

#11052-HSS-R Optoelectronic TTL-Converter for NAUTICAM and HUGYFOT underwater photo housings (for CANON cameras)

/March-2023/

USER'S MANUAL

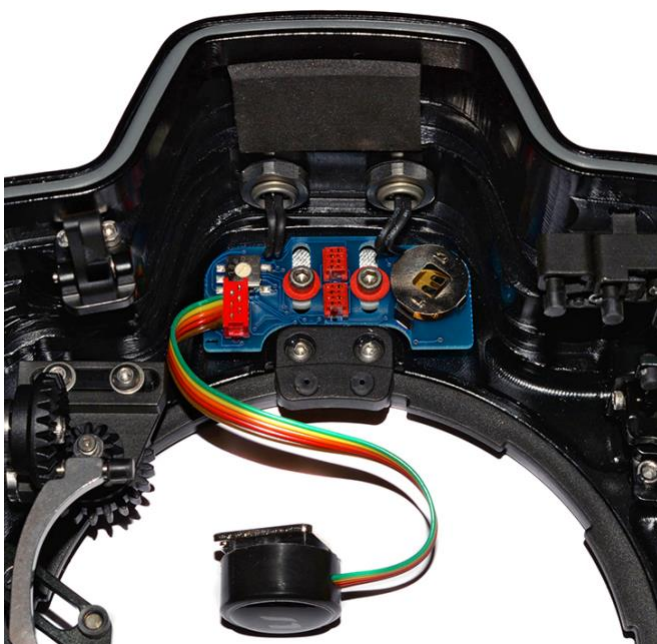
Specifications

- Compatible underwater housings: Nauticam, Hugyfot
- Compatible photo cameras: Canon
- Compatible TTL strobes: Inon Z-240, Z-330,
Sea&Sea YS-250, YS-D1, YS-D3 Mark II
Ikelite DS-230, DS-162, DS-161, DS-160, DS-125
Retra Pro X (including HSS functionality),
Subtronic Pro 270, Pro 160 (via electric sync cord)
- TTL outputs onboard: 2 optical + 2 electric
- HSS (High Shutter Speed sync) support: manual type HSS with Retra Pro X strobe (up to 1/8000 s)
- Continuous shooting mode (CL / CH) support: yes
- "Rear/Front Curtain" modes support: yes
- Switching "TTL / M" underwater: yes
- (+/-) "Flash Exposure compensation" control underwater: yes
- Switching power "ON/OFF": automatic by camera command
- Battery type: CR1632 (2pcs.)
- Current consumption (in standby mode): 0.01 mA
- Battery capacity (+20°C): 45 000 flashes, 1 year in standby mode
- Recommended Fiber-optic cable type: 613-fiber core: (Nauticam #26216 / #26217, HowShot 613L etc.)
- Available Electric Bulkhead type (optional accessory): Nikonos, S-6, Ikelite
- Dual Electric cables support (Sea&Sea, Ikelite): yes

Safety Warning for Batteries usage

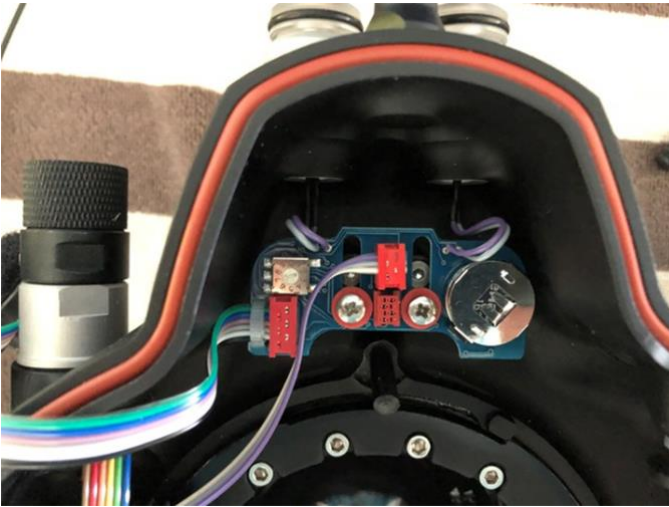
- Use batteries only CR1632 type.
- Batteries must be new and undamaged. Carefully check batteries before usage.
- To avoid leakage or explosion, always check appropriate battery terminals position ("plus" / "minus") before installing to the TTL-Converter.
- Never expose batteries to overheating, short-circuiting, disassembling, high pressure, mechanical deformation. Save batteries from high humidity and water. All these circumstances may cause a chemical leakage, electric shock, explosion or fire, which can be dangerous for health.
- Remove batteries from TTL-Converter before longtime storage.
- Utilize used batteries according appropriate rules.
- Keep out batteries of children. Save batteries in inaccessible for children place

