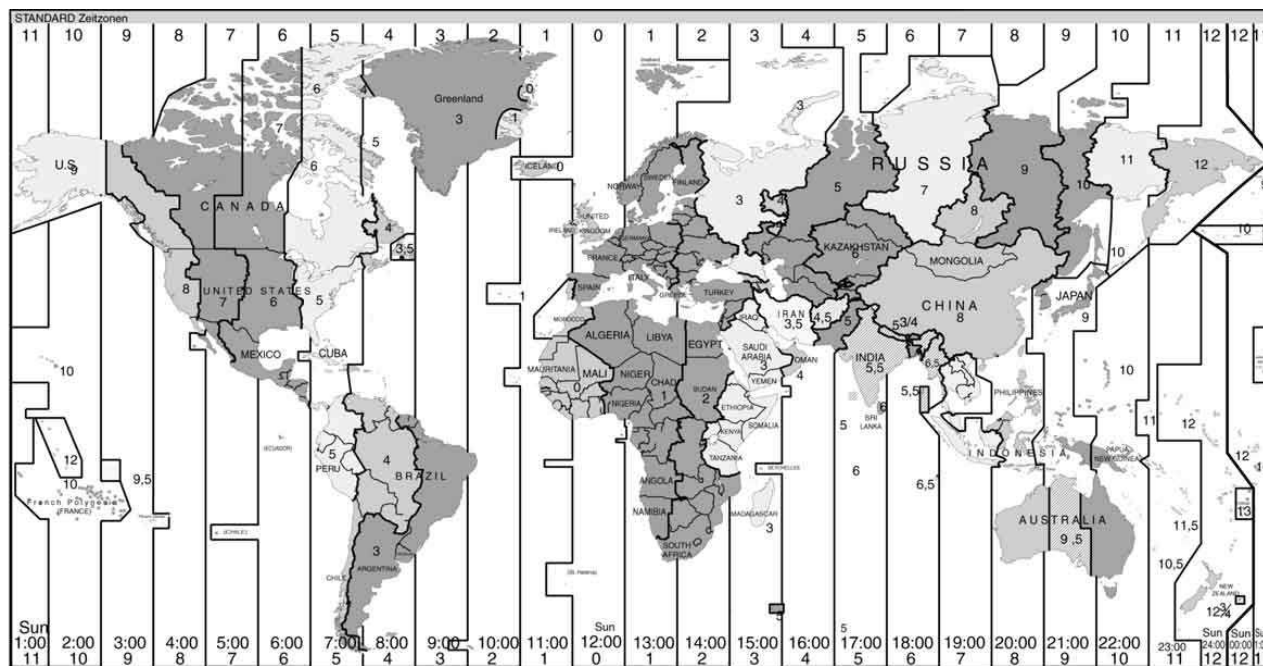
Offset: UTC = CET – 1:00 hour;
Offset: UTC = CEST – 2:00 hours.

There is no summer time in UTC.
- **Zulu*** = is a NATO (or any other) military time base, equivalent to **UTC**. (Z = Zero = 0).

Time Zones pre-set (= pre-programmed) in the Master Clock

Anchorage (USA)	UTC offset: - 9:00 h.	Begin of daylight-saving time:	Second Sunday in March.
		End of daylight-saving time:	First Sunday in November.
Los Angeles (USA)	UTC offset: - 8:00 h.	Begin of daylight-saving time:	Second Sunday in March.
		End of daylight-saving time:	First Sunday in November.
Denver (USA)	UTC offset: - 7:00 h.	Begin of daylight-saving time:	Second Sunday in March.
		End of daylight-saving time:	First Sunday in November.
Chicago (USA)	UTC offset: - 6:00 h.	Begin of daylight-saving time:	Second Sunday in March.
		End of daylight-saving time:	First Sunday in November.
San Salvador (El Salvad.)	UTC offset: - 6:00 h.	No daylight-saving time.	
New York (USA)	UTC offset: - 5:00 h.	Begin of daylight-saving time:	Second Sunday in March.
		End of daylight-saving time:	First Sunday in November.
Panama (Panama)	UTC offset: - 5:00 h.	No daylight-saving time.	
Caracas (Venezuela)	UTC offset: - 4:30 h.	No daylight-saving time.	
Buenos Aires (Argentina)	UTC offset: - 3:00 h.	Begin of daylight-saving time:	Third Sunday in October.
		End of daylight-saving time:	Third Sunday in March.
Trindade	UTC offset: - 2:00 h.	No daylight-saving time.	
London (England)	UTC offset: ± 0:00 h.	Daylight-saving time:	Same as CET/CEST.
Istanbul (Turkey)	UTC offset: + 2:00 h.	Daylight-saving time:	Same as CET/CEST.
Riad (Saudi Arabia)	UTC offset: + 3:00 h.	No daylight-saving time.	
Moscow (Russia)	UTC offset: + 3:00 h.	Daylight-saving time:	Same as CET/CEST.
Abu Dhabi (U.A.E.)	UTC offset: + 4:00 h.	No daylight-saving time.	
Tashkent (Uzbekistan)	UTC offset: + 5:00 h.	No daylight-saving time.	
New Delhi (India)	UTC offset: + 5:30 h.	No daylight-saving time.	
Dhaka (Bangladesh)	UTC offset: + 6:00 h.	No daylight-saving time.	
Bangkok (Thailand)	UTC offset: + 7:00 h.	No daylight-saving time.	
Shanghai (China)	UTC offset: + 8:00 h.	No daylight-saving time.	
Tokyo (Japan)	UTC offset: + 9:00 h.	No daylight-saving time.	
Sydney (Australia)	UTC offset: +10:00 h.	Begin of daylight-saving time:	Last Sunday in October.
		End of daylight-saving time:	Last Sunday in March.

Dates are without obligation and subject to change by national authorities. Status June 2010.



Menu 1.5

Checking the Time Reference

Will the Master Clock be synchronised to current time and date by an optional DCF77 (reception 2,000 km round Frankfurt/Main only) or by an optional GPS (worldwide reception) radio receiving aerial this menu offers options to check the radio synchronisation of time and date and the reception quality of the received radio signal.

Important! GPS antenna should be installed outdoors (when indoors: close to windows), "free sight to the sky", to find the satellites!

Checking the continuity of DCF77 or GPS radio signal reception

Select **menu 1.5** by either using the arrow keys ◀▲▼▶ or by directly dialling "menue, 1, 5". A black square blinks alternately in place of the character you want to enter.

After input by key combination "menue, 1, 5" display shows:

```
1.5# Master Clock
reference DCF  ✓  *
```

A check mark (✓) will indicate that synchronisation by either DCF77 or GPS radio signal has been achieved during the past 24 hours.

Should a question mark (?) be displayed instead of a check mark (✓) the DCF77 or GPS receiving aerial must be realigned, as the Master Clock has not achieved synchronisation during the past 24 hours and is only operating in quartz clock accuracy. If the Master Clock is intentionally operated as a quartz clock only, in this case the question mark will be the "okay-" indication. Accuracy in quartz mode is $\pm 0.1s$ within 24 hours. In case of change-over from summer to winter time and vice versa the corresponding dates have to be entered in menu 1.4 resp. menu 5.4. Corresponding time zone for the Master Clock (system time) must be entered in menu 1.4 and for the corresponding slave clock lines (slave clock time) in menu 2.2. Will the required time zone not be offered in menu 1.4 the required time zone may be manually entered in menu 5.4 "manuell".

Checking the date

If the Master Clock is in either DCF77 or GPS radio control mode, pressing the arrow key ▶ will call a sub-menu to show at what **date** the Master Clock achieved DCF77 or GPS*) radio time synchronisation latest.

```
1.5# Master Clock
L. sync.      16.07.10  *
```

Date when latest DCF77 or GPS*) radio time synchronisation was achieved.

Checking the time

Pressing the arrow key ▶ again will call the sub-menu to show the **time** of the latest DCF77 or GPS*) radio time synchronisation.

```
1.5# Master Clock
L. sync.      23:59:45  *
```

Time when latest DCF77 or GPS*) radio time synchronisation was achieved.

***) Note:** In case of GPS radio control the indicated date and time information is based on UTC-time!

Checking the quality of the radio signal

Pressing the arrow key ► once more will call the sub-menu radio reception **quality**. The number of black squares shown in the display represents the quality of radio reception. This can be used to align the DCF77 resp. GPS antenna.

```
1.5# master clock
receipt  -■■■■+  4
```

in case of DCF77 radio control:

- ■■■■ + = good radio reception
- ■■■ + = adequate radio reception
- ■■ + = poor radio reception, maybe no synchronization
- + = no radio reception, no DCF antenna connected

The operation can be interrupted at any time or leave this menu by pressing keys "menue, 1, 1" or by using the arrow keys.

```
1.5# master clock
receipt  -■■■■+  4
```

in case of GPS radio control:

- ■■■■ + = good radio reception
(more than 3 satellites will be received)
- ■■■ + = adequate radio reception
(3 satellites will be received)
- ■■ + = poor radio reception, maybe no synchronization
(less than 3 satellites)
- + = no radio reception, no GPS antenna connected

Menu 1.6

Altering the Hours Display (12/24 hrs mode)

Hours may be displayed in 12-hours mode (with suffix "a" for AM and "p" for PM) or 24-hours mode.

24-hours mode is standard.

Select **menu 1.6** by either using the arrow keys ◀▲▼▶ or by directly dialling the key combination "menue, 1, 6". A black square blinks alternately in place of the character you want to enter.

When "menue, 1, 6" is entered display shows:

```
1.6# master clock
hour mode    24 hrs.
```

Press "edit" to change display to...

```
1.6  master clock
hour mode  ^24 hrs.
```

...this setting. Pressing the ▲ key, the 12-hours mode can be selected. Confirm with "edit".

Example: standard mode 16:33:00 24-hour-mode
changed mode 04:33:00p 12-hour-mode

The operation can be interrupted at any time or leave this menu by key combination "menue, 1, 1".

Menu 1.7

Altering the Date Display

The display mode for the date can be either the sequence day-month-year or month-day-year.

Day-month-year mode is standard.

Select **menu 1.7** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 1, 7". A black square blinks alternately in place of the character you want to enter.

When "menue, 1, 7" is entered display shows:

```
1.7* master clock
date mode      t.m.j
```

Press "edit" to change display to...

```
1.7 master clock
date mode      m/d/y
```

... this setting. Pressing the ▲ or ▼ key, the date display mode can be selected. Confirm with "edit".

Example: standard mode 16.07.10 day.month.year mode
 changed mode 07/16/10 month/day/year mode

The operation can be interrupted at any time or leave this menu by key combination "menue, 1, 1".

Menu 2: Slave Clock Lines

Menu 2.1

Checking the current drain of slave clock lines

Current drain is displayed in amperes (A). Total current available is 1 A max. at 24 V line voltage or 2 A max. at 12 V. Actual current drain depends on line voltage either 24 V (1A) or 12 V (2A) and on the number of slave clocks per line (if Master Clock is equipped with only one line, only one line will be displayed).

Select **menu 2.1** by either using the arrow keys ◀▲▼▶ or by directly dialling the key combination "menue, 2, 1". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 1" is entered display shows:



The measured electrical power values are displayed in ampere (A) per line.

Load carrying capacity of the slave clock lines in the **24 V** mode:

- Minute pulses: Each line can carry a maximum current of 1 A.
One to four lines may be loaded to 1 A maximum in total.
- Half minute pulses: Each line can carry a maximum current of 1 A.
One to four lines may be loaded to 1 A maximum in total.
- Second pulses: One line may be loaded to a maximum of 0.2 A only.
One to max. four lines may be loaded to a maximum of 0.2 A in total only.
The difference to the load of 1 A maximum in total may be filled up by minute pulse slave clocks, minimum 2 lines provided ("one mode per line").
- *DCFport24* telegrams: One line may be loaded to a maximum of 0.25 A only.
One to max. four lines may be loaded to a maximum of 0.25 A in total only.
The difference to the load of 1 A maximum in total may be filled up by minute pulse slave clocks, minimum 2 lines provided ("one mode per line").

At 12 V line voltage, twice the current as stated above may be drawn. Each individual line is, however, limited to a maximum of 0.5 A.

