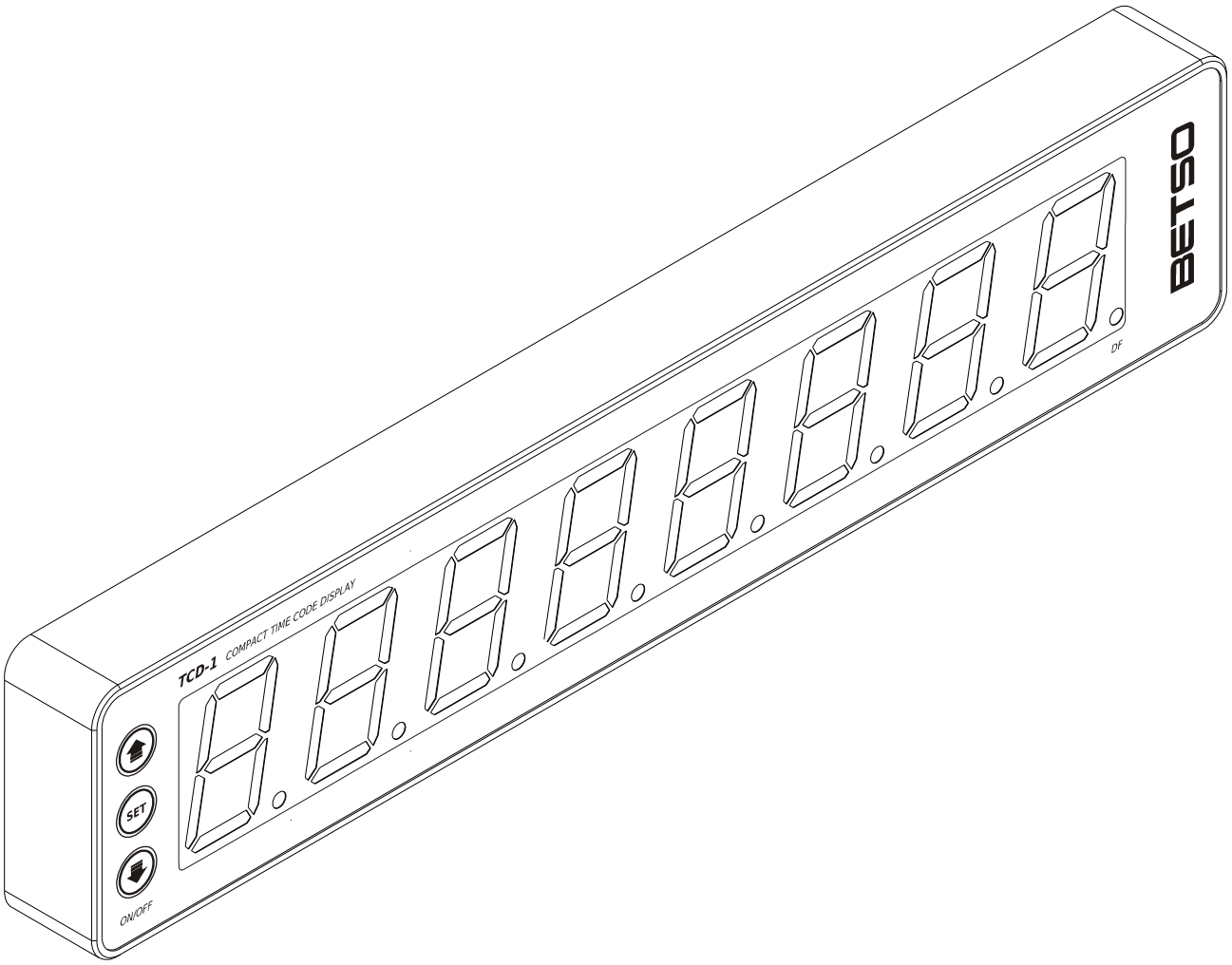
TCD-1

1“ Compact Time Code display



Contents

Used symbols

Indicates text that has only informative character. If you overlook this information, it can't result in product damage by it's mishandling.

Indicates text that has important instruction character. If you overlook this information, it may result in product damage.

Thank you that you have purchased the product BETSO!

