

Displays of the MTD Time Timer Time Code System

AV-MTD DD15 R/G/Y 6



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A1 Safety Instructions

General rules:	Only use the device as directed in a dry atmosphere. Treat the AV-MTD DD15 R/G/Y 6 with the same care as other studio devices. Please follow the advice in the following operators 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 DD15 R/G/Y 6 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.

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A3 CE declaration of conformity

We,

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herewith declare under our sole responsibility that the

AV-MTD DD15 R/G/Y 6

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

AV-MTD DD15 R/G/Y 6 is a combination of two displays (7-segment LEDs) of 15mm digit height. R or G or Y responds to the colour of the LEDs : R = red, G = green, Y = yellow. The colour of the LEDs may be different for each display. Digit 6 stands for a 6-digit display.

Alpermann+Velte has developed a system for Multiple Time Displays (MTD). A MTD system consists of a central generator unit, digital displays and/or analogue clocks, and user console(s). The central generator unit outputs a special LTC format. This LTC will henceforth denoted as LTC(MTD). The LTC(MTD) represents the data link to all the digital displays, and it contains real time, date and user selectable timers.

To select the operating mode use HEX turn switch at the front panel, individually for each display. Mode „0“ and the MTD BT keypad connected at the 9-pin KEY female connector (with its four keys START, STOP, HOLD, RESET) permits to operate one of the displays as a local stop timer.

To use the unit as an LTC reader display, mode „6“ (= LTC time display) or mode „7“ (= LTC user display) should be selected. All other modes are provided for being used in a MTD system, and the display will extract the data of the LTC(MTD). In case that a minus sign should be displayed it appears at the most significant digit (tens of hours). If this digit is not blank, it will be overwritten with the minus sign.

The brightness of the LED's are adjustable by using the BCD turn switch located on the front panel, individually for each display:

Stage	Function
0	The display becomes inactive, only a decimal point in the lowest possible brightness is lit up.
1 - 7	Adjusts the brightness (1 = lowest, 7 = highest).
8	Reserved.
9	Test mode, where all LED's are lit up with maximum brightness.

After power-on, all of the LED's will light up shortly and then the display will show the revision number (e.g. „7.0 do“), any built-in options and the selected operating mode.

Each display operates independently from the other, they can be treated as two separate units combined in one housing. They only share the rear connections (LTC and power supply).

Operating modes

Positions of the HEX turn switch:

Mode	Description	Remarks
0	local stop timer	no LTC required
1	1 st main time	display of one time unit out of A - F, 2, 3
2	real time	
3	date	
4,5	not used	
6	LTC time information	LTC reader: display of time
7	LTC user bits	LTC reader: display of user bits
8	2 nd main time	display of one time unit out of A - F, 2, 3
9	3 rd main time	display of one time unit out of A - F, 2, 3
A	time A	display of time A (e.g. stop timer A)
B	time B	display of time B (e.g. stop timer B)
C	time C	display of time C (e.g. stop timer C)
D	time D	display of time D (e.g. stop timer D)
E	time E	display of time E (e.g. stop timer E)
F	time F	= time of the LTC read by the MTD generator

After a change of mode with the HEX turn switch the display indicates the new mode for a moment (e.g.: „mode B“). As soon as new LTC data are read, the selected time can be displayed.

Mode 0 = local stop timer

The local stop timer is run internally, i.e. no LTC connection is required. The time of this stop timer will only be shown at this display.

To operate the local stop timer with the BT option, connect the MTD BT keypad with its START, STOP, HOLD, RESET keys (9-pin KEY female connector).

Functions:

START	Stop timer counts upward. Resets the HOLD function.
STOP	Stop timer stops. Resets the HOLD function.
HOLD	Current time display freezes, clock continues counting internally. Press HOLD again to refresh the time displayed.
RESET	Stop timer stops and is reset to zero.

The local stop timer always counts upwards (UP) and has the following fixed settings:

- Leading zeros will not be displayed
- Display format = HH:MM:SS
- Colons to separate hours, minutes, seconds

Modes 1, 8 and 9: Main time

With this function the displays of the MTD System can be operated by remote control. Within one system three groups of displays may be defined, each group may be remote controlled independently from the other groups, within one group all displays show the same time. The individual group is defined by the operating mode selection:

- displays of mode 1 will show the first „Main Time“
- displays of mode 8, will show the second „Main Time“
- displays of mode 9 will show the third „Main Time“

The „Main Time“ shown at the displays may be one of the following time units:

A, B, C, D, E, F, real time or date.

An user console (e.g. MTD BE, MTD BTK, MTD BE19, ...) is used to select which time unit out of these eight is determined to serve as the “Main Time”.

→ Please also refer to „LTC dropout“ ←

Mode 2 = real time

In this mode, the time unit 2 (real time encoded in the LTC(MTD)) receives one additional frame and then this time is displayed.

The following formats may be selected via an user console (e.g. MTD BE, MTD BTK, MTD BE19, ...) to display the real time:

- Leading zeros (of the hours) on/off.
- Three user selectable symbols to separate hours/minutes/seconds: colon, decimal point or without any.
- Display formats:
 - 7 = 24-hour format
 - 8 = 12-hour format

→ Please also refer to „LTC dropout“ ←

Mode 3 = date

In this mode, the time unit 3 (date encoded in the LTC(MTD)) is displayed.

