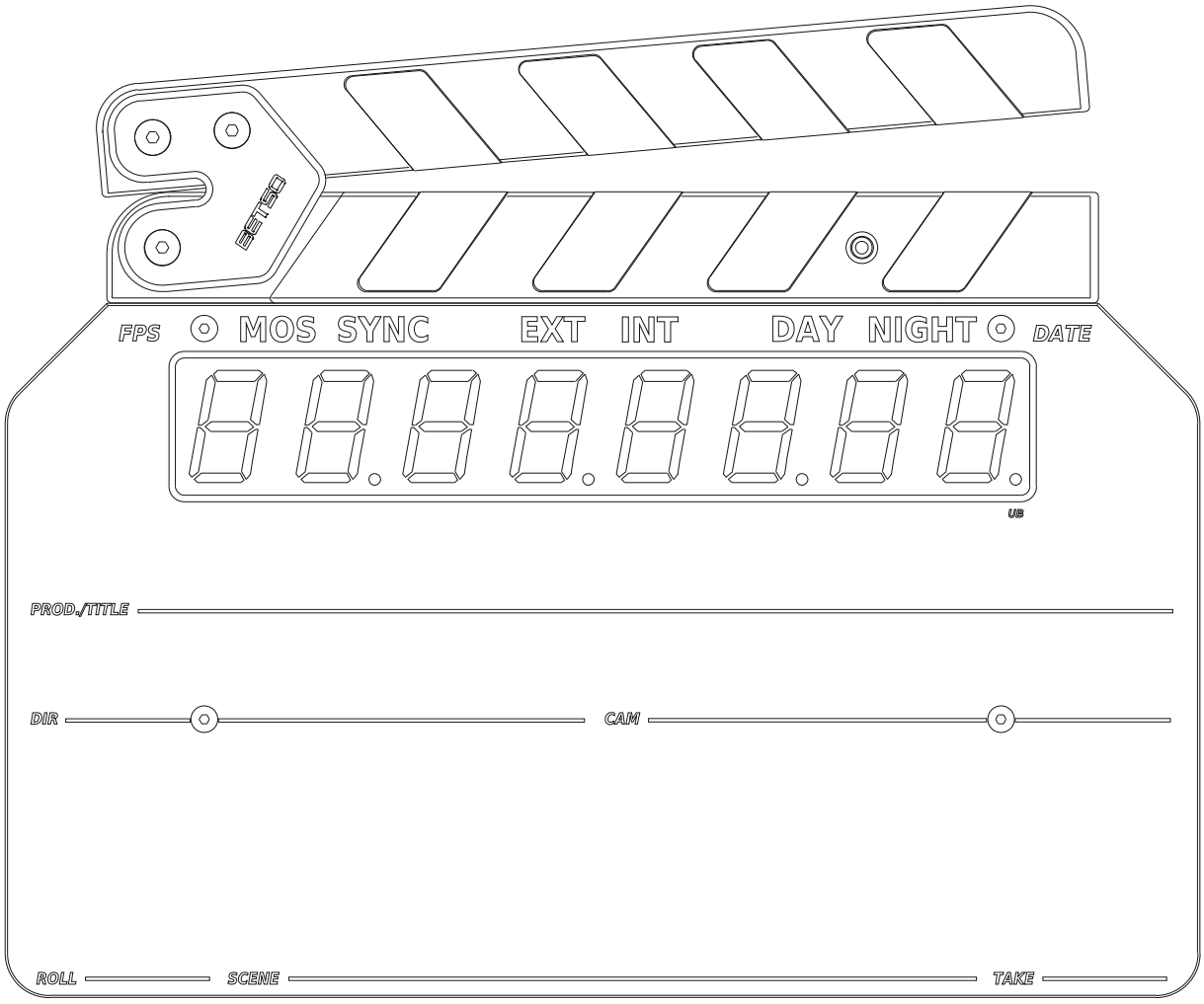
WTCS

16 channel wireless digital TC slate



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 for purchasing BETSO product!

