



**ST100 TRANSMITTER
OPERATING INSTRUCTIONS**
1892 1280

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

The Wood & Douglas ST100 UHF transmitter is intended to fulfil numerous OEM applications by virtue of its highly flexible synthesized design approach, miniature size and cost-effective performance. The transmitter can accept analogue and digital data input and provides an RF output power of 100mW (adjustable down to 1mW, refer to Sales Office for details).

INSTALLATION

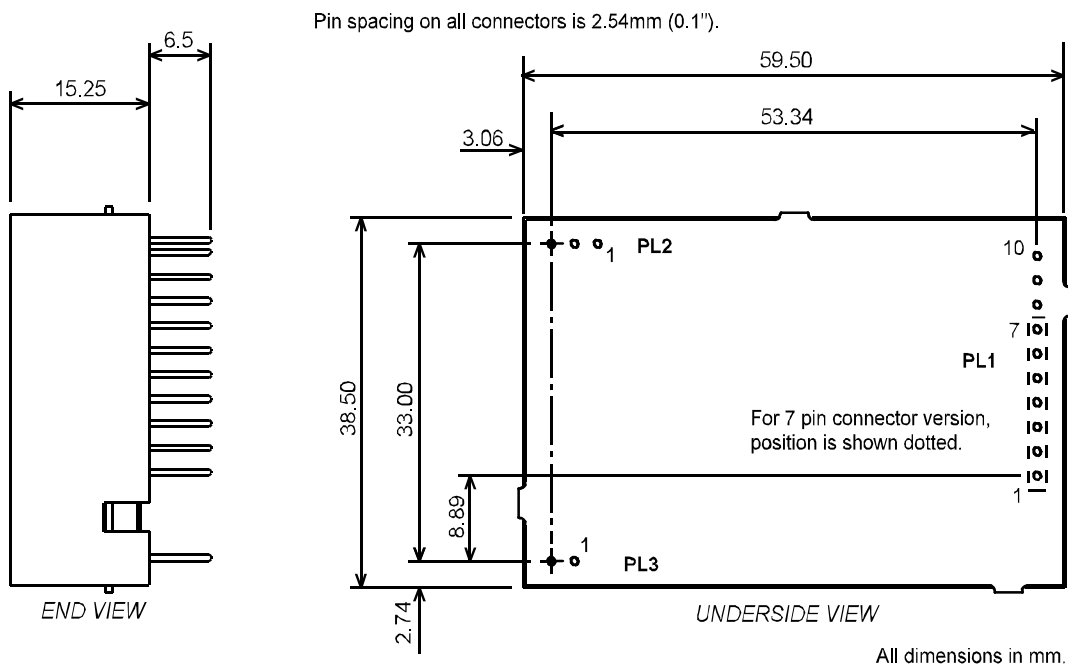


Figure 1 - Unit dimensions and connectors

CONNECTION

Connection to the ST100 transmitter is via PL1, PL2 and PL3 which plug directly into the user's own equipment. The location of these connectors is shown in Figure 1 and detailed in the following tables. (The unit is fitted with a 10 pin connector when parallel frequency select facility is provided).

PL1 PIN	NAME	FUNCTION	REMARKS
1	0V	0 volts	common ground
2	TXE	transmit enable	o/c = transmitter disabled LOW <+0.5V = transmitter enabled 1k nom. internal pull-up to +Vin
3	DIGITAL I/P	data input	0/+3V to 0/+12V, DC-coupled
4	ANALOGUE I/P	data input	> 300 mV pk-pk, AC-coupled
5	+5V _{OUT}	+ 5 volt supply output	50mA maximum current drain
6	RS232 I/P	serial programming i/p	RS232 level programming input Note: Inverted TTL data can also be used. If not used, leave not connected, or connect to 0V
7	0V	0 volts	common ground
8	RB1	parallel frequency select	internal pull-up to +5V, active low
9	RB2		
10	RB3		

Connector PL1 pin detail

PIN	NAME	FUNCTION	REMARKS
1	0V	0 volts	common ground
2	RF O/P	RF output	50 ohms output
3	0V	0 volts	common ground

Connector PL2 pin detail

PIN	NAME	FUNCTION	REMARKS
1	+VIN	positive supply	+6.0V to +15.0V
2	0V	0 volts	common ground

Connector PL3 pin detail

FREQUENCY PROGRAMMING

The ST100 has an internal memory which can store up to 128 RF channels (16 randomly programmed and 112 sequentially programmed). The frequency and set-up information is programmed into the unit by a synchronous PCM interface protocol.

