

Operational displays of the
MTD Time Timer Time Code System

AV-MTD BDD15 R/G/Y 6



TABLE OF CONTENTS	Page
A1 SAFETY INSTRUCTIONS	
A2 COPYRIGHT	
A3 CE-DECLARATION	
FUNCTIONS OVERVIEW	1
OPERATING MODES	2
MODE 0 = LOCAL STOP TIMER	3
MODES 1, 8 AND 9: MAIN TIME	4
MODE 2 = REAL TIME	5
MODE 3 = DATE	5
MODE 6 = LTC TIME	6
MODE 7 = LTC USER	6
OPTION BTK: MODE 8 = OPERATIONAL MODE WITH INSTALLATION	7
OPTION BTK: MODE 9 = OPERATIONAL MODE WITHOUT INSTALLATION	7
MODES A, B, C, D, E, F = STOP TIMER OR DIFFERENCE TIME OR OFFSET TIME	8
LTC DROPOUT	8
REAR PANEL AND SPECIFICATION	9

A1 Safety Instructions

General rules:	Only use the device as directed in a dry atmosphere. Treat the AV-MTD BDD15 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 BDD15 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

No part of this publication may be reproduced, translated into another language, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written consent of Alpermann+Velte Electronic Engineering GmbH. Technical changes are reserved. All brand and product names mentioned herein are used for identification purposes only, and are trademarks or registered trademarks of their respective holders.

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.

Copyright © Alpermann+Velte Electronic Engineering GmbH 1999-2000. All rights reserved.

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

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 BDD15 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 BDD15 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. User consoles communicate over a RS485 serial interface with the central generator.

One 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 (keypad MTD BTK) or connected through a 9 pole DSUB KEY (keypad CP20). The twenty keys 0 - 9, START, STOP, HOLD, RESET, and programmable function keys provide enhanced facilities of operation.

The operating mode is selected with the HEX turn switch at the front panel, individually for each display. With the BTK option (for one of the displays) another facility to switch the operating mode is to use the BTK or CP20 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 one of the displays 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 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 Td" without BTK option, "7.0 Tk" with BTK option), 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, RS485 and power supply).

Operating modes

Positions of the HEX turn switch:

Mode	Description	Remarks
0	local stop timer	no LTC or RS485 required
1	1 st 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 nd 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 rd 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	display and operation of time F (e.g. stop timer F)

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:

START	Stop timer counts upward. Resets the HOLD function.
STOP	Stop timer stops. Resets the HOLD function.
HOLD	Current time display freezes, the timer keeps running. Press HOLD again will update 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

To operate the local stop timer with the BTK option, connect the MTD BTK or CP20 keypad with its twenty keys 0-9, +, -, START, STOP, HOLD, RESET and programmable function keys. 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 1st main time can be selected. With mode = 8 the time unit of the 2nd main time and with mode = 9 the time unit of the 3rd 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 or CP20 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 (2nd and 3rd 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

The 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 or CP20 (BTK option). For description please refer to the manual for MTD system operation.

Mode 3 = date

The 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 or CP20 (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 = 2nd 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 or CP20.

Using keys "+" and "-" of the unit MTD BTK or CP20 each mode 0 - F can be reached. This replaces to turn the HEX switch Mode. The 2nd 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 = 3rd main time): enables operation and display of all times.

Using keys "+" and "-" of the unit MTD BTK or CP20 each mode 0 - F can be reached. This replaces to turn the HEX switch Mode. The 3rd 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, F = stop timer or difference time or offset time

The times A, B, C, D, E, F 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 or CP20 (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.

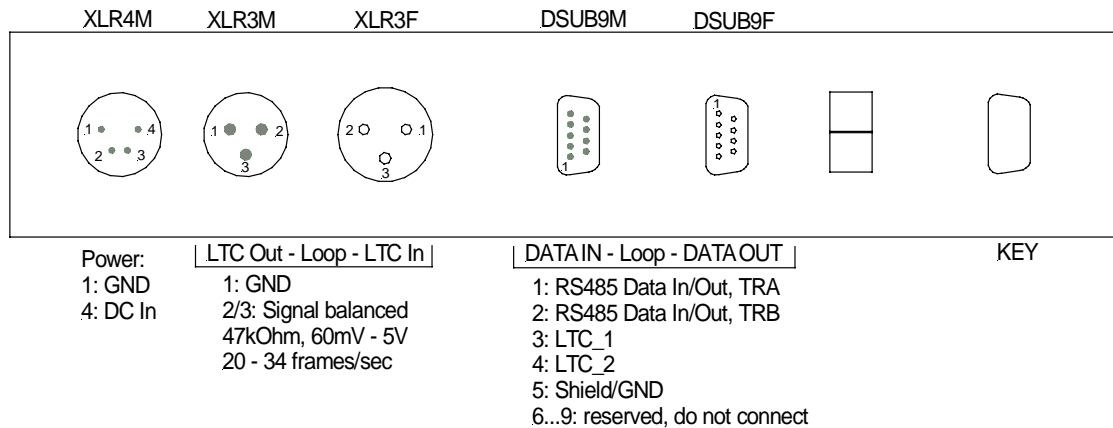
→ Please also refer to „LTC dropout“ ←

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



Power supply (without keypad CP20): 10-30V DC, 10W max (7W typical)
 Power supply (with keypad CP20): 10.5-16.5V DC, 12.5W max (8W typical)

Dimensions (½ 19" unit): 214.5 (W) x 43.5 (H) x 140 (D) mm (½ 19", 1U)
 Dimensions (19" unit): 436.5 (W) x 43.5 (H) x 140 (D) mm (19", 1U)

Weight (½ 19" unit): 1.5kg approx.
 Weight (19" unit): 2.0kg approx.

Operating temperature: 5°C to 40°C
 Relative humidity: 35% to 85%, non-condensing

KEY connection: BTK keypad = 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

CP20 keypad = 9-pins DSUB 1:1 connection:

pins	DSUB9F at BDD15	DSUB9M at CP20
1/6	V+ OUT, fused with 200mA, automatic recovery	V+ IN, 10-16V DC, max. 150mA
2	TxD output	RxD input
3	RxD input	TxD output
4	reserved	
5/9	GND	GND
7	CTS input	RTS output
8	RTS output	CTS input