

November 2025

WIRC

User Manual



FDS
TIMING SOLUTIONS

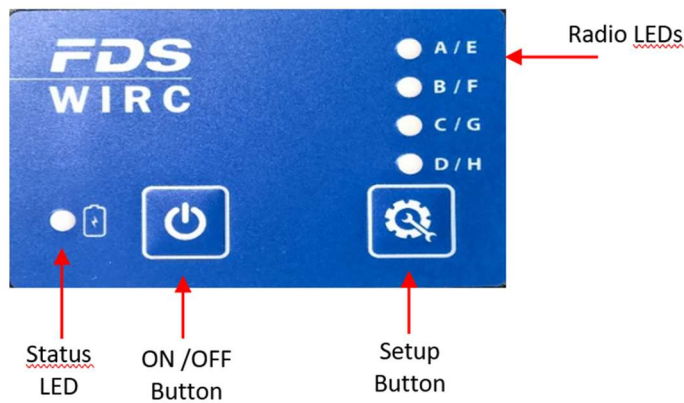
FDS-TIMING, SWITZERLAND

WIRC (Wireless Infra-Red Photocells)

The **Wireless Infra-Red Cells (WIRC)** consist of an infrared emitter and receiver pair designed to operate seamlessly with the TBox-Radio in an FDS wireless setup. In addition to wireless operation, the WIRC units are also compatible with wired equipment via a standard 3.5 mm jack connector.

1. Keypad and connections

WIRM-RX

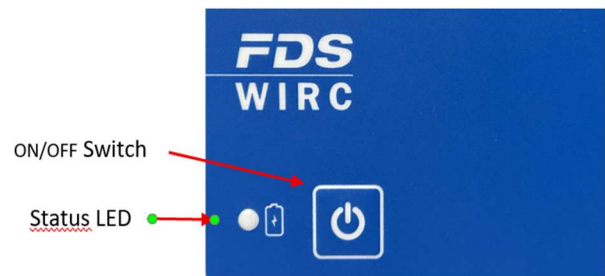


WIRM-TX

Model 10



Model 20



2. Power control and status

2.1. Power ON/OFF

Using the **Impulse Devices Manager** (PC application), three different power ON/OFF sequences can be selected:

WIRC-RX

1. The **“Secured”** sequence (All Firmware).
 - Press the power switch briefly (0.5s–1.5s) until the battery status is indicated on Radio LEDs **A–D**.
 - Release the power switch and repress it within **1 second**.
 - Hold the switch down until:
 - All four Radio input LEDs are ON, and
 - An audible beep signal is emitted (if the buzzer is enabled).
2. The **“Simplified”** sequence (Firmware \geq V2.4.0).
 - Press and hold the power switch for about **3 seconds**.
 - Indications:
 - During the first second, the Radio LEDs A–D display the battery status.
 - After \sim 3 seconds, all Radio LEDs and the Power LED light up:
 - Green** = Power ON
 - Red** = Power OFF
 - An audible beep signal is emitted.
3. The **“Automatic”** sequence (Firmware \geq V2.4.0).
 - The WIRC powers **ON automatically** when USB external power is applied.
 - It powers **OFF automatically** after a defined delay once USB power is removed.
 - Manual ON/OFF is still possible. If used, the WIRC reverts to the **Secured/Simplified** sequence.

WIRC-TX

1. The **“Secured”** sequence (All Firmware, all Models).
 - Press the power switch briefly (0.5s–1.5s) until the status LED indicate the battery level.
 - Release the power switch and repress it within **1 second** (LED will turn Yellow).
 - Hold the switch down until:
 - LED turns to Green (ON) or Red (OFF).