Power drain of different PEWETA slave clockworks/movements

Minute pulse slave clockwork/movement	6 mA at 24 V, 12 mA at 12 V line voltage
Half-minute pulse slave clockwork/movement	6 mA at 24 V, 12 mA at 12 V line voltage
Minute/second pulse slave clockwork/movement	6 mA at 24 V, 12 mA at 12 V line voltage for "minutes line" 6 mA at 24 V, 12 mA at 12 V line voltage for "seconds line"
second pulse slave clockwork/movement (creeping minute)	6 mA at 24 V, 12 mA at 12 V line voltage
<i>DCFport24</i> slave clockwork/movement	10 mA at 24 V, 10 mA at 12 V line voltage

(Coil resistance of the slave clockworks/movements: at 24 V line voltage = 4 kΩ, at 12 V line voltage = 1 kΩ.)

Menu 2.2

Setting the time zone of one or several slave clock line(s)

This menu is used to set time zones of slave clock line(s). **CET/CEST is standard.**

Select **menu 2.2** by either using the arrow keys ◀▲▼▶ or by directly dialling the key combination "menue, 2, 2". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 2" is entered display shows:

```
2.2# line 1
time zone CET/CEST
```

First, select the line by using number keys #1...#4.
Press "edit" to get to the time zones...

```
2.2 line 1
time zone#LONDON
```

...represented by 22 international city names.
Press arrow key ▲ or ▼ repeatedly to select desired time zone, press "edit" to confirm.

Following **22 time zones**, represented by international city names are pre-set (=pre-programmed) in the Master Clock already with their corresponding UTC offsets, until year 2084, without obligation and subject to change (from West to East): Anchorage, Los Angeles, Denver, Chicago, San Salvador, New York, Panama, Caracas, Buenos Aires, Trindade, London, Athens, Riad, Moscow, Abu Dhabi, Tashkent, New Delhi, Dhaka, Bangkok, Manila, Tokyo and Sydney.

Also time zones CET/CEST, CET, CEST, UTC (= ZULU) are pre-set as well as the possibility to **manually** enter an individually selected time zone. Additional information please see page 52.

Note: For **world time clocks** each slave clock line may be set to a different time zone.

Important! If a time zone is not offered for selection, it may be **manually** defined in menu 5.4.

Menu 2.3

Setting the slave clock lines "on" and "off"

This menu is used to set the slave clock lines "on" or "off". **"off" is standard.**

Select **menu 2.3** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 2, 3". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 3" is entered display shows:

```
2.3# line 1
status on
```

First, select the line by using number keys #1... #4.
Confirm with "edit" to get to...

```
2.3 line 1
status #on
```

...the status "on" or "off". Either ▲ or ▼ will be displayed.
Press arrow key ▲ or ▼ to change status.
Confirm with "edit". Will status be changed from "off" to "on", all correctly connected slave clocks of this line will automatically adjust to the current time (= time of the Master Clock = system time).

Important! When status is changed from "off" to "on" all slave clocks will automatically adjust to current time (=systemtime).

Menu 2.4

Setting the pulse mode

This menu is used to set the pulse mode of each slave clock line to either minutes, half-minutes or seconds pulses or to **DCFport24** pulse telegram.

Select **menu 2.4** by either using the arrow keys ◀▲▼▶ or by directly dialling the key combination "menue, 2, 4". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 4" is entered display shows:

```
2.4# line 1
node      minutes
```

First, select the line you want to set by using number keys #1...#4. Press "edit" to select the required pulse mode.

```
2.4 line 1
node      ^minutes
```

Left-hand of the pulse mode currently set, an ▲ or ▼ arrow will appear. Use arrow keys ▲ or ▼ to set the desired mode. Confirm with "edit".

pulse modes available:

minutes = alternating polarity pulses at 1 minute intervals to operate/control minute pulse slave clocks without second hands. **"minutes" is standard.**

1/2-minutes = alternating polarity pulses at ½-minute intervals to operate/control half-minute pulse slave clocks.

Seconds = alternating polarity pulses at 1 second intervals to operate the second hands of so-called minute/second pulse slave clocks. **Note:** Additionally, minute pulses from a separate line are needed to operate the hour and minute hands of these minute/second pulse slave clocks.

DCFport24 = positive polarity DCF77 pulse telegram to operate PEWETA **DCFport24** slave clocks.

<u>Note!</u>	Simultaneous operation of choice of a.m. pulse modes is possible, provided Master Clock is equipped with minimum 2 slave clock lines ("one mode per line").
---------------------	---

Menu 2.5

Setting the update cycle

This menu is used to set the updating cycle of each slave clock line.

Select **menu 2.5** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 2, 5". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 5" is entered display shows:

```
2.5# line 1
cycle      12 hrs.
```

First, select the line you want to set by using number keys #1...#4. Press "edit" to select the cycle.

```
2.5 line 1
cycle      ^12 hrs.
```

Left-hand of the cycle mode currently set, an ▲ or ▼ arrow will appear. Using arrow keys ▲ or ▼ to set the desired cycle. Confirm with "edit".

Select one of following cycles:

- 60 sec. = for all slave clocks with second hands in minute/second pulse analog slave clocks
- 12 hrs. = for all analog slave clocks controlled by minute- or half-minute pulses, also for second pulse slave clocks with "creeping" minute hands. **"12 hrs" is standard.**
- 24 hrs. = for all LED/LCD digital slave clocks with 24-hour displays
- 1 week = for all LED/LCD digital slave clocks with additional date displays
- [AUTO] = for all analog and digital **DCFport24** slave clocks (is set automatically when line is set to **DCFport24**, can not be altered)

Menu 2.6

Setting the Power Failure Reserve

This menu is used to set the power failure reserve battery/back-up battery (if Master Clock is equipped accordingly) to "on" or "off" for slave clock lines. **"On" is standard.**

Select **menu 2.6** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 2, 6". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 6" is entered the display shows:

```
2.6# line 1
battery on
```

Choose the desired line by using number keys #1...#4. Then press "edit"...

```
2.6 line 1
battery ^on
```

... to see an arrow left to status "on".
Press arrow key ▼ to set battery "on" for this line.
Press arrow key ▲ to set battery "off" for this line.
Press "edit" to confirm.

In case of power failure a back-up battery in the Master Clock (if equipped) will keep the slave clock lines with reserve set "on" going. If the power outage is of longer duration and battery voltage drops below 21 V in 24 V mode (resp. below 10 V in 12 V mode) the lines will be turned off, all slave clocks will stop.

In Master Clocks with more than one connected slave clock line, the power failure reserve time of one line can be extended by setting another line's power outage reserve to "off".

Important! When mains power is restored all slave clock lines connected will **automatically** be updated to current time.

Menu 2.7

Adjusting the Time of Slave Clock Lines

This menu is used to adjust each slave clock line to current local time (or world times in a world time clock system) at start-up or after malfunctions.

Important 1: Check and make sure that corresponding slave clock line(s) have been switched “off” in menu 2.3. “Off” is standard (=pre-set) when clock is been delivered.

Important 2: Decide whether you want to connect and control/operate either

- a) conventional analog slave clocks
(pulse mode: either minute or minute/second alternating pulses 12/24 V, PEWETA slave clock item numbers start with 71.., 72.., 73.. or 74..) **or**
- b) PEWETA *DCFport24* pulse telegram slave clocks
(pulse mode *DCFport24*, PEWETA slave clock item numbers either start with 81.. or 83.. for digital clocks) **or**
- c) a combination out of above mentioned pulse modes
(Master Clock with minimum 2 slave clock lines is obligatory, “one mode per line”).

Important 3:

In case of a) please follow the instructions described under **Important 4** and following text.
In case of b) please follow the instructions described under ***DCFport24* slave clocks** (page 37)
In case of c) please follow the instructions described under a) and b) individually for each line/pulse mode.

Important 4: Please make sure that all analog slave clocks, operated by either alternating minute pulses 12/24 V or by alternating minute/second pulses 12/24 V, show an arbitrarily but **uniform (!) time**. You may adjust this arbitrarily but uniform time by the small adjusting wheels directly at each slave clock movement. **This does not apply to *DCFport24* slave clocks! See page 21.**

Select **menu 2.7** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 2, 7". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 7" is entered the display shows:

```
2.7# line 1
slavetime 03:00:---
```

Select the line to be adjusted by using number keys #1...#4. The display shows an arbitrarily slave time. Confirm with “edit”.

```
2.7 line 1
slavetime 12:00:---
```

Now enter the manually set uniform (!) time of the slave clocks connected to this line by using number keys #1...#9. Confirm with “edit”.

Important 5: Now select menu 2.3 (lines “on”/“off”) by using the corresponding keys and **start** the line you just entered the uniform time, for example line 1. Switch line 1 “on”.

All correctly connected slave clocks of this line will automatically adjust to the correct local time. Have the slave clocks been addressed to **more than 1 slave clock line** (Master Clock with minimum 2 slave clock lines is obligatory) proceed for each slave clock line separately, exactly as described above, resp. as follows on page 35 in case of different pulse mode(s).

Digital slave clocks with date:

- 1) Select "1 week" in **menu 2.5** (cycles).
- 2) Here in **menu 2.7** you have to enter the current day of the week (1=Monday, 7=Sunday). Enter sub-menu with arrow key ►, confirm with "edit" and select current weekday. Confirm with "edit".
- 3) Start corresponding slave clock line(s) in **menu 2.3**.

DCFport24 pulse telegram analog slave clocks

- 1) Correctly connect all *DCFport24* slave clocks to that slave clock line(s) which you defined as DCFport24 in **menu 2.4**.
- 2) Start corresponding slave clock line(s) in **menu 2.3**.
- 3) All correctly connected *DCFport24* analogue slave clocks will **automatically** adjust to current time, first to 12 o'clock position, then to current time.

Menu 2.8

Setting Pulse Length/Pause

This menu is used to set the pulse length of minutes, half-minutes and seconds pulses.

Important: There is no need and no means to change pulse length of the *DCFport24* pulse telegram!

Select **menu 2.8** by either using the arrow keys ◀▲▼▶ or by directly dialling the key combination "menue, 2,8". A black square blinks alternately in place of the character you want to enter.

When "menue, 2, 8" is entered the display shows:

```
2.8* line 1
pulselen. 2.0s
```

First, select the line by using number keys #1...#4. Pulse length initially set on this line will be shown. Press "edit" to change it ("menue" for return).

```
2.8 line 1
pulselen. █.0s
```

Enter desired pulse length (max. 9.9 sec.) by using number keys #0...#9. Confirm with "edit".

Standard pulse lengths are:	minute pulses	1 second (default setting)
	half-minute pulses	1 second
	second pulses	1 second (polarity shifts from positive to negative and vice versa without pause)

In minutes and half-minutes modes, the relation of pulse length to pause length is fixed at ratio 1:2, means length of pause is twice the time as pulse length.

Examples of pulse length/pause length in **minutes mode**:

a pulse length of 1 second entails a pause length of 2 seconds

a pulse length of 2 seconds entails a pause length of 4 seconds and so on.

Note: In **seconds** mode, **pulse** length is 0.5 sec. during adjustment. As in normal mode, **pause** length during adjustment is 0.0 sec.

Menu 3: Switching (Switch Channels)

Menu 3.1

Status of Switch Channels

If the Master Clock is equipped with switch channels (see page 7) in this **menu 3.1** the status of switch channels may be viewed, but can not be altered. Channels 1...4 (if applicable) are shown from left to right, indicating individual status.

- A number, 1...4, indicates corresponding channel is "on".
- A dash (-) in place of the number indicates corresponding channel is "off".
- A dot to the right of the dash (-.) indicates "channel off and locked".
- A dot to the right of a number 4. indicates "channel on and locked".

```
3. 1- switch channels
status      - 2 -. 4.
```

channel No. 1: off
channel No. 2: on
channel No. 3: off and locked
channel No. 4: on and locked (examples only)

```
3. 1- switch channels
status      - - - -
```

When delivered, no switching action is been programmed.
A dash will represent every channel installed, if Master Clock is equipped accordingly.

Menu 3.2

General procedure for programming switch channels

For better understanding please also follow the display schematics and descriptions of the following pages.