Please pay sufficient attention to the following user manual of your new product BETSO. Following these instructions, you will avoid the possible damages of your new device and at the same time, they will be presented to you all the available features that allow you to take advantage of the potential of the product.

For the latest informations about our products BETSO please contact your local distributor or visit our website http://www.betso.eu.

1. Product description

The Time Code Display BETSO TCD-1 is a small compact, self powered solution for displaying time code. It supports all frame rates and detects frame rate automatically. Menu-based settings allow quick setup of brightness, internal battery and external source voltage readout (for simply check of cart or bag power). Besides other features, we have also implemented a special power saving modes.

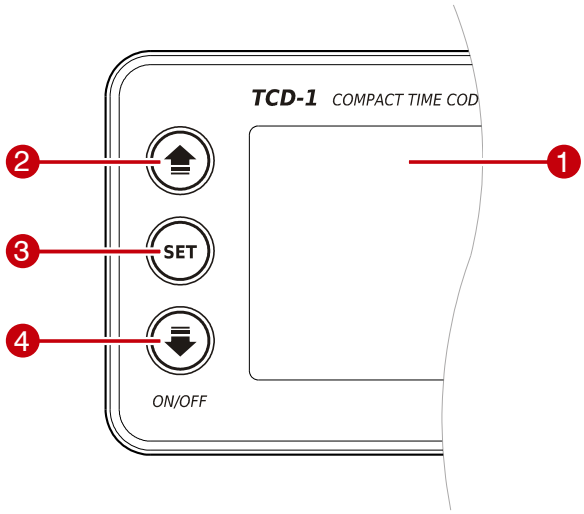
BETSO TCD-1 is made from lightweight aluminum alloy by precise CNC milling and laser cutting. With its small dimensions and light weight it is ideal for portable use.

2. Top features

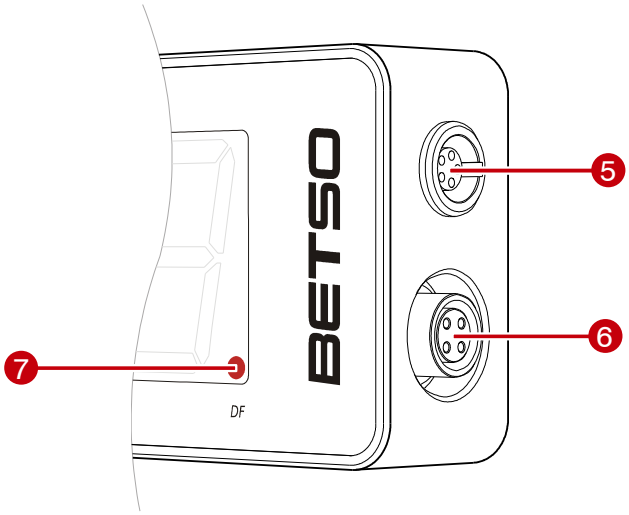
- precise mechanic construction from aluminium alloy (CNC, laser technology)
- intuitive control with the possibility of quick settings using menu
- alternative displaying of time code / user bits
- Power Saving functions enabling saving of the energy of the accumulators by showing only each 2nd, 5th or zeroth frames, alternatively by showing of time code only on command (On Push function - pressing of button)
- TC hold function for leaving last valid time code on display (after failure or stop of input time code signal)
- Full brightness function for showing of each zeroth frames with maximum brightness of display
- Automatic turning on / off function depending on whether valid TC is received or not
- possibility of charging automatically after adapter insertion, alternatively after confirmation (for prevention of external source energy consumption by unrequested charging)
- 6 levels of display brightness settings

- supports 23.976 fps - 30 fps drop frame and non drop frame SMPTE TC formats (includes up to two times speeded up TC for use in video clips etc.)
- low power consumption allowing operation time up to 1000 hours in "Power Saving – 00 Frame" mode and up to 60 hours in basic mode (operation time is strongly dependent on display brightness level)
- variable powering (integrated Li-Po accumulators or external 9-16V DC power source)
- advanced monitoring of accumulators energy level with the signalization of low level

3. Control elements



1. Display
2. Button „UP"
3. Button „SET"
4. Button „DOWN"



5. Input connector LEMO 5-pin for TC connection
6. Input connector Hirose 4-pin for external power source connection
7. Indication of drop frame format of incoming TC

4. Charging of accumulators

Before first use of display BETSO TCD-1 charge inbuilt accumulators on maximum.

