



M a s t e r c l o c k

L C U

O p e r a t i n g

M a n u a l

m-lcu-e4.doc

Attention !

- Never remove the covers. This device must not be served by the user.
- If service is necessary call the manufacturer or an authorised dealer.
- If some foreign objects or liquid get into the cabinet, immediately disconnect mains and have it checked by qualified personnel before operating it any further.
- Handle the power cord carefully. Hold the plug when unplugging the cord.
- No liability is taken for damage that results of improper handling.
- Details of this Operating Manual are subject to change even without previous notification.
- This Operating Manual has been prepared very carefully to cover all aspects of the master clock. If you feel that some explanations are not adequate, unclear, or difficult to understand, please do not hesitate to contact the manufacturer or an authorised dealer.
- Be sure to use the master clock after you have fully understood the hardware and the software specifications and limits.
- No part of this publication may be reproduced, stored in a retrieval system in any form or by photocopying, recording or otherwise.

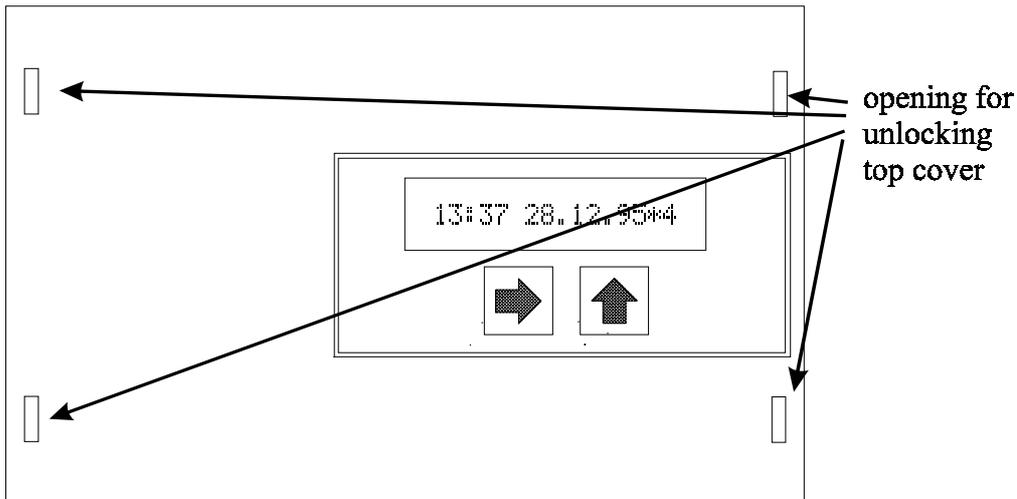
Master clock LCU

1 MOUNTING INSTRUCTIONS	2
2 OPERATING INSTRUCTIONS	4
2.1 General instructions	4
2.2 Unlocking the clock	5
2.3 Time setting of the master clock	5
2.4 Time setting of the slave clock lines	6
2.5 Setting timer duration	7
2.6 Programming of the switching outputs	7
2.7 DCF77 Status	8
2.8 DCF-Time Offset	8
2.9 Summer/Winter time changeover	9
2.10 Language selection	10
2.11 Exit from menus	10
3 TECHNICAL DATA	11

