

12-38-0000 VHF AND UHF TRANSCIVER



PRODUCT INFORMATION

SEA AIR AND LAND COMMUNICATIONS LTD, CHRISTCHURCH, NEW ZEALAND

12-38-0000 VHF and UHF Transceiver

DESCRIPTION

The 12-38-0000 transceiver is capable of accurate control and telemetry over long distances. Designed to be used in hostile environments it can withstand temperature extremes as well as being resilient to electrical noise often found in industrial plants.

The on-board SD card is used to store the configuration of unit for easy swap-out and can be also store log and audio wave files. The unit could be made to respond to an event by seizing a radio channel and broadcasting the wave file audio. Anyone carrying a radio transceiver could receive the message.

The 12-38-0000 could also be configured as a store and forward radio repeater to extend the radio range of any installation. This will allow monitoring and control of sites in difficult locations without clear radio access.

The 12-38-0000 is a 5 watt analogue transceiver with for both transmitting and receiving and comes in two variants, a VHF (136-174 MHz) or UHF (440 – 470 MHz). All parameters are programmable such as frequency, power output and deviation.

The RJ45 connector can be used for audio input and output and the RJ12 input connector can be used to initiate pre-canned audio messages for transmission over the air.

INSTALLATION

The power supply is connected via PI, green power connector to +13.8 Volts DC and Ground. The 12-38 is protected against reversed supply connections. The power source must be reasonably noise free.

Radiation Hazard: Important! To comply with FCC Controlled/Occupational Exposure Limits the aerial must be positioned or mounted to operate at least 0.26 metres away from Operational Staff and 0.57 metres away from the General Public.

It is recommended to site the aerial a few metres away from the 12-38 to avoid the possibility of RF feedback causing problems with the transmitter operation. An outside aerial is preferable and will provide better radio coverage. The aerial connection is via the BNC connector and should present a nominal load of 50Ω, with a VSWR of better than 1.8:1.

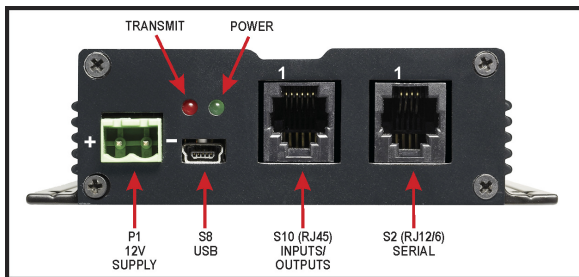
CONNECTIONS

External indicators consist of a power indicator GREEN LED, normally flashing ON once a second to indicate healthy microcontroller operation.

S2 and S10 Connections

S2 Connections:-	
Pin 1	Ground
Pin 2	Output 1
Pin 3	Input 2
Pin 4	Input 1
Pin 5	RS232 Tx
Pin 6	RS232 Rx

S10 Connections:-	
Pin 1	GROUND
Pin 2	PTT input
Pin 3	Analogue input 100mV
Pin 4	FSK input
Pin 5	Relay out 0-12V
Pin 6	Switch 100R to GND
Pin 7	Speaker
Pin 8	+5V



PROGRAMMING

Preparations for Connecting the Programming Software

To change the field programmable options the unit must be connected to a PC either by the preferred USB port S8 (using the supplied USB mini cable), or the standard serial RS232 port S2. When connected via the USB the unit will appear as a virtual storage device.

Note: To make up a serial cable, the S2 connections are shown on page 3. Alternatively purchase an optional Salcom 12-45 serial programming cable.

The 12-38-0000 must be powered during programming, +13.8V to power terminals.

CONFIGURATION

Via a Terminal Programme

All serial commands are sent and received using a standard terminal application connected at 9600:N:8:1 using a 12-45 programming adaptor. Ensure that the correct COM port is selected.

Sending MAP<CR> to the 12-38 will display current configuration information. To change a parameter refer to the terminal programme instructions. An example is given below:

+03=456675000<