2. The **“Simplified”** sequence (Firmware >= V1.4.0 & Model 20).
 - Press and hold the power switch for about **3 seconds**.
 - Indications:
 - During the first second, the LED will display the battery status.
 - After ~3 seconds, the LED light up:
 - Green** = Power ON
 - Red** = Power OFF

3. The **“Automatic”** sequence (Firmware >= V1.4.0 & Model 20).
 - The WIRC powers **ON automatically** when USB external power is applied.
 - It powers **OFF automatically** after a defined delay once USB power is removed.
 - Manual ON/OFF is still possible. If used, the WIRC reverts to the **Secured/Simplified** sequence.

2.2. Battery Status

The power LED give an indication of the battery status. See table below:

Power LED	Device Power	USB	Battery
Yellow ON	OFF	connected	Battery Charging
Green ON	OFF	connected	100% charged
Yellow blinking	ON	connected	Battery Charging
Green blinking	ON	connected	100% Charged
Green blinking	ON	disconnected	> 25%
Red blinking	ON	disconnected	Low battery

WIRC-RX

Press and hold the ON/OFF button for about 1sec.

The Radio LEDs (A-D) will illuminate to indicate the battery charge status.

- 4 LEDs ON green: 75-100 %
- 3 LEDs ON green: 50-75%
- 2 LEDs ON green: 25-50%
- 1 LED ON green: 10-25%
- 1 LED ON red: < 10% (Will work only with external power plugged)

WIRC-TX

Press and hold the ON/OFF button for about 1sec.

The status LED will illuminate to indicate the battery charge status.

- Red: < 30%
- Yellow: 30 - 60%
- Green: > 60%

3. Radio configuration

The WIRC photocell is configured and linked to a TBox-Radio using two Parameters. Both of them must match on WIRC and TBox

- **Group** (radio frequency)
- **Input/ID** (TBox Input / WIRC serial number)

3.1. Group

To configure your desired Group, press the Setup button 

The selected Group is indicated by the LED array (A, B, C, D).

Release the button and press again to change the selected group.


Group	LED A	LED B	LED C	LED D
A	GREEN			
B	GREEN	GREEN		
C	GREEN	GREEN	GREEN	
D	GREEN	GREEN	GREEN	GREEN
E	YELLOW			
F	YELLOW	YELLOW		
G (*1)	YELLOW	YELLOW	YELLOW	
H (*1)	YELLOW	YELLOW	YELLOW	YELLOW
OFF (*2)	RED	RED	RED	RED

(*1) only available for North America and Japan

(*2) The radio transmission function is disabled. This mode should be selected to save power when you connect the photocells using a hard-wired solution (jack output).

Country (Groups)	Distance of transmission (*3)	Min locking time
Europe/India/Russia (A, B, C, D)	Up to 2000m	200ms
Europe/India/Russia (E, F)	Up to 5000m	500ms
USA (A, B, C, D)	Up to 4000m	200ms
USA (E, F, G, H)	Up to 6000m	500ms
Japan (A, B, C, D)	Up to 1000m	200ms
Japan (E, F, G, H)	Up to 1500m	500ms

(*3) Clear line of sight

 In Groups E-H, if more than 1 impulses per second is expected (all devices), radio transmission can become slow and impulses might be missed.

Radio Setup Lock Function

To prevent accidental radio group changes, the Radio Setup button can be locked or unlocked by pressing and holding both the Radio button and the Power button simultaneously.

- When locked: **LEDs A and D flash red**
- When unlocked: **LEDs A and D flash green**



3.2. WIRC and TBox-Radio Pairing

Each WIRC has a **unique ID** (serial number) that can be paired with a **TBox-Radio input (A–F)**. Pairing can be done via an application or manually.

Option 1: Using the application “Device Manager”

- No need to be in presence of WIRC (Just the SN is required)
- Enter the Device Serial Number in the TBox inputs settings
- Do not use the same serial number for more than one TBox input.

