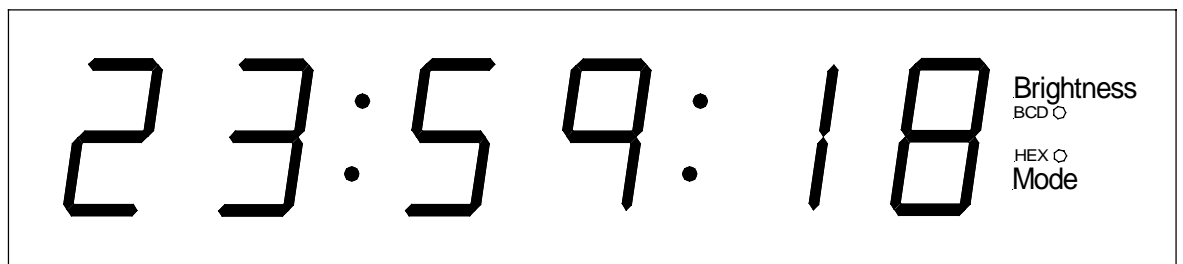


Operational displays of the  
MTD Time Timer Time Code System

# AV-MTD BD25 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 BD25 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 BD25 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.

## A2 Copyright

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Information in this publication replaces all previously published information. Alpermann+Velte Electronic Engineering GmbH assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. Whenever it is likely that safe operation is impaired, the instrument must be made inoperative and secured against unintended operation. The appropriate service authority must then be informed.

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For further information please contact your local dealer or:

### ***Alpermann+Velte***

Electronic Engineering GmbH

Otto-Hahn-Str. 42

D-42369 Wuppertal

Phone: ++49 - (0)202 – 244 111 0

Fax: ++49 - (0)202 – 244 111 5

E-Mail: [info@alpermann-velte.com](mailto:info@alpermann-velte.com)

Internet: <http://www.alpermann-velte.com>

## **A3 CE declaration of conformity**

We,

### ***Alpermann+Velte***

Electronic Engineering GmbH  
Otto-Hahn-Str. 42  
D-42369 Wuppertal

herewith declare under our sole responsibility that the

## **AV-MTD BD25 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

MTD BD25 are displays (7-segment LEDs) with a digit height of 25mm. R or G or Y responds to the colour of the LEDs : R = red, G = green, Y = yellow. 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. User consoles communicate over a RS485 serial interface with the central generator.

A display can be converted into a user console (operational unit) through the use of an external keypad.

- A display with the **Option BT** has a four button keypad, connected through a 9 pole DSUB KEY. The four keys have the functions START, STOP, HOLD, RESET (e.g. for stopwatch functions), or - having switched on the "main time" function - they can select 4 time units A, B, C or real time.
- A display with the **Option BTK** has a twenty button keypad, connected through a 15 pole DSUB-HD KEY. The twenty keys 0 - 9, START, STOP, HOLD, RESET, and four function keys provide enhanced facilities of operation.

The **operating mode** is selected with the **HEX turn switch** at the rear or front panel. With the BTK option another facility to switch the operating mode is to use the BTK keypad: set HEX turn switch to position 8 or 9 and select all operating modes now using key "+" or "-". Selecting mode „0“ in connection with the BT option permits e.g. to operate the display as a simple local stopwatch. 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 or the rear panel:

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 Td“ without BTK option, „7.0 Tk“ with BTK option), any built-in options and the selected operating mode.

## Operating modes

Positions of the HEX turn switch:

Mode	Description	Remarks
0	local stop timer	no LTC or RS485 required
1	1 <sup>st</sup> main time	display and/or select one time unit out of A - F, 2, 3
2	real time	display and/or set
3	date	display and/or set
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 <sup>nd</sup> main time	display and/or select one time unit out of A - F, 2, 3
	with BTK option	operating mode with installation; display and operation of all time units
9	3 <sup>rd</sup> main time	display and/or select one time unit out of A - F, 2, 3
	with BTK option	operating mode without installation; display and operation of all time units
A	time A	display and operation of time A (e.g. stop timer A)
B	time B	display and operation of time B (e.g. stop timer B)
C	time C	display and operation of time C (e.g. stop timer C)
D	time D	display and operation of time D (e.g. stop timer D)
E	time E	display and operation 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 data of the selected time can be displayed.

## Mode 0 = local stop timer

The local stop timer is run internally, i.e. no LTC or RS485 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:

<b>START</b>	Stop timer counts upward. Resets the HOLD function.
<b>STOP</b>	Stop timer stops. Resets the HOLD function.
<b>HOLD</b>	Current time display freezes, the timer keeps running. Press HOLD again will update the time displayed.
<b>RESET</b>	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

To operate the local stop timer with the **BTK option**, connect the MTD BTK keypad with its twenty keys 0-9, +, -, START, STOP, HOLD, RESET and four function keys (15-pin KEY female connector). This option provides enhanced facilities of operation; please see manual for MTD system operation.

## 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 is used to select which time unit out of these eight is determined to serve as the “Main Time”. A MTD display together with **BT option** or **BTK option** represents an user console. Using the external keys (connected at KEY connector) and having the display switched to mode = 1, the time unit of the 1<sup>st</sup> main time can be selected. With mode = 8 the time unit of the 2<sup>nd</sup> main time and with mode = 9 the time unit of the 3<sup>rd</sup> main time can be selected.