Master clock LCU

1 Mounting instructions

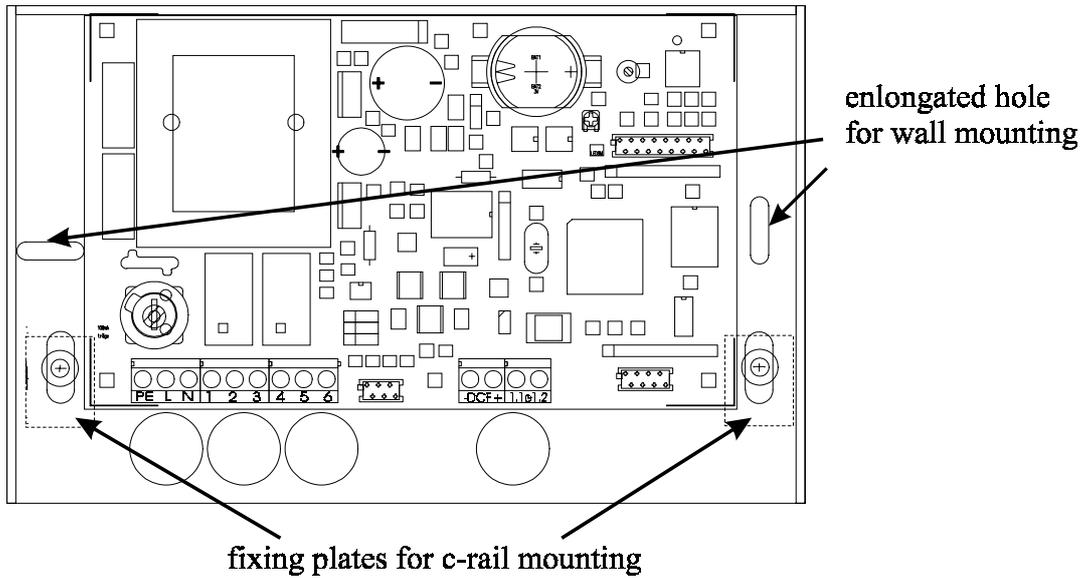
The LCU casing is designed for wall or switchbox mounting. The dimensions of the casing permits mounting directly on a c-rail in a standardised switchbox. Open the casing by inserting a flat blade screwdriver in the frontside holes and pressing carefully the screw driver outwards.



Simultaneously pull the upper part of the casing and lift up the top cover. For removing the top cover completely (with display) unplug the connection cable between the top cover and the CPU-PCB.

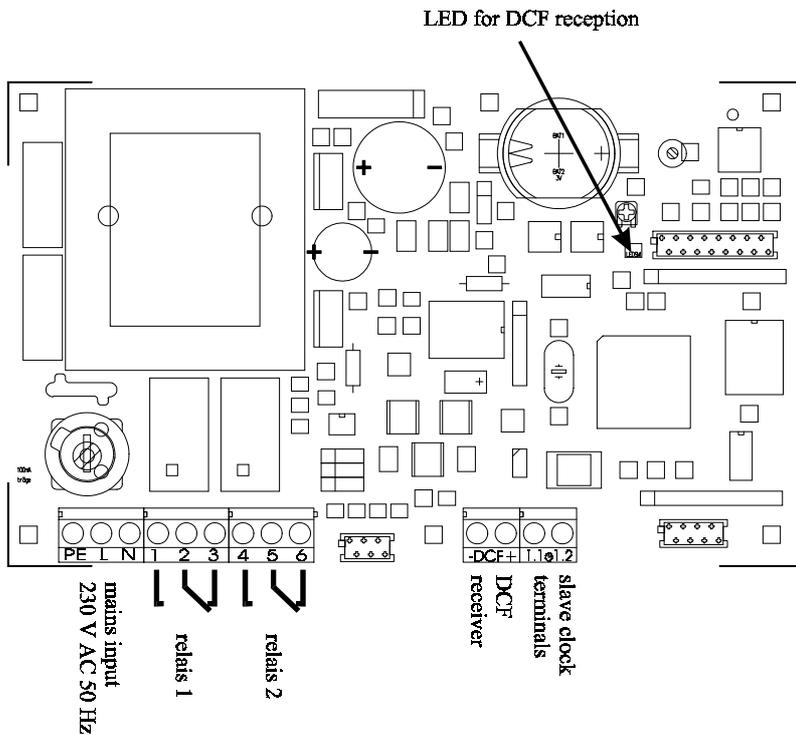
Mount the casing by means of two holes to a wall or directly to a c-rail of a switchbox. For cable inlet remove the pre-punched openings.

Master clock LCU



For wall mounting use two screws (max. 4x50mm). For mounting in a switchbox slide the two plates in the lower position. Hang in the case on the c-rail, slide the plates in the upper position and fix the screws.

Connect the cables of mains, DCF, slave clock line and switching outputs to the corresponding terminals.



Master clock LCU

Important advice: Because of EMC reasons connection cables within the LCU should be as short as possible.

If a DCF-receiver is connected to the LCU and mains are on, the LED for DCF signal has to flash in a one second rhythm.

