Uplands House, Castle Howard Road, Malton YO17 6NJ
www.micronrc.co.uk
+44 (0)1653 696008

Tx22v2 User Information

Tx22v2 is a hand-held wireless transmitter intended to control up to 12 model railway trains. It has controls for Speed, Inertia and Loco selection plus a toggle switch and push button that can be used for controlling lights, sound cards, couplers, etc. Tx22v2 is available in 2 versions: with and without a detent on the throttle control:

- the detent version has a mechanical 'click' at the centre of the travel and is intended for use with DT receivers configured for fwd/rev control on the throttle channel,
- the no-detent version is for use with receivers configured for full-range throttle and direction control using the toggle switch.

When the Tx22v2 toggle switch is not used for direction, it is available for controlling auxiliary functions such as lights and sound modules.

Tx22v2 may be used for receiver programming using the toggle switch to step through programming levels. Programming details for each receiver may be accessed from the web page for the receiver.

Technology

- Tx22v2 uses the 2.4GHz band which requires no frequency channel control and is very resilient against interference. All radio frequency components are contained on an internal module. There are no user adjustable parts on this module and it should not be modified.
- Tx22v2 is compatible with all DSM2 receivers; this includes Micron and Deltang receivers.
- Any number of receivers can be bound to your Tx22v2 but only up to twelve, bound to different Selecta positions, should normally be switched on at a time to operate them independently.
- Range is suitable for indoors and small outdoor sites; the outdoor free-air range to a model rail receiver is at least 50m. Range indoors is affected by building construction materials, furniture, people and receiver installation.
- Control knob, switch and push button actions are transmitted as separate R/C 'channels' which must match the receiver configuration:

Throttle:	channel 1
Selecta:	channel 2
Inertia:	internal use for inertia or may be reconfigured to control channel 4 or channel 5
Toggle switch:	channel 3 (up or forward = channel high, down or reverse= channel low)
Bind button:	channel 5 or none if inertia configured as channel 5) (up = channel high, down = channel low)

Battery

Tx22v2 uses a PP3 9V battery, preferably Alkaline or NiMH / Lithium rechargeable. The maximum working voltage of the internal electronics module is 10V and there is a protection diode wired in series with the battery lead. This allows the battery voltage to be up to 10.7V. If the battery voltage is above this value, the internal regulator will shut down and the transmitter will not operate.

epbl{thumb('tx22v2_battery_compartment.jpg', title => 'Tx22pb Battery Compartment', float => 'right', image_width => '150px'); } To replace the battery:

- Make sure that the power switch is off (up) before adding or removing a battery.
- Remove the lid at the bottom rear of the case by sliding it downwards. When Tx22v2 is new this will require a bit of effort to slide it past the retaning 'click'. The image at the right shows the case rear with the battery lid removed.
- Remove the battery from the compartment and pull the battery clip off the terminals. Replace the clip

on the new battery which will only fit one way round. TAKE CARE, if force is needed, the connector is probably the wrong way round.
- Replace the battery cover by sliding it up from the bottom making sure that the retaining tab goes under the case rear. The battery is held in place with a piece of foam attached to the cover and you will feel some resistance as the cover is pushed down onto the battery.

On/Off Toggle Switch
Tx22v2 has a latching toggle switch for power with a separate indicator LED. Power is on when the toggle is down. The LED lights continuously when the transmitter is on and flashes when Tx22v2 is in bind mode (see below). It is best to switch the transmitter on before the receiver. If a receiver is switched on with Tx22v2 off, it is likely to enter bind mode with rapid flashing of the LED on the receiver board. If you did not intend to bind, switch the receiver off, then switch Tx22v2 on followed by the receiver.

Speed/Throttle Knob
The centre-off or low-off throttle type is actually implemented in the receiver. Transmitter difference are the front-panel label and whether there is a centre-click on the throttle.

centre-off
: Off/Stop is in the centre of rotation when the white dot is pointing toward the top of the transmitter; a 'click' will be felt as the knob is centred. Rotating the knob to the right (clockwise) will move your loco forwards. If it goes in reverse, you need to swap the two wires connected to the motor in your loco.

low-off
: Off/Stop is at the fully counter-clockwise rotation of the knob and speed increases at the knob is rotated clockwise; the toggle switch is used to control direction. The receiver will change the motor direction only when the throttle knob is at zero.

