DigiONE+

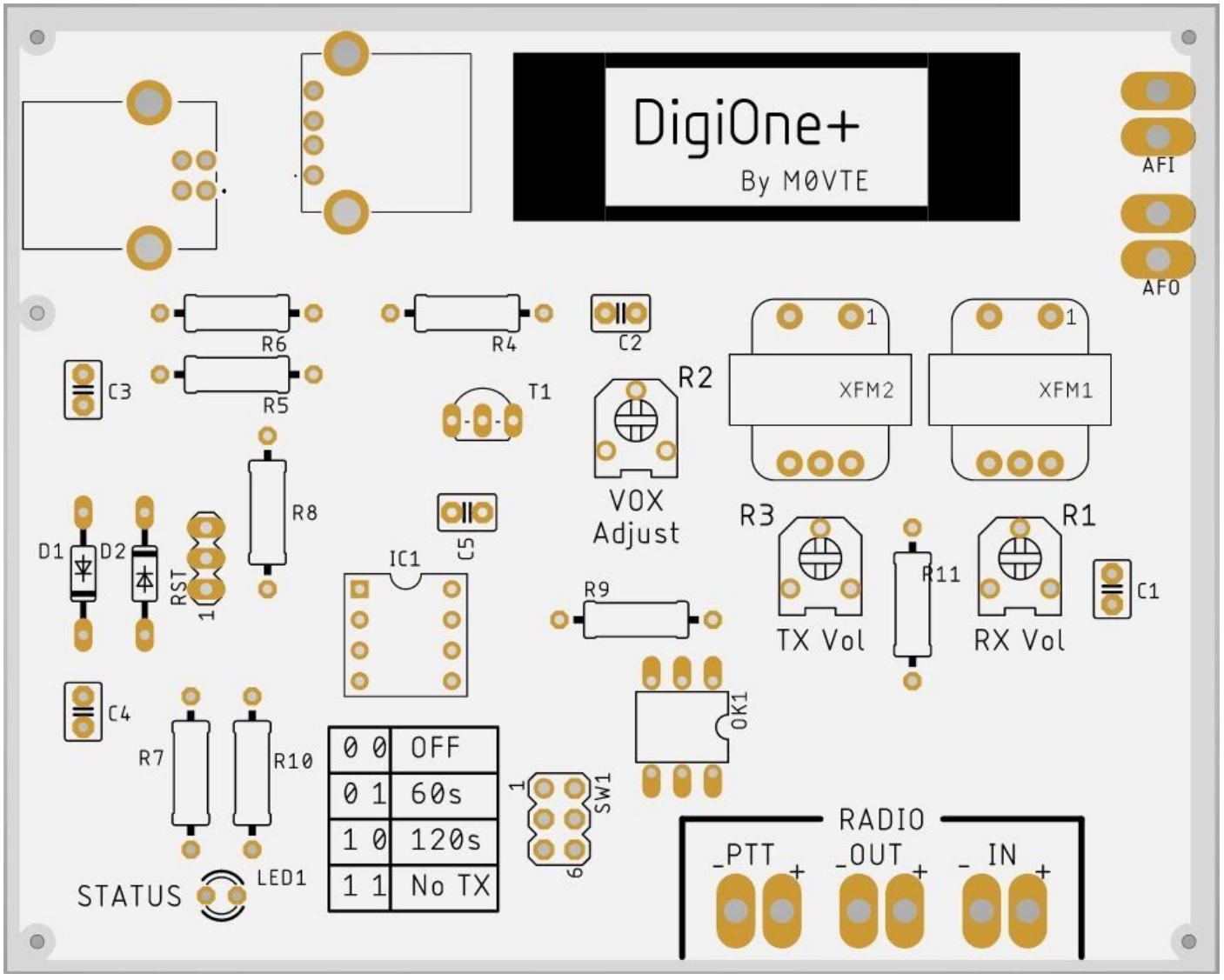
Assembly & Operation Manual

The DigiOne+ is a complete digital modes adapter offering onboard VOX, complete isolation and a watchdog protection for your transceiver