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 information about our products BETSO please contact your local distributor or visit our website http://www.betso.eu.

1. Product description

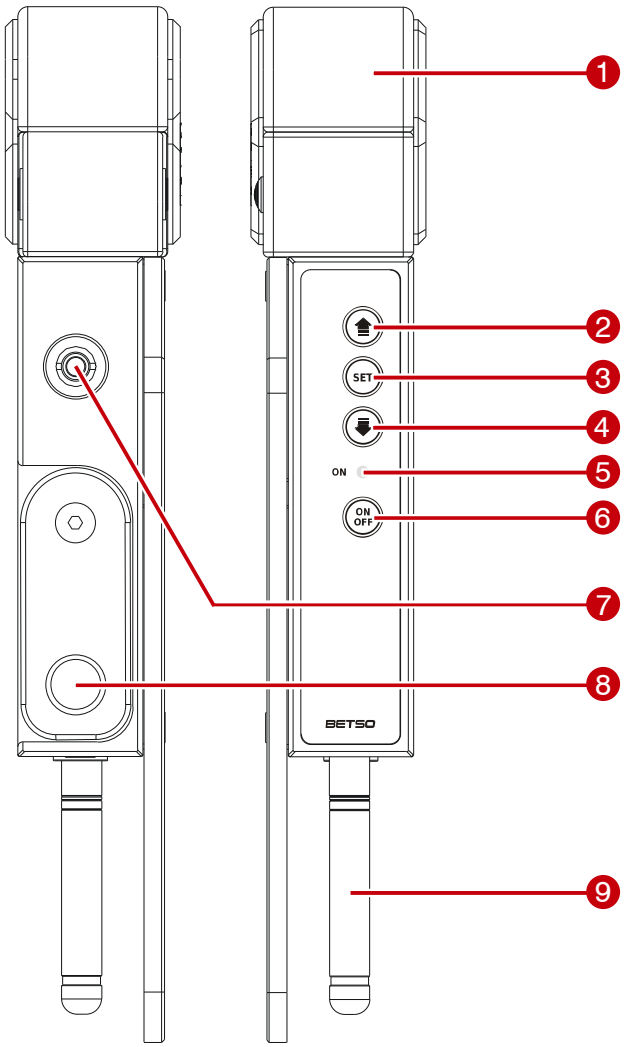
The function of our wireless slate BETSO WTCS is to receive and display the time code (TC = Time Code) signal of any frame rates including up to double speed up TC signal. Supports reception of TC signal in BETSO PACKET™ standard that was developed to significantly reduce the transmission failure in the noisy RF radio environment. Of course it's also possible to connect TC signal to the wireless slate BETSO WTCS through cable. The settings of all special functions of our wireless slate BETSO WTCS is done via an intuitive menu. The slate can be batteries powered as well as an external power source can be used.