Inertia/Momentum Knob
Unless reconfigured to operate R/C channel 4 or 5, the Inertia knob position is used internally to control acceleration and deceleration. The Throttle knob sets a target speed and Inertia changes the transmitted throttle value slowly until it reaches that target. The LED flickers while a change is in progress.

To stop quickly both Throttle and Inertia must be in the 'off' position. Inertia is off when turned fully to the left.

Selecta
This is a 12-way rotary switch with positions matching those of a clock. It allows 12 locos to brought in and out of service without touching them and requires a Selecta enabled receiver. Selecta uses R/C channel 2; a receiver stores the value of channel 2 when it is bound. During normal operation, the received channel 2 value is compared with the stored value. If they match (plus/minus a small delta), the receiver responds to the transmitter controls; if they don't match the receiver does not respond and, usually, the receiver LED will show a double flash to indicate that is it not selected.

Bind Button
If a receiver has not previously been bound, it has to be 'paired' with the transmitter. Binding is only required once per receiver.

1. Put your receiver into Bind mode (if a Micron or Deltang receiver, switch it on and wait for the LED to flash fast).
2. Press and hold the Bind push-button on the transmitter.
3. Switch the transmitter on by pushing the Power button and then release the Bind button.
4. Binding is complete when the receiver LED stops flashing.

During normal operation, the bind button can be used as an auxilary control - e.g. horn or whistle sound trigger. **TAKE CARE** to avoid holding the bind button down for 20 seconds or more as this will cause the transmitter to enter calibration mode or reconfigure some of the controls.

Toggle Switch and Bind Button
The toggle switch and Bind button can be used to control auxiliary functions such as lights, sound module triggers, couplers, etc. via the P or F outputs on Micron or Deltang receivers.

Receiver programming is used to associate an action on one of these controls with a change to one or more receiver outputs. Receiver programming is beyond the scope of this transmitter manual, you should refer to the programming instructions for a particular receiver.

The toggle switch can be used as a Direction switch to select forward/reverse with receivers that have low-off motor control. Tx22v2 may be ordered with either a momentary (return to centre) or latching toggle switches. All Micron receivers with a built-in speed controller can use either switch type for direction control as the latching in forward or reverse is implemented in the receiver. If Tx22v2 is used for a live-steam loco, the latching toggle switch should be specified.

Receiver Programming

Tx22v2 can be used to program Micron and Deltang receivers. The receivers have a rich set of functionality which is not possible to describe here, refer to the receiver's programming instructions for details of the available functions and the programming sequence to modify the functions.

The receiver must first be put into programming mode and then the Tx22v2 toggle switch is used to enter a programming sequence. There are 2 methods of getting a receiver into programming mode:

1. place the controls for R/C channels 2 and 4 at the extreme positions and then switch receiver on, or
2. switch receiver on and enter the morse code SOS using the bind button (R/C channel 5)

Method 1 works for all receivers, method 2 is not supported by Deltang Rx4x receivers.

Method 1 (chan 2 and 4)

1. switch Tx22v2 on, receiver off
2. set the Inertia knob to control channel 4 (described above).
3. rotate the channel 2 (Selecta) and channel 4 (Inertia) knobs fully left or right (not centred).
4. centre the toggle switch.
5. put the Throttle control in the 'off' position.
6. switch the receiver on.
7. the receiver LED will flash rapidly
8. centre the Selecta and Inertia knobs
9. the receiver LED will flash once, pause and repeat

Method 2 (SOS)

1. switch Tx22v2 on and then the receiver, receiver LED must be lit
2. centre the toggle switch
3. wait at least 5 seconds without touching any transmitter control
4. tap out the morse SOS (... --- …) on the bind button where:
    - a dot is a short press of less than 0.7 second
    - a dash is a long press of about 2 seconds
    - pauses between dots or dashes is about 1 second
5. if the SOS is accepted, the receiver LED will flash once, pause and repeat
6. if the SOS was not accepted go back to step 3

To enter a receiver program sequence

A program sequence comprises 5 values, one for each column from the programming table. The Tx22v2 toggle switch is used to enter the value for each level of the sequence, the receiver LED flashes to show the digit value. Program data is modified by pulsing the switch low (toggle down or reverse) and stored by pulsing the switch high (toggle up or forward).