Option 2: Manual Pairing (No Application)

- **Requirements**
 - Both TBox-Radio and WIRC must be powered on.
- **Steps**
 1. Enter pairing mode on TBox-Radio
 - Press the Setup button  for **3 seconds** until a long beep sounds.
 - LED corresponding to input A flashes yellow.
 2. Select the desired input (A–F)
 - Perform a **short press** on the Setup button until the correct input is selected.
 3. Enter pairing mode on the WIRC
 - Press the Setup button  for **3 seconds** until a long beep sounds.
 4. Completion (When pairing is successful):
 - LEDs A–F on the TBox flash yellow.
 - Both TBox and WIRC return to normal operation.
- **Exiting Manual Pairing Mode**
 - Press the Setup button on either the TBox or WIRC for 3 seconds until a long beep sounds.

4. Radio communication

Any messages that do not receive an ACK from the TBox-Radio will be retransmitted several times. The WIRC indicates each time an impulse is transmitted or retransmitted by flashing its A/E LED:

- **Green flash:** Pulse transmission successfully completed.
- **Yellow flash:** The last message did not receive an ACK.
- **Red flash:** No ACK has been received from the TBox-Radio after all attempts (the impulse may be lost).

Those indications provide the user with a basic method to test the positioning and communication between the TBox-Radio and WIRC.

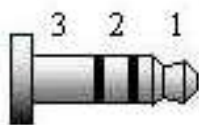
Frequent yellow or red flashes may indicate unstable communication. Adjusting the position of the WIRC or the TBox-Radio—or even just the antennas—may improve the connection.

- ⚠ Radio transmissions cannot be 100% guaranteed. An unfavorable environment, lack of line of sight, interference or an improper installation might lead to the loss of data. FDS cannot be held responsible for any of the above.

5. Wired connection (Impulse and Data)

The jack connector at the back of the WIRC photocell receiver allows a hard-wired connection to most modern timing devices.

It features an optocoupler on the output, which can safely handle up to 16 V.



- 1: Impulse optocoupled output
- 2: RS232 RXD
- 3: GND

The same Jack connector can be also used to connect our RCID (RFID) device. When received, the competitor number is immediately sent by radio to the TBox.

6. USB

The USB-C connector has various functions including:

- External power supply and battery charging
- Configure the WIRC photocell options and parameters
- Update the Firmware
- Hardware reset in the unlikely event of a frozen WIRC

7. Firmware Update Procedure

Updating the WIRC firmware is straightforward. The FdsFirmwareUpdate software is required.

1. **Install Software**
 - Install the application **FdsFirmwareUpdate** on your computer.
 - Launch the application.
2. **Connect Device**
 - Connect the USB cable between your PC and the WIRC photocell.
3. **Select COM Port**
 - Choose the COM port corresponding to the connected WIRC device.
4. **Select Firmware File**
 - Select the **“.bin” firmware file** for the update.
5. **Start Update**
 - Press **Start** in the program.
 - The WIRC photocell firmware will update automatically.
6. **Finalize Update**
 - Once the update completes, **disconnect the USB cable**.
 - **Switch ON** the WIRC photocell to activate the new firmware.

8. Technical specifications

Frequencies & Power:		
Europe	869.4 - 869.65 MHz	100mW
India	865 - 867 MHz	100mW
Russia	868.7 - 869.2 MHz	100mW
North America	920 - 924 MHz	100mW
Japan (TBox-41 only)	922 - 927 MHz	20mW
Radio impulse precision	1/10'000 sec	
Min locking time (between two detections)	200ms for Groups A-D 500ms for Groups E-H	
Operating temperature	-20°C to 60°C Battery charge possible only between 0°C and 45°C	
External power input	USB compatible (5V +/- 5%) up to 1.5A	
Battery	LiPo 1700mAh	
Autonomy @20°C: Receiver Transmitter	150 hours radio ON / 250 hours radio OFF 180 hours	
Dimension (RX & TX)	111x58x27mm	
Weight (RX & TX)	200g	
Homologation	FIS : FDS.001T.20 FEI : 2019001-1B/C	

9. Copyright and Declaration

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