1. Select **menu 3.2** by either using the arrow keys ◀ ▲ ▼ ▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately with the character you want to enter.
2. Select channel by using number keys #1...#4, the number will be shown on the display.
3. Press arrow key ▶, repeatedly if needed, until "**new**" is displayed on the right-hand in the upper line (unless it is already shown), see pictures of next page(s).
4. Press "edit", use arrow key ▲ to select "program week" or "program year" and press "edit" to confirm.
5. Using number keys #1...#7, select day(s)-of-week (1=Monday, 7=Sunday) or, in case of "program year", using number keys #0...#9, to enter the date for the switch action.
6. Enter the time and press "edit" to confirm.
7. Use arrow keys ▲ or ▼ to select the desired operation:
"pulse" will turn the channel "on" for a certain period (to be defined) at the time you programmed,
"on" will turn the channel "on" for an indefinite period,
"off" will cancel either of the above selections,
"lock" will inhibit execution of all switch instructions entered on this channel,
"unlock" will cancel a previous "lock" set on this channel.
Press "edit" to confirm.
8. If the selected function is either "on" or "off", programming for a week would be completed now.
9. If the selected function, however, is "pulse", the **duration** must be set, using number keys #0...#9. Duration may be from 1...60 seconds. Press "edit" to confirm.
10. The display will now offer a selection of **repetitions** "0...3". If the pulse is not to be repeated, press "edit". Else press number key #1 for 1 repetition (2 pulses total), key #2 for 2 repetitions (3 pulses total) or key #3 for 3 repetitions (4 pulses total), 3 repetitions is maximum. Press "edit" to confirm.

Entering a week's program

Example 1: "pulse" program for a week

Assume channel 1 to control the bells in a school building, which are supposed to ring Monday through Friday at 08:00:00 for a duration of 4 seconds. Enter this program with the following steps:

Select **menu 3.2** by either using the arrow keys ◀▶▶▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately in place of the character you want to enter.

When "menue, 3, 2" is entered display shows:

```
3.2# channel 1  new
----- 00:00:00  ---
```

Select channel 1 (unless it is not already shown) by pressing number key #1. Press arrow key ▶ until "new" is shown top right (unless it is not already shown). Press "edit" to confirm ("menue" to cancel).

```
Program node
^Program week
```

Use arrow keys ▲▼ to select mode "program week" (unless it is not already shown) and confirm with "edit" ("menue" to cancel).

```
day of week
MDMDF--
```

Use number keys #1...#7 (1=Mo, 7=Su) to enter the days on which the bells are to ring. In our example keys #1...#5 for Monday till Friday. Press "edit" to confirm ("menue" to cancel).

```
time
08:■0:00
```

Also use number keys to enter the **time**. A black square blinks alternately with the character you are dialling. Press number keys #0 and #8 for 08:00:00. Press "edit" to confirm ("menue" to cancel).

```
function
^Pulse
```

Select the **function** to be performed, using arrow keys ▲▼, in this case "pulse". Press "edit" to confirm ("menue" to cancel).

```
duration(1-60s.)
■4
```

Use number keys to enter **duration**, in this case #0 and #04 for 4 sec. A black square blinks alternately with the character you are dialling. Press "edit" to confirm ("menue" to cancel).

```
repeat (0-3)
0
```

In the next sub-menu "repeat", enter #0 as number for **no repetitions**. Press "edit" to confirm ("menue" to cancel).

```
3.2# channel 1  _1#
MDMDF-- 08:00:00  P1
```

Programming is completed. The display shows the data you entered. The figure at the right in the top line indicates which position your switch instruction has in the channel's programming. In this example, "1" stands for 1st instruction in channel 1, "pl" stands for "pulse" is programmed.

Example 2: timed switching "on", once a week

Assume a lighting system of the school, connected to channel 2, is supposed to be turned **on** at 17:00:00 hours each Wednesday ("off" see example 3, bottom this page).

Select **menu 3.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately in place of the character you want to enter.

When "menue, 3, 2" is entered the display may show (example):

```
3.2# channel 2  new
----- 00:00:00  ---
```

Select channel 2 by number key #2. Press arrow key ▶ until "new" is shown top right (unless it is not already shown).

Press "edit" to confirm ("menue" to cancel).

```
Program mode
*Program week
```

Confirm "program week" with "edit" key.

```
day of week
MTWTF
```

Select Wednesday by pressing number key #3 (1=Mo, 7=Su), confirm with "edit".

```
time
17: 00:00
```

Enter the **time** 17:00:00 hours by pressing number keys #1 and #7 for 17:00:00. A black square blinks alternately with the character you are dialling.

Press "edit" to confirm ("menue" to cancel).

```
function
*on
```

Select the **function** to be performed, using arrow keys ▲ ▼, in this case "on".

Press "edit" to confirm ("menue" to cancel).

```
3.2# channel 2  _1▶
--M----- 17:00:00  on
```

Programming is completed. The display shows the data you entered. The figure at the right in the top line indicates which position your switch instruction has in the channel's programming. In this example, "1" stands for 1st instruction in channel 2, "on" stands for "on" is programmed.

Example 3: timed switching "off", once a week

Assume the above lighting system, connected to channel 2 and turned on at 17:00:00 hours on Wednesday, is to be turned **off** at 23:00:00 hours.

Follow procedure as described above, however, until sub-menu "time" only.

```
function
*off
```

In „time“ enter #2 and #3 for 23:00:00, confirm with "edit". In "function" enter "off" by using arrow keys, confirm with "edit". Programming is completed.

Programming for a Year

Example 3: timed switching "on", once a year

Assume the lighting system of the school, connected to channel 2, is supposed to be turned **on** at 18:00:00 hours on November 22nd only. (Note: every Nov. 22nd if not deleted later, see menu 3.2 "delete entry", page 45).

Select **menu 3.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately in place of the character you want to enter.

When "menue, 3, 2" is entered, the display may show a time or the previous program of this menu.

```
3.2# channel 2 new#
----- 00:00:00 ---
```

Select channel 2 by pressing number key #2, press arrow key ▶, repeatedly if needed, until "new" is shown in the display top right. Confirm with "edit" ("menue" to cancel).

```
program mode
#program year
```

Use arrow keys ▲▼ to select mode „program year“, confirm with "edit" ("menue" to cancel).

```
date
22.1#
```

Enter the **date** by pressing number keys #2 and #1 for 22.11. A black square blinks alternately with the character you are dialling. Press "edit" to confirm ("menue" to cancel).

```
time
18:##0:00
```

Enter the **time** by pressing number keys #1 and #8 for 18:00:00 hours. A black square blinks alternately with the character you are dialling. Press "edit" to confirm ("menue" to cancel).

```
function
#on
```

Select the **function** to be performed, using arrow keys ▲▼, in this case "on". Press "edit" to confirm ("menue" to cancel).

```
3.2# channel 2 ___3#
22.11 18:00:00 on
```

Programming is completed. The display shows the data you entered. The figure at the right in the top line indicates which position your switch instruction has in the channel's programming. In this example, "3" stands for 3rd instruction in channel 2, "on" stands for "on" is programmed.

Example 4: timed switching “off”, once a year

The lighting system, connected to channel 2, has to be switched **off** at 19:00:00 hours on November 22nd only. (Note: every Nov. 22nd if not deleted later, see menu 3.2 “delete entry”, page 44).

Select **menu 3.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately in place of the character you want to enter.

When „menue, 3, 2“ is entered the display may show a time or the previous program of this menu.

```
3.2# channel 2 new#
----- 00:00:00  ---
```

Select channel 2 by pressing number key #2, press arrow key ▶, repeatedly if needed, until “new” is shown in the display top right. Confirm with „edit“ („menue“ to cancel).

```
Program mode
#Program year
```

Use arrow keys ▲▼ to select mode “program year”, confirm with “edit” (“menue” to cancel).

```
date
22/1#
```

Enter the **date** by pressing number keys #2 and #1 for 22.11. A black square blinks alternately with the character you are dialling. Press “edit” to confirm (“menue” to cancel).

```
time
19:##0:00
```

Enter the **time** by pressing number keys #1 and #9 for 19:00:00 hours. A black square blinks alternately with the character you are dialling. Press “edit” to confirm (“menue” to cancel).

```
function
#off
```

Select the **function** to be performed, using arrow keys ▲▼, in this case “off”. Press “edit” to confirm (“menue” to cancel).

```
3.2# channel 2 _4#
22/11 19:00:00 of
```

Programming is completed. The display shows the data you entered. The figure at the right in the top line indicates which position your switch instruction has in the channel’s programming. In this example, “4” stands for 4th instruction in channel 2, “of” stands for “off” is programmed.

Example 5: Year program „locked“

The break bells of a school are attached to channel 1. The break bells must not ring due to school vacation from July 24th, 08:00:00, to August 4th, 00:00:00.

Select **menu 3.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately in place of the character you want to enter.

When „menue, 3, 2“ is entered the display may show a time or the previous program of this menu.

```
3.2# channel 1 new#
----- 00:00:00 ----
```

Select channel 1 by pressing number key #1, press arrow key ▶, repeatedly if needed, until "new" is shown in the display top right. Confirm with "edit" ("menue" to cancel).

```
program mode
+program year
```

Use arrow keys ▲▼ to select mode "program year", confirm with "edit" ("menue" to cancel).

```
date
24.0■.
```

Enter the **date** by pressing the corresponding number keys for 24.07. A black square blinks alternately with the character you are dialling. Press "edit" to confirm ("menue" to cancel).

```
time
08:■0:00
```

Enter the **time** by pressing the corresponding number keys for 08:00:00. A black square blinks alternately with the character you are dialling. Press "edit" to confirm ("menue" to cancel).

```
function
#lock
```

Select the **function** to be performed, using arrow keys ▲▼, in this case "lock". Press "edit" to confirm ("menue" to cancel).

```
3.2# channel 1 _2#
24.07. 08:00:00
```

Programming is completed. The display shows the data you entered. The figure at the right in the top line indicates which position your switch instruction has in the channel's programming. In this example, "2" stands for 2nd instruction in channel 1, "lo" stands for "locked" is programmed.

Important: Programming of the school bells (in our example 1, page 39, Monday to Friday for 4 sec. each week) has now been locked as from 24.07., 08:00:00, and **for all following days**. To activate the programming this locking has to be **released**, see next example 6 "unlock".

Example 6: Year program “unlock”

The locked program on channel 1, see example 5 on page 42, shall be released as per August 4th, 00:00:00.

Select **menu 3.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately in place of the character you want to enter.

When „menue, 3, 2“ is entered the display may show a time or the previous program of this menu.

```
3.2# channel 1 new#
----- 00:00:00 ----
```

Select channel 1 by pressing number key #1, press arrow key ▶, repeatedly if needed, until “new” is shown in the display top right. Confirm with “edit” (“menue” to cancel).

```
Program mode
+Program year
```

Use arrow keys ▲▼ to select mode “program year”, confirm with “edit” (“menue” to cancel).

```
date
04.08.
```

Enter the **date** by pressing the corresponding number keys for 04.08. A black square blinks alternately with the character you are dialling. Press “edit” to confirm (“menue” to cancel).

```
time
00:■0:00
```

Enter the **time** by pressing the corresponding number keys for 00:00:00. A black square blinks alternately with the character you are dialling. Press “edit” to confirm (“menue” to cancel).

```
function
#unlock
```

Select the **function** to be performed, using arrow keys ▲▼, in this case “unlock”. Press “edit” to confirm (“menue” to cancel).

```
3.2# channel 1 __3#
04.08 00:00:00 ul
```

Programming is completed. The display shows the data you entered. The figure at the right in the top line indicates which position your switch instruction has in the channel’s programming. In this example, “3” stands for 3rd instruction in channel 1, “ul” stands for “unlocked” is programmed.

Note: In our example school bells will now ring again as from Aug. 4th, 08:00:00 hours, as programmed in channel 1, every Monday to Friday, however, until next year Juli 24th, 08:00:00 hours only, as programmed “locked” this way! To delete programmed instruction(s) please see menu 3.2 “delete entry”, page 45

Menu 3.2

Delete individual switch instructions (switch times)

Each **individual** switch instruction (switch time) of each separate switch channel can may be erased **one by one** in **menu 3.2**. If you want to delete all switch times of a switch channel proceed to menu 3.3.

Select **menu 3.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 2". A black square blinks alternately in place of the character you want to enter.

Select the appropriate channel by pressing number keys #1...#4.

The recently entered switch instructions will be displayed. You may leaf ("scroll") through each switch time(s) of each channel with the arrow keys ◀▶.

```
3.2# channel 1  _1▶
MTWTF-- 08:00:00 P1
```

Select the individual instruction of the corresponding channel you want to delete, in this example instruction - -1 in channel 1.
Press number key #0.

```
delete entry?
NO=1          YES=2
```

The display shows „delete entry?“

Enter #1 if you do not want to delete the switch instruction.
Enter #2 for deletion of **this** switch instruction.