For charging of accumulators insert charging adapter into the connector (see chapter 3). When the "Battery charging" function is set on the "On Insert" option (see chapter 8.6) the charging will be started automatically after the adapter insertion. When the same function is set on the "User Select" option it is necessary to confirm charging by button SET (option "b. Ch. on").

If the goal of adapter insertion is only to power the display TCD-1 (not to charge the inbuilt accumulators), we can set in the menu the function "Battery charging" on option "User Select" and after adapter insertion we turn off the charging by the option "b. Ch. oFF".

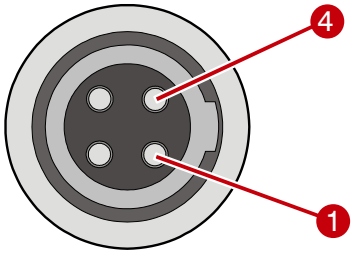
Warning: Never connect the power adapter with the voltage higher than 16V. It could lead to the serious damage of the device.

Warning: Never connect external power with wrong polarity. It would caused device failure.

When you connect external power and display will not show it immediately, remove it as soon as possible and check polarity of external power source.

5. External power

It is possible to lead the external power 6-16V DC by a special cable into input connector Hirose 4-pin, which is connected like indicated bellow in the picture.



1. GND

4. 9-16V DC

Warning: Never connect the power adapter with the voltage higher than 16V. It could lead to the serious damage of the device.

Warning: Never connect external power with wrong polarity. It would caused device failure.

When you connect external power and display will not show it immediately, remove it as soon as possible and check polarity of external power source.

6. Turning on

Turning on - ON	long press of **DOWN** button
Turning off - OFF	long press of **DOWN** button

After the turning the display TCD-1 on it will show a welcome text "BETSO". After that the dispaly is immediately ready for use according to the last saved settings.

7. Control of the menu

Start menu	long press of **SET** button
End menu	long press of **SET** button in the menu
Move up	short press of **UP** button
Move down	short press of **DOWN** button
Enter setting	short press of **SET** button
Change of parameter	short press of **UP** / **DOWN** button
Save changes	short press of **SET** button

After the closing of the menu all the settings will be automatically saved.

8. Settings of the display TCD-1

Control of the menu is described in the previous chapter 7 Control of the menu.

8.1 **Display settings** – settings of the displayed information

menu / Display settings

Thanks to this function we can set, whether the display should display time code (TC), user bits (UB), or whether it should periodically switch between these two informations.

TC	display will all the time show time code (TC)
UB	display will all the time show user bits (UB)
TC-UB	display will show during 10 frames time code (TC) and during next 10 frames user bits (UB) and it will all the time periodically switch between these two informations

8.2 **Power saving functions** – Power saving functions

menu / Power saving functions

Thanks to this function we can set the way in which the incoming time code (TC) is displayed, or more precisely whether it should be displayed continually, whether it should be displayed only each umpteenth frame, or whether the time code (TC) should be displayed only on command (after pressing of button).

Off	the time code is displayed continually
On Push	the time code is displayed continually, but only on command (after pressing of **UP** or **DOWN** button. After the pressing of one of the buttons, the time code is displayed only during the time set in the menu in "TC hold" function (see chapter 8.3)
00 Fr.	it is displayed only each zeroth frame *prolonged operational time: 24-30 times than with Off settings*
2 of 10	it is displayed only each fifth frame *prolonged operational time: 5 times than with Off settings*
5 of 10	it is displayed only each second frame *prolonged operational time: 2 times than with Off settings*

This function makes prolonged operational time on inbuilt accumulators possible.

8.3 **TC hold** – settings of time for displaying of time code (TC)

menu / TC hold

The time set up in this function affects two functions of BETSO TCD-1. First case where this time is applied is the situation when on the input it stops to receive valid time code (TC). In this situation it will be shown the last valid time code before this signal loss during the time set as TC Hold.