The software supplied with the ST100 transmitter is the STSRn00.exe program. The software can be run on a PC with the serial port connected to PL1 of the ST100 transmitter via a suitable adaptor as shown in Figure 2. If the read-back function is desired, then PL1 pin 10 of the transmitter must be connected to pin 2 of the PC serial port via a buffer circuit. A 1k pull-up resistor to +5V must also be provided as shown.

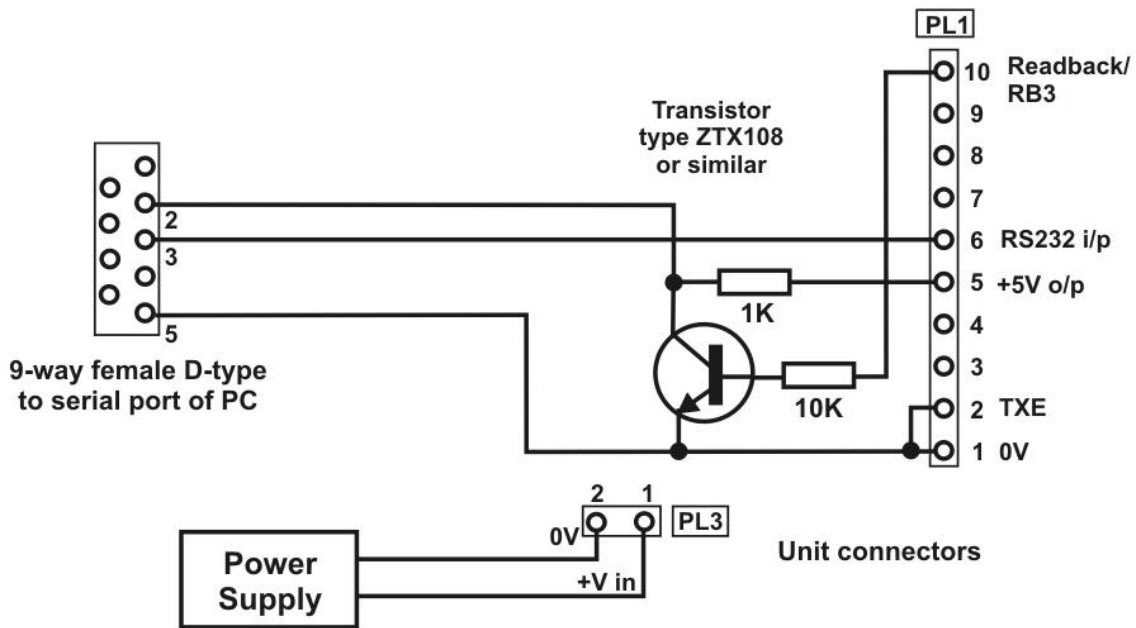


Figure 2 Programming Adaptor

RUNNING THE SOFTWARE

1. Connect ST100 to a suitable supply and to the PC using the programming adaptor.
2. Insert the STSRn00 disk into drive A and type:

A:STSRn00 <return>

3. The user is then prompted to enter the PC serial port number which is used to communicate with the ST100 receiver. Enter 1 or 2.
4. Next there is a prompt to select STn00 or SRn00. Enter 1 for the ST100
5. Next is the prompt to select freq. range:
1 : ST100 (125 - 180MHz)
2 : ST500 (400 - 500MHz)
3 : ST800 (860 - 880MHz)

After the software has successfully loaded the main menu screen is displayed as shown in Figure 3. The screen shows the default settings which are entered at factory set-up. These default settings will be displayed whenever the STSRn00 software is run.