Switch times (=switch instructions) can be erased **one by one** for every separate channel. If further switching instructions of the same channel shall be erased one by one, proceed as described above.

If single switch instructions of another channel shall be erased **one by one**, you select the corresponding channel with the number keys #1...#4 and proceed as described above.

Menu 3.3

Delete all switch instructions (switch times)

All switch instructions (switch times) of each separate channel may be deleted in **menu 3.3**.

Select **menu 3.3** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 3". A black square blinks alternately in place of the character you want to enter.

Select the appropriate channel by pressing number keys #1...#4.

The recently entered switch instructions will be displayed. You may leaf through ("scroll") each switch time(s) of each channel with the arrow keys ◀▶.

```
3.3# channel 1
delete all?
```

Press the key „edit“ if you want to delete **all** switch instructions of channel 1.

```
delete all?
NO=1          YES=2
```

NO = 1, YES = 2 will be indicated.

Enter #1 if you do not want to delete the switch instruction.
Enter #2 if you want to delete **all** switch instructions.

If **all** switch instructions of another channel shall be deleted, you select the corresponding channel with the number keys #1...#4 and proceed as described above.



Menu 3.4

Manual setting of switch channels ("test")

Each individual switch channel may be switched **manually** with this menu 3.4.

This menu 3.4 enables functionality test(s) on correctly connected optical and/or acoustical signal devices. If the required channel will be switched **on** the signal device(s) operate. After this test turn channel **off** again. If a switch program has already been entered it will not be effected, deleted or erased.

Select **menu 3.4** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 3, 4". A black square blinks alternately in place of the character you want to enter.

The recently entered switch instructions will be displayed. You may leaf through ("scroll") each switch time(s) of each channel with the arrow keys ◀▶.

```
3.4* switch channels
manual      - 2 - -
```

Press number keys #1...#4 to turn required channel **on**.
Press number keys #1...#4 again to turn same channel **off**.

Menu 4: Reports (= messages) of the System

Menu 4.1

Reports (= messages)

The Master Clock supervises the clock system on following errors:

- 1) Short-circuit of slave clock line(s)
- 2) Over-load of individual slave clock line(s)
- 3) Over-load of the clock system (total line load/total output power of the Master Clock exceeded)
- 4) Power failure
- 5) Low voltage
- 6) Battery back-up (accumulators) empty – system stopped

Select **menu 4.1** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 4, 1". A black square blinks alternately in place of the character you want to enter.

Important: Merely the **number** of error messages is **displayed** in menu 4.1. The error messages will be **processed/cleared** in menu 4.2 only.

If one of the errors mentioned above occurs, the number in the display (2) increases by the value 1, up to max. 8. As long as an error is stored, the red "alarm" LED below the display lights up and the alarm contact is switched on.

When "menue, 4, 1" is entered display shows (example):

4. 1+ messages(2)

Example shows 2 error messages in error list "(2)". Press arrow key ▼ to enter menu 4.2.

Menu 4.2

Edit on messages

The messages are **stored** and may **deleted** in menu 4.2. Up to max. 8 messages will be stored, however, the latest message is at first place.

Select **menu 4.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 4, 2". A black square blinks alternately in place of the character you want to enter.

When "menue, 4, 2" is entered display shows:

4. 2+ messages 1/2+
L3 short-circuit

The messages can be leafed through (= scrolled) with arrow keys ◀ and ▶ and deleted with the key "edit". Example shows 1 of 2 stored error messages, in this case "short-circuit on line 3".

If error counter (error list) is set to 0, the red "alarm" LED will go off, the alarm contact will be switched off.

Attention: If an error message will be deleted the failure itself (e.g. short-circuit) is, of course, **not** been repaired!

1) Short-circuit on slave clock line(s)

```
4.2* messages 2/2*
L4 short-circuit
```

```
line 4 set?
NO=1 YES=2
```

With left shown message „short-circuit on line 4“ (example), a dialogue will be initiated which allows to start the slave clock line as follows:

- Always repair failure first!
- Press „edit“ to delete error message.
- Confirm with number key #2 (= yes) to set (=start) line 4. All correctly connected slave clocks of this line will automatically adjust to the correct time.

Tip:

You may **delete** error message by pressing number key #1 before repair, however, line will not be adjusted! The advantage would be: if a loud acoustic signal is connected to the **alarm contact** you may switch off the disturbing signal only. **Now repair failure (!)** on slave clock line and start slave clock line 4 in menu 2.3 (see page 33).

2) Overload of single slave clock lines

Number of slave clocks of a **single** line exceeds the max. output power. Load carrying capacity of each single slave clock line please see page 33, resp. menu 2.1. Consumption (= power drain) of each slave clock movement see page 33, or label on corresponding slave clock movement itself.

Debug: Reduce number of slave clocks of the corresponding line(s) or install a PEWETA booster amplifier (type series 930) for further extension of the output power.

After repair of the failure press „edit“ key in menu 4.2 to delete the error message **“overload Lx”** (x= number of line), start slave clock line by following the dialog on LCD display, you may also see 1) as above, otherwise line remains in off-status.

3) Overload of all slave clock lines (complete system)

Number of slave clock of **all** lines exceeds the max. output power of the Master Clock. Load carrying capacity of each single slave clock line please see page 32, resp. menu 2.1. Consumption (= power drain) of each slave clock movement see page 32, or label on corresponding slave clock movement itself.

Status of lines (menu 2.3) will automatically be set to “off”.

Debug: Reduce number of slave clocks of the corresponding line(s) or install a PEWETA booster amplifier (type series 930) for further extension of the output power.

After repair of the failure press “edit” key in menu 4.2 to delete the error message **“overload”**. All slave clock lines must be set manually (= started) in menu 2.3, please see page 34.

4) Power failure

the error message **“power fail”** informs that Master Clock has cut from mains power (230 VAC/50 Hz).

Is the Master Clock equipped with back-up batteries, see page 10, the slave clocks of the corresponding lines (battery on? See menu 2.6) will keep on operating for a certain period depending on number of slave clocks connected! If Master Clock is not equipped with back-up batteries, all slave clocks will stop, slave clock lines will be stopped. LCD display of Master Clock and red “alarm” LED will be turned off, however, **Master Clock will count all missing pulses (minutes, minutes/seconds)**. After return of mains power these missing pulses will automatically be forwarded from the Master Clock to all slave clocks which finally display the correct, present time again.

Debug: Make sure that mains power 230 VAC/50 Hz is correctly connected to mains power terminal No. 3, see page 10. Also check mains power fuse (No. 2), see page 10. If defect, change it.

The error message “power fail” will **automatically** be deleted after return of mains power and/or change of mains power fuse.

If you delete error message “power fail” **manually** in menu 4.2 by pressing “edit” key but not having repaired the failure error message it will be displayed again after 3 to 5 minutes!

If failure is repaired, however, error message “power fail” will **not** be deleted **automatically** the Master Clock is **faulty** and may be sent to PEWETA for repair.

5) Low voltage

The error message „**low voltage**“ informs about

- a) either Master Clock has cut from mains power (230 VAC/50 Hz) **or**
- b) tension of the back-up batteries (if Master Clock is equipped accordingly) is less than 20 V at 24 V line-tension status, resp. less than 10 V at 12 V line-tension status.

(All) slave clock line(s) will be stopped, all slave clocks are stopped.

Note: **DCFport24 telegram slave clocks:** All *DCFport24* telegram operated slave clocks will be supplied with tension, however, time protocol will not be provided but slave clocks will operate in “Quartz-time-basis” for a certain period (depending on number of connected slave clocks) until tension of back-up batteries is less than 18 V at 24 V line-tension status resp. 8 V at 12 V line-tension status.

Debug: The error message “low voltage” is a sequence error of “power fail”. Debug exactly as 4) “power fail”. After repair of failure the error message “low voltage” will **automatically** be deleted. Slave clock line(s) will be started **automatically**.

6) Accu empty – system stopped

The error message “**accu empty – system stopped**” informs about

- a) either Master Clock has cut from mains power (230 VAC/50 Hz) **or**
- b) tension of the back-up batteries (=accu = accumulators), if Master Clock is equipped accordingly, is less than 18 V at 24 V line-tension status, resp. less than 8 V at 12 V line-tension status.

(All) slave clock line(s) will be stopped, all slave clocks, including *DCFport24* telegram slave clocks, are stopped. Master Clock cannot be used anymore via keyboard. LCD display will go out if tension of the back-up batteries (if equipped accordingly) is less than 6 V. If battery tension is less than 4 V even red alarm LED goes out and alarm relay opens.

Debug: The error message “accu empty – system stopped” is a sequence error of “low voltage”. Debug exactly as 4) “power fail”. After repair of failure the error message “accu empty – system stopped” will **automatically** be deleted. Slave clock line(s) will be started **automatically**.

Menu 5: System

Menu 5.1

System

In menu 5.1 specific Master Clock profiles may be selected, activated/deactivated, adjusted or retrieved.

Select **menu 5.1** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 1".

When "menue, 5, 1" is entered display shows:



Press arrow key ▼ to proceed to menu 5.2...

Menu 5.2

Entering and changing the keyboard code

With a keyboard code the keyboard can be locked. If initialized, the operation and programming of the Master Clock is protected from inadvertent changes and/or from deliberate manipulations.

Select **menu 5.2** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 2". A black square blinks alternately in place of the character you want to enter.

When "menue, 5, 2" is entered display shows:



Display offers the possibility of entering or changing the keyboard code. The keyboard code in delivery state is **"0000"**, the keyboard is **not locked**. Press "edit" to confirm ("menue" to cancel).



First, enter your **old** code. In delivery state code is **"0000"**. A black square blinks alternately with the character you are dialling. Press "edit" to confirm ("menue" to cancel).



If you entered the correct **old** code, now enter your **new** code. Write down your individual 4-digit code before you are entering it! A black square blinks alternately with the character you are dialling. Press "edit" to confirm ("menue" to cancel).

The keyboard locking will now activate **automatically** 10 minutes after the **latest activity** on the keyboard. Future keyboard locking **always** activates automatically 10 minutes after the latest keyboard activity.

Important: Code "0000" **does not activate** keyboard locking! Keyboard is not locked!

Important: **Write down/note** your individual keyboard code, preferably **before** entering! In case you can't remember your individual keyboard code please contact PEWETA.

Unlock (= open) keyboard

If the keyboard code is activated (= keyboard is locked) by input of individual 4-digit code (except "0000") the operator will be asked to enter the keyboard code at any keyboard activity to open the keyboard. In this case...



...enter your key code by using number keys #1...#9 and confirm activities with "edit". The keyboard is now open for keyboard actions.

Important: Keyboard locking activates **automatically** 10 minutes after latest keyboard activity!

Menu 5.3

Display language (= system language)

In menu 5.3 the display languages (language of the Master Clock) may be selected resp. changed. At present technical status the Master Clock offers following languages:

- German (display shows: deutsch)
- French (display shows: francais)
- Spanish (display shows: espanol)
- Dutch (display shows: nederlands)
- Italian (display shows: italiano)
- Portuguese (display shows: portugues)
- English (display shows: english)

At date of delivery the display language may be set to German only by manufacturer PEWETA.

Select **menu 5.3** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 3".

When "menue, 5, 3" is entered display shows:



When display shows „Sprache deutsch“ (language German) and you want to change it press "edit".



Select desired language by using arrow keys ▼▲...



...and confirm with "edit".



The display of the Master Clock will now show all information in selected language.

Menu 5.4

Time zone, manual entry

UTC-offset and date/time of start and end of summer-/wintertime changeover (= daylight saving) may be entered here in menu 5.4, provided "time zone manual" has been entered in menus 1.4 and/or 2.2.

Select **menu 5.4** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 4".