Second case is the situation which was already mentioned in the chapter 8.2, when the "On Push" function is set up and time code is shown only after pressing of one of the buttons **UP** or **DOWN**. In this case it will be shown the time code after the pressing of one of the buttons continually during the time set as TC Hold.

0 sec	function TC hold is turned off
10 sec	function TC hold is set on 10 seconds
30 sec	function TC hold is set on 30 seconds
60 sec	function TC hold is set on 60 seconds
300 sec	function TC hold is set on 300 seconds
600 sec	function TC hold is set on 600 seconds

8.4 **Full brightness** – function of full brightness for zeroth frames

menu / Full brightness

This function, when turned on, shows each zeroth frame of receiving time code (TC) with maximum brightness of the display. Other frames are shown with the brightness actually set on the display.

on	function Full brightness is turned on
off	function Full brightness is turned off

Allows you to save the energy of the accumulators by the setting the display brightness to a lower value than would be necessary for a proper camera record under the actual light conditions. Thanks to this feature all zeroth frames displayed by BETSO TCD-1 will be always very well readable on the record made by camera under any light conditions.

8.5 **Auto off** – automatic turning on / off

menu / Auto off

This function allows automatically turn on and turn off the display BETSO TCD-1 according to whether there is actually receiving valid time code (TC) on the input or not. If the display is turned off and function "Auto off" is turned on, when we connect valid time code (TC) on the input of the display BETSO TCD-1, the display will turn on itself. Contrarily if the display is turned on and we disconnect time code signal from the input, the display will turn off itself after 5 seconds.

on	function of automatic turn on / off is turned on
off	function of automatic turn on / off is turned off

Allows to save the inbuilt accumulators during the situations, when the time code (TC) is often turned on and off.

8.6 **Battery charging** – setting of automatic charging after insertion of adapter

menu / Battery charging

This function allows set up, whether it should be started the charging of the accumulators after the insertion of external adapter with a proper voltage level for charging (9-16V DC), or whether it should be confirmed by user before start of the charging.

On insert	inbuilt accumulators will start to charge after the insertion of external adapter
User select	inbuilt accumulators start to charge when the external adapter is inserted and when the charging is confirmed by user ("b. Ch. on." by button **SET**)

If the goal of adapter insertion is only to power the display TCD-1 (not to charge the inbuilt accumulators), we can set in the menu the function "Battery charging" on option "User Select" and after adapter insertion we turn off the charging by the option "b. Ch. oFF".

9. Control of the display

change of brightness	short press of **UP / DOWN** button
show of TC format	long press of **UP** button
show of accumulators state	short pres of **SET** button

9.1 Change of brightness of the display

Display BETSO TCD-1 allows adapt brightness of the display to the actual light conditions of the environment where it is being used. It offers six levels of brightness. The last setting is always saved.

Function "Full brightness" allows use lower brightness, than would be required by actual light conditions and save the inbuilt accumulators (see chapter 8.4).

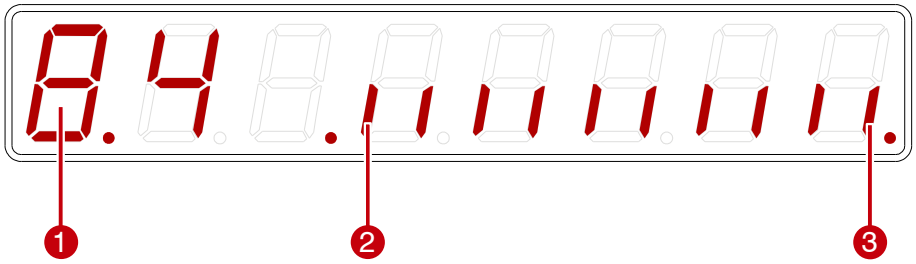
9.2 Show of TC format

This function shows the format of incoming TC signal on the display. Display is able to recognize all frame rates including speeded up or slowed. (speeded up and slowed multiplied by 0.5 or 2)

When you push UP button for a while and display show „BUSY", please wait few seconds and try it again. Display is in process of checking incomming TC frame rate.