Modify programme sequence value:	**Pulse the toggle switch down.** The Rx LED will briefly show rapid flashing and then the next flash in the sequence – i.e. if it was showing 1-flash it will now show 2-flash. The flash sequence returns to 1-flash when advancing beyond the last value in a sequence. The number of the last value depends on the particular sequence being programmed.
Store programme sequence value:	**Pulse the toggle switch up.** The Rx LED will briefly show rapid flashing and then show the currently programmed flash pattern for the next in the sequence. If this is the last value in the program sequence, there is a brief pause with the LED off while the changes are written to safe storage and then the LED comes on solid.

Repeat the above for each program function that you wish to alter.

For example, to set the ESC output (the first if the receiver has multiple ESC) to respond to full range throttle on channel 1 and direction control on channel 3, the programme sequence is 1,1,2,1,3:

- Enter programming mode
- Rx LED displays 1-flash, push toggle up to accept
- Rx LED displays 1-flash, push toggle up
- If Rx LED does not display 2-flash, push toggle down until it does, push Tx toggle up
- If Rx LED does not display 1-flash, push toggle down until it does, push Tx toggle up
- If Rx LED does not display 3-flash, push toggle down until it does, push Tx toggle up
- Rx LED lights solid

Calibration

All ready-to-use transmitters are calibrated as the final manufacturing step. This sets the throttle control centre position and normally only needs to be done once. If you suspect that the throttle control is not operating correctly or you have replaced any of the internal components (e.g. throttle potentiometer), your transmitter may need calibration.

If the bind button has been inadvertently held down for longer than 20 seconds, the previously stored calibration data will have been overwritten and you could find that the throttle control behaves strangely.

To perform calibration:

- Centre the Throttle knob
- Rotate the Selecta switch to position 6 (pointer on knob is pointing vertically down)
- If the toggle switch is a latching type, ensure the toggle is in the centre
- Set Inertia to off
- Switch the Tx on
- Within 60 seconds, press and hold the Bind button
- After 20 seconds, the Tx LED will:
    - go out for 2 seconds
    - come on for 3 seconds
    - go out for 2 seconds
    - come on for 3 seconds
    - go off and stay off
- Release the Bind button, the Tx LED will stay on

The transmitter controls are now calibrated.

Change Inertia Control Function

If the Bind button is pressed for more than 20s, it alters how the Inertia knob is used:

- if the Bind button is pressed for 20s or more within the first 60s of switching on, it will perform calibration of the throttle knob centre position
- if the Bind button is pressed for 20s or more after the first 60s of switching on, it will toggle what the Inertia knob is used for – Inertia or control of channel 4 or channel 5.

The default behaviour of the Inertia knob is to control acceleration and deceleration as described above. To toggle the Inertia knob function:

1. switch the Tx on and wait 90s without touching the Bind button
2. press and hold the Bind button
3. after 20s the power LED will go off for 2s and then come on for 3s; release the Bind button in this 3s to toggle the Inertia knob between controlling Inertia or controlling channel 4.
4. after a total of 25s (i.e. after the 3s of LED on) the power LED will go off and stay off until you release the Bind button; this causes the Inertia knob to control channel 5
5. repeat steps 1 to 3 to revert to the Inertia knob controlling throttle inertia.

If the Inertia knob is being used for Inertia or channel 4, the Bind button controls channel 5 if pressed for less than 20s. If the Inertia knob is being used for channel 5, the Bind button has no effect on channel 5 but is still used for binding and toggling what the Inertia control is used for.