2. Top features

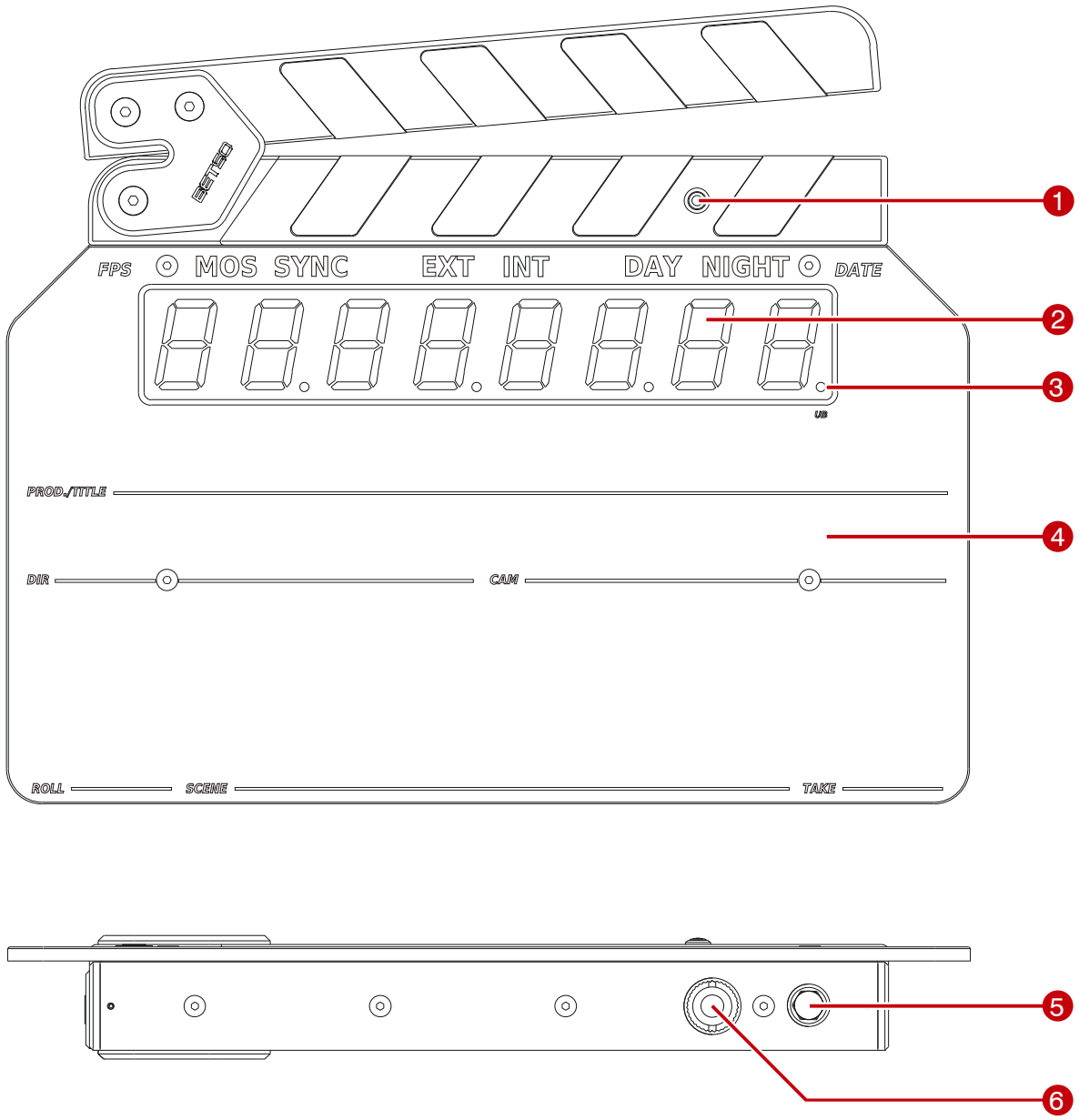
- precise mechanic construction from anodized aluminium alloy and stiff wood
- ball bearing utilized for gentle operation and long lifetime of the arm of the slate
- easy recall the sync time of a last clap
- optional displaying of synchronization time / user bits
- intelligent functions full-brightness and led-flash
- 10 levels of display brightness
- possibility of external back light of the slate information area
- intuitive control with quick, menu based, setting of all advanced functions
- auto-off function
- 16 RF channels in the band 433.15 - 434.65 MHz
- possibility of reserve random RF channel for co-operation with TC receiver for script BETSO WSR
- packet mode of RF transmission according to BETSO PACKET™ standard minimizing the transmission failure in the interfering radio environment

- basic mode of RF transmission that allows reception of TC signal by other transceiver BETOS TCX
- automatic choice between RF / cable input of TC signal
- wireless range of up to 450 m in packet and up to 350 m in standard mode in the conditions of direct visibility
- 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 consumption allowing operating time up to 600 hours in standby (closed arm of the slate) and up to 60 hours in active mode (operating time in active mode depends on the level of display brightness of the slate)
- variable power supply (6x AA batteries/accu or external 6-18V DC power supply)
- advanced monitoring of batteries level with signalization of discharged batteries