When "menue, 5, 4" is entered display shows:

```
5.4# system
time zone manual
```

Start input procedure by pressing the "edit" key. Every additional input step must be confirmed with "edit" until input procedure is completed.

```
UTC-Offset
■1:00
```

First you need your local time zone (= time difference to UTC in hours and minutes). Press arrow key ▼ for a negative value, press arrow key ▲ to delete a negative omen. Enter corresponding values by pressing corresponding number keys #1...#9, confirm with "edit".

```
day1. Saving
yes
```

Next is to confirm whether you want daylight saving or not. If you enter "no" by pressing arrow key ▼ and confirm with "edit", input procedure is completed. If you enter "yes" and confirm with "edit" it will lead to further prompts.

```
day1. saving start
month ■3
```

Enter the **month** in which summertime **starts**. A black square blinks alternately with the character you are dialling. Confirm with "edit". An entry of #1...#6 (January..June) marks a regulation for the northern hemisphere, #7...#12 (July..December) for the southern hemisphere.

```
day1. saving start
weekday ^Sunday
```

Enter the **weekday** in which summertime **starts** by arrow keys ▼▲ and confirm with "edit".

```
day1. saving start
^last Sunday
```

Select first, second, third or fourth or the latter (of) the month (display shows "last") in which summertime **starts** with arrow keys ▼ or ▲, confirm with "edit".

```
day1. saving start
hour ■2
```

Enter the **hour** in which summertime **starts**. A black square blinks alternately with the character you are dialling. Confirm with "edit".

```
day1. saving end
month 0
```

Enter the **month** in which summertime **ends**. A black square blinks alternately with the character you are dialling. Confirm with "edit".

```
day1. saving end
^last Sunday
```

Select first, second, third or fourth or the latter (of) the month (display shows "last") in which summertime **ends** with arrow keys ▼ or ▲, confirm with "edit".

Input procedure of Time zone with (or without) changeover of daylight saving is now completed.

Attention: The **weekday** and the **hour** of **end** of daylight saving period will be **automatically** copied from inputs of **start** of daylight saving period.

Menu 5.5

RS232 on/off

The RS232 interface may be switched on or off in menu 5.5. **Standard is "off"**.

Select **menu 5.5** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 5".

When "menue, 5, 5" is entered display shows:

```
5.5# system
RS232      off
```

Press "edit"...

```
5.5  system
RS232      on
```

...to display "on" or "off" status. Select desired status by keys ▼ or ▲ and confirm with "edit".

Menu 5.6

Access code for the following service menus

Important: This service menu with its sub-menus is scheduled for the operator and/or technicians only!

The service menu can only be released by input of a specific code. **The code No. is "1404"**. The code No. cannot be amended!

Select **menu 5.6** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 6". A black square blinks alternately in place of the character you want to enter.

When "menue, 5, 6" is entered display shows:

```
5.6* service
access      _ _ _ _
```

Press „edit“...

```
5.6 service
access      140■
```

... a black square blinks alternately with the character you are dialling. Enter "1404" by number keys, press "edit" to confirm.

```
5.6* service
access      _ _ _ _
```

Press arrow keys ▲ or ▼ to get to desired sub-menu.

Menu 5.7

Initialize system

"Initialize system" resets all parameters of the Master Clock to the **standard** modes (= defaults).

Important: Entered switch instructions in the switch channels (see menu 3 and sub-menus) will not be deleted!

Note: Check whether menu 5.7 has been activated by input of the code No. 1404 in menu 5.6

Select **menu 5.7** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 7".

When "menue, 5, 7" is entered display shows:

```
5.7* system
initialize?
```

Press „edit“...

```
Initialisieren?
NO=1      YES=2
```

... and select status by pressing number keys:

Key #1: cancel

Key #2: initialize system

All parameters of the Master Clock, except switch instructions of menu 3 and sub-menus, will be resetted to **standard** modes (= defaults).

Menu 5.8

DCF77 statistics

Menu 5.8 informs about current data of the DCF77 radio telegram. **Remember:** Only available within a radius of approx. 2,000 km around Frankfurt/Main and correctly connected/orientated DCF77 receiving aerial, see menu 1.5.

Note: Check whether menu 5.7 has been activated by input of the code No. 1404 in menu 5.6

Select **menu 5.8** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 8".

When "menue, 5, 8" is entered display shows:

```
5.8# DCF      16:25:00
31>A3>02    5 16.07.10
```

The data of the currently received DCF77 radio telegram will be displayed:

16:25:00 = time latest received

16.07.10 = date latest received

5 = weekday of above date (1= Monday etc.)

31> = dezimal seconds of the DCF77 data

A3> = hexadecimal presentation of the DCF77 data

02 = number of necessary time telegrams remaining to take over the clear and usable DCF77-protocol.

Menu 5.9

Reports of internally measured tensions

This menu reports internally measured tensions of each slave clock line.

Note: Check whether menu 5.7 has been activated by input of the code No.1404 in menu 5.6

Select **menu 5.9** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 5, 9".

When "menue, 5, 9" is entered display shows:

```
5.9#      21.5 27.4
0.25 0.25 0.25 0.25
```

Example

(values shown are on basis "on/off switch"/voltage selector is on 24 V position, also see page 10, resp. check with your Master Clock and connected slave clock movements)

5.9 = menu 5.9

21.5 = line control tension is 21.5 V

27.4 = operating voltage for line drivers is 27.4 V
(in 12 V-mode: 13.6 V)

0.25 = line current per each slave clock line is 0.25
(= 0.25A = 250 mA)

Menu 6: Options

Menu 6.1

Option 1, for example: GPS

If Master Clock is configured as **special option**, for example as **GPS-version** incl. GPS receiving aerial (option suffix -95, please see page 15), the display shows the kind of option. In this example GPS card is connected to terminal 17, also see page 10. If necessary, menu 6.1 will be completed by sub-menus (not necessary for GPS-version). In any case, corresponding option will be explained by a separate installation manual, coming with the Master Clock.

Select **menu 6.1** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 6, 1".

When "menue, 6, 1" is entered display shows:



The display shows the kind of option.

Menu 7: Options

Menu 7.1

Option 2, for example: RS485

If Master Clock is configured as **special option**, for example with **RS485 interface**, the display shows this kind of option. In this example the RS485 interface is connected to terminal 18, also see page 10. If necessary, menu 7.1 will be completed by sub-menus (not necessary for RS485-version). In any case, corresponding option will be explained by a separate installation manual, coming with the Master Clock.

Select **menu 7.1** by either using the arrow keys ◀▲▼▶ or by directly dialling key combination "menue, 7, 1".

When "menue, 7, 1" is entered display shows:



The display shows the kind of option.

Technical data

Case	
Material (case/frontglass)	Polycarbonate LEXAN® 500R/940A
Color (case)	RAL 7035 light grey
Measurements (HxWxD)	184 x 240 x 115 mm (approx.)

Electrical values	
Operating voltage	220...230 VAC/50...60 Hz mains power
Permanent connection	Internal, snap-in termination
Line voltage	12 V or 24 V alternating slave clock line voltage
Power input	53 VA (max.)
Impulse current total, max. (basis: minute pulse)	2 A at 12 V line voltage, 1 A at 24 V line voltage, distributed on max. 4 lines
back-up batterie (extra)	2 x accumulators 12 V/0,6 Ah (if equipped)
Internal software clock and pulse memory (in case of mains failure)	Automatic adjustment of Master and slaves after return of mains power

Performance features	
Number of slave clock lines	1, 2 or 4, depending on type of Master Clock
pulse modes	Seconds, seconds with creeping minutes, minutes, <i>DCFport24</i> pulse telegram
World time functionality	1 time per line incl. time-zone pre-set
Password protection (operator lock)	4-digit key-board code
Data interface	RS232 for synchronization of IT-network systems
Alarm contact	30 V/0.5 A, potential-free

Signal facilities	
Switch channels	none, 2 or 4, depending on type of Master Clock
Switch times	600 (max.)
Switch modes	Mono- or bistable
Contact load	250 VAC/2 A

Environmental values	
Protection grade	IP 32 (EN 60 529)
Safety class	I
Environmental temperature	0 °C...40 °C
Weight (approx.)	2.3 kg, max., incl. Batteries (if equipped)

DCF77 radio control (if equipped)	
DCF77 receiving aerial	In scope of supply incl. 5 m connection wire (LIYCY 4x0.25 sqmm), may be extend to 100...150 m max.
Case measurement (HxWxD)	65 mm (+35 mm) x 50 mm (+30 mm) x 35 mm
Case color	RAL 7035 light grey
Case material	Polycarbonat MAKROLON®
Operating voltage	7 - 30 VDC
Current consumption	12 mA at 12 V (approx.)
Output current	≤ 50 µA
Protection grade	IP 68 (EN 60 529)
Environmental temperature	-10 °C...60 °C
Weight, incl. stainless-steel fixture	190 g (approx.)

Network Connection

At the bottom of the clock you will find a network connection (RJ45).

The master clock can synchronize to an NTP Server, which is located in the Network, like this it can receive Time and Date from an NTP Server.

The master clock cannot synchronize other NTP Clients (it is no NTP Server).

By default the Clock's network card is delivered as a DHCP Client.

Configuration:

1. Establish a network connection:

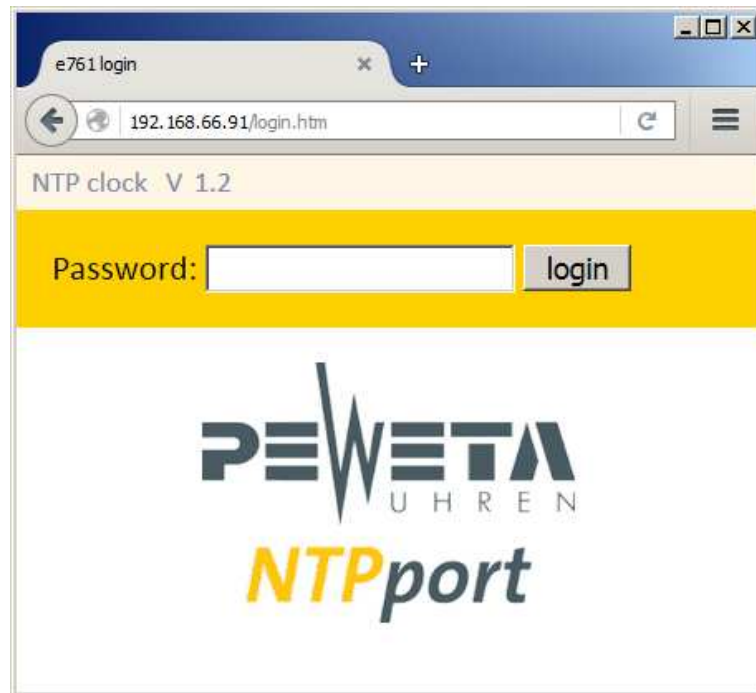


2. At the bottom of the clock the network card's MAC Address can be found. Determine the corresponding IP in your DHCP Server.

3. Open a HTML browser and enter the IP into the address line and a Login-page will appear. If the IP is unknown you can also enter the name.
The name (for the DNS resolution) consist the following parts: "PWCLK", a minus sign, the last 6 digits of the MAC Address, a dot and the domain.

