



Shadow TX(A) Asset Management and RFID Transmitter Tags Shadow RX Asset Management Receiver

The **Shadow TX(A)** and **Shadow RX** wireless asset management system is a standalone wireless asset tracking system which allows for monitoring of single or multiple assets. The assets to which the **Shadow TX** is attached, may be any stationary, portable or mobile object/s. The **Shadow TX(A)** attached to the object will be detected by the Shadow RX when it is within radio range or trigger an alarm event in the **Shadow RX** when the asset moves beyond the radio range of the receiver.

General Features

- FM or AM versions
- 433.92MHz, 315MHz or 868MHz
- Long Term Battery operation (~6 months)
- Range up to 180ft. (FM with Shadow TXA tag)
- Range up to 60ft (FM with Shadow TX)

RX Features

- Manage up to 8 transmitters (assets)
- Automatic transmitter recognition
- Transmitter activity monitor
- LED, Beep and/or Vibrate alarm mode
- "Acknowledge/Silence Alarm" mode
- Internal battery powered or externally powered
- RSPSMA antenna connector
- Compact size: 2.6" X 2.6" x 1.1"

TX Features

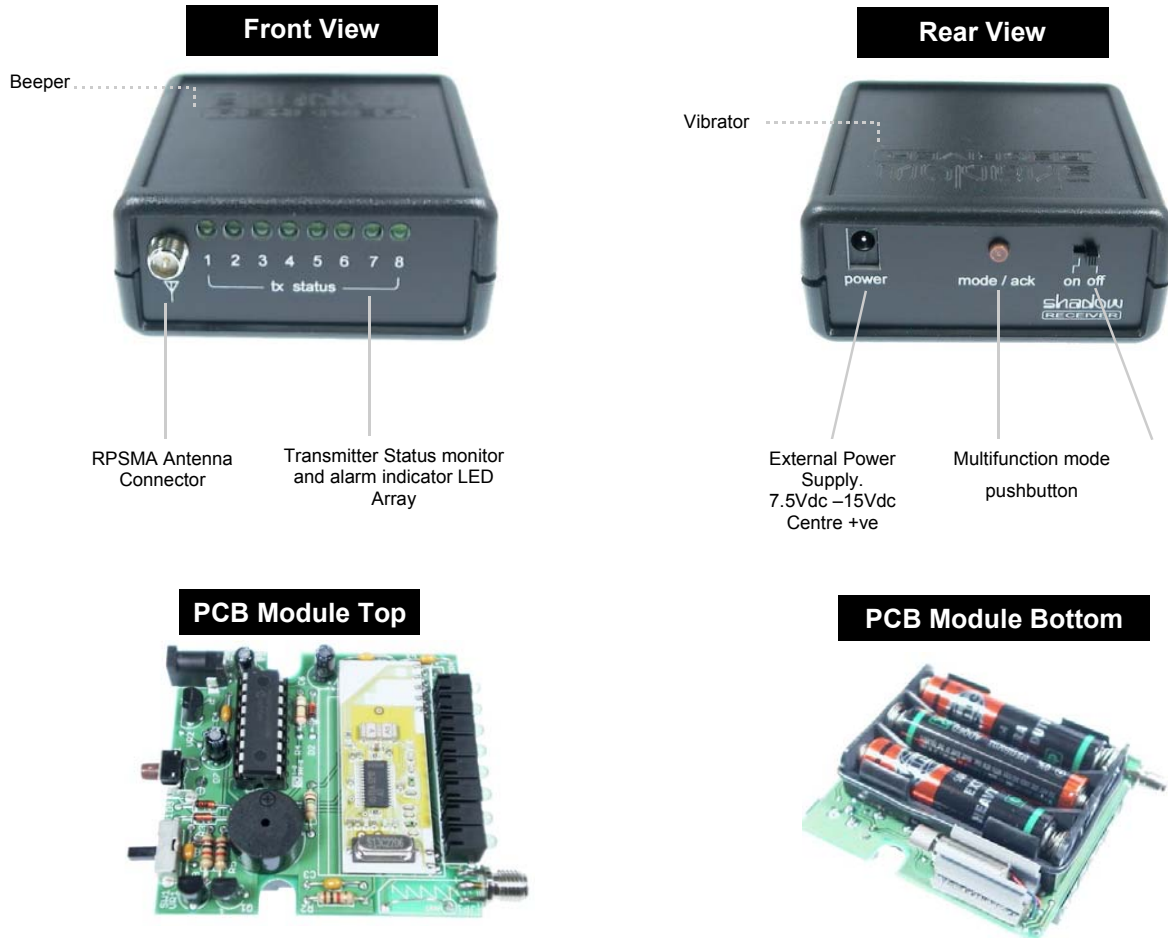
- 3V Lithium Coin Battery powered
- Lightweight: 30g (Key Ring version)
- Compact size: 1.9" X 1.36" X 0.8"
- Belt Clip or Key Ring attachment options
- Internal antenna. External antenna optional (TXA version) for longer range.