Installation in Nauticam housing



- Open underwater housing. Pick up mirror prism by a sharp knife. (Prism is glued very slightly, like a sticker, on the plastic podium, easy to delete it by the knife). Delete mirror prism from the housing.
- Using hex wrench unscrew 2 bolts from plastic podium. Delete podium from the housing.
- Insert batteries into TTL-Converter. Before installation check that "plus" terminal of each battery is in Up position.
- Try TTL-Converter installation to its place. Bend LED wires as necessary for concrete housing. Try to insert both LEDs into optical bulkheads.
- Install 2 white plastic spacers. Install TTL-Converter board. Screw 2 bolts, included with TTL-Converter package, by screwdriver.
- (Optional). In case of using Electric Wire Synchronization, connect electric bulkheads flat cables to 4-pin sockets on the board.
- **IMPORTANT!** Push both LEDs maximum deep into the optical bulkheads by any tool. The LED must be maximum close to transparent optical element inside the bulkhead to get normal TTL accuracy.

Installation in Hugyfot housing



- Insert batteries into TTL-Converter. Before installation check that "plus" terminal of each battery is in Up position.
- Try TTL-Converter installation to its place. Bend LED wires as necessary for concrete housing. Try to insert both LEDs into optical bulkheads.
- Install 2 white plastic spacers. Install TTL-Converter board. Screw 2 bolts, included with TTL-Converter package, by screwdriver.
- (Optional). In case of using Electric Wire Synchronization, connect electric bulkheads flat cables to 4-pin sockets on the board.
- **IMPORTANT!** Push both LEDs maximum deep into the optical bulkheads by any tool. The LED must be maximum close to transparent optical element inside the bulkhead to get normal TTL accuracy.

Optional Accessories for Nauticam housing

- UW Technics #91340 Nikonos style Bulkhead (M14 screw) with flat cable and 4-pin MicroMatch connector.
- UW Technics #91341 Ikelite style Bulkhead (M14 screw) with flat cable and 4-pin MicroMatch connector.
- UW Technics #91342 S-6 style Bulkhead (M14 screw) with flat cable and 4-pin MicroMatch connector.
- Bulkheads are optional products and must be purchased separately.



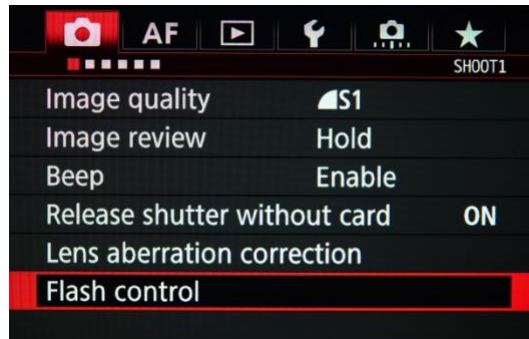
External cable connections for underwater strobes

- TTL-Converter maintains synchronization for underwater strobes by Fiber Optical cable connection and by electric cable connection as well.
- Maximum 2 Fiber Optic cables can be used (via housing optical bulkheads). It is possible to connect 2 underwater strobes.
- **IMPORTANT!** Dual fiber optical cables usually don't support reliable TTL operation via Nauticam optical bulkheads, because of their construction. Recommended to use for TTL operation only single fiber optical cables.
- Maximum 2 Electric cables can be connected (via housing electric bulkheads).
- Dual electric cables ("Sea&Sea", "Ikelite") are supported by TTL system at each electric output as well. Using 2 dual cables, it is possible to connect 4 underwater strobes simultaneously.