Example 1: IP is known: 192.168.66.81

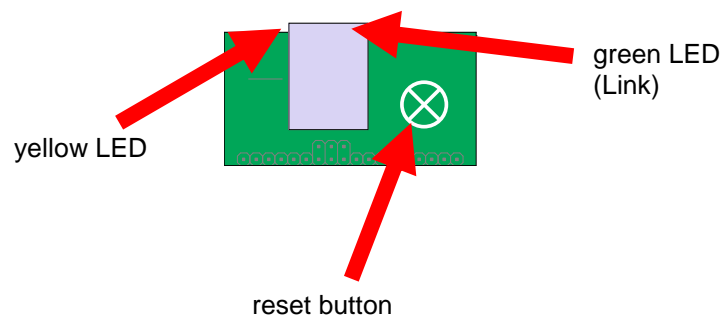
Example 2: IP is unknown: PWCLK-123456.company.local



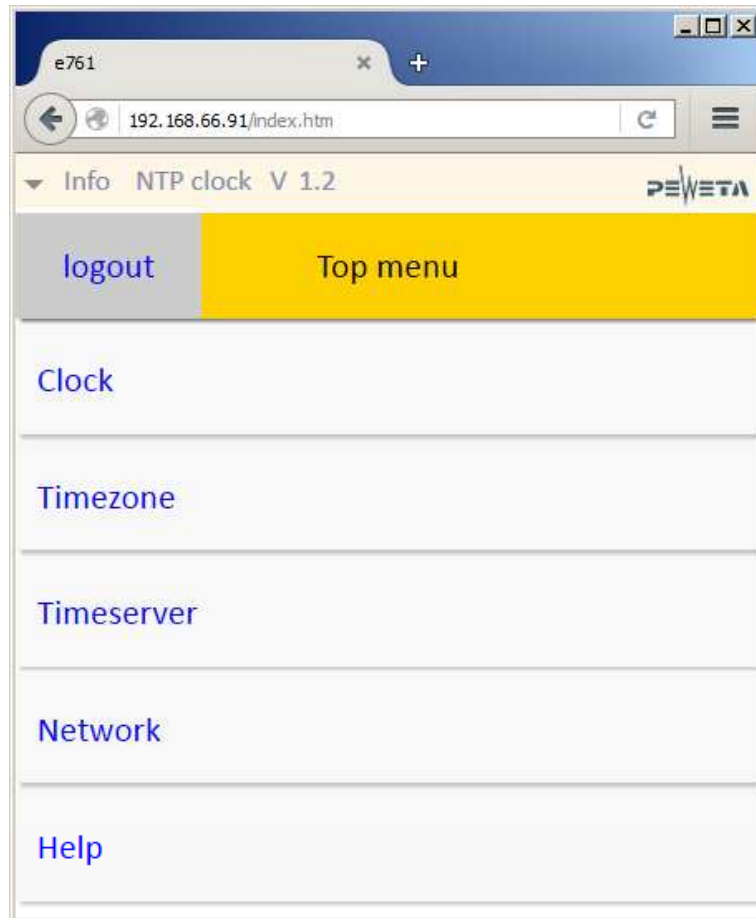
Putting into Operation without DHCP Server:

1. Open the clear cover of the master clock
2. Remove the 4 screws of the keyboard and lift the keyboard carefully. Don't disconnect the wire of the keyboard and the display. Now you can see the network interface of the master clock.
3. Remove the 2 screws of the terminal cover and remove the cover.
4. Put the on/off switch of the master clock in center position. The masterclock goes out (see page 13)
5. Keep placing a finger on the "reset button".
6. Put the on/off switch of the master clock in previous position. The masterclock goes on (see page 13)
7. The yellow LED of the network interface flashes every second. Wait until the yellow LED flashes for 6 times or more and remove your finger from the reset button.
4. Now, the clock's IP is 192.168.1.100 and can be contacted by a PC, which is in the same network.

Network interface:



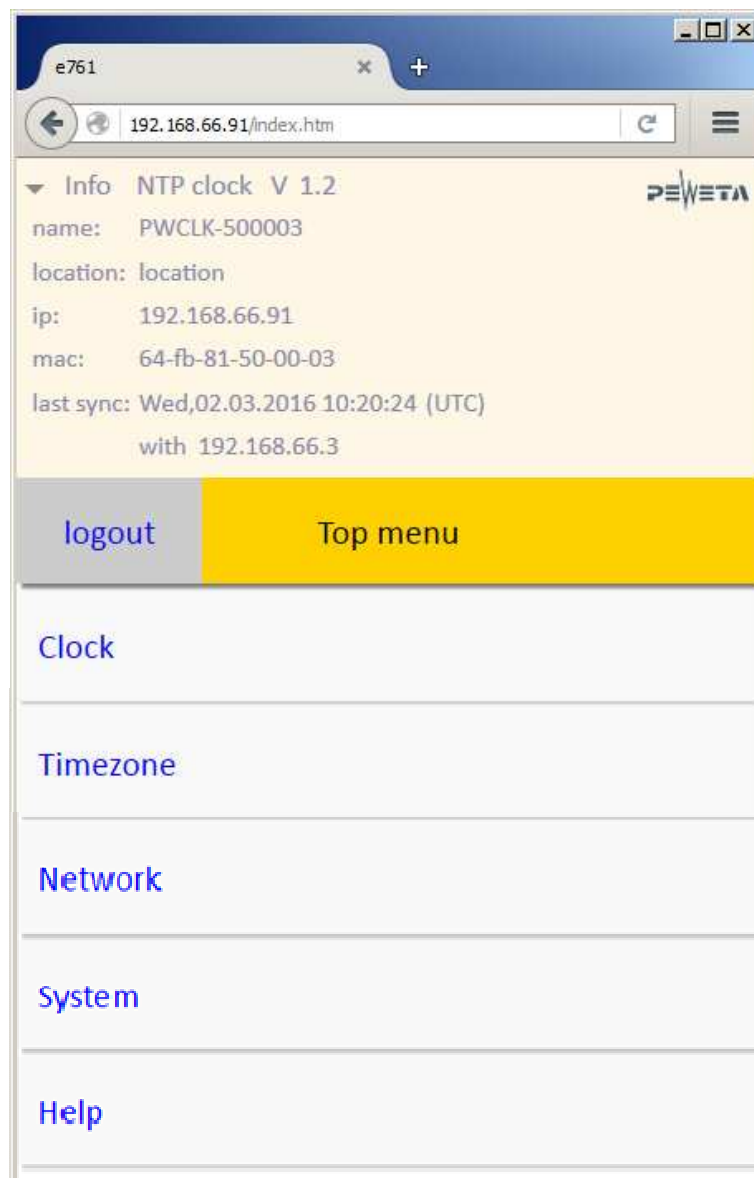
4. Enter the password „ntp“ and click on the button “login”.
The „TOP MENU“ appears:



Compatible with:

Mozilla	Firefox	Version 43.0.1 or higher
Apple	Safari	Version 9.0.2 or higher
Microsoft	Internet Explorer	Version 11.0.9600 or higher
Microsoft	Edge	Version 25.10586 or higher

5. By clicking on the arrow in front of the „info“ button, the latest network parameters and the NTP-Synchronization state are displayed:



Menu „Clock“:

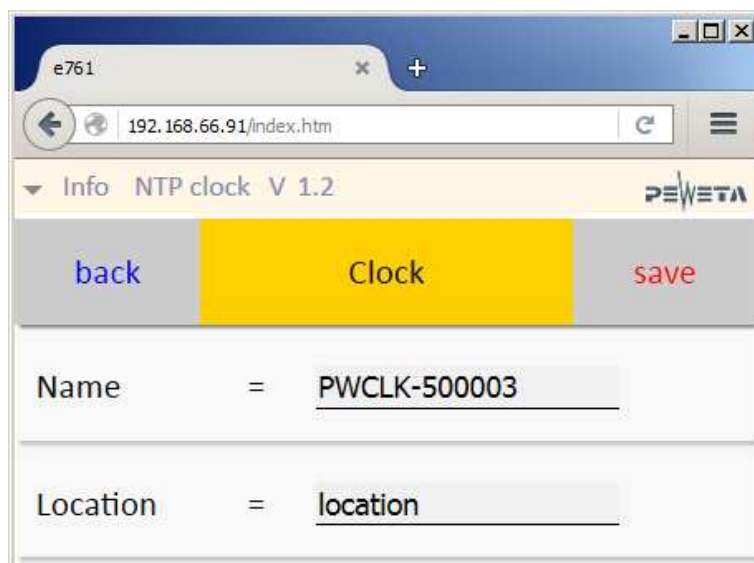
Name: In this field fill in the device name. At corresponding DHCP configuration it can be used for DNS name resolution. Permitted are 15 characters as letters:

Letters: Between upper case and lower case is not differentiated, umlauts, spaces and “?” are not supported.

Numbers: 0 to 9

Special Characters: “-“ characters, may not be at the beginning or the end

Location: Fill in a value which identifies the clock (e.g. location)



Note:

Changes are only taken over if they are confirmed with „save“!

Please use the button „back“ to return to the „TOP MENU“, do not use the return arrow of the HTML browser, because this would cause a logout.

Menu „Timeserver“:

Note:

Changes are only taken over if they are confirmed with "save"!

Please use the button "back" to return to the "TOP MENU", do not use the return arrow of the HTML browser, because this would cause a logout.

- Local NTP port: In this field you can change the port of the main clock for the NTP protocol.
- Accept broadcast: If you check the box the clock will synchronize on NTP broadcast packets.
- Accept multicast: If you check the box the clock will synchronize on NTP multicast packets.
- Multicast address: Fill in the multicast IP.
- Server NTP port: Here you can change the port of the NTP server for the NTP protocol.
- Timeserver 1 Fill in the standard NTP server.
- Timeserver 2 Here you can fill in an alternative NTP server. If NTP timeserver 1 is not accessible, the requests are send to timeserver 2.
- Timeserver 3 Here it is possible to fill in an additional NTP server. If NTP timeserver 1 and 2 are not accessible, the requests are sending to NTP timeserver 3.
- Timeserver 1 DHCP: If you have selected the box and the IP address of an NTP server is transmitted via Option 42 in the DHCP, a timeserver which was manually entered in Timeserver 1 will be overwritten.

Figure on the next page

e761 x +

192.168.66.91/index.htm

Info NTP clock V 1.2 PEWETA

back Timeserver save

Local NTP port	=	123
Accept broadcast	=	<input type="checkbox"/>
Accept multicast	=	<input type="checkbox"/>
Multicast address	=	224.0.1.1
Server NTP port	=	123
Timeserver 1	=	192.168.66.3
Timeserver 2	=	0.0.0.0
Timeserver 3	=	0.0.0.0
Timeserver 1 DHCP	=	<input checked="" type="checkbox"/>

Menu „Network“:

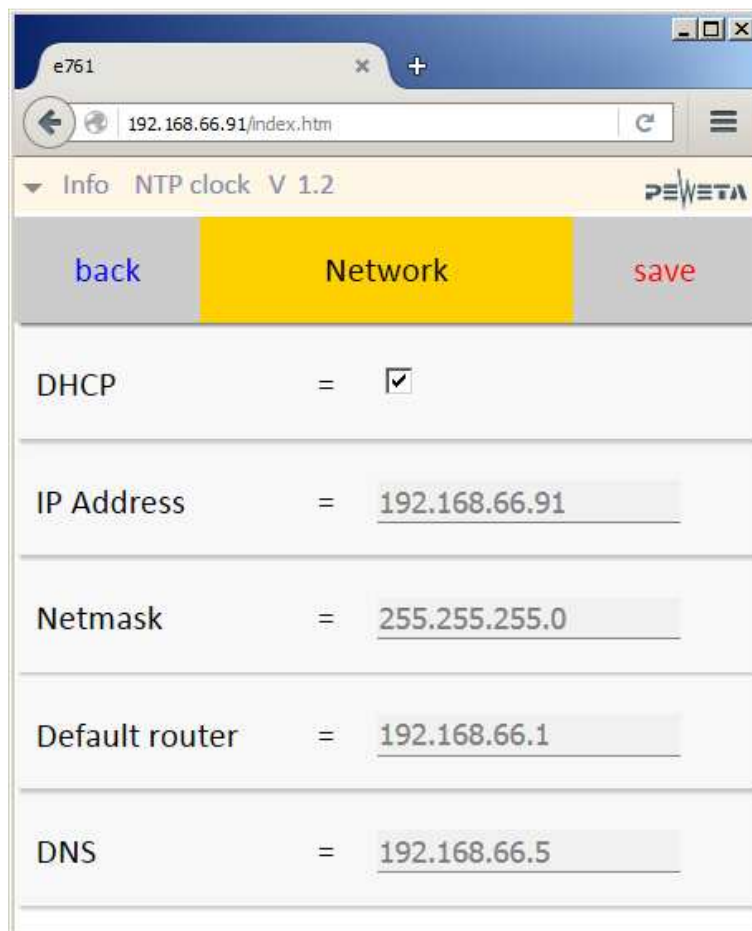
DHCP: If you have checked the box, the network card will obtain the network parameters from a DHCP server.

IP Address, Netmask, Default Router and DNS can be assigned/changed manually, if you have not checked the DHCP checkbox.

Note:

Changes are only taken over if they are confirmed with "save"!

Please use the button "back" to return to the "TOP MENU", do not use the return arrow of the HTML browser, because this would cause a logout.



