Timpdon Electronics

UltraRad Radio System
Transmitter Model *UTX3*

The ***UltraRad*** Multi-Channel Radio Transmitter Model ***UTX3*** is designed to be used with any ***UltraRad*** radio receiver and controller.

It incorporates one analogue speed channel, one analogue forward / stop / reverse channel, with trim settings and two digital auxiliary channels for the control of whistles and lights.

Each transmitter is coded with ten unique serial numbers which permit it to be locked to up to ten different receivers and controllers at any time.

The transmitter is fitted with a ten channel selector switch, which allows control to be switched instantly between up to ten different vehicles to which it has previously been locked.

It complies fully with all UK legislation for licence free operation.

Specification

Frequency	434.20 MHz
Radiated Power	+10 dBm[10 mW]
Modulation	Frequency Modulation
Duty Cycle	2.6% standard, 9% maximum
Range	30 metres with ***URX1*** receiver, in a normal model railway or garden environment
Channels	Ten channels, user switchable
Size	111mm x 66mm x 50mm
Weight	170g
Batteries	2 x 1.5 V AA cells
Battery Life	In excess of 100 hours in normal operation

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Operation

Data is transmitted in packets, approximately 26ms long, which incorporate details of all analogue and digital channel settings, the unique serial number of the transmitter/channel and checksum data to permit the data integrity to be verified by the receiver.

Normally, a new data packet is transmitted approximately once every second but, in addition, an immediate transmission is made each time the user makes a change to any channel setting, up to a maximum rate of one transmitted packet every 300 ms.

Each time a new data packet is transmitted, the **Tx** indicator lamp flashes once.

A receiver and associated controller will respond only to transmissions from one specific transmitter and channel, to whose serial number they have been locked.

Multiple transmitters and associated receivers/controllers may be operated in close proximity at the same time without mutual interference.

Channel Selector Switch

Each of the ten available positions of the channel selector switch assigns a different, unique serial number to the transmitter. For each position, the transmitter can be locked to a different ***UltraRad*** receiver and controller, allowing independent control of up to ten vehicles from the same transmitter.

Switch positions are numbered **0** to **9**.

Control may be switched between different channels / vehicles at any time, but remember that you can only control one vehicle at any time.

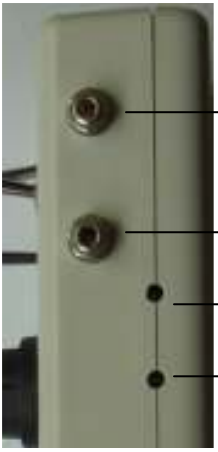
For safety, if you change the channel when the reverser is not set to **Stop**, transmission on the original channel will be immediately halted, but no transmission will be made on the new channel until the reverser is first set to **Stop**. This is to ensure that a vehicle on another channel can not be set in motion accidentally if the channel selector is changed inadvertently.

Caution

1 Because of the fail safe feature built into all ***UltraRad*** controllers, when you change channels, the vehicle you were controlling on the original channel will stop after 10 seconds, as it will now have lost radio control. On request, and to special order, ***Timpdon Electronics*** can supply ***UltraRad*** controllers with the fail safe feature disabled, to permit vehicles to continue operating on loss of radio communication.

Subsidiary Transmitter Controls

The ***UTX3*** is fitted with a number of subsidiary transmitter controls not fitted to the ***UTX1*** transmitter. These are mainly required only for the control of live steam vehicles



Reverser Forward Trim Control [F_Trim]

Reverser Reverse Trim Control [R_Trim]

Calibrate Push Button Switch [Cal]

Transmitter Lock Push Button Switch [Lock]

Reverser Trim Controls

On live steam vehicles, some users require to be able to trim the position of the reverser servo during running to permit optimum adjustment of the reverser valves as the locomotive heats up. The reverser trim controls each have a trim range of about 15% of total reverser servo travel and are independent for each direction. The reverser **stop** position is not affected.

When set fully clockwise, each trim control sets the reverser servo to its respective calibrated position – see below. Anticlockwise rotation trims the servo position back towards the **stop** position, in each case.
Each trim control has twenty turns of rotation for full range.

These controls have no function on battery electric vehicles,

Calibrate Push Button Switch

UltraRad Controllers Model ***URC3*** and ***URC4*** for live steam vehicles incorporate provision for calibration of servo settings to match a particular vehicle installation. Once calibrated, settings are retained in non-volatile memory within the controller. This permits a calibrated controller to be used with any transmitter without adjustment.