Typical applications

- Equipment management
- Pet management and tracking
- Model Rocket Tracking
- Asset management and tracking
- Valuables management and tracking
- RFID
- Access Control

Shadow RX Anatomy



Description of Operation

The **Shadow RX** asset management / tracking receiver will monitor the presence of up to eight **Shadow TX** transmitters. After the receiver has been configured with the number of transmitters in the system, it will continually monitor for the presence of the beacon data signal from these transmitters. As long as the transmitters are within radio range of the receiver, the receiver will idle in its monitoring mode and flash the transmitters associated LED every time it receives the beacon signal from each transmitter. This results in a random pattern of flashing LED's in the TX STATUS LED array and provides visual indication of the presence of the **Shadow TX** transmitters.

When a transmitter goes out of radio range of the shadow receiver, the receiver will output an audible beeper alarm and visually indicate which receiver has caused the alarm by turning ON the transmitter's associated LED. In addition, depending on the mode selected, a vibrator will also turn ON if this mode is

selected.

The alarm condition is reset automatically when the transmitter is brought back into radio range of the receiver. Alternatively, the alarm condition may be manually reset by momentarily pressing the mode/ack. pushbutton.

Configuring the System

Powering the Receiver:

The receiver may be powered either by internal batteries (3xAAA) or by an external power supply such as a wall adapter. With the receiver powered and the ON/OFF switch is in the OFF position, the receiver is in the ready state for the system configuration below.

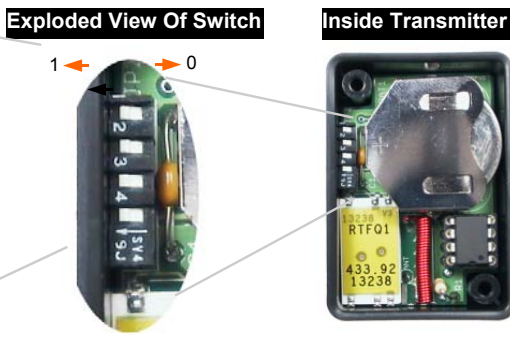
Powering the Transmitter/s:

The transmitters are powered by CR2477 lithium coin batteries and are typically supplied with the battery installed. The transmitter has an internal magnetic reed switch which enables or disables the transmitter. Removing the supplied magnet from the white indexed screw head of the enclosure will turn ON the ShadowTX. Conversely, the ShadowTX switches OFF when the magnet is attached to the white indexed screw head.

Setting the ShadowTX ID number with the 4 position SIL switch. (Note: these are preconfigured during assembly and this procedure may not be necessary unless the original configuration needs to be changed by the user)

Note: The following settings should be used in sequence, depending on the number of transmitters to be used in the system: for example, if using only one transmitter, set this transmitter as number 1. For two transmitters set transmitter 1 as 1 and transmitter 2 as 2....for three transmitters set transmitter 1 as 1, 2 as 2, 3 as 3 ...and so on.. For up to the maximum system capacity of eight transmitters. **FOR CORRECT OPERATION, IT IS IMPORTANT TO APPLY THIS RULE.**

TX No.	Sw. 4	Sw. 3	Sw. 2	Sw. 1
1	1	0	0	0
2	1	0	0	1
3	1	0	1	0
4	1	0	1	1
5	1	1	0	0
6	1	1	0	1
7	1	1	1	0
8	1	1	1	1



The image shows two photographs. The left one is labeled 'Exploded View Of Switch' and shows a 4-position SIL switch with positions 1, 2, 3, and 4. Red arrows point to positions 1 and 0. The right one is labeled 'Inside Transmitter' and shows the internal components of a transmitter, including a coin cell battery and a reed switch.

With reference to the above table and by way of an example:

For a system with only one transmitter, switches 1 through 3 will be set to the 0 position.