9.3 Show of accumulators state

Shows bar graph of the state of the accumulators. If the accumulators are almost discharged and the last segment of bar graph is already flashing, charge the accumulators immediately. Display will show the state of the accumulators in this way (without adapter)



1. Voltage of the accumulators in volts
2. Indicator of lower voltage – indicates completely discharged accumulators
3. Indicator of higher voltage – indicates completely charged accumulators

In the case of adapter connected and charging of the accumulators, it will be displayed:

1. Indicate proper voltage level of external adapter
2. Voltage of external power source in volts
3. Indicator of charging in progress (in the case, that accumulators are not being charged or that are already charged, it will be shown only the voltage of external power source).

9.4 Indication of drop frame format

Drop frame format is indicated by the last decimal point on the display BETSO TCD-1 in the way that the decimal point shines, when the incoming time code (TC) has drop frame format.

9.5 Indication of user bits

Displaying of user bits is indicated by 4 decimal points on the display BETSO TCD-1 in the way, that decimal points shine, when there are actually displayed user bits.

10. Recommended accessories

Optional accessories include various cables for the connection of the TC signal and the external power supply.

For the latest information about our products BETSO please contact your local distributor or visit our websites http://www.betso.eu

11. Troubleshooting

It is impossible to turn on the display

Probably means, that accumulators are discharged. For charging of the accumulators connect adapter of external power source and turn on the charging. When the accumulators are being charged it is already possible to use the display normally.

Display doesn't respond to the control

For reseting of the display press all three buttons and hold them until “reset” appears on the display. In this way the display is reseted.

Safety instruction

Never open an electrical device! All reparations must be performed by an authorized service center. In the case of opening of the device away from the authorized service center, you will automatically loose the warranty of the device.

Do not use the electrical device in the places with high humidity, especially take care to protect the device against direct contact with water.

To clean the device, use a dampened piece of cloth. Never use any chemical solvents!

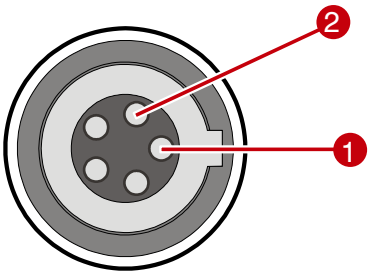
12. Technical specifications

Dimensions (w x h x d)	215 x 44.5 x 21 mm
Weight	283g (incl. accumulators)
Construction	anodized aluminium alloy
TC signal (SMPTE)	23,97 fps - 30 fps (incl. up to 2x speeded up signal)
Input level	0,2 - 10 V (p-p)
Power supply	Inbuilt Li-Po accumulators / external 9-16V DC
Consumption	approx. 1 mA to 550mA (in dependence on the brightness and setting of the Power Saving functions)
	approx. 50µA (when the display is turned off)
Operating time	up to 60 h (with lower brightness of the display)

13. Connectors wiring

Connector for connection of TC

LEMO EGG.0B.305.CLL

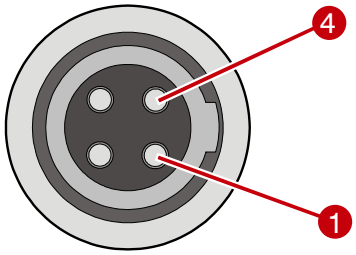


1. GND

2. SMPTE TC input signal

Connector for connection of external power

Hirose HR10A-7R-4S(73)



1. GND

4. External power 9-16V DC

14. EC Declaration of conformity

CE

BETSO ELECTRONICS s.r.o.

Elisky Premyslovny 1335, 156 00 Praha 5 - Zbraslav

Reg. number: 28955706

declares that this device

BETSO TCD-1

specifications: Compact Time Code Display with own power supply

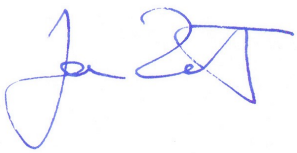
conform to the essential requirements of the R&TTE Directive 1999/5/EC. To demonstrate compliance with these requirements, the following standards were consulted:

EN 301 489 (Electromagnetic Compatibility)

EN 60065/2002 (Safety of Electrical Equipment)

Conformity assessed via Annex III. using a Technical Construction and Results of measurements.

In Prague 31. 5. 2011



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