3. Control elements



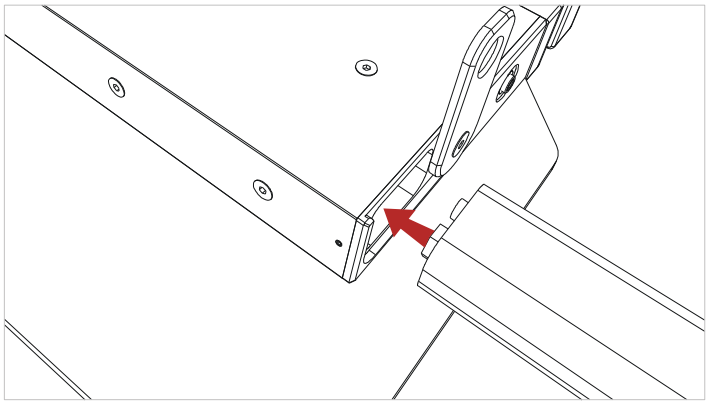
1. Arm of the slate
2. Button „UP“
3. Button „SET“
4. Button „DOWN“
5. Power on indication LED
6. Button „ON/OFF“ for power on of the slate
7. Connector for connection of the external back light for writing sheet
8. Door of battery compartment
9. Antenna



1. Sync, high brightness LED for indication of clap or 00 frame
2. Display
3. Indication of displaying user bits of incoming TC signal
4. Replaceable slate writing sheet
5. Antenna / RP-SMA connector
6. Input connector jack Neutrik™ 6.3 mm for connection of cable with TC input signal or external power supply

4. Insertion of batteries / accumulators

To power TC slate insert 6 cell of alkaline batteries or accumulators of size AA/UM3 to the attached battery pack. After checking of the polarity of the inserted batteries / accumulators insert the battery pack into the slate in the indicated way.

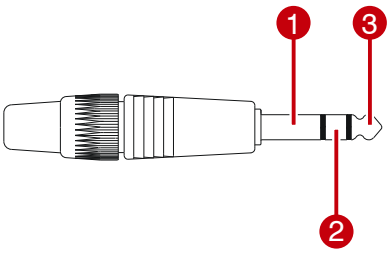


The slate is protected against destruction by inserting battery pack with wrong polarity.

Warning: Never insert the batteries if you use the external power supply. It may result in the damage of the slate and rapid battery discharge!

5. External power supply

External power supply 6-18V DC is possible to connect using a special cable connected to the input jack connector, which connection is shown below.



1. GND
2. 6-18V DC
3. TC SIGNAL

Warning: Never insert the batteries if you use the external power supply. It may result in the damage of the slate and rapid battery discharge!

6. Turning on

Turning on - ON	long press **ON/OFF** button
Turning off - OFF	long press **ON/OFF** button

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

7. Control of the menu

Start menu	long press **SET** button during the off state of the slate
End menu	long press **SET** button in the main menu / by opening of the arm of the slate
Move up	press **UP** button
Move down	press **DOWN** button
Enter sub menu	short press **SET** button
Leave sub menu	long press **SET** button
Enter setting	short press **SET** button
Change of parameter	press **UP / DOWN** buttons
Save changes	short press **SET** button

You can rapidly leave the menu by opening of the arm of the slate.

8. Settings of the slate

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

8.1 **Battery type** - setting of the type of the batteries

menu / battery type

With this feature, you can give the information about the type of the batteries used in the slate.

accu 1,2V	1,2V accumulators are used in the slate
battery 1,5V	1,5V batteries are used in the slate

Setting of the type of the batteries affects some functions of the slate (Low batteries indicator), we recommend to actualize this setting when you change the type of the batteries.

8.2 **TC source** - setting of the source of TC signal

menu / TC source

With this feature you can set whether you want to use wireless, cable or automatic selection of input for the synchronization SMPTE TC signal. By the automatic input selection it is preferred the cable one. In other words, if you connect the cable to the slate, the RF input will be ignored, even if the cable doesn't contain a valid SMPTE TC signal.

auto	automatic selection between RF / cable input (cable preferred)
cable	cable input selected
radio	radio input selected

Default and recommended setting is „auto“.