Please note that mouse operation is not supported with this program.

FREQUENCY STORAGE

The internal PIC processor allows for both random allocated frequencies and sequential channels. The program displays the 16 (as channel 0 to 15) random channels on the main screen. If a sequential table is used then these are stored in channels 16 to 127. These cannot be displayed or printed out.

To simplify the situation, the first 16 channels of the sequential table can be copied to the random channel by pressing the F2 button.

The first 8 channels (0 to 7) can be selected using the serial interface or the parallel interface, as described later.

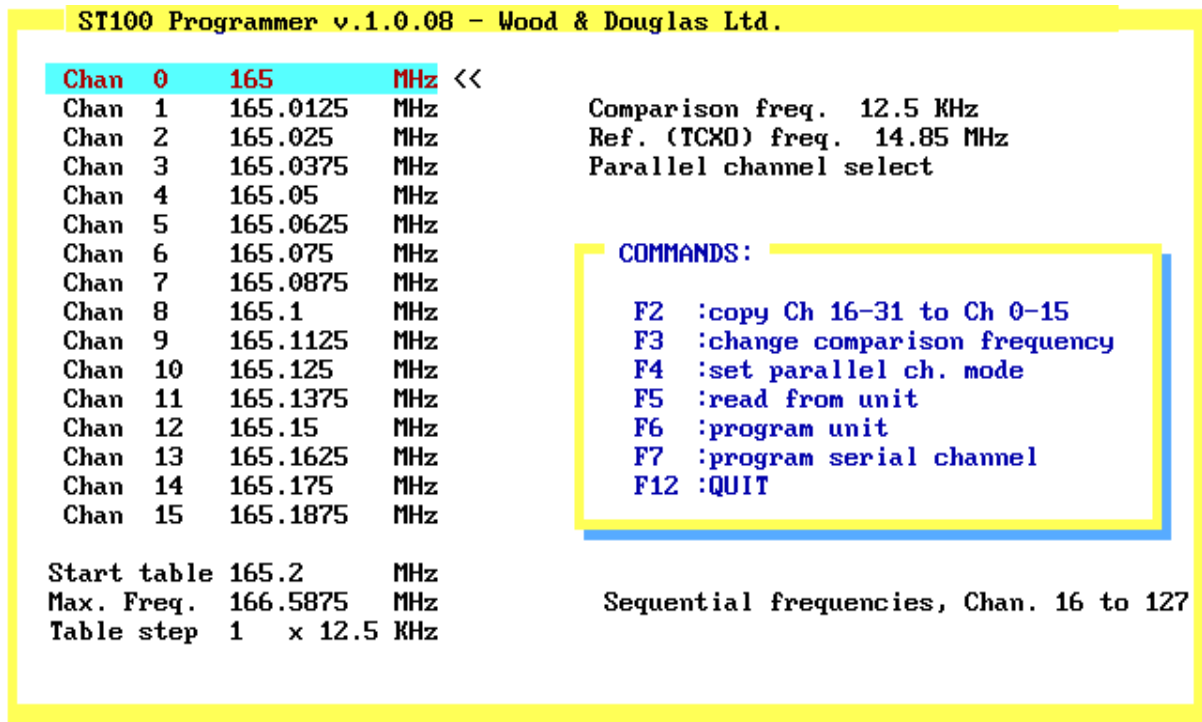


Figure 3 Programming S/W Screen

NOTES:

1. The reference (TXCO) frequency is not programmable.
2. The readback function (F5) reads the current settings from the unit into the PC.
3. Function F6 (program the unit) is only enabled after the read-back, (refer to Figure 2). This function re-programs the unit connected.
4. A value for each parameters has to be entered.
5. Only channel 0 to 15 frequencies can be displayed by this software explicitly.
6. Sequential channel table is displayed as start, step and stop frequencies.

Serial channel selection

The unit defaults to serial channel selection whenever the software is run. Selecting the F7 function key prompts the user to enter the new serial channel number which is then displayed in 'Serial channel selected'.

