

Analogue Clocks of the MTD Time Timer Time Code System

AV-MTD AC 230 - Slave

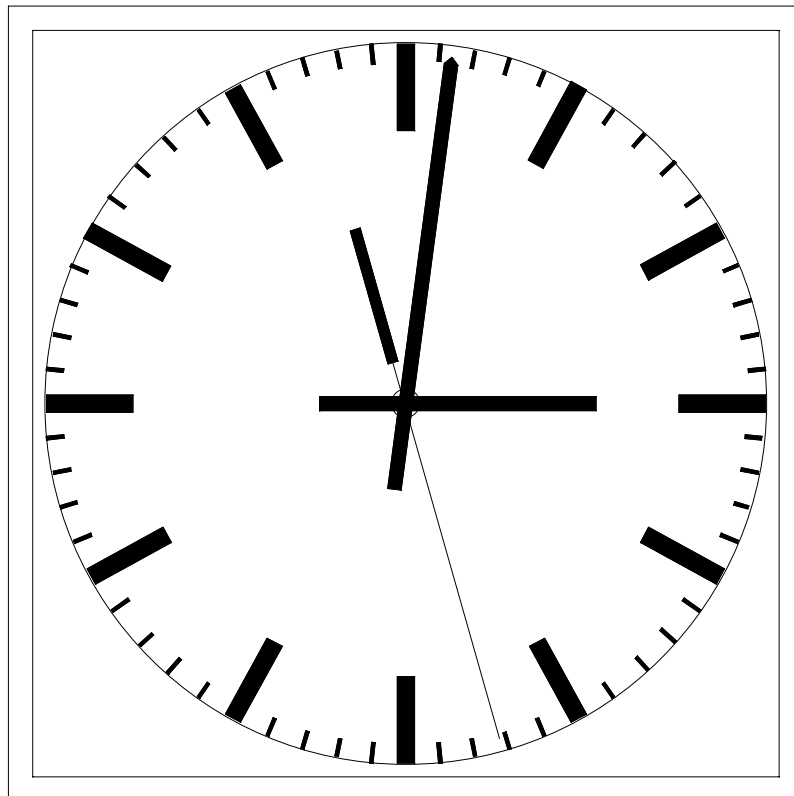


TABLE OF CONTENTS	Page
A1 SAFETY INSTRUCTIONS	
A2 COPYRIGHT	
A3 CE-DECLARATION	
FUNCTIONS OVERVIEW	1
DESCRIPTION OF THE ANALOGUE CLOCK	1
LINKING MASTER - SLAVE	2
TECHNICAL SPECIFICATIONS	2

Operating Manual AV-MTD AC 230 - Slave

A1 Safety Instructions

General rules:	Only use the device as directed in a dry atmosphere. Treat the AV-MTD AC 230 - Slave with the same care as other studio devices. Please follow the advice in the following operator's manual.
Damages in transit:	If the device shows obvious damages from transit the shipper in question must be notified and the dealer must be informed.
Positioning:	Position device only where sufficient air circulation can be maintained. Extreme temperatures, dust, humidity, shocks and strong electromagnetic fields must be avoided.
Maintenance:	Use a moist soft textured fabric cloth when cleaning the housing. Do not use polish or any other cleaning agents.
Repairs:	The AV-MTD AC 230 - Slave does not require any extra maintenance. There are no user serviceable parts inside the device. Repairs should be sent to an authorized service partner.
EMC:	The EMC regulations are observed only under the following condition: use high quality shielded cables at data inputs and outputs.

Battery Use Warnings



CAUTION: Danger of explosion if battery is incorrectly placed. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

A2 Copyright

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A3 CE Declaration of Conformity

We,

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herewith declare under our sole responsibility that the

AV-MTD AC 230 - Slave

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

89/336/EEC Electromagnetic Compatibility

EN 50081-1 Emissions

- EN 55022
- EN 55103-1

EN 50082-1 Immunity

- EN 55024
- EN 55103-2

Functions Overview

MTD AC 230 - Slave is an analogue clock in a square housing (230 x 230 mm approx.). The face is white, its markings of hours and minutes as well as the hands for the hours and minutes are black. The seconds hand is red.

The clock is for use in dry interior rooms only.

