Timpdon Electronics

UltraRad Radio System
Transmitter Model *UTX5*

The ***UltraRad*** Radio Transmitter Model ***UTX5*** is primarily designed to be used with ***UltraRad*** Controller Model ***URC8*** for live steam vehicles. It may, however, also be used with any ***UltraRad*** radio receiver and controller.

It is primarily designed for users of **Accucraft** steam locomotives with separate regulator and reverser servos, where full user control of the reverser servo position may be required.

It incorporates one analogue speed channel, one analogue reverser channel, with full reverser control, and two digital auxiliary channels for the control of whistles and lights.

Each transmitter is coded with a unique serial number which permits it to be locked to one or more specific receivers and controllers.

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	9% maximum
Range	30 metres with ***URX1*** receiver, in a normal model railway or garden environment
Size	111mm x 60mm 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 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, 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.

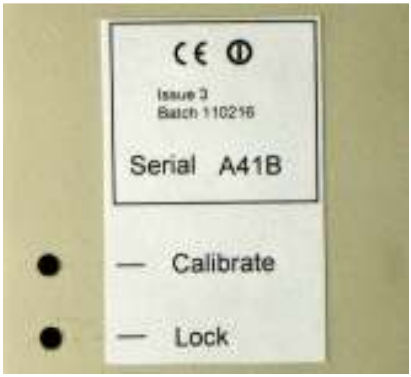
Reverser Control

The rotary reverser setting on the ***UTX5*** permits full control of the reverser servo on a steam locomotive when used with a ***URC8*** controller.

For other ***UltraRad*** controllers, both on steam and battery electric vehicles, which are designed to accommodate only three switched reverser settings – **Reverse**, **Stop** and **Forward**, the control range is as follows:

Reverser setting	**Controller Output**
0% to 25%	**Reverse**, with reverser servo trim, if used with a ***URC3*** controller
25% to 75%	**Stop**
75% to 100%	**Forward**, with reverser servo trim if used with a ***URC3*** controller

Subsidiary Controls – On Rear Panel



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 a unique serial number embedded within each transmitter during manufacture.

Each ***UltraRad*** receiver and controller must be locked to an individual transmitter 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.

To lock a controller directly from the transmitter, first ensure that the ***UTX5*** is turned on. Then apply power to the receiver and controller and immediately press the recessed **Lock** push button switch on the rear of the ***UTX5*** for about a second using, for example, a paper clip. 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 ***UTX5*** **Tx** indicator lamp. The system may then be used normally. Once a controller is locked to a particular transmitter, 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 ***UTX5*** 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 ***UTX5***, 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.

Calibrate Push Button Switch

UltraRad Controllers Models ***URC3, URC4*** and ***URC8*** 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 ***UTX5***, operating in a special **calibration mode**.

To enter **calibration mode**, ensure that both **Aux1** and **Aux2** switches are **off**. Then press and hold the recessed **Calibrate** push button switch on the rear of the ***UTX5***, using, for example, a paper clip. The **Cal** indicator lamp will flash rapidly for five seconds and then go fully on. You may then release the push button. The ***UTX5*** is now in calibration mode.

For detailed calibration instructions for each controller type, refer to the following separate calibration procedures:

URC3 and ***URC8***	**Technical Note 6** ***UltraRad*** Controllers ***URC3*** and ***URC8*** Calibration Procedure
URC4	**Technical Note 10**

Notes Once the ***UTX5*** is placed in calibration mode, there is no exit until the ***UTX5*** is turned off and then on again.

Calibration mode has no function when the transmitter is used with ***URC1***, ***URC2***, ***URC4*** and ***URC5*** Controllers.

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 ***UTX5*** 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.

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

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.