Parallel channel selection

To enable parallel channel selection mode press the F4 (Parallel channel mode) function key, The screen then displays 'parallel channel selected'.

Three inputs RB1, RB3 and RB3 applied via PL3 to pin 8, pin 9 and pin 10 respectively, select the operating channel as shown in the following table.

CHANNEL SELECTION			
PIN 10	PIN 9	PIN 8	CHANNEL
LOW	LOW	LOW	7
LOW	LOW	HIGH	6
LOW	HIGH	LOW	5
LOW	HIGH	HIGH	4
HIGH	LOW	LOW	3
HIGH	LOW	HIGH	2
HIGH	HIGH	LOW	1
HIGH	HIGH	HIGH	0

The logic levels are : LOW < 0.8V HIGH > 2V or floating

Programming random channels

Random channels between 0 and 15 can be entered using the Up ▾ and Down ▾ arrow keys and then entering the required operating frequency. The entered value must be an integer multiple of comparison frequency otherwise an 'invalid' message is displayed.

Programming sequential channels

To generate a new frequency table the following parameter values must be entered:

- start frequency
- the table step as a multiple of comparison frequency.

The maximum frequency is calculated from the start table frequency and the table step.. Therefore if the calculation exceeds the maximum frequency then this parameter will be increased automatically.

When the frequency table has been generated the user then selects F6 to program the unit, assuming the unit has been read before.

The function key F2 can be used to copy the contents of channel 16-31 to channel 0 - 15 to ease sequential programming.

Programming from customer equipment

If you want to control the ST100 transmitter using your own equipment then the following data sequence must be used, allowing 5ms between the characters in the data stream:

1200 baud, RS232 levels, 1 start bit - 8 bit data - no parity - 1 stop bit

40 (decimal 64) synchronising code

7 bit channel 0 - 127 (bit 7 = 0)

95 (decimal 149) confirmation byte

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 analogue signals

Range versus TX power			
Frequency (MHz)	Power (mW)	Power (dBm)	Range (km)
170MHz	1mW	0	1.4km
170MHz	10mW	10	4.4km
170MHz	100mW	20	14km
170MHz	500mW	27	31.3km

TECHNICAL SPECIFICATION

Frequency range	:	125-180 MHz (banded)
Switching bandwidth	:	2 MHz
Frequency stability	:	±5ppm
Number of RF channels	:	up to 128 (16 randomly programmable, 112 sequential), serial select/reprogram, 1200 baud RS232 or 1 of 8 parallel select
RF output power into 50 ohm	:	100 mW adjustable to 1mW
Adjacent channel power	:	<200nW (-37dBm)
TX switching time	:	<60 ms
Modulation input	:	
analogue	:	300 mV to 15V p-p AC coupled nominal = 750mV pk-pk = 265.1mV rms
digital	:	+3 to 12V square wave DC coupled
Frequency response	:	9Hz to 3kHz at -3dB
Deviation	:	
25kHz channel spacing	:	±3kHz nom (±5kHz max)
20kHz channel spacing	:	±2.3kHz nom (±4kHz max)
12.5kHz channel spacing	:	±1.5kHz nom (±2.5kHz max)
Channel switching delay	:	<50ms across switching bandwidth
Channel spacing	:	12.5kHz/20kHz/25kHz available
Modulation type	:	F1D/F2D/F3D
Spurious emissions (conducted & radiated)	:	in accordance with ETS/CEPT specifications
Supply voltage	:	6 - 15V DC -ve earth
Supply current at 7.2V	:	<100mA for 100mW output
Interface connections	:	2 and 10 pin 0.1" header
RF connection	:	3 pin 0.1" header
Operating temperature	:	-20°C to +55°C
Storage temperature	:	-30°C to +70°C
Size overall	:	60 x 39 x 15 mm (2.36 x 1.53 x 0.59 inches)
Weight	:	30g
Type approval	:	designed to meet ETS 300/220 and MPT 1329
General facilities	:	+5V output analogue and digital inputs