Version 1.0

Construction

Board Layout



Label	Usage	Comment
AFO	Source Audio Output	Max: 2vpp 100-600Ω
AFI	Source Audio Input	Max: 2vpp 100-600Ω
IN	Sink Audio Input	Max: 2vpp 100-600Ω
OUT	Sink Audio Output	Max: 2vpp 100-600Ω
PTT+	PTT	Radio PTT output
PTT-	PTT	Radio Ground

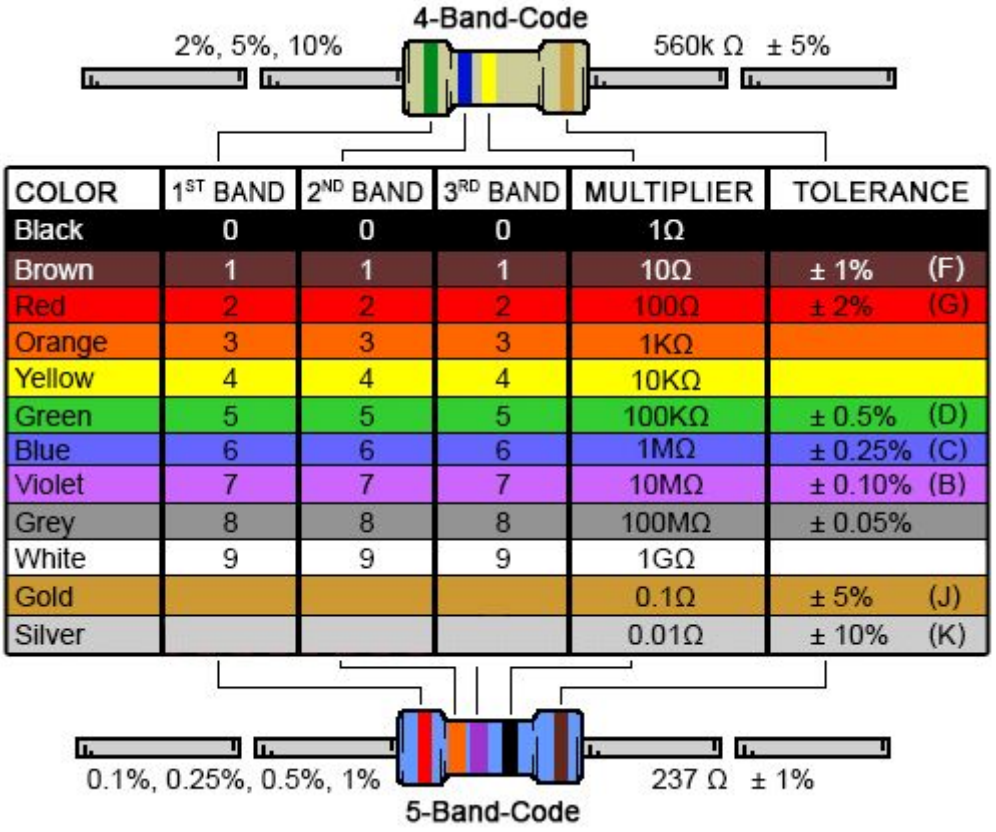
Parts

Label	Value	Comment
C1, C2, C3, C4, C5	100nF	Ceramic Capacitor
D1, D2	IN4148	
IC1	ATtiny-13A	Pre-flashed Microcontroller
IC1	8 pin DIL Socket	IC1 Socket
LED1	3-5mm LED	
OK1	4N35	Optocoupler
R1, R2, R3	10KΩ Trimmer	
R4	47KΩ	1/4W Metal Film
R5	300KΩ-330KΩ	1/4W Metal Film
R6,R11	4K7Ω	1/4W Metal Film
R7	100KΩ	1/4W Metal Film
R8, R10	1KΩ	1/4W Metal Film
R9	10KΩ	1/4W Metal Film
SW1	2x3 2.54mm Header	Mode Select
RST	1x3 2.54mm Header	Reset
T1	BC547	NPN
X1		USB-B Socket
X2		USB-A Socket
XFM1, XFM2	LT44	Audio Transformer
N/A	CM108	USB Sound Card Module
N/A	Asst. Wire	

Assembly Instructions

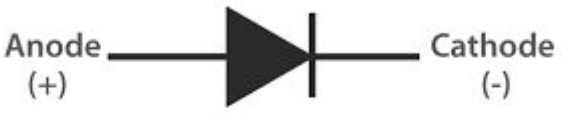
1. **Preparation**
   Layout and assort parts on a flat work surface, pre-heat and tin soldering iron as necessary

2. **Resistors**
   Carefully bend the resistor leads to 90’ angles and insert into holes, once located in the board hold the component in place and rotate the board so the backside is facing you then carefully bend leads outwards to hold component in place for soldering. Trim leads flush once soldered. Do not attempt to install more than one component at a time.



