

WIRC (Wireless Infra-Red Photocells)

1. Appearance



The Wireless Infra-Red Cells (WIRC) is a pair of infrared emitting and receiving photocells designed to work together with a TBox-Radio on a FDS wireless setup.

They are also compatible with any wired equipment via an external 3.5mm Jack connector.

2. Power ON/OFF

The ON/OFF button switch has 2 functions:

1) Battery status (WIRC OFF)

Press and hold the ON/OFF button (front left)

LED green: > 60%

LED yellow: > 30%

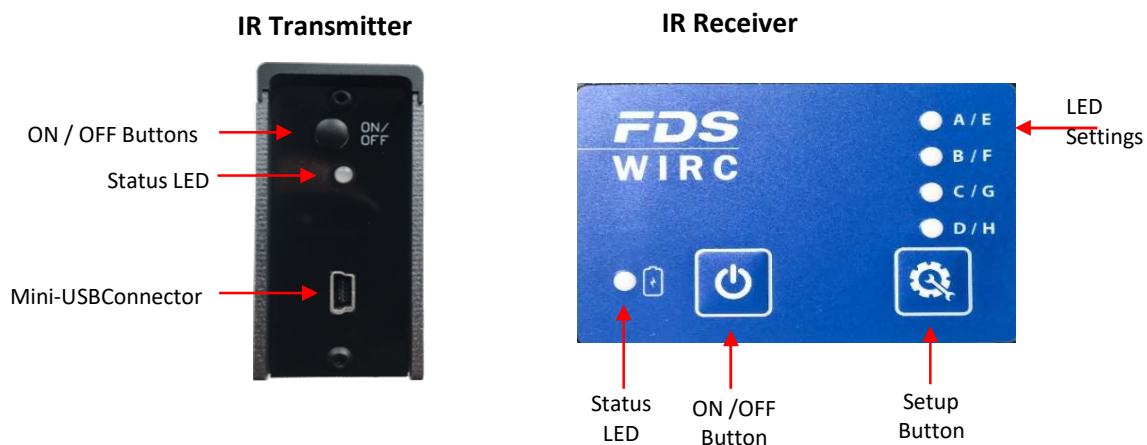
LED red: < 30%

2) Switch ON – OFF the WIRC

a) Press and hold (1sec. – 2secs.) the ON/OFF button until the battery LED status is Yellow

b) Immediately release the ON/OFF button and quickly repress it (within 1 second) and hold down until the battery Led status briefly flashes Yellow and then turns to Green.

c) To switch OFF WIRC, simply repeat step a and b (until the LED is OFF)



3. Battery status (IR Receiver)

1) Battery status whilst charging

LED	WIRC On/Off	USB	Battery
Yellow	OFF	connected	Battery Charging
Green	OFF	connected	100% charged
Yellow Flashing	ON	connected	Battery Charging
Green Flashing	ON	connected	100% Charged

2) Battery status with device ON and USB disconnected

LED	WIRC On/Off	USB	Battery
Green	ON	disconnected	60% - 100% charged
Yellow	ON	disconnected	15% - 50% charged
Red	ON	disconnected	< 15% charged

3) Battery status with device OFF and USB disconnected

Test by briefly pressing ON / OFF button

LED	WIRC On/Off	USB	Battery
Green	OFF	disconnected	60% - 100% charged
Yellow	OFF	disconnected	30% - 60% charged
Red	OFF	disconnected	< 30% charged

4. Wireless configuration

The WIRC photocell is configured and linked to a TBox-Radio using two Parameters:

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

NOTE: TBox-Radio and WIRC photocells must be configured with an identical Group setting

4.1. Groups (radio frequencies) - Europe / India / Russia

6 Groups are available.

Group A, B, C, D:

Wireless Transmission Distance: up to 2000m (clear line of sight)

Each group uses ¼ of the full frequency band

Min locking time of 200ms

Group E, F:

Wireless Transmission Distance: up to 5000m (clear line of sight)

Each group uses the full frequency band

Min locking time is longer: 500ms

OFF:

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).

4.2. Groups (radio frequencies) - North America / Japan

8 Groups are available

Group A, B, C, D:

Tested wireless Transmission Distance (clear line of sight)

US : up to 4000m

Japan : up to 1000m

Min locking time of 200ms

Group E, F, G, H:

Tested wireless Transmission Distance (clear line of sight)


US : up to 6000m

Japan : up to 1500m

Min locking time is longer: 500ms

OFF:

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).