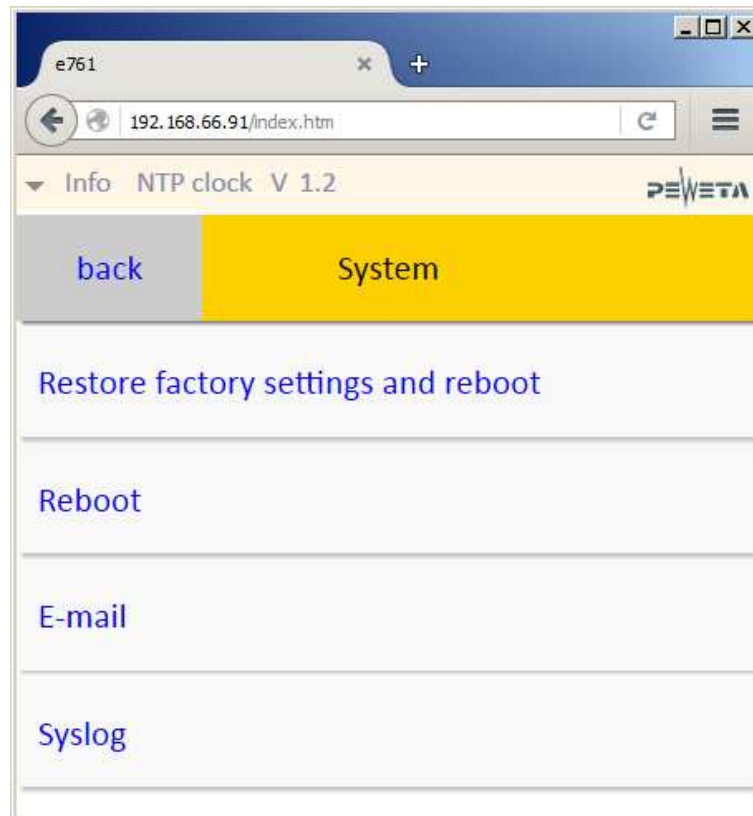
Info NTP clock V 1.2			PEWETA
back	Network	save	
DHCP	=	<input checked="" type="checkbox"/>	
IP Address	=	<input type="text" value="192.168.66.91"/>	
Netmask	=	<input type="text" value="255.255.255.0"/>	
Default router	=	<input type="text" value="192.168.66.1"/>	
DNS	=	<input type="text" value="192.168.66.5"/>	

Menu „System“:

Note:

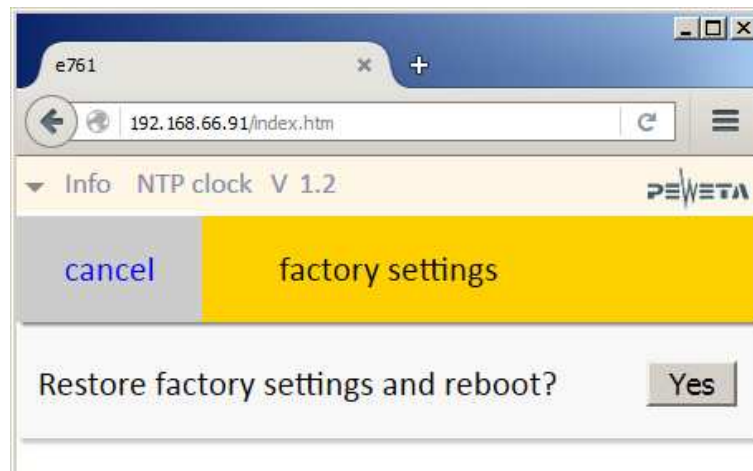
Changes are only taken over if they are confirmed with "save"!

Please use the button "back" to return to the "TOP MENU", do not use the return arrow of the HTML browser, because this would cause a logout.



Restore factory settings and reboot:

Sets the network parameters back to the factory settings and restarts the network card.



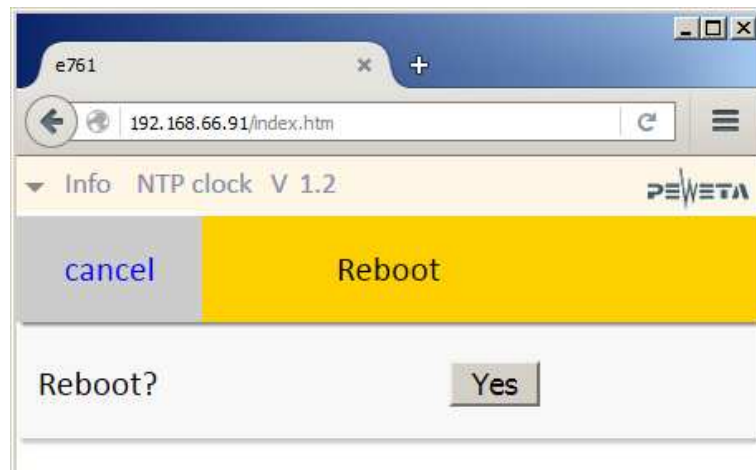
Restore factory settings and reboot of the network interface **at the master clock:**

1. Open the clear cover of the master clock
2. Remove the 4 screws of the keyboard and lift the keyboard carefully. Don't disconnect the wire of the keyboard and the display. Now you can see the network interface of the master clock.
3. Remove the 2 screws of the terminal cover and remove the cover
4. Put the on/off switch of the master clock in center position. The masterclock goes out (see page 13)
5. Keep placing a finger on the "reset button".
6. Put the on/off switch of the master clock in previous position. The masterclock goes on (see page 13)
7. The yellow LED of the network interface flashes every second. Remove your finger from the reset button **before** the yellow LED flashes for 4 times.
8. Now, defaults are like in the Table of page 68.

Table of defaults:

<u>Clock</u>	
Name:	PWCLK-xxxxxx (last 6 digits of mac address)
Location:	location
<u>Timeserver</u>	
Local NTP port:	not set
Accept multicast:	not set
Multicast address:	224.0.1.1
Server NTP port:	123
Timeserver 1:	not set
Timeserver 2:	not set
Timeserver 3:	not set
Timeserver 1 DHCP:	set
<u>Network</u>	
DHCP:	set
<u>System E-Mail</u>	
Mail server (SMTP):	0.0.0.0
Mail port:	25
User:	admin@this.net
Password:	not set
<u>System Syslog</u>	
Server:	0.0.0.0

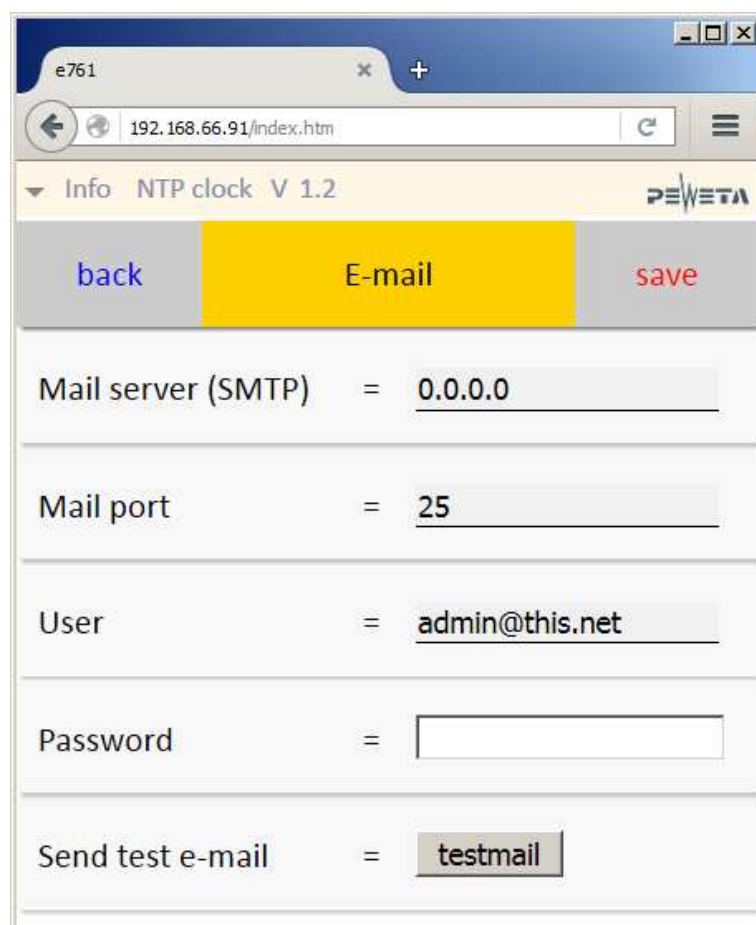
Reboot: Reset of the network interface of the master clock without changing to default values.



E-mail: Deposit the e-mail parameters to receive error messages and system information. The mail client supports SMTP with LOGIN- authentication. Enter the IPv4-address of your server and mail account information in this field and click on "save". This done, you can verify the connection by sending a test e-mail.

You will receive the following information via mail:

1. Reset
2. No time synchronization for more than an hour
3. Successful synchronization after reset or loss of synchronization

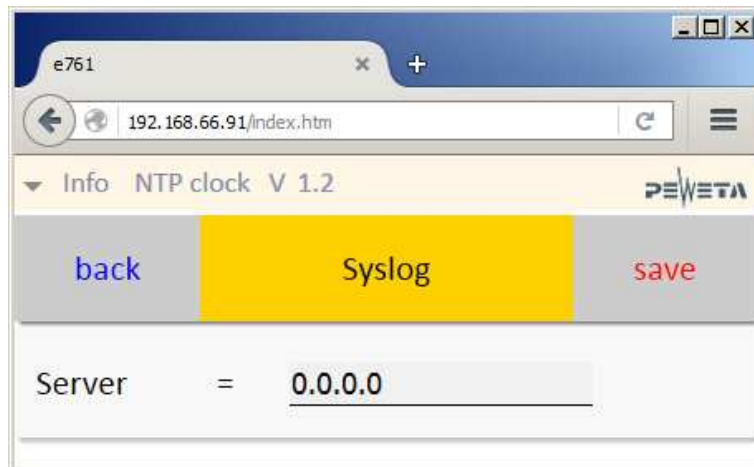


Syslog: Deposit a syslog-server to receive error messages and system information.

Enter the IPv4-address of your syslog-server in this field.
The clock sends out via UDP/Port 514.

You will receive the following Information via Syslog:

1. Reset
2. No time synchronization for more than an hour
3. Successful synchronization after reset or loss of synchronization



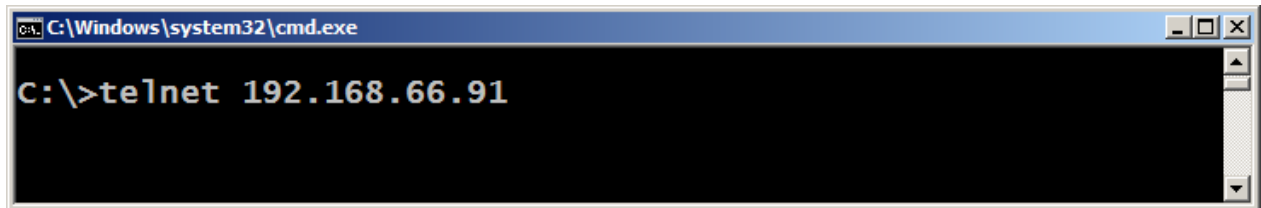
The screenshot shows a web browser window with the address bar displaying "192.168.66.91/index.htm". The page title is "Info NTP clock V 1.2" and the PEWETA logo is in the top right corner. The main content area has three buttons: "back" (blue text), "Syslog" (yellow background), and "save" (red text). Below these buttons, there is a label "Server" followed by an equals sign and a text input field containing "0.0.0.0".