All calibration is performed from the ***UTX3***, operating in a special **calibration mode**.

To enter **calibration mode**, press and hold the recessed **calibrate push button** switch, using, for example, a pencil point. The **Cal** indicator lamp will flash rapidly for five seconds and then go fully on. You may then release the push button. The ***UTX3*** is now in calibration mode. For detailed calibration instructions, refer to the following separate calibration procedure:

URC3	**Technical Note 6** ***UltraRad*** Controller ***URC3*** Calibration
URC4	**Technical Note 10** ***UltraRad*** Controller ***URC4*** Calibration

Note Once the ***UTX3*** is placed in calibration mode, there is no exit until the ***UTX3*** is turned off and then on again.

Transmitter Lock Push Button Switch

All transmitters and receivers in the ***UltraRad*** range operate on the same radio frequency. Individual control is achieved by the use of unique serial numbers embedded within each transmitter during manufacture.

Each ***UltraRad*** receiver and controller must be locked to an individual transmitter / channel serial number before it will operate. Transmitter lock may be performed in one of two ways, either from the receiver and controller, or directly from the transmitter, provided that the controller has been wired to permit remote lock.

To lock a controller directly from the transmitter, first ensure that the ***UTX3*** is turned on and set to the required channel number. Then apply power to the receiver and controller and immediately press the recessed transmitter lock push button on the ***UTX3*** for about a second. The receiver and controller will lock automatically to the transmitter and the indicator lamp on the controller will start to flash in synchronism with the ***UTX3*** **Tx** indicator lamp. The system may then be used normally. Once a controller is locked to a particular transmitter and channel number, you will never need to lock it again unless you wish to change the transmitter.

For more details on Transmitter lock procedures, refer to **Technical Note 8**, ***UltraRad*** Transmitter Lock Procedures.

Note For safety, to minimise the risk of a controller being inadvertently locked to another transmitter, transmitter lock from the ***UTX3*** will function only for a period of 20 seconds after the receiver and controller have been turned on.

Caution Before using the Transmitter lock function from the ***UTX3***, take care that no ***UltraRad*** receivers and controllers other than the one you one you wish to lock to are energised in the vicinity, to avoid any risk of inadvertently locking to another controller.

Auxiliary Control Switches

Both the **Aux 1** and **Aux 2** control switches are dual operation, latched and momentary.

Push switch **up** for momentary operation.

Push switch **down** for latched operation.

Batteries

The ***UTX3*** is designed to operate from 3V battery supplies, using two 1.5V AA primary cells mounted within the case. Operation from rechargeable cells is not permitted, as these only provide a voltage of 1.2V per cell.

In normal operation, battery life is in excess of 100 hours continuous operation.

To change batteries, proceed as follows:

1 Remove the four case fixing screws on the rear of the case.

2 Carefully separate the two halves of the case, hinging about the left hand vertical side, taking care not to strain the cable harness connecting the front panel.

3 Locate the battery holder at the lower end of the case front section.

4 Carefully remove the old batteries, and replace with two new 1.5 V size AA primary [non-rechargeable] cells, checking that you have installed them with the correct polarity.

5 Refit the battery holder in the case as shown in the illustration, re-assemble the front panel to the case rear and finally refit the four fixing screws.

Other Timpdon UltraRad Radio Control Products

Receivers

Model ***URX1***	Compatible with all ***UltraRad*** transmitters

Transmitters

Model ***UTX1***	Single Channel Compatible with all ***UltraRad*** receivers. For battery electric vehicles Not recommended for live steam vehicles
Model ***UTX2***	Single Channel Primarily for live steam vehicles Can be used with battery electric systems Compatible with all UltraRad receivers

Controllers

Model ***URC1***	For battery electric vehicles Bi-directional PWM speed controller
Model ***URC2***	For battery electric vehicles Bi-directional PWM speed controller Two digital auxiliary channels – for lights and horn
Model ***URC3***	For live steam vehicles with separate regulator and reverse servos Three servo outputs • Regulator • Reverser • Auxiliary- for steam whistle One digital auxiliary channel – for lights
Model ***URC3***	For live steam vehicles with combined single regulator / reverse servo Two servo outputs • Regulator / Reverser • Auxiliary- for steam whistle One digital auxiliary channel – for lights
Model ***URC5***	For battery electric vehicles requiring more than 2.5A continuous Requires third party ESC • Standard RC speed control output • Directional Forward/Reverse lighting outputs • Auxiliary channel for horn