Having a display with **BT option** (MTD BT keypad) four time units may be selected:

pins DSUB KEY	function = main time	function = stop timer
3	time B	START
4	time C	STOP
5	real time	RESET
6	time A	HOLD
9	GND	GND

Having a display with **BTK option** (MTD BTK keypad) eight time units may be selected:

main time	key
A	A (HOLD) or 4
B	B (START) or 5
C	C (STOP) or 6
D	7
E	8
F	9
2 = real time	TIME (RESET) or 2
3 = date	3

Using the HEX turn switch to select mode = 8 or mode = 9, the display with **BTK option** not immediately switches to the “main time” function, but these operating modes enable to switch to every operating mode. The “main time” functions (2<sup>nd</sup> and 3<sup>rd</sup> main time) now are selected, if the mode = 8/mode = 9 is selected with the keys “+” or “-” again.

→ 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 with the **BTK option** or via an user console (e.g. MTD BE, 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“ ←

In case the central generator has no real time reference signal, the real time may be set manually using the unit MTD BTK (**BTK option**). For description please refer to the manual for MTD system operation.

## Mode 3 = date

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

The following formats may be selected with the **BTK option** or via an user console (e.g. MTD BE, 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

In case the central generator has no real time reference signal, the date may be set manually using the unit MTD BTK (**BTK option**). For description please refer to the manual for MTD system operation.

## 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 with the **BTK option** or via an user console (e.g. MTD BE, 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.

## **Option BTK: Mode 8 = operational mode with installation**

Available only with **BTK option** (without this option: mode 8 = 2<sup>nd</sup> main time): enables operation and display of all times as well as the installation of:

- access rights
- display and stop timer functions
- function keys of MTD BTK.

Using keys "+" and "-" of the unit MTD BTK each mode 0 - F can be reached. This replaces to turn the HEX switch **Mode**. The 2<sup>nd</sup> main time (selected with mode = 8) now is selected, if the mode = 8 is selected with the keys "+" or "-" again.

For operating instructions see manual for MTD system operation.

## **Option BTK: Mode 9 = operational mode without installation**

Available only with **BTK option** (without this option: mode 9 = 3<sup>rd</sup> main time): enables operation and display of all times.

Using keys "+" and "-" of the unit MTD BTK each mode 0 - F can be reached. This replaces to turn the HEX switch **Mode**. The 3<sup>rd</sup> main time (selected with mode = 9) now is selected, if the mode = 9 is selected with the keys "+" or "-" again.

For operating instructions see manual for MTD system operation.

## 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 with the **BTK option** or via an user console (e.g. MTD BE, 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“)

By connecting the unit MTD BT (**BT option**) with its keys and functions START, STOP, HOLD, RESET, the time selected may be operated. The selected functions will not only take local effect but will be communicated to the central generator via the RS485 interface. Thus, all displays of the system adjusted to the same operating mode will simultaneously show any changes made.

By connecting the unit MTD BTK (**BTK option**) with its twenty keys 0-9, +, -, START, STOP, HOLD, RESET and four function keys, enhanced facilities of operation are provided; see manual for MTD system operation.

→ 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 with the **BTK option** or via an user console (e.g. MTD BE, 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

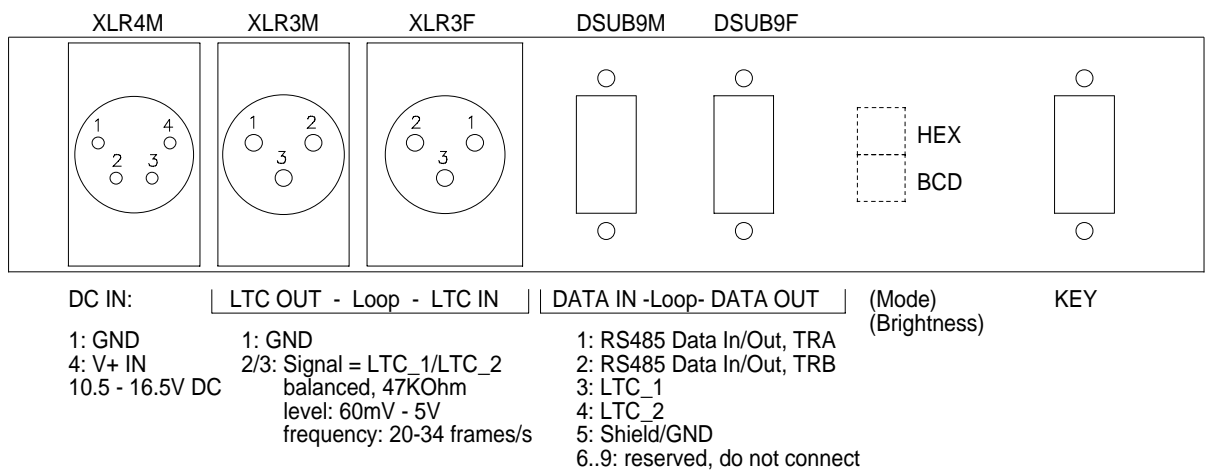
→ Please also refer to „LTC dropout“ ←

## LTC dropout

In case of a dropout of the LTC(MTD) the current operation of modes 1, 8 and 9 (main time), 2 (real time), A, B, C, D, E or F will continue 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 is signalled by simultaneous lighting of the decimal points and colons.**

## Rear panel and specification



Current consumption: typical 410-460mA, maximum 660mA  
 Dimensions: 214 (W) x 43 (H) x 140 (D) mm (1/2 19", 1U)  
 Weight: 1kg approx.  
 Operating temperature: 5°C to 40°C  
 Relative humidity: 35% to 85%, non-condensing

KEY connection: BTK option: 15-pins DSUB-HD female, pins 1..15 = keys input

BT option = 9-pins DSUB female:

pins	function main time	function stop timer
3	time B	START
4	time C	STOP
5	real time	RESET
6	time A	HOLD
9	GND	GND