Technical Specifications of the Network Card

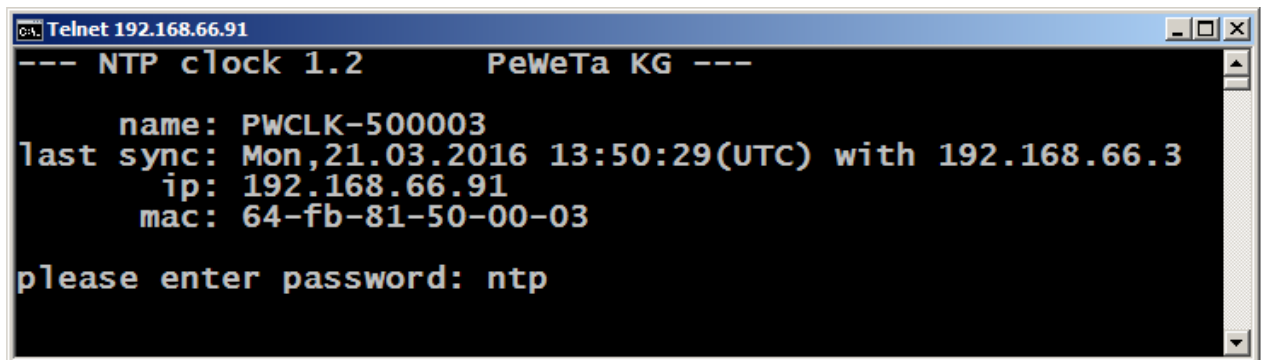
Connection	
Connector plug	RJ45
Cable	CAT5 or higher
Electrical Values	
Power Supply	PoE (Power over Ethernet) according to IEEE -Standard 802.3af-2003
Alternative Power Supply	12V – 24V DC (+/- 10 %)
PoE	Class 1
Max. Power Consumption	0,9 Watt
Performance Characteristics	
Network	Ethernet 10/100 BaseT Full/Half duplex, Auto negotiation, Auto MDI-X
Protocols	IPv4, TCP, UDP, ICMP, ARP, IGMP, DHCP, HTTP , SNMP Client (uni-, multi- und broadcast), SMTP, Syslog
Ambient Values	
Protection Type	IP 30 (EN 60 529)
Protection Class	I
Climate	Operating temperature: 0 ... 55°C Storage temperature: -10 ... 60°C 10-95% relative humidity at 25°C, non-condensing

Firmware Update

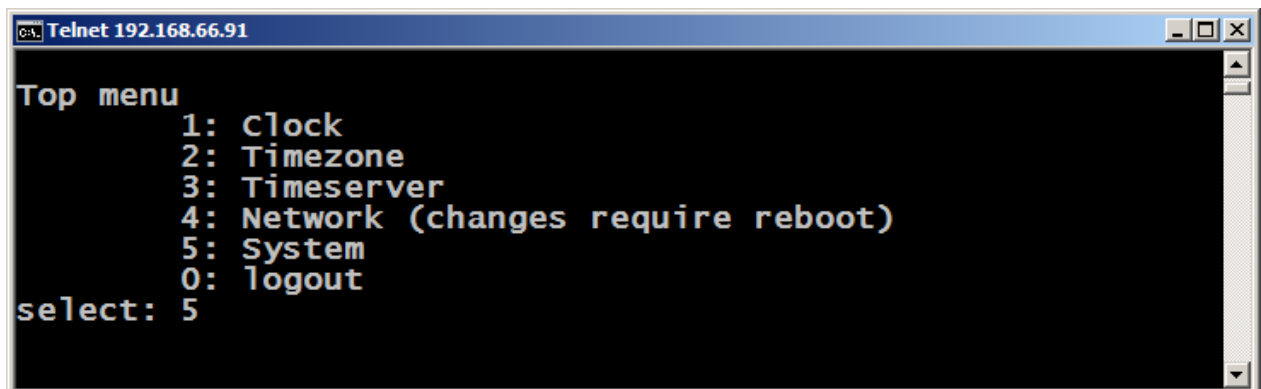
Open a command line (also called console or terminal) and establish a connection to the clock with Telnet (telnet spaces IP). Confirm with Enter.

A screenshot of a Windows command prompt window. The title bar reads 'C:\Windows\system32\cmd.exe'. The command prompt shows 'C:\>telnet 192.168.66.91'.

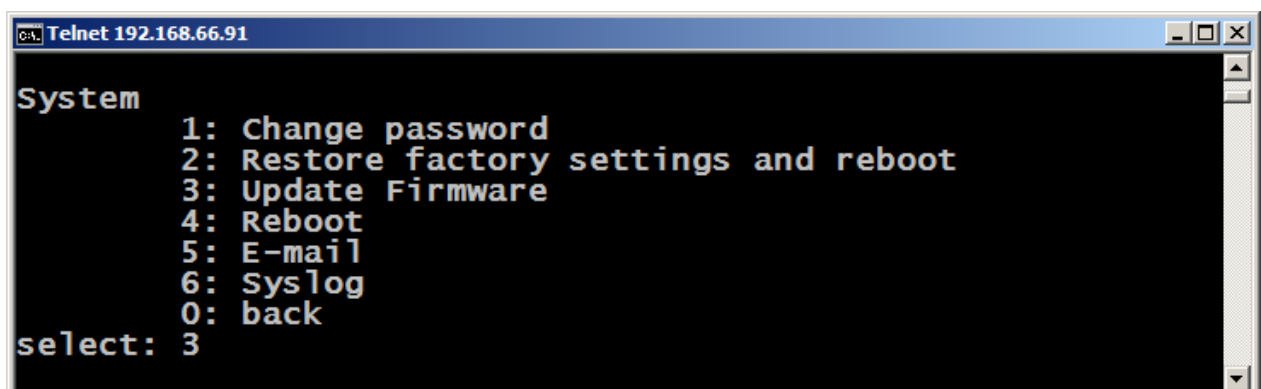
You will be asked for the clock's password, the deposited default password is "ntp". Confirm with Enter.

A screenshot of a Telnet session window titled 'Telnet 192.168.66.91'. The output shows: '--- NTP clock 1.2 PeWeTa KG ---', 'name: PWCLK-500003', 'last sync: Mon,21.03.2016 13:50:29(UTC) with 192.168.66.3', 'ip: 192.168.66.91', 'mac: 64-fb-81-50-00-03', and 'please enter password: ntp'.

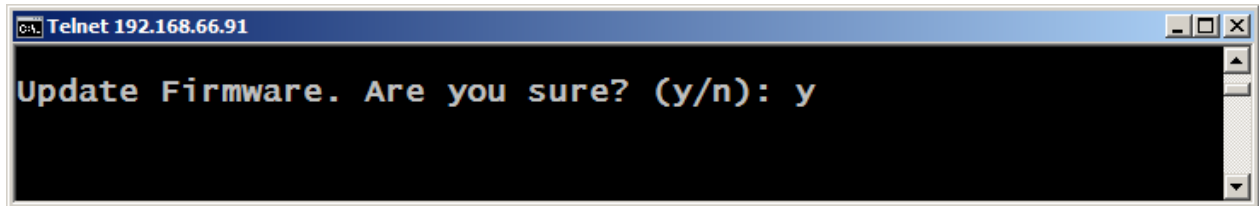
Now you access the main menu, select menu item 5 for "system" and confirm with enter:

A screenshot of a Telnet session window titled 'Telnet 192.168.66.91'. The output shows a 'Top menu' with options: '1: Clock', '2: Timezone', '3: Timeserver', '4: Network (changes require reboot)', '5: System', and '0: logout'. The user has entered 'select: 5'.

This takes you to the system menu, select menu item 3 for "Update Firmware" and confirm with enter:

A screenshot of a Telnet session window titled 'Telnet 192.168.66.91'. The output shows a 'System' menu with options: '1: Change password', '2: Restore factory settings and reboot', '3: Update Firmware', '4: Reboot', '5: E-mail', '6: Syslog', and '0: back'. The user has entered 'select: 3'.

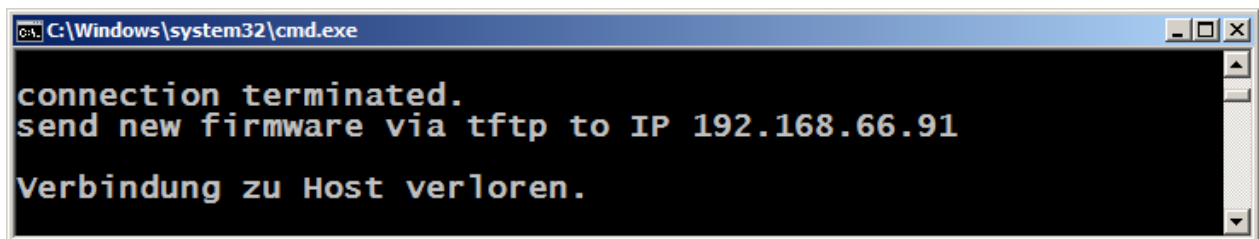
Enter "y" to continue the process or "n" to cancel operation.



```
C:\> Telnet 192.168.66.91

Update Firmware. Are you sure? (y/n): y
```

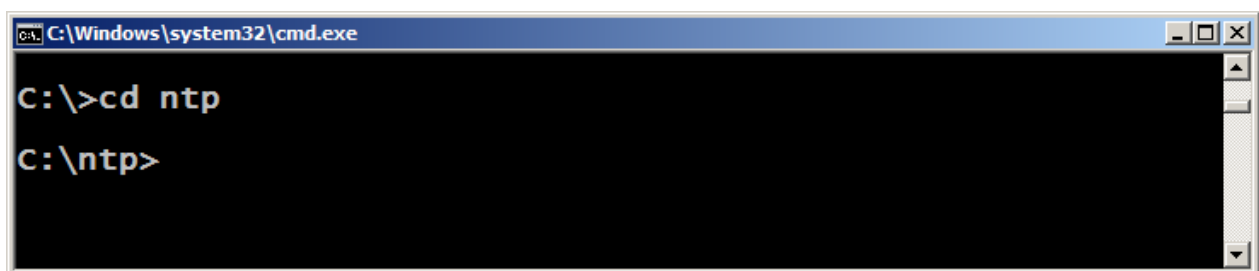
After you enter "y" the Telnet connection is terminated.



```
C:\Windows\system32\cmd.exe

connection terminated.
send new firmware via tftp to IP 192.168.66.91
Verbindung zu Host verloren.
```

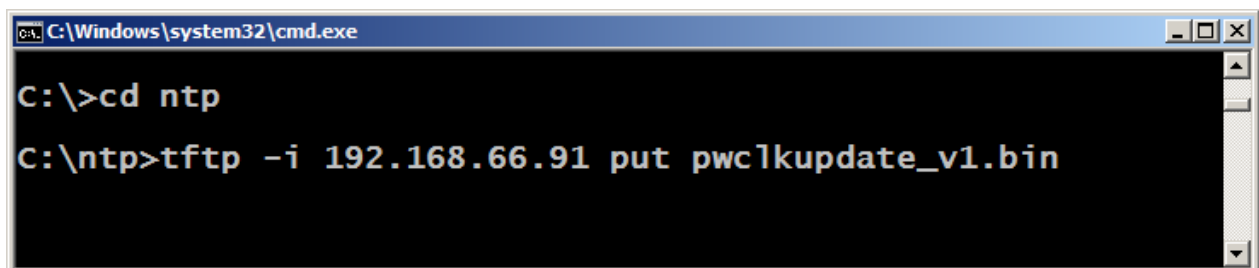
Copy the update file onto a drive of your computer, open a command line and go to the same Directory as the update file:



```
C:\Windows\system32\cmd.exe

C:\>cd ntp
C:\ntp>
```

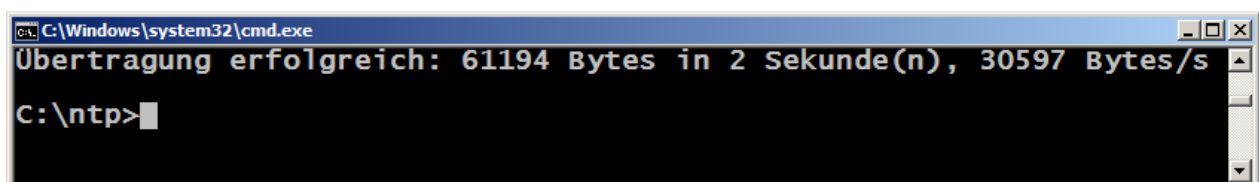
Download the update file via TFTP command onto the clock: `tftp -i IP put name.bin`



```
C:\Windows\system32\cmd.exe

C:\>cd ntp
C:\ntp>tftp -i 192.168.66.91 put pwclkupdate_v1.bin
```

The successful update is confirmed:



```
C:\Windows\system32\cmd.exe

Übertragung erfolgreich: 61194 Bytes in 2 Sekunde(n), 30597 Bytes/s
C:\ntp>
```

Put the clock back to factory settings: "Restore factory settings and reboot", see the top of page 14. If the clock is no longer reachable via HTML after the firmware update, please execute "Restore factory settings and reboot" on the clock, see the bottom of page 14.

Disposal

■ Used and damaged products:



Electrical and electronic products do not belong to household waste! Please dispose the clock when it is no longer of use according to the current local regulations.

■ Used batteries:



The user is legally obliged by battery regulation to return used batteries to local collecting points. Disposing used batteries in the household waste is prohibited! Batteries containing hazardous substances are marked with the crossed-out wheeled bin. The symbol indicates that the product is forbidden to be disposed via the domestic refuse. The chemical symbols for the corresponding hazardous substances are Cd=Cadmium, Hg=Mercury, Pb=Lead.

For any queries, additional information and further questions please contact:



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