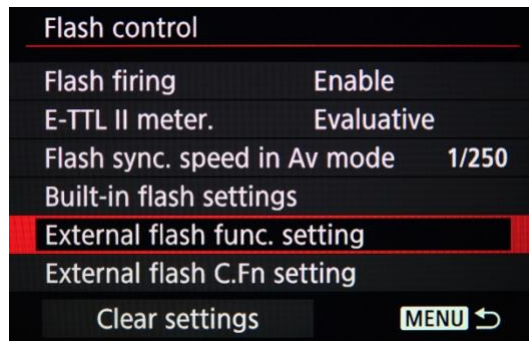
Initial Settings

- Set and check camera settings before underwater shooting:
 - Set Camera mode ("M", "P", "A", "S" etc.), dependently of preferences. For underwater shooting it is recommended to use "M" mode, when user set fixed aperture and shutter speed manually.
 - Set appropriate Exposure Metering ("Evaluative", "Partial", "Spot", "Center-weighted) according your shooting conditions . Right type of Exposure Metering is the key setting for accurate TTL work. In case of wrong setting, the shot may be over-lighted, or under-lighted.
 - Set "Mechanical" shutter type for both 1-st and rear curtains. All other options regarding shutter type in camera menu must be set for "mechanical" type too.
 - Set camera's "Flash Exposure Compensation" (and "Exposure Compensation") to "0 Ev", as initial setting.
 - Set appropriate ISO. For most of cases it is recommended to use ISO 200...400 for best resolution and TTL accuracy underwater. For TTL shooting with Retra Pro X strobe recommended to use ISO 400 and higher.
 - Set Aperture and Shutter Speed according real underwater conditions and shooting task.

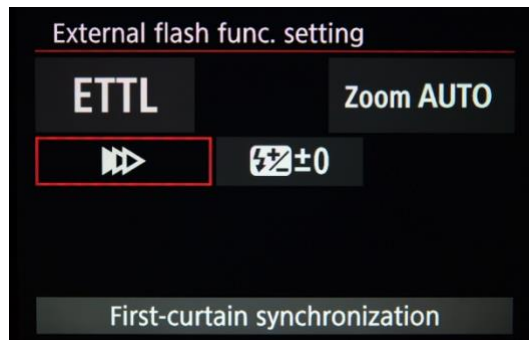
- Shooting in TTL mode with casual underwater strobes, maximum mono-flash sync speed for DSLR cameras is about 1/250.
 - Shooting in manual mode with Retra Pro X strobe, sync speeds are available also in HSS range, - up to 1/8000.
 - Recommended apertures F8-F16 for wide angle underwater photo, and F16-F22 for Macro photo, as initial settings.
 - Use other settings recommended by your camera User's Manual.
- Using camera menu photographer can totally control TTL-Converter underwater. Flash settings are always stored in TTL-Converter nonvolatile onboard memory, even after power is turned off.
 - Enter **Flash control** menu to set initial preferences:



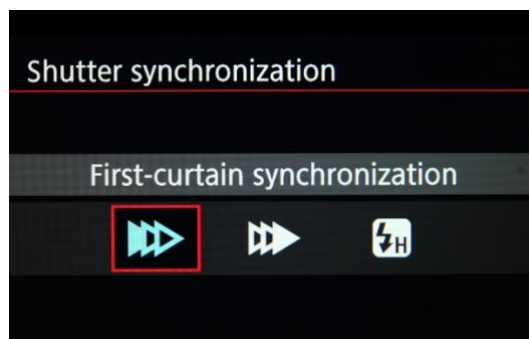
- Enter **External flash functions setting** submenu:




- **Flash firing** – “Enable” (switch ON the flash) or “Disable” (switch OFF the flash)
 - **E-TTL II meter.** – Recommended to set “**Average**” metering type, as initial setting, “**Evaluative**” type also can be useful with some camera models.
 - **Flash sync. speed in Av mode** – “1/250 fixed”, “1/60-1/250 auto” or “Auto’
- Enter submenu for **Synchronization** settings:

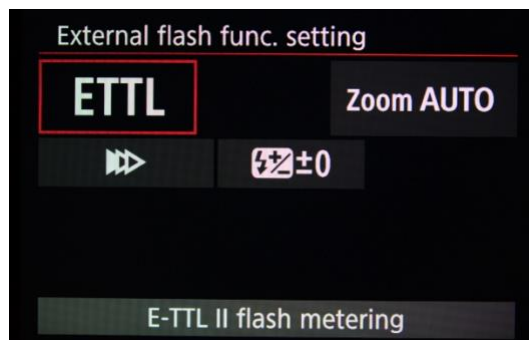


- Set “1st curtain” or “2nd curtain”, or “HSS” synchronization, dependently of the shooting task.



