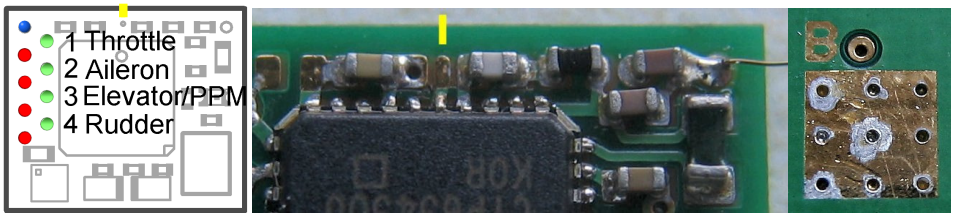
DT 2.4GHz RECEIVER INSTRUCTIONS
Rx25 (Solder Tabs) – v3.1.1

Battery may be connected with correct orientation to designated points (6v max).
The Red dots in the illustration below are Positive (+).
The Blue dot (top left) and most of the bottom of the board is Negative (-).
The Green dots are signal connections.
Care is needed to avoid short circuits under the board.
The Tx/Rx may be switched On/Off in any order.

LED:
Led On = perfect reception (real-time indicator).
Led Off = not perfect (useful for range tests/interference indicator).
1 flash = scanning (~2sec between flashes; wrong model if never stops).
2 flash = brownout (receiver voltage went too low; check battery/servo load).
4 flash = failsafe (signal lost for >1s eg: Tx switched off before Rx).
5 flash = watchdog (program recovery mechanism; should never happen).
Note: Flashes are also used in Programming Mode (faster flashes).

FAILSAFE:
Outputs are not driven (do nothing) on startup and while scanning.
Outputs 'hold' on short signal losses (<1sec) and then do nothing (>1s).



AUTO BIND (default):
1. The Rx will go into Bind mode 30 seconds after being switched on if no Tx signal is recognised. The led will flash rapidly.
2. Switch Tx on in bind mode. Hold the Tx bind button until the Rx led stops flashing rapidly. The led will stay off for a few seconds and may flash.
3. As soon as the led comes on and stays on the Rx is bound and ready to use.
4. If led does not come on within 20sec or flashes every 2sec (=scanning), the bind has failed. Allow several flashes then switch Tx and Rx off, move them closer or further apart and start again. Binding is more reliable with no other Tx's on.

MANUAL BIND (optional):
The Rx checks whether the bind pin is connected to Negative (-) on startup. To enter bind mode when auto bind has been disabled, connect the bind pin to Negative from before switching on and until the led does something. The bind pin is marked in Yellow above. It can be connected to either adjacent component/pad on the edge of the board. Alternatively Pad B under the board can be connected to the square gold pad under the board. This connection may be removed once the Rx is powered up.

MODES OF OPERATION:
The Rx has three primary modes:
Mode 1: Servo outputs (default mode)
Mode 2: PWM outputs (for A3901 for 2 actuators & Fet for brushed motor)
Mode 3: Sequential PPM (for quadcopters)

OPTIONS WITHIN MODES:
Mode 1 (default):

Pad1: Throttle	Servo output/external ESC (default) or PWM/external FET (for brushed motor/A1442)
Pad2: Aileron	Servo output
Pad3: Elevator	Servo output
Pad4: Rudder	Servo output

Mode 2:

Pad1: Aileron	PWM/external A3901 (for actuator) - Rudder optional
Pad2: Aileron	PWM/external A3901 (for actuator) - Rudder optional
Pad3: Elevator	PWM/external A3901 (for actuator)
Pad4: Elevator	PWM/external A3901 (for actuator)
PadB: Throttle	Servo output/external ESC) (default) or PWM/external FET (for brushed motor/A1442)

Mode 3:
Pad3: Sequential PPM (all Mode 1 and Mode2 settings are reset/ignored)
7 channels, idle high, 300us low trigger pulse
Order: 1,2,3,4,5,6,7 (Throttle, Aileron, Elevator, Rudder, Gear, Aux1, Aux2)

'ESC' FEATURE:
When the throttle output is set to 'PWM' it only requires an external Fet and protection diode to act as a brushed ESC (for brushed motor or A1442-type single-phase brushless controller). The output acts like an ESC; eg: close throttle to arm on startup. A 3.0v LVC (Low Voltage Cutoff) is enabled by default but can be disabled.

PROGRAMMING APPROACH:
Modes and other options are selected over radio link using the Elevator stick. High/Low selects alternatives and mid-stick then confirms a choice and moves on. 'High' means pushing the elevator stick towards the top of the Tx (if not reversed).