8.3 **RF channel** - setting of RF channel for TC signal reception

menu / RF channel

With this feature, you can set the RF channel on which the TC signal will be received.

channel set 0 – F setting of one of sixteen channels for SMPTE TC signal reception. (0, 1, ..., 9, A, B, C, D, E, F)

You must set the same channel, which is set on RF transceiver BETSO TCX. This feature allows that up to 16 independent systems "slate - transceiver" or "transceiver - transceiver" can be used on one place

8.4 RF type - setting of RF mode used for TC signal transmission

menu / RF type

With this feature, you can choose the type of RF data transmission mode which is currently used by the transceiver. Supports reception of TC signal in packet format of BETSO PACKET™ standard that was developed to significantly reduce the transmission failure by other RF systems, or in the second case you can choose a standard mode of TC transmission, which on the other hand allows the co-operation with the system BETSO TCXS.

robust packet mode of TC transmission

normal standard mode of TC transmission

Default and recommended setting in the case, that you don't need to use the slate with BETSO TCXS is „robust".

8.5 display TC - setting of displayed data during opened arm of the slate

menu / display settings / display TC

This feature allows you to specify which data will be displayed on the display of the slate after the opening of the arm of the slate. There is the possibility to display the sync time of TC, or in the second case the user bits.

time code after the opening of the arm of the slate it will be continuously displayed incoming sync time of TC signal

user bits after the opening of the arm of the slate it will be continuously displayed information stored on user bits positions within the incoming TC signal

8.6 **TC hold** - setting of duration of displaying of TC after a clap

menu / display settings / TC hold

This feature allows you to set the time during which there will be displayed time code on the display of the slate after the clap. We can set the time of displaying in the number of frames, on which we want to have a time code recorded.

0 - 250 frames setting of duration of displaying of TC after the clap (in frames)

After a clap it is always displayed first during "TC hold" time code, and then during "UB hold" user bits of the frame in which the clap occurred.

8.7 **UB hold** - setting of duration of displaying of user bits after a clap

menu / display settings / UB hold

This feature allows you to set the time during which there will be displayed user bits on the display of the slate after the clap. We can set the time of displaying in the number of frames, on which we want to have user bits recorded.

0 - 250 frames setting of duration of displaying of user bits after the clap (in frames)

After a clap it is always displayed first during "TC hold" time code, and then during "UB hold" user bits of the frame in which the clap occurred.

8.8 **Full brightness** - feature of full brightness after a clap

menu / special functions / full brightness

Feature full brightness will increase the brightness of the display after the clap to maximum value during displaying time code and user bits („TC hold" + „UB hold").

On / Off this feature can be enabled and disabled

Allows you to save the energy of the batteries 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 the data displayed by the slate after a clap will be always very well readable on the record made by camera under any light conditions.

8.9 **00 frame** - feature of flashing of sync LED in zero frames

menu / special functions / LED flash / 00 frame

Function 00 frame will turn on the sync LED during each zero frame of each new second.

On / Off this feature can be enabled and disabled

8.10 **Clap** - feature of flashing of sync LED during a clap

menu / special functions / LED flash / clap

Function “clap” will turn on the sync LED during the frame in which the clap will occur.

On / Off this feature can be enabled and disabled

8.11 **Board LED** - feature of backlight of the slate information area

menu / board LED

Feature Board LED activates the output 7 which is ready for connection of e.g. LED backlight of the slate information area.

On / Off this feature can be enabled and disabled

Schematic of connector for connecting of e.g. LED backlight of the slate information area is provided in the technical specifications at the end of this manual.

8.12 **Auto OFF** - setting of automatic turn off delay

menu / auto OFF

This feature allows you to enable the automatic turn off of the slate if the slate is not used for a prolonged time. Delay before the automatic turn off can be set to 1, 2 or 3 hours.