This clock operates as a slave clock which must be driven by any MTD master clock (e.g. MTD AC 230). The clock allows the display of a real time or time of a time code (LTC). It is completely self-setting with automatic change-over and change-back if time changes occur (e.g. switching to Daylight Saving Time). The power supply and the data signals (telegram) will be delivered from the master clock. Connection can be made using the cable with the DSUB9 male connector at the end (1:1 straight connection to a master output) or using the screwing posts within the housing of the unit.

Description of the Analogue Clock

The three independent stepper motors of the clockwork drive the three hands. With delivery the hands as well as the clockwork are set to the 12 o'clock position. The two built-in sensors of the clockwork serve to detect this position enabling a check and correction of the hands.

Following a RESET (e.g. after power-on), the stepper motors start moving to reach the 12 o'clock position. First the hours and seconds hands are moved, and then the minutes hand. This process takes up to 3 minutes time. After this adjustment, all hands must exactly point at the 12 o'clock position. If not, the hands must be manually adjusted (by qualified personnel only).

After RESET the clock is immediately ready to receive the telegram. If a telegram is received, the seconds hand will move in sync with the data bits received (after the 12 o'clock position has been reached). If two valid telegrams are received, the clock adjusts to the time received, the internal reference is locked. This process normally takes up to 3 minutes time. If no telegram can be received, the hands will stand still.

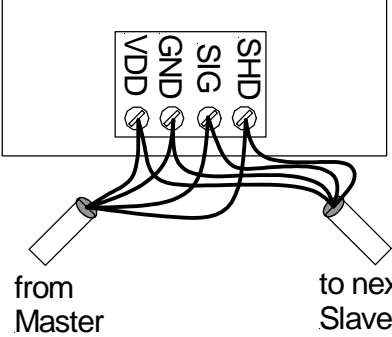
The clock will execute a self-test to check the position of the hours and minute's stepper motors every 12:00:00 and 00:00:00 o'clock. The check regarding the seconds is made every minute. If necessary, the position of the hands will be corrected automatically to achieve precise sync to the internal reference. Every hour the clock will synchronise the internal reference by reading the telegram at every 59th minute. As a usual process, the minutes hand will take the last two seconds of every minute to move to the next marking. If no valid telegram can be received, the minutes hand will change to a quasi-continuous run, i.e. the minutes hand will take 30 positions every minute. This quasi-continuous run will automatically be changed to the stepping run only if at a following full hour a valid telegram can be received. This way, a continuous stepping run will indicate the presence of the time telegram.

Operating Manual AV-MTD AC 230 - Slave

Linking Master - Slave

Power supply as well as the data line will be supplied from the master clock. The data signals are similar to the German broadcast radio telegram DCF77 carrying data bits with pulses at each second. At a full minute one pulse will be suppressed.

Putting in a back-up battery will keep the clock running if power fails. As long as power from the master is present the battery automatically is disconnected. Please notice the battery use warnings.

<table border="1"><tr><td>Connector Slave</td></tr><tr><td>Cable + DSUB9M</td></tr><tr><td>1: V+</td></tr><tr><td>2: V-</td></tr><tr><td>7: Signal</td></tr><tr><td>8: Signal GND</td></tr></table>	Connector Slave	Cable + DSUB9M	1: V+	2: V-	7: Signal	8: Signal GND	 <p>The diagram shows a DSUB9M connector with four pins labeled VDD, GND, SIG, and SHD. Wires connect these pins to a cable labeled 'from Master' and another labeled 'to next Slave'.</p>
Connector Slave							
Cable + DSUB9M							
1: V+							
2: V-							
7: Signal							
8: Signal GND							
<p>The pins not specified should not be used. Use e.g. a two-paired, twisted cable, twist 1 with 2 and 7 with 8.</p>	<p>Screwing posts at the printed circuit board which is assembled at the inner side of the rear cover.</p>						

Technical Specifications

- Dimensions: 235 (W) x 235 (H) x 63 (D) mm
- Weight: 1.2 kg approx.
- Operating temperature: 5°C to 40°C
- Relative humidity: 35% to 85%, non-condensing
- Operating voltage: 11 - 18 V DC
- Current consumption: 16 mA (during hands adjustment), 9 mA typically
- Technical data of the clockwork:
 - Crystal time base: 32kHz (accuracy ±0.5 s/day)
 - Clockwork: Junghans W718
 - Type of battery: 2x round cell 1.5V IEC LR14 alkali-mangan (do not use zinc-carbon batteries)
- Mean power consumption under battery operation: 1 mA