To configure your desired Group, press the Setup button 
 The current Group selected is indicated by the (LED array A, B, C & D).
 Release and press the number of times you want to change the setting.

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 (*)	YELLOW	YELLOW	YELLOW	
H (*)	YELLOW	YELLOW	YELLOW	YELLOW
OFF	RED	RED	RED	RED



(*) only available for North America and Japan

To prevent unwanted radio group changes, the radio Setup button can be locked / unlocked by a simultaneous long press on both radio button and Power button.
 LEDs A and Led D will flash red (locked) or green (unlocked).

4.3. TBox-Radio Input (WIRC Pairing)

Each WINP/WIRC has a unique ID (serial number) that can be paired with a TBox-Radio input (A-D).

Pairing can be performed on a TBox using the “TBox-Setup” application (no need to power ON WIRC/WINP). It can also be performed manually without any application. In this case, both TBox-Radio and WINP/WIRC have to be powered and the following procedure executed.

- 1) On the TBox-Radio, enter the pairing mode by pressing the Setup button  for 3 sec until a long beep sounds and LED A flash yellow.
- 2) Select then the desired input (A, B, C or D) by performing short press on the same button.
- 3) Finally enter the pairing mode on the WINP/WIRC by pressing the Setup button  for 3 second.

When pairing is completed, LEDs A to D of the TBox flash yellow and both TBox and WINP/WIRC resume normal operation.

To exit manually the pairing mode on either TBox or WINP/WIRC, just press the Setup button for 3 second until a long beep sound.

NOTE: In case an IOS or PC application is used to configure the radio inputs on a TBox, do not use the same WIRC/WINP serial number for more than one input.

5. Radio communication

Any messages which did not receive an ACK from the TBox-Radio will be resend several times. The WIRC/WINP indicates each time an impulse is transmitted or re-transmitted, by flashing its A/E LED.


Green flash on A/E LED means that pulse transmission is successfully completed.

Yellow flash on A/E LED means the last message did not received any ACK.

Red flash on A/E LED means no that no ACK has been received from the TBox-Radio after all attempts (impulse might be lost).

The ACK feature provides the user with a basic level of testing the positioning and communication between TBox-Radio and WIRC/WINP.

Many attempts (yellow or red flashes) may indicate that the communication is not very stable. A change of position of the WIRC/WINP or the TBox-Radio (maybe just the antennas) may improve the communication.

 Radio transmissions cannot be 100% guaranteed. An unfavourable 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.

6. Wired connection

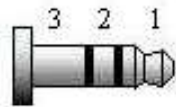
The Jack connector on the rear of the WIRC photocell receiver enables a hard-wired connection to most of the timing devices available today.

Two versions of photocells exist.

In the first version, the photocells output is an open collector transistor with a serial impedance of 680 Ohm and a max voltage on the output pin of 5.5V.

The second generation of WIRC (SN > 00160) is equipped with an optocoupler supporting up to 16V.

The RS232 input (SN > 00160) allows communication with other device such as our RCID (RFID-TAG detector)



- 1: Output
- 2: RS232 RXD
- 3: GND

7. USB

The Mini-USB 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 (using the app “WIRC/WINP Setup & Reset”)

8. How to update the WIRC firmware

Updating the firmware is relatively simple. The software “FdsFirmwareUpdate” is requested

- a) Install the program “FdsFirmwareUpdate” on your computer
- b) Connect the USB cable to your PC and WIRC Photocell
- c) Run the program “FdsFirmwareUpdate”
- d) Select the COM Port
- e) Select the update file (.bin)
- f) Press Start on the program
- g) The photocell WIRC will update
- h) Once the update is finishing, remove USB cable and switch ON the photocell WIRC

9. 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 1A	
Battery	LiPo 1700mAh	
Autonomy @20°C:	Receiver Transmitter	150 hours radio ON / 250 hours radio OFF 180 hours
Dimension	111x58x27mm	
Weight (Tx / Rx)	200g / 200g	
Homologation	FIS : FDS.001T.20 FEI : 2019001-1B/C	

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