

Tx22pb User Information

Tx22pb is a hand-held wireless transmitter intended to control up to 12 model railway trains. It has controls for Speed and Loco selection plus a toggle switch and 2 push buttons that can be used for controlling lights, sound cards, couplers, etc. Tx22pb 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 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 Tx22pb toggle switch is not used for direction, it is available for controlling auxiliary functions such as lights and sound modules.

Tx22pb 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

- Tx22pb 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.
- Tx22pb 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

Toggle switch (S1): channel 3 (up or forward = channel high, down or reverse = channel low)

Push button (S2): channel 4 (up = channel mid, down = channel low)

Bind button: channel 5 (up = channel high, down = channel low)

Battery

Tx22pb 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.



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 Tx22pb 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

Tx22pb 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 Tx22pb is in bind mode (see below). It is best to switch the transmitter on before the receiver. If a receiver is switched on with Tx22pb 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 Tx22pb 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 as 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.

Selecta

This is a 12-way rotary switch with positions matching those of a clock. It allows 12 locos to be 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 it is 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 auxiliary 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 Push Buttons

The toggle switch and push buttons 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. Tx22pb 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 Tx22pb is used for a live-steam loco, the latching toggle switch should be specified.

Receiver Programming

Tx22pb 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 Selecta switch (R/C chan 2) to #12 plus press and hold down the S2 button 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 Tx22pb on, receiver off
2. centre the toggle switch.
3. put the Throttle control in the 'off' position.
4. rotate the channel 2 (Selecta) fully left or right (not centred).
5. press and hold down S2
6. switch the receiver on.
7. the receiver LED will flash rapidly
8. centre the Selecta knob and release S2
9. the receiver LED will flash once, pause and repeat

Method 2 (SOS)

1. switch Tx22pb 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 Tx22pb 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
- 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.