Locator	Value	Band 1	Band 2	Band 3	Band 4	Band 5
R4	47KΩ	Yellow	Violet	Black	Red	Brown
R5	300KΩ	Orange	Black	Black	Orange	Brown
R6, R11	4.7KΩ	Yellow	Violet	Black	Brown	Brown
R7	100KΩ	Brown	Black	Black	Orange	Brown
R8, R10	1KΩ	Brown	Black	Black	Brown	Brown
R9	10KΩ	Brown	Black	Black	Red	Brown

3. Diodes
Much like the resistors the diodes are an axial package and are installed in the same way however unlike the resistors they are a polarised component so please pay careful attention to the orientation of the component when installing.

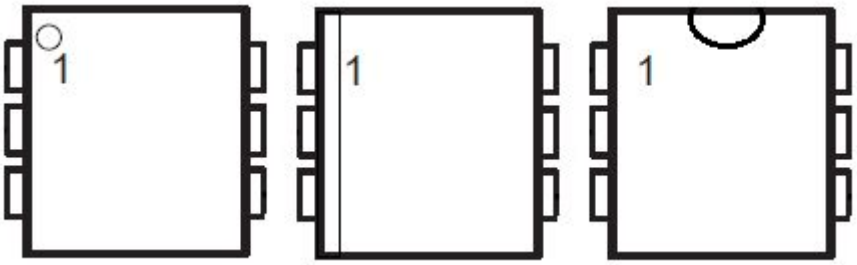


Locator	Value
D1, D2	1N4148 Signal Diode

4. IC Socket
The IC socket is an 8-pin polarised component. Locate the component onto the board making sure to match orientation as shown on the solder mask.

Do not install IC1 into the socket until step 13

5. Optocoupler
The optocoupler is a 6-pin polarised component, Locate the component onto the board making sure to match orientation as shown on the solder mask.



6. Trimmers
The trimmer resistors are a 3 pin polarised component with a rotatable slotted head (coloured blue) . Locate the component onto the board and solder whilst being careful not to melt the plastics of the component with excessive heat.

Locator	Value
R1, R2, R3	10KΩ (103)

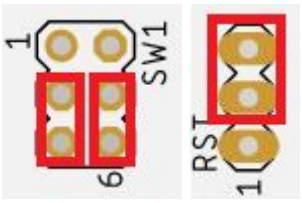
7. Capacitors
Much like the resistors, the capacitors are two pin components with no polarisation and are installed similarly. Take care not crack or break the ceramic body of the component when installing

Locator	Value
C1, C2, C3 ,C4	100nF (104)

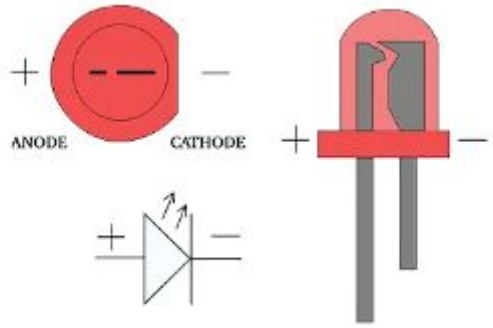
8. USB Sockets
Install the USB sockets as illustrated on the board. Be careful to not bridge the pads together, in such cases desoldering wick will remove the bridge. Once the pins are soldered, carefully add additional solder to the tabs to properly secure each socket to the board.

9. Transistor
The transistor is a small 3 pin polarised component. Please make sure the component is orientated correctly on the board.

10. Jumpers / Headers
Install the 2.54mm 3 way headers and install the jumpers as pictured



11. LED
The Light Emitting Diode is a 2 pin polarised component, Please make sure the component is orientated correctly on the board.