If there is a poor DCF reception quality the LED flashes not in a second rhythm or permanently. Try to rotate the position of the DCF-receiver. The DCF-receiver casing should be in 90° angle to the direction Frankfurt/Mainflingen. If this does not improve the reception, change the mounting place of the DCF-receiver. (outside of buildings which are made of reinforced concrete, on the roof, etc.)

Reconnect the cable between CPU-PCB and display. Close top cover if all connections are made and the DCF receiver is correctly installed.

2 Operating Instructions

In the default display the master clock shows hh:mm DD:MM:YY W for e.g.:

12:05_17.12.95*7

Summer time is indicated if the display shows a sign after the time. In case of wintertime this place remains empty. The last character indicates the day of week. 1 for Monday, 2 for Tuesday, and 7 for Sunday. The state of the two switching outputs is indicated by the dots between the date display. The left dot references switching output 1 and the right dot references switching output 2. A small dot indicates that the switching output is off, a large dot indicates that the switching output is on.

If a DCF-receiver is connected to the master clock, a blinking * or a blinking sign is displayed behind the date. A * indicates that a sufficient DCF-information is received, a indicates that a noisy DCF-information is received. If a is displayed for a longer period check the location of the DCF-receiver.

2.1 General instructions

The LCU is controlled by means of two keys (→ ↑) and a display with 16 characters.

The meaning of key ↑ is either to change over to the next menu or to increase the actual displayed value. The meaning of key → is either to activate the actual displayed menu or to change over to the next input position.

Only valid inputs are accepted.

If the clock is powered on the first time the clock shows automatically the language selecting menu.

Master clock LCU

```
Deutsch  
English  
Italiano
```

Select with **↑** the desired language and confirm with **→** .
All display readouts are shown in the selected language.

For all further examples „English“ is used.

After language selection the following menus may be used:

```
channel 1  
channel 2  
master clock  
slave clocks  
end  
DCF sync status  
timer
```

For all menus:

On position **M** (Mode) you can select with **↑** between

÷ continue input

↵ OK-select function e.g.: synchronise time with next minute

× cancel

With key **→** the selected function will be executed.

2.2 Unlocking the clock

If the LCU shows the default display, the clock has to be unlocked by pressing simultaneously **→** and **↑** before getting access to the menus.

The display changes from

```
11:55_02.07.95*7
```

to

```
channel 1
```

2.3 Time setting of the master clock

Time setting of the master clock take place in the menu

```
master clock
```

Master clock LCU

The following inputs are available:

```
M hh:mm YY-MM-DD  
+ 08:15 95-01-27
```

⌘ OK-select function e.g.: synchronise time with next minute
× cancel

On position M with ⌘ and → the selected time is synchronised with next minute.
(Second will be set to 0)

2.4 Time setting of the slave clock lines

Time setting of the slave clock lines take place in the menu

```
slave clocks
```

The following inputs are available:

```
M F hh:mm  
+ * 08:15
```

⌘ OK-select function e.g.: synchronise time with next minute
× cancel

On position F you can select between

○ slave clock line off
* slave clock line on

or

on position F is displayed

? indicates slave clock line error (e.g.: short circuit)

On position M with ⌘ and → the time of the slave clock line is synchronised with the master clock time. If there is no difference between the time of master clock and slave clock line the slave clock line is started. If there is difference between master clock and slave clock line, the slave clock line automatically fast forwards to the master clock time.

It is recommended to set the timer duration after setting master clock and slave clock lines. If not, 5 seconds will be used as default timer duration.

Master clock LCU

2.5 *Setting timer duration*

With menu `timer` the duration of the timer is adjusted. Timer will be used at programming of the switching outputs.

```
M SS
+ 59
J OK-select function e.g.: synchronise time with next minute
X cancel
```

The amount on position `M` will be accepted with `#` and pressing key `→`. Timer duration may be from 1 to 59 seconds. 0 means that this function is not available for programming.

2.6 *Programming of the switching outputs*

Programming take place separate for each channel. The programming sequence is identical for all channels. A maximum count of 130 entries over all channels may be programmed.

The following inputs are available:

```
M WWWWWW5 hh:mm
+ 1--456-? 08:15
```

On position `M` (Mode) you can select between

- + input, continue input
- J OK-select function (save actual line)
- ^ leaf through memory, after pressing `→` cursor remains on position `M`, next program line will be displayed
- X cancel
- erase actual displayed program line. After pressing `→` actual program line will be erased, next line will be displayed

Positions `WWWWW` represents weekdays (1 for Monday, 2 for Tuesday, 7 for Sunday). The display changes (to the corresponding digit) by pressing `↑` on the desired position.