Shooting in TTL mode

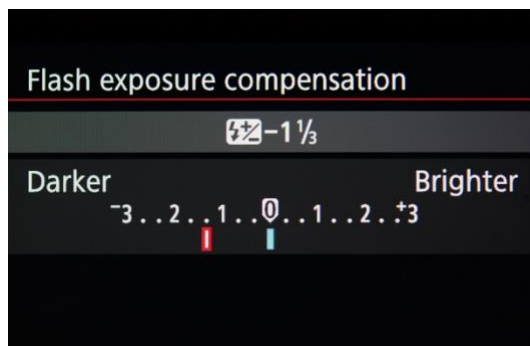
- Set TTL-Converter onboard rotary switch according your strobe type:
 - **0 – Manual Mode** (TTL protocol is disabled)
 - **1 – Inon Z-240**
 - **2 – Sea&Sea YS-D1**
 - **3 – Sea&Sea YS-D3 Mark II**
 - **4 – Ikelite DS-230, Sea&Sea YS-250**
 - **5 – Ikelite DS-162, DS-161, DS-160, DS-125**
 - **6 – Inon Z-330**
 - **7 – Retra Pro X** (including HSS functionality)
 - **8 – Subtronic Pro-160** (via electric sync cord)
 - **9 – Subtronic Pro-270** (via electric sync cord)
- Set main dial switch on the underwater strobe body to TTL mode. Please refer to concrete strobe User's Manual to choose appropriate mode (Z330, Z-240, Retra Pro set to "S-TTL", YS-D1/D2 set to "DS-TTL", YS-250/DS-161/DS160 set to "TTL").
- Set another dial (+/- Ev correction) on the underwater strobe body to "0 ev" position, as initial setting. Using Z-240/Z330 strobes, pay attention: magnet must be in "Push" position, for fiber optical connection set second dial switch to "0 Ev" (position "12 o'clock"), for electric wire connection set to "ttl" mark as fixed position ("9 o'clock"). In case of optical TTL, adjustment (+/-) is available by the strobe dial "+/- Ev" and also by the camera wheel "flash exposure compensation", the final value is the sum of these two corrections. In case of electric wire TTL, adjustment (+/-) is unavailable by the strobe dial, but available by the camera control wheel using "flash exposure compensation".
- Connect TTL-Converter Hot Shoe plug to the camera Hot Shoe socket. Switch ON the camera. TTL-Converter activates automatically (switch ON) when user pushes camera Shutter Release Button for shooting or focusing. Device goes to standby mode (switch OFF) also automatically few seconds later (according the camera command), or after disconnection from camera Hot Shoe socket.
- Camera recognizes E-TTL device on the Hot Shoe socket and confirms compatibility by the "Flash" symbol  on the service screen. Submenu "External Flash func. settings" becomes available in camera menu only in case of full compatibility of camera and TTL-Converter.
- Enter submenu **Flash mode**:



- Set **ETTL mode**:



- Set "1-st curtain" or "2-nd curtain" synchronization type. Don't use "HSS" position if shooting in TTL mode.
- During the initial test, dependently of concrete camera model, strobes condition etc., photographer should initially adjust (+/-) correction to TTL Flash exposure control. (Flash Exposure Compensation). Pay attention on this. Later, photographer should use necessary correction in wide range, according shooting conditions, if images are to bright or too dark.



For the shooting, TTL Flash exposure compensation is available by 2 ways:

- Use "+/- Ev" dial on the underwater strobe body (adjustment works for fiber-optical type connection only).
- Use camera "Flash Exposure Compensation" function. Such adjustment is recommended, it is deeper, more accurate, works for both types of connection. Available "Flash Exposure Compensation" range for Canon cameras: -3 Ev...0...+3 Ev. User can adjust it by steps 0.3 Ev or 0.5 Ev (choose the step by camera menu), viewing the value on the camera menu scale.

The same adjustment is available by camera wheel, looking to camera service screen scale.