Disabled	automatic turn off feature is disabled
1 - 3h	automatic turn off feature is enabled with delay of 1, 2 or 3 hours

Delay of the automatic turn off feature is measured from the time of the last pressed key, or from the time of the last clap of the slate.

8.13 **script** - setting of RF channel for co-operation with BETSO WSR product

menu / script

This feature allows co-operation with scripting device BETSO WSR. To activate this feature you need to set the RF channel on which you wish to run this function. If this channel is set, and this feature is enabled, then after each clap of the slate there will be transmitted the concrete SMPTE TC signal containing the time code and user bits of the frame in which the clap occurred by the slate. This data will be transmitted in the packet mode of the BETSO PACKET™ standard.

transfer OFF	script feature is disabled
channel set 0 - F	after the setting of one of 16 channels (0, 1, ..., 9, A, B, C, D, E, F) the script feature will be activated

9. Control of the opened slate

clap	the clap of the arm of the slate
displaying of user bits / time code	long press and subsequent hold of **SET** button
change of display brightness	press **UP / DOWN** button
show TC frame rate	short press **SET** button
battery power indication	short press **ON/OFF** button

9.1 Clap

After the clap of the arm of the slate, it will be stopped the displaying of currently running TC and on the display of the slate there will be temporally displayed time code during the "TC hold" time and after that user bits during the "UB hold" time. Both informations displayed are those which have been received in the frame in which the clap occurred.

After these informations, there can be displayed the low batteries power indication on the display. If this warning accurs change the batteries immediately.

Whenever after the clap you can recall the time code and user bits of the frame in which the last clap occurred by short press **SET** button. To switch between time code and the user bits of the frame in which the last clap occurred press **UP / DOWN** button.

9.2 Switching between user bits / time code

If in the menu / display settings / display TC is set the continuous viewing of time code, there will be displayed user bits while **SET** button is hold. On the other hand, if in the menu / display settings / display TC is set the continuous viewing of user bits, there will be displayed time code while **SET** button is hold.

This feature facilitates to display the user bits or time code without having to change the settings in the menu - see chapter 8.5 *Display TC*.

9.3 Change of display brightness

The slate allows you to adapt the brightness of the display to the actual light conditions. There are ten levels of display brightness available. The last setting is automatically saved.

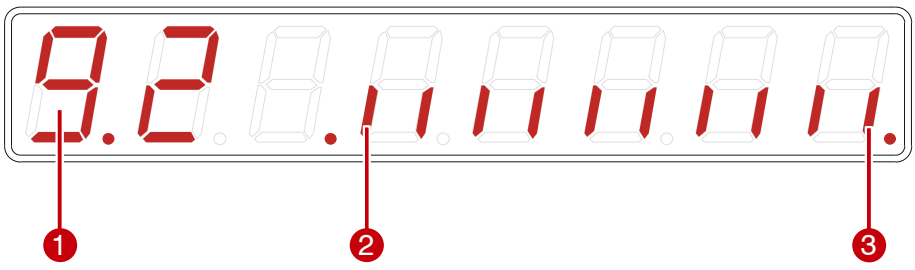
Feature “full brightness” allows you to use lower brightness than would be necessary for a proper camera record under the actual light conditions. See chapter 8.8 *Full brightness*.

9.4 SMPTE TC signal frame rate information

This feature displays the frame rate of the receiving SMPTE TC signal on the display of the slate. In the case, that it is used non-integer frame rate (23.98, 29.997 etc.) it will be displayed a rounded value (24, 30 etc.). In the case of "drop frame” format, there will be displayed dF characters after the frame rate information or ndF characters in the case of “non drop frame” format.

9.5 Battery level display

Displays a bar graph of battery level. If the batteries are just before discharge and the last segment of the bar graph is already flashing, immediately replace the batteries with the new ones.



1. Battery voltage in volts
2. The lower level segment – indicates discharged batteries
3. The higher level segment – indicates fully charged / new batteries

10. Recommended accessories

Optional accessories include a compact front slate information area FD-1 or FD-2, receiver for the script BETSO WSR and various cables for the connection of the SMPTE TC signal and the external power supply.

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

11. Troubleshooting

It is impossible to turn on the slate

If you use an external power supply, check if there are no batteries inserted, and that the inversion of the polarity of the external power supply didn't occurre. Otherwise, make sure that there are inserted charged batteries, or whether they are not inserted with the reversed polarity.

The slate doesn't receive SMPTE TC signal

If it is used the wireless transmission - Make sure, that it is used the same RF channel as the transmitter is using - see chapter 8.3 . Than the function *RF type* - see chapter 8.4 has to be set on the same mode of transmission as the transmitter is using. Finally make sure, that function *TC source* is set to one of the options “Auto” or “Radio” - see chapter 8.2 (if the option “Auto” is selected make sure, that the cable is not connected to the slate).

If it is used the transmission via cable - Make sure, that function *TC source* is set to one of the options “Auto” or “Cable” - see chapter 8.2 and that the cable is connected to the slate.

The slate in the wireless mode receives a very noisy TC signal

If you are not trying to use the slate away from the work range of the transmitter try to use an another RF channel - see chapter 8.3 *RF channel*. Than you can choose in the setting of function *RF type* - see chapter 8.4 the option “Robust” (make the same change of RF mode setting on your transmitter).

The automatic choice between RF / cable input doesn't work

Use the manual setting of function *TC source* to "Cable" for reception via cable, or to "Radio" for the wireless reception of the SMPTE TC signal - see chapter 8.2 .

Safety instruction

Never insert the batteries if you use the external power supply it can damage the slate!

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.

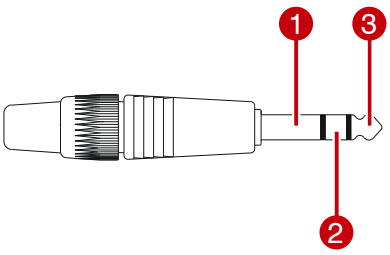
To clean the device, use a dampened piece of cloth. Never use any chemical solvents!

12. Technical specifications

Dimensions (w x h x d)	270 x 207 x 30 mm (with large writing sheet) 225 x 150 x 30 mm (with large writing sheet)
Weight	approx. 1130 g (including battery)
Mechanic construction	anodized aluminium alloy, wood and ball bearings
SMPTE TC signal	23,976 fps - 30 fps (including up to 2x speeded up)
Input sensitivity	0,2 – 10 V (p-p)
Powering	6x AA alkalic battery / accumulator external powering 6-18 V via 6,3mm Jack connector
RF output power	10mW (10dBm)
Number of channels	16 (0 - F)
Frequency range	433,15 - 434,65 MHz
Channel bandwidth	100 kHz
Frequency deviation	20 kHz
Current consumption	approx. 0,3 - 8 W* (30 - 900 mA) approx. 0,02 W (2,5 mA) in stand-by mode (arms of the slate closed)
Battery life	up to 64 hours (with the lowest display brightness)

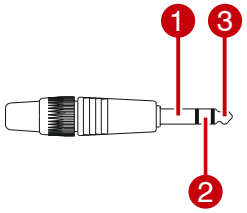
13. Schematics of connectors

Input connector



1. GND
2. External power supply 6-18V DC
3. SMPTE TC signal

Connector of LED backlight



1. Unconnected
2. GND
3. +5V 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 WTCS

specification: Digital wireless time code slate

frequency range: 433,15 – 434,65 MHz

radiated power: 10 mW (10 dBm) max., duty cycle < 10%

RF channels: 16

channel bandwidth: 100kHz

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

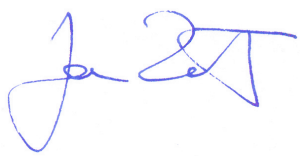
EN 300 220 (Radio spectrum Matters ERM)

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.

August 2010



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