The following formats may be selected via an user console (e.g. MTD BE, MTD BTK, MTD BE19, ...) to display the date:

- Leading zeros (i.e. leading zero at highest position) on/off
- Three user selectable symbols to separate day/month/year: colon, decimal point or without any
- Display formats:
 - 1 = DD/MM/YY
 - 2 = MM/DD/YY
 - 3 = YY/MM/DD

Mode 6 = LTC time

The time of the LTC (according to SMPTE/EBU specification) is displayed. The LTC is read forward or reverse, within a range of 20-34 frames/second. One frame is added to the readout time when moving in the forward direction, subtracted when moving in the reverse direction.

Reading LTC which is not of LTC(MTD) format, the time is displayed as HH:MM:SS, i.e. a 6-digit format, separating symbols are set to colon, leading zeros will be displayed.

Reading the LTC(MTD) the following formats may be selected via an user console (e.g. MTD BE, MTD BTK, MTD BE19, ...) to display the LTC time:

- Leading zeros on/off
- Three user selectable symbols to separate hours/minutes/seconds/frames: colon, decimal point or without any
- Display formats:
 - 1 = hours/minutes/seconds
 - 4 = minutes/seconds/frames

Mode 7 = LTC user

The user bits of the LTC (according to SMPTE/EBU specification) are displayed. LTC is read „forward“ or „reverse“, within a range of 20-34 frames/second.

The display shows the six user digits of higher significance in hexadecimal format. Leading zeros will be displayed, but no decimal point or colon.

Modes A, B, C, D, E = stop timer or difference time or offset time

The times A, B, C, D, E are encoded in the user bits of the LTC(MTD).

To display these times the following display formats may be selected via an user console (e.g. MTD BE, MTD BTK, MTD BE19, ...):

- Leading zeros on/off
- Flashing in case of negative values on/off
- Three user selectable symbols to separate hours/minutes/seconds: colon, decimal point or without any
- Display formats:
 - 1 = HH:MM:SS (stop timer)
 - 2 = MM MM:SS
 - 3 = SS SS SS
 - 4 = MM:SS:FF
 - 5 = MM:SS.T
 - 6 = SS SS.T
 - 7 = HH:MM:SS (24-hour format „real time“)
 - 8 = HH:MM:SS (12-hour format „real time“)

→ Please also refer to „LTC dropout“ ←

Mode F = time of the LTC read by the MTD generator

The time F is encoded in the user bits of the LTC(MTD).

The time F contains the time information of an LTC read from the special MTD generator. The reading range comprises „normal play speed“, i.e. 20-30 frames/second, forward and reverse. The displayed data are frame accurate unless there is a change of direction. It is not possible to realise dynamic changes of direction frame accurate because of a delayed status transmission.

The following display formats may be selected via an user console (e.g. MTD BE, MTD BTK, MTD BE19, ...) to display the time F:

- Leading zeros on/off
- Three user selectable symbols to separate hours/minutes/seconds: colon, decimal point or without any
- Display formats:
 - 1 = hours/minutes/seconds
 - 4 = minutes/seconds/frames

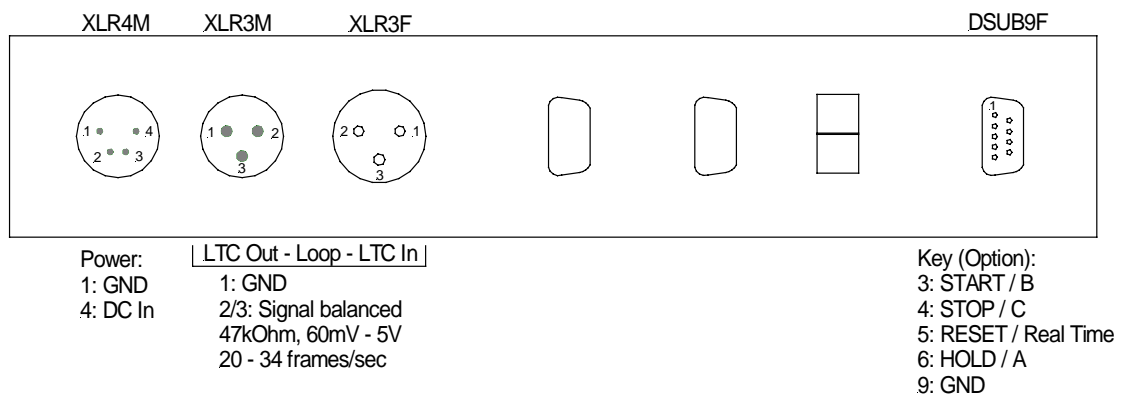
→ Please also refer to „LTC dropout“ ←

LTC dropout

In case of a dropout of the LTC(MTD) during the current operation a display set to mode 1, 8 or 9 (main time), 2 (real time), A, B, C, D, E or F will keep on with the actual function using its internal clock, i.e. an up-counting or down-counting time will continue counting, a still time will not change.

A dropout has occurred when both decimal points and colons are simultaneously lit up.

Rear panel and specifications



Power supply:	10-30V DC, 9W max (5W typical)
Dimensions:	214 (W) x 43 (H) x 140 (D) mm (½ 19", 1U)
Weight:	1.5kg approx.
Operating temperature:	5°C to 40°C
Relative humidity:	35% to 85%, non-condensing