- Shooting macro, for normal TTL accuracy the nearest distance from underwater strobe to a target must be more than 0.35m underwater (or more than 0.7m for the land tests), to keep the system inside of working TTL range. But camera can be positioned as close to the target as user needs.
- TTL-Converter is tuned for normal TTL accuracy under water. Land tests may give another results.
- In some shooting conditions or camera settings, TTL system may be not effective or out of working range. This case photographer should use Manual modes.

Shooting in Manual mode

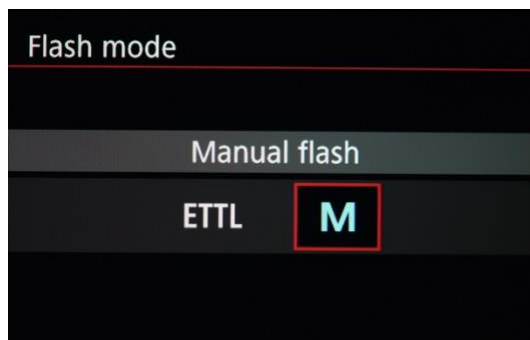
- Underwater photographer can use 3 different ways to shoot in Manual mode:
 - Camera menu Manual mode
 - Underwater strobe Manual mode
 - TTL-Converter hardwire Manual mode

- **Camera menu Manual Mode (controlled M mode)**

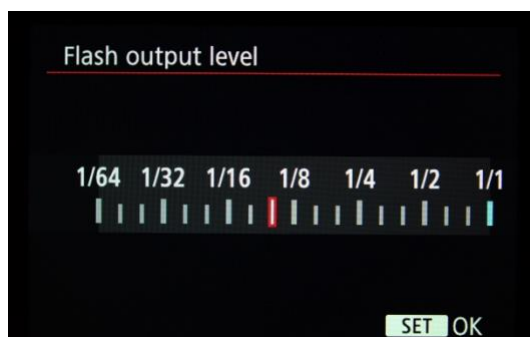
Switch system to Manual mode by camera menu.

Set underwater strobe to S-TTL (TTL) mode for availability of flash output adjustment via camera controls.

This is preferable Manual mode for universal usage, easy switchable and controllable under water during the diving. This case TTL-Converter also switches to appropriate M mode automatically by camera command.



In such Manual mode also becomes available flash output level scale in submenu. User can adjust flash output level by camera wheel, looking to this menu scale (or looking to camera service screen):



Some manual underwater strobes (like MF-1) requires very strong optical signal for synchronization, this case necessary to set maximum power by this scale (1/1).

- **Underwater Strobe Manual Mode:**

Set underwater strobe to M mode without pre-flashes. Adjust strobe light intensity by the dial switch on the strobe body.

Recommended settings in camera menu: "M" mode, flash output level "1/1".

For information: If camera is in "M" mode by menu, - all Pre-flashes in system are disabled.

If user needs to get full dump from underwater strobe, - set "FULL" on the strobe body, set camera menu to "M" mode and flash output level "1/1" by camera menu.

- **TTL-Converter hardware Manual Mode (set by onboard switch to "0" position):**

Set TTL-Converter onboard rotary switch to "0" position.

Set underwater strobe to M mode without pre-flashes. Adjust strobe light intensity by the dial switch on the strobe body.

Setting TTL-Converter rotary switch to "0" position can be done only before submerging, when the housing is open. This is forced Manual mode. This case camera does not recognize any device on it's HotShoe socket, TTL protocol in system is totally disabled.

In this mode TTL-Converter emits single pulse of fixed (maximum) duration at each shutter release.

This mode is recommended for any creative shooting, for example using long length fiber optical cables (up to 40m length is supported), or for usage with TTL incompatible underwater strobes, or for any other difficult situations.

For information: In this Manual mode all Pre-flashes are disabled.