The led flashes the option currently being set (eg: Option 1 = single-flash 1sec apart).
The Rx assigns a value to each option (Low elevator=0; High=option number).
The Rx flashes the sum of all options once complete to confirm settings
(eg: High on options 3 and 4 will yield 7 flashes after Tx switched off).

The Tx changes frequencies every time it is switched on. Auto-programming can only be entered if the Tx is using the same frequencies as were used during the most recent bind. So you have to perform a successful new bind (led comes on solid), keep the Tx on to maintain the same frequencies, and then power cycle the Rx 3 times making sure the led comes on solid after each power cycle. The led should then give a repeating single-flash every 1 second. This is described in steps below:

PROGRAMMING PROCEDURE ('Auto' mode):

1. Bind Rx to Tx and led will come on solid.
2. Keeping the Tx ON, switch the Rx OFF then ON until it reconnects again (led on).
3. Perform step 2 three times until led flashes the first program option (single-flash).
4. Use High/Low Elevator to make choices and mid-stick to confirm and move on
5. Switch Tx off at any time to save settings.
6. The led will then flash the sum of new program settings; switch Rx off when done.
7. Switch Rx off before Tx at any time to exit without saving changes.
8. To restore defaults, perform steps 1-3 and switch the Tx off (or select Low elevator on all options). The led will not flash after switching the Tx off because all options are reset to 0/Low.

PROGRAMMING PROCEDURE ('Manual' mode):

To enter program mode 'manually', Rx must already have been bound to Tx:

1B. The Rx checks for electrical continuity between signal pads 1 and 2 on startup. So connect Pad1 to Pad2 before switching the Rx on and until the led does something. The led should flash rapidly as if in Bind mode. Remove connection.

2B. Switch Tx ON and wait for Rx to flash the first program option (single flash) - the led will stay off if Tx is not bound or on wrong model memory.

3B. Perform steps 4-8 above.

PROGRAM OPTIONS/FLASHES (L=0=Default or not applicable):

1. L = Mode 1: PPM outputs (to drive servos/external esc's)
   H = Mode 2: PWM outputs (to drive external actuator/esc board)

2. L = Mode 1 Pin1: PPM Throttle output to drive servo/external ESC
   H = Mode 1 Pin1: PWM Throttle output to drive external FET (eg: for A1442)

3. L = Mode 2 PinB: PPM Throttle output to drive servo/external ESC
   H = Mode 2 PinB: PWM Throttle output to drive external FET (eg: for A1442)

4. L = Mode 2 Pins1/2: AILERON (Pins 3/4=Elevator, Pin B=Throttle)
   H = Mode 2 Pins3/4: RUDDER (Pins 3/4=Elevator, Pin B=Throttle)

5. L = ESC low voltage cutoff: ENABLED
   H = ESC low voltage cutoff: DISABLED

6. L = Mode 3: Sequential PPM DISABLED
   H = Mode 3: Sequential PPM ENABLED

7. L = Bind & Program mode entry: AUTO
   H = Bind & Program mode entry: MANUAL

PROGRAMMING EXAMPLES:

EXAMPLE 1:
4 servos or brushless esc; auto bind enabled
Option 1-7 Low
Flashes after programming 0

EXAMPLE 2:
4 servos as above but auto bind disabled
Option 1-6 Low
Option 7 High
Flashes after programming 7

EXAMPLE 3:
Sequential PPM for quadcopter
Option 1-5 Low
Option 6 High (Mode 3)
Option 7 Low if auto bind is to be enabled
Flashes after programming 6

EXAMPLE 4:
3 servos (Aileron. Elevator, Rudder)
+ Throttle ESC for brushed motor (external Fet/Diode required)
Option 1 Low (Mode 1)
Option 2 High (Pin1 PWM)
Option 3-7 Low if ESC LVC and auto bind are to be enabled
Flashes after programming 2

EXAMPLE 5:
PWM outputs for 2 Actuators using Rudder/Elevator (external A3901 required)
+ Throttle for external brushless ESC (external ESC required)
Option 1 High (Mode 2)
Option 2 Low (only applies to Mode 1)
Option 3 Low (PinB throttle PPM for brushless esc)
Option 4 High (Rudder/Elevator)
Option 5 Low (LVC only applies when Options 1 or 2 are High)
Option 6 Low (sequential PPM disabled)
Option 7 Low if auto bind is to be enabled
Flashes after programming 5