For a system with two transmitters, transmitter # 1 is configured as just described and transmitter # 2 will be configured with Sw. 1 in the 1 position, Sw. 2 and 3 in the 0 position and Sw. 4 in the 1 position....and so on. Note in all configurations Sw. 4 is always in the 1 position.

To proceed with the next step of binding the Shadow TX transmitters with the ShadowRX receiver, ensure the transmitters are activated by removing their magnets

Transmitter/Receiver Binding Procedure:

With the receiver and transmitters setup as described above, the final step in configuring the system is to train the receiver to bind with the active transmitters. This is performed in 3 simple steps:

1. Press and hold the mode/ack pushbutton switch on the receiver, and while pressed, switch the receiver power slide switch to ON.
2. Keeping the mode/ack. Switch pressed, watch the TX status LED array illuminate each LED as it learns the associated transmitter.
3. Once all associated LED's are illuminated for the number of transmitter configured for the system, release the mode/ack. Pushbutton. This ends the learning process and the wireless asset management operating mode begins.

Once the learning procedure has been completed, the process need not be repeated again even if power is removed. If however, in a situation where the number of transmitters in the system changes, by either adding more transmitters or reducing the number of transmitters, the configuration process will need to be repeated.

Alarm Response Mode Selection:

Apart from the learning (binding) function, the mode/ack. switch in the receiver's normal operating mode, is used to set the alarm output for beep or beep and vibrate. Each successive press on the mode/ack. switch will cycle through the two alarm response modes. The selected alarm output mode will be stored by the receiver until changed by the user.

Initial Testing:

With the system fully configured and operating, a test can be performed to verify the alarm operation. To perform the test, attach the magnet to one of the transmitters. After a short time (approx. 30 sec) (for a multi transmitter system) (approx. 5 sec. for single transmitter system) the shadow receiver will enter an alarm condition and indicate on the TX status LED array the associated offending transmitter.

This test may be repeated with all the transmitters if required. The transmitter/s with its magnet attached, simulates the transmitter as being out of range. Removing the magnet, will reset the alarm indicating the transmitter is back in radio range.

CAUTION: Keep magnets away from magnetic data media and other sensitive objects that may be destroyed by magnetic fields.

Alarm Acknowledge:

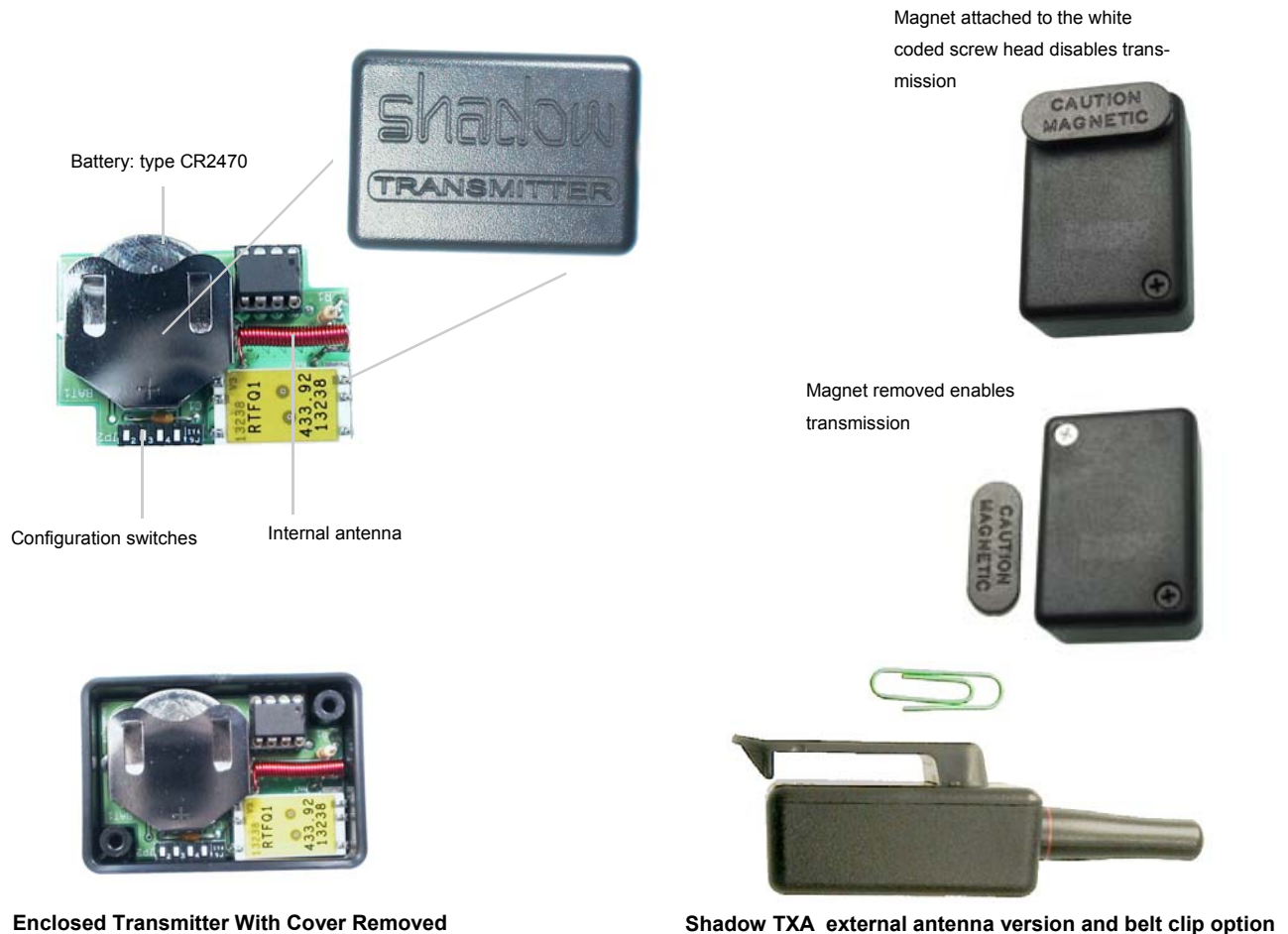
In addition to the aforementioned functions of the mode/ack. pushbutton switch, when the shadow receiver is in an alarm condition, this switch assumes the function of enabling user acknowledgement of the alarm. When the receiver is in alarm mode, having detected an out-of-range transmitter, the user can silence the alarm by pressing the mode/ack. button. Once pressed, the mode/ack button resumes it's function as an alarm output mode selector.

Note, the acknowledge button does not reset the LED alarm indication, which is only reset by the transmitter when it is brought back into radio range.

Temporary Alarm Events

With shadow systems which contain multiple transmitters, a momentary alarm event will occasionally occur which serves as verification that the system is in operation. These momentary events automatically reset within seconds and require no user action.

Shadow TX Anatomy



Transmitter Options:

To cater for different applications, the Shadow TX is available with the following attachment options:

- **belt clip**
- **keyring**
- **no attachment is standard**

The Shadow **TXA** version has an external antenna for longer range applications (range up to 180ft).



RFID Application with the SRX series remote control receivers

The Shadow TX and Shadow TXA transmitters are compatible with all the **SRX series** receiver modules, and are well suited to applications such as RFID access control. When used together with the SRX series remote control receivers, the SRX series receivers relay output/s remain de-energized as long as the Shadow TX (A) transmitter is within receiving range. Once the transmitter goes out of range, the receiver's relay output/s will energize and actuate a connected device.

In an application for RFID access control, for example, an electronic door lock may be automatically controlled by the ShadowTX and the 1CH-SRX receiver. With the 1CH-SRX controlling the electric door lock, a person with the Shadow TX clipped to their belt will automatically unlock the door when within range of the door receiver and automatically lock the door when going out-of-range of the door. This same principle may be applied to many other RFID access control applications.

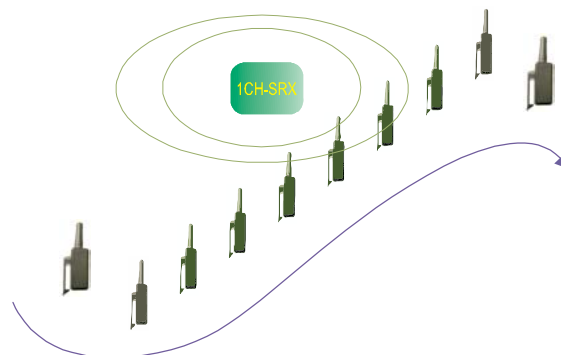


Diagram showing a traveling ShadowTX tag. When the tag is within range of the receiver, the receiver's output will be active, and when the tag is out of range of the receiver, the receivers output will be inactive