HSS (High Speed Synchronization) with "Retra Pro" strobe

- New generation "Retra Pro X" strobe supports High Speed Synchronization ("HSS" in Canon terminology).
- "HSS" shutter speeds on most of Canon cameras are available in range 1/3201/8000 s.
- Pay attention, that "Retra Pro X" High Speed Sync supports only Manual type flash, but not TTL. In this strobe mode Retra flash intensity can be adjusted by the strobe dial knob only.
- For shooting with a flash at HSS speeds, use the following settings:
 - Update your Retra strobe firmware to latest version, using "Retra-UWT" application via I-Phone or I-Pad bluetooth connection.
 - Set Retra Pro X strobe switch to "HSS" position on the newest version strobes), according the assigned position for HSS.
 - Set HSS type synchronization in the camera menu for external flash.
 - Set M mode by camera menu for external flash (to exclude pre-flashes in system).
 - Use camera at any shutter high speeds (1/320 ...1/8000 s). Check operation with HSS flash. Adjust necessary flash intensity by the strobe dial knob and camera Aperture or ISO.
 - Pay attention that 1/200 and 1/250 camera speeds usually don't require HSS type flash. Independently of camera menu HSS option, many Canon cameras use just a normal sync flash for them in reality.

Shutter High Speeds availability for shooting with ambient light

- Classic underwater strobes produce a mono-flash, they cannot work in HSS range speeds (excluding Retra Pro X), camera automatically limits sync speed 1/250 for them, usually until Hot Shoe plug is connected. But our new TTL-Converter firmware allows shutter high speeds usage for shooting underwater with ambient sunlight as well (without flash) even if Hot Shoe plug is connected. User does not need to reopen the housing to disconnect the Hot Shoe plug.
- Shutter high speeds for shooting are available in Manual HSS mode of the system in range 1/3201/8000 (and faster, dependently of camera model). All models of underwater strobes (excluding Retra Pro X) in this case don't produce a flash, automatically OFF via TTL-converter control. Only Retra Pro X strobe in this mode can produce a flash (HSS flash).

Continuous (Serial) Shooting using underwater strobes

- TTL-Converter supports Continuous shooting in all modes, including TTL and M modes. But the main role in this case plays underwater strobes specific (read below).
- Compact size underwater strobes like Z-240, Z-330, YS-D1, YS-D3 Mk II etc. have rather weak charger inside, which can not charge the strobe quick enough between series of TTL doubled flashes (pre-flash + main flash). Each next shot the energy is not enough to keep accurate pre-flash duration. That is why, compact size underwater strobes are not recommended for Continuous (Serial) Shooting in TTL mode. The 1st shot will have normal lighting, next shots will have different lighting or none at all. The effect depends on specific strobe's capabilities.
- Large size underwater strobes, like YS-250, DS-161, DS-160 etc. have more powerful charger inside and large main capacitor. Those strobes work some better in Continuous (Serial) Shooting TTL mode. The user can make more shots with

acceptable lighting. However, the best lighting accuracy will be on only the first 1-3 shots in series, the others may have different lighting. The effect depends on specific strobe's capabilities.

- For Continuous (Serial) Shooting with underwater strobes, it is strongly recommended to use **Manual mode** and set **small flash intensities** manually. This way it is possible to get serial shots with acceptable lighting accuracy due to reduced recycle times.

Battery energy saving

- Set acceptable Review Time and Time before going to Standby mode in camera menu, this is most important setting for TTL-Converter battery saving. When camera is in Standby mode, the TTL-Converter is switched OFF automatically. **Recommended time before going to standby mode, – 4...8 seconds, or another MINIMUM time allowed by concrete camera menu.** Use a minimum time to look an image underwater and save energy. Don't set "Hold" option in camera menu, it causes fast battery drain.

Storage

- After shooting switch Off the camera.
- Disconnect TTL-Converter Hot Shoe plug from camera after the diving. This way you defend the TTL-Converter from any accidents. Also, you save TTL-Converter battery, because current consumption is minimum in this case.
- For a longtime storage remove batteries from TTL-Converter.

Warranty

- Product warranted against any manufacturing defects for 2 year from the date of purchase for consumer use.
- Manufacturer accepts no liability for any damage to and defects in the housing caused by improper use and/or poor maintenance.
- Manufacturer does not hold responsibility for damage of any nature, to any equipment used with the product.
- Manufacturer accepts no liability for any loss of captured images or the inability to capture images even if it is due to the malfunctioning of the product.
- This warranty only applies to products purchased from authorized dealers and does not extend beyond the original retail purchaser.
- Unauthorized modifications and/or repairs of the product will automatically invalidate this warranty.
- To return products for service, please contact authorized dealer in your region.