T400 TRANSCEIVER
OPERATING INSTRUCTIONS

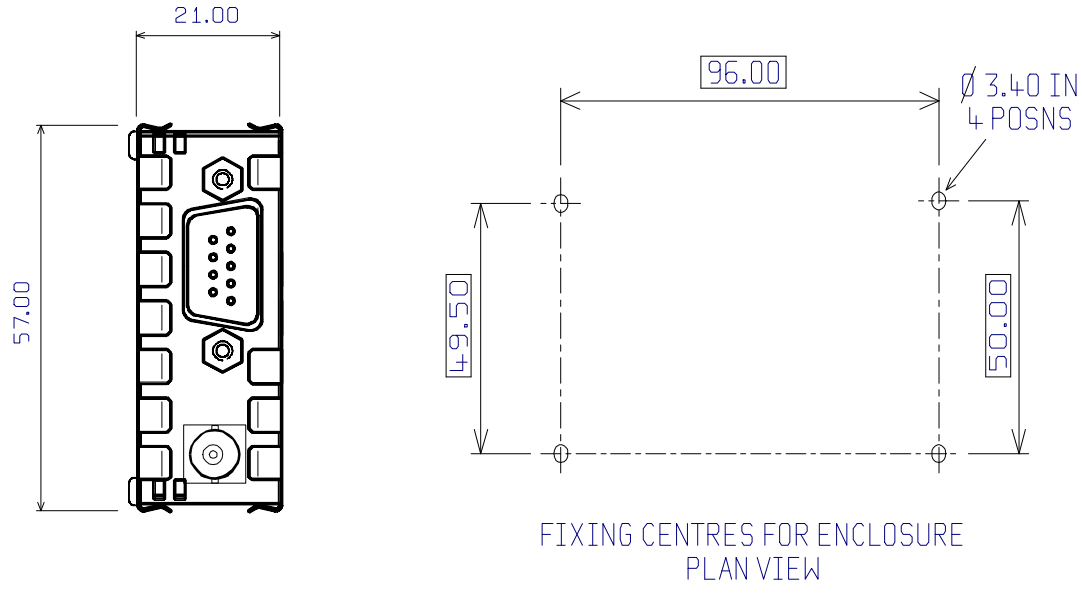
1892 1144

These operating instructions are intended to provide the user with sufficient information to install and operate the unit correctly.

The Tactical Electronics T400 synthesized UHF transceiver is intended to fulfil the numerous OEM applications by virtue of its reliable design, miniature size and quality manufacture.

INSTALLATION

The T400 is intended to fit easily and with minimum space requirements into the user's own equipment housing. The complete module is housed in a tin-plated enclosure and is secured by means of four 10mm sheet metal screws which locate in the four corners through the lower screening cover. DO NOT overtighten these screws during installation.



INTERFACE

The radio antenna connects by means of a BNC miniature coaxial connector. All other connections to the T400 transceiver are made using a standard 9-way D type connector as detailed in the table below.

PIN	NAME	FUNCTION	REMARKS
1	MOD I/P	Modulation input	To transmitter; Analog (750mV p-p for nominal deviation) or TTL/CMOS compatible (factory set)
2	RX O/P	Receiver Output	Analog (350mV p-p) or 5V CMOS levels, high (+5V) when no signal present (factory set)
3	$\overline{\text{TXE}}$	transmit enable	HIGH >2.5V = receive LOW <0.8V = transmitter enabled
4	0V	0 volts	common DC and signal ground
5	+ Vin	positive supply	+10 to +14 V DC
6	SQF	Squelch flag output	HIGH (+5V, 10kΩ pull-up) = Signal present LOW (<0.8V) = Signal not present
7	CS	channel select	Serial channel select input (RS232 compatible)
8	RSSI	Received Signal Strength Indicator	+1 to +3V DC nominal, 50dB range
9	0V	0 volts	common DC and signal ground

OPTIONS

Channel spacing

The T400 is available in the channel spacings as detailed in the table. The code designations form part of the product variant type. This is shown on the label fixed to the top screening cover of the module.
The T400 is FCC approved for 25Khz. The T400B is FCC approved for 12.5Khz.

FREQUENCY RANGE (MHZ)	CHANNEL SPACING	
	12.5kHz	25kHz
430 - 450	31	33
450 - 470	51	53

RF connection

As well as the standard BNC coaxial connector, the T400 is also available with a SMB or flying lead RF connection. Contact Tactical Electronics for details.

CHANNEL SELECTION

The software supplied with the T400 transmitter is the TPRG.exe program. The software can be run on a PC with the serial port connected to pin 7 of the transmitter via a suitable adaptor as shown in Figure 1. The unit may be programmed in-situ provided that pin 7 is available. There is no feed-back facility with this circuit, and for this reason, the TPRG software repeats the programming three times to eliminate error.

This version of software is programmed by a series of 8 byte data packets at 1200 baud. Each packet includes a 16 bit sync code and an 11 bit checksum to eliminate the possibility of spurious programming.

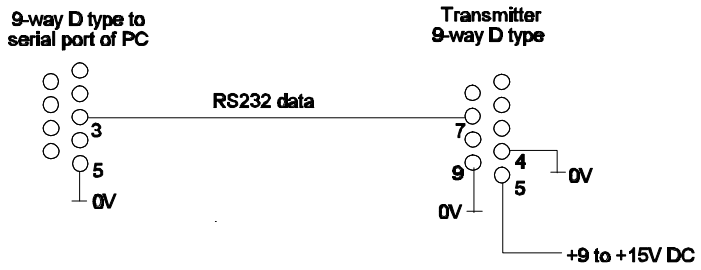


Figure 1 Programming adaptor

RUNNING THE SOFTWARE

Please note that mouse operation is not supported with this program

1. Connect the TX00 transceiver to a suitable supply and to the PC using the programming adaptor.

2. Insert the TPRG disk into drive A and type:

   A:TPRG <return>

3. The user is then prompted to enter the serial port number of his PC which is used to communicate with the TX00 transmitter. Enter 1 or 2.

After the software has successfully loaded the screen displays the following prompts:

Enter frequency in MHz?

The user can then enter the required operating frequency and then ‘0' to quit.

RANGE INFORMATION

The following table gives an indication of the typical ranges to be expected between a transmitter and receiver that have simple end-fed dipole antennas.

The following assumptions have been made in the calculations:

line-of-sight between antennas
0dB gain for the transmitter and receiver antennas
0dB loss for connectors and cables between the antenna and the radio connector
20dB fade and environmental margin
-100dBm received signal strength, allowing for digital and analog signals

Range versus TX power			
Frequency (MHz)	**Power (mW)**	**Power (dBm)**	**Range (km)**
458.5	1mW	0	0.5
458.5	10mW	10	1.7
458.5	100mW	20	5.3
458.5	500mW	27	11.9

TECHNICAL SPECIFICATION

Frequency of operation	:	450 to 470MHz (other frequency bands available)
Channel spacing	:	25kHz (12.5kHz available as an option)
Number of RF channels	:	One, set by PIC micro controller
RF output power	:	2W nominal at 12V DC
Frequency stability	:	±2.5ppm over temperature range
Supply voltage	:	+12V DC nominal (+10 to +14 volts possible)
Supply current		
Transmit	:	600mA typical at 2W
		400mA typical at 1W
Receive	:	32mA typical
Size	:	119 x 57 x 21mm (l x w x h) including connectors
Weight	:	120 gms
Temperature (operating)	:	-30 to +55 °C standard
Temperature (storage)	:	-30 to +70 °C