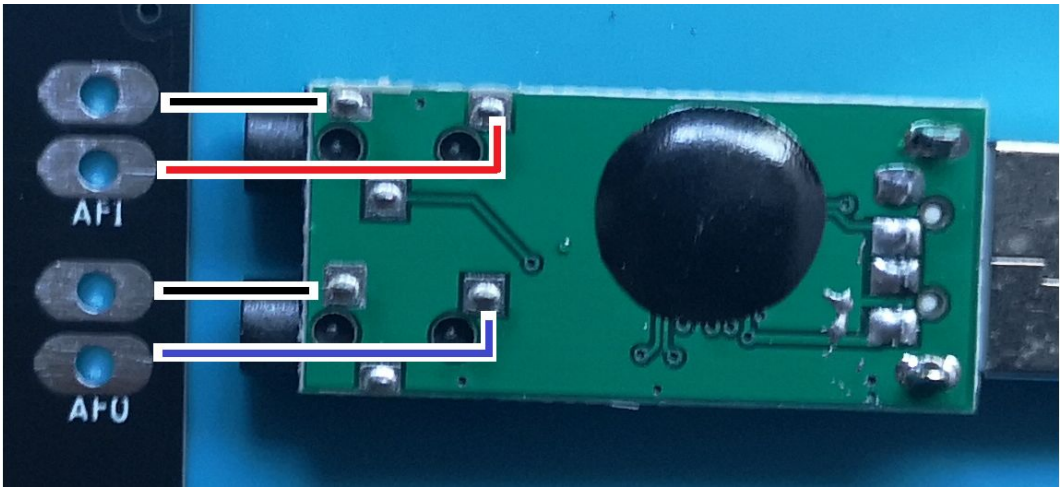
12: Transformers
Make sure component legs are free of residue and install the transformers as indicated on the board solder mask. Depending on the manufacturer the center pin may not be used and can be left unpopulated.

13: Microprocessor
Install IC1 into the socket, taking note of correct orientation

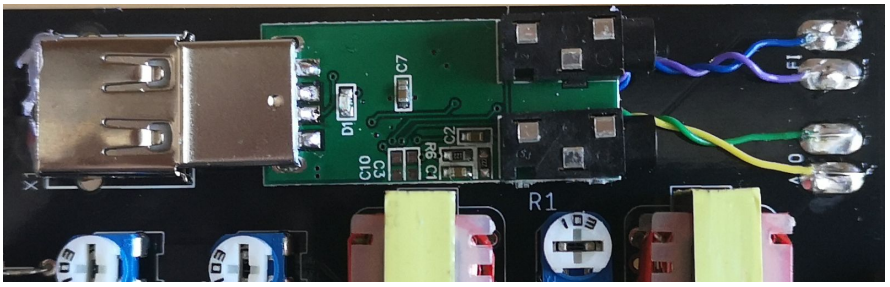
Sound Card Installation

Option 1: Direct installation (default)

1. Measure and cut the supplied wires to ~ 30mm in length (Colour not important)
2. Twist two wires together to form two pairs of twisted wire
3. Trim ~1mm of insulation from each end of each wire
4. Solder wires to each pad on the underside of the sound card as pictured

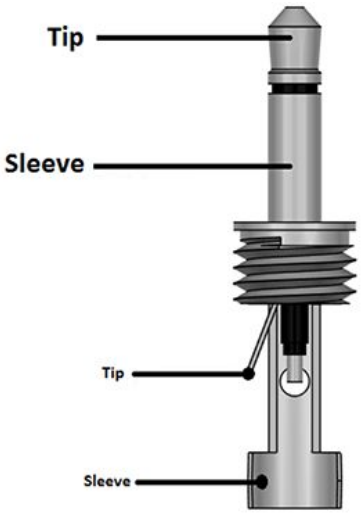


5. Solder opposing ends of each wire to the corresponding pads on the board observing polarity (pictured below)
6. Install sound card into the USB socket
7. Carefully fold any excess wire under the sound card module



Option 2: Jack Installation

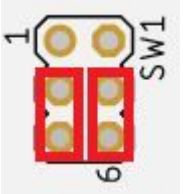
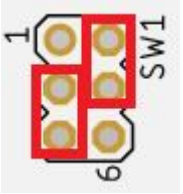
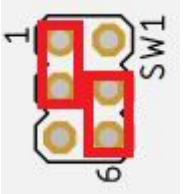
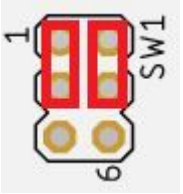
1. Remove outer sleeve from each 3.5mm connector [Not Included]
2. Carefully tin all pins of each 3.5mm connector
3. Trim ~10mm of the outer insulator from the coaxial audio cable [Not Included]
4. Separate and twist together the copper stands of the sleeve conductor
5. Trim ~2mm of the inner insulator
6. Tin both inner conductor and outer sleeve
7. Solder conductors to pins of jack connector
8. Thread outer sleeve of 3.5mm connector onto coaxial cable and secure to jack
9. Repeat steps 3-6 at the opposite end of coaxial cable
10. Solder conductors to pad on the board
11. Install the soundcard into the USB socket
12. Install each 3.5mm jack into the sound card module



Operation

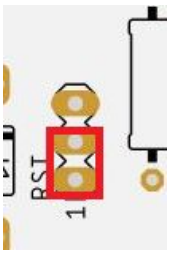
Operating Modes

The DigiONE has 3 modes of operation denoted by the positions of the SW1 jumpers. The Watchdog timer helps prevent damage to your radio equipment by limiting how long PTT transmit is permitted, if enabled and once timeout limit is reached the DigiONE will enter fault mode and PTT switching will be disabled (denoted by the status LED flashing) in which it must be repowered or reset

SW1-0	SW1-1		Mode
0	**0**		Watchdog Disabled
0	**1**		Watchdog enabled (60 second timeout)
1	**0**		Watchdog enabled (120 second timeout)
1	**1**		Watchdog disabled, Transmit Disabled

Reset

To reset DigiOne, move the jumper labelled RST from the ‘off’ position to ‘on’ and then return to ‘off’ after at least 1 second.



’ON’ position

Calibration

1. Connect USB cable to computer
2. Leave radio off or disconnected
3. Wait for sound module driver to install (if used)
4. In OS set both playback and Recording to use USB device (if used)
5. Set both Volume and Recording levels to ~50% on the computer
6. Set 'RX Vol' & 'TX Vol' to ~50%, Set 'Vox Adjust' to 100%
7. Open Radio software of choice (ie HRD, FlDigi, WSPR…)
8. Setup to transmit (leaving radio disconnected or Off)
9. Adjust 'Vox Adjust' so that the status LED remains solidly illuminated during transmit cycle
10. Connect Radio
11. Adjust 'RX Vol' until desired input audio level is achieved, if level remains too high reduce recording volume within operating system
12. Setup to transmit and use LOW power setting on the radio
13. Whist transmitting adjust 'TX Vol' so S-meter deflection is achieved, if level if unachievable adjust playback volume within operating system

For normal operating (depending on mode and software used) the operating system sound settings may not need to be set to the USB sound module.

TIP Try to adjust TX volume so that ALC (Automatic Level Control) on the radio is as close to zero as possible, whilst this may reduce RF power output it will improve signal clarity

TIP Adjust operating system / software levels for best results and use 'RX Vol / TX Vol' for fine control

Common Issues

Issue	Cause	Resolution
Radio will not enter TX	● Vox Detection Level ● PTT Wiring ● DigiONE is not powered*	● Check LED is lit continuously, if not adjust R2 and operating system playback audio level ● Check wiring of PTT is correct (LSP1 - PTT, LSP2 - GND) ● Make sure USB cable is connected
Radio flickering between TX/RX during transmit	● Vox Detection Level ● Audio playback level too low	● Adjust R2 and operating system playback level until LED is lit continuously during TX
TX Audio overmodulated	● Audio playback level too high	● Adjust R1 and software audio levels until desired level is achieved. A good level should lightly wobble the S-Meter needle around the specified output power level and should NOT tigger ALC (if present)
Status LED Flashing	● Watchdog timer triggered	● Disconnect / Reconnect power ● Reset DigiOne Board ● Adjust operating mode if trigger is reached too often