On position `S` (switching function) select `*` for on , `o` for off or `?` for timer. Function `?` (timer) may be used only if duration is not programmed to „0“.

Master clock LCU

2.7 DCF77 Status

Check-up of DCF77 status is available with function

```
DCF sync status
```

The following inputs are available:

```
MShh: mmZTTMMJJ W  
×100: 15_270595 6
```

On position **M** you can select between

- × cancel
- ↵ OK-select function e.g.: synchronise time with next minute
- * activate DCF77-receiver and synchronisation
- deactivate DCF77-receiver and synchronisation
- enable take-over DCF-time to master clock
- ^ disable take-over DCF-time to master clock

Position **Z** indicates daylight saving time. Summer time is indicated by **—**. In case of wintertime this place remains empty.

Position **S** (status) indicates the status of the DCF-receiver. Time is the last valid received DCF time. The displayed characters have the following meaning:

○ empty display: DCF77-receiver and synchronisation was deactivated with

capital letter: clock was never synchronised by DCF-receiver

invalid DCF-signal: letters a-d

- a time of clock was exact
- b time of clock was too fast
- c time of clock was too slow
- d time was not comparable

valid DCF-signal: letters i-l

- i time of clock exact
- j time of clock too fast
- k time of clock too slow
- l time not comparable

2.8 DCF-Time Offset

The DCF-Time Offset can be set by pressing the **→** button during the start-up procedure of the LCU after switch-on the power supply until following display

Master clock LCU

appears:

→ - 00:00

following meaning:

M U hh:mm

instead of M you can select the mode

- input, continue input
- ↵ OK-select function e.g.: store DCF-Time Offset
- ✕ cancel

instead of U you can select the sign (direction) of the DCF-Time Offset +/-
instead of hh:mm you can select the DCF-Time Offset in hours and minutes.
The time base will be corrected with the Summer/Winter time that is set different to the Summer/Winter time based on DCF-Time.

On position M with ↵ and → the selected DCF-Time Offset will be stored.

2.9 Summer/Winter time changeover

Summer/Winter time changeover times are adjusted in menu

dawlight savine

The LCU display shows:

M S
→ 1
↵ OK-select function
✕ cancel

3 options are selectable:

- 1 summer/winter time changeover takes place on last Sunday in march at 2.00 o'clock and on last Sunday in October at 3.00 o'clock.
- 2 summer/winter time changeover takes place on the stored date.
- 0 LCU performs no summer/winter time changeover.

In case you select the option 2 you can set the exact date/time of Summer/Winter time changeover (s/w time c.o.) and Winter/Summer time changeover (w/s time c.o.):

Master clock LCU

→ 02 401 03 1031

M		select the mode → or ↵ or ✕
hh		select the time (02) for 2:00 of w/s time c.o.
MM	TT	select the date (401) for 4.1. of w/s time c.o.
hh		select the time (03) for 3:00 of s/w time c.o.
MM	TT	select the date (1031) for 31.10. of s/w time c.o.

On position M with ↵ and → the set data will be stored.

2.10 Language selection

Display languages are selected in menu

language

The following languages are available:

Deutsch
English
Italiano

2.11 Exit from menus

With menu

end

you get to the default display where the clock shows time and date.

Master clock LCU

3 Technical Data

- large, well legible liquid crystal display (LCD) with digit height of 6mm
- foil keyboard with two keys
- accuracy of quartz time base: $\pm 0,1$ sec./day at 25°C
- slave clock output:
 - impulse voltage: ± 24 V DC
 - impulse current: max. 200mA
 - impulse ratio: fixed 2 seconds, fixed 2 seconds
- contact rating switching outputs: switch over contacts 250V AC, 3A
- grey, durable plastic casing
- dimensions: 175x110x56mm (WxHxD)
- supply voltage: 220-240V AC / 100-120V AC, 50/60Hz
- power consumption: 12VA
- temperature range: 0-50°C
- atmospheric humidity: 20-80%, non condensing
- weight: 0,6 kg

Auth. Agent

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