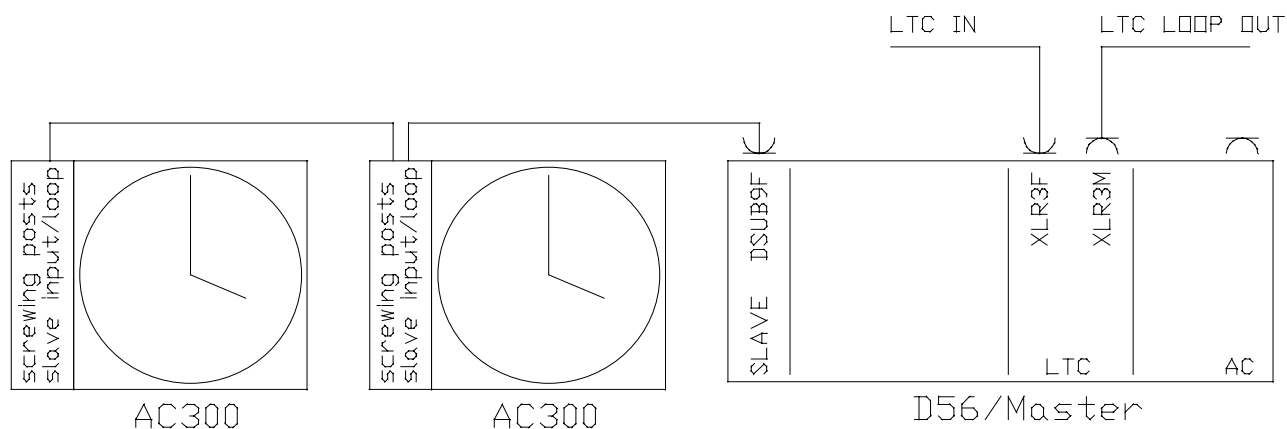


# Option „Master“

for displays of the MTD Time Timer Time Code system



## Functions overview

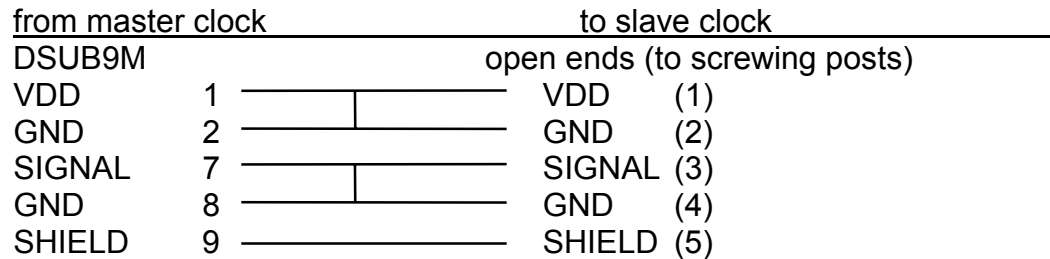
With this option, a digital display (MTD D25, MTD D56) is enhanced by a control module to connect analogue index clocks (MTD AC230, MTD AC300, Eurochron clock). The digital display is termed master clock and permits to read and display LTC time code as well as all time units of the MTD Time Timer Time Code system - reading the LTC(MTD) generated by a special MTD generator. The analogue index clock is termed slave clock and permits to display a time other than the time displayed at the master clock. The time to be displayed at the slave clock is selected by a turn switch at the master clock.

The master clock supplies the slave clock with power as well as with time data. The time data are provided by the LTC and will be converted to form a telegram similar to the German radio time telegram DCF77. The data bits are transmitted every second, at the change of the minute the seconds pulse will be suppressed. The telegram is synchronous to the readout LTC. Screwing posts at the slave clock serve as connectors, making an easy loop-through to a next slave clock possible.

The digital display of the master clock displays the time in 24-hour format, the analogue slave clock in 12-hour format. For detailed descriptions of the digital and analogue clocks of the MTD system please see respective operating instructions, e.g. for MTD D25, MTD D56 and MTD AC300.

## Connecting the master/slave combination

A 9-pin DSUB female connector SLAVE is mounted at the rear panel of the digital master clock. Below the pin assignment and a wiring example:



The pins not specified should not be used.

Use e.g. a two-paired, shielded cable with pairs twisted (1 with 2, 7 with 8).

### Cable lengths MTD master:

Every slave clock requires  $\leq 11\text{mA}$  at  $\geq 6\text{V}$ . To calculate the maximum cable length, output voltage, cross section, specific resistance and number of clocks have to be involved. For radial arrangement of copper cables with a cross section of  $0,22\text{mm}^2$  and a output voltage of  $12\text{V}$ , the following cable lengths are possible for every lane:

no. of clocks	1	2	5	10	20	30
length m	3500	1750	700	350	175	117

The maximum number of clocks is limited by a 300mA fuse.

## Operating the master/slave combination

After power-on of the master clock the display shows the revision number (e.g. „7.0 TA“), built-in options if any, the operating mode selected for the slave clock (e.g. „zone 2“) and the operating mode selected for the master clock (e.g. „mode A“). Three turn switches serve to select the operating mode:

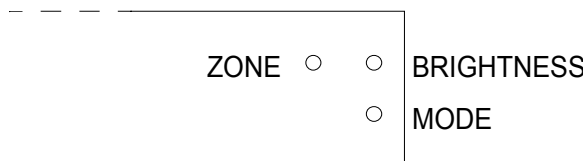
- BCD turn switch **BRIGHT** modifies the brightness of the digital display.
- HEX turn switch **MODE** serves to select the operating mode of the digital display:

Pos.	Description	Remarks
0	local stop watch	
1	1 <sup>st</sup> main time	LTC(MTD): one time unit out of A...F, 2, 3
2	real time	LTC(MTD)
3	date	LTC(MTD)
4,5	not used	
6	LTC time information	
7	LTC user bits	
8	2 <sup>nd</sup> main time	LTC(MTD): one time unit out of A...F, 2, 3
9	3 <sup>rd</sup> main time	LTC(MTD): one time unit out of A...F, 2, 3
A,B,C,D,E	time A, B, C, D, E	LTC(MTD): stop watches
F	time F	LTC(MTD): LTC time read by MTD generator

For more details see respective operating instructions.

- HEX turn switch **ZONE** serves to select the operating mode of the analogue index clock. The positions 2, 6 and A-F are available with their functions corresponding to those of the MODE switch.

The turn switch **ZONE** may be at the rear or at the front of the display. For example the three switches at the front may have the arrangement:



All connected index clocks display the time selected with the **ZONE** turn switch. This way it is possible to display different times at master clock and slave clock. If a new time has been selected, the digital display shows for a moment the new operating mode, e.g. „zone 2“. Then all connected index clocks start their automatic setting, i.e. the hands move to the 12 o'clock position and then adjust to the time transferred. This operation will take three minutes approx.

For more details regarding the index clocks please see description (MTD AC230 or MTD AC300).

#### **ZONE 2 = real time**

The real time encoded in the LTC(MTD) receives one additional frame and then this time is converted into the telegram.

There is an automatic adjustment of the index clock to the Daylight Saving Times, as well as an automatic correction of any deviation from real time occurring during the daily operation. To take advantage of such automatic adjustment it must be ensured that the central MTD generator is receiving correct 'real time' signals or does the Daylight Saving Times switching automatically.

#### **ZONE 6 = LTC time information**

The time of the LTC is converted into the telegram and displayed by the index clock. The LTC has to be provided continuously, without jumps/breaks and at normal frequency.

#### **ZONE = A, B, C, D, E, F**

Basically one of these operating modes may be selected as well. Note that only up-counting times will be accepted. Moreover it has to be taken into consideration that the index clocks will only be synchronised to the telegram at every full hour. For this reason the stop watch functions are not recommended as operating modes. One possible application is the display of time zones. The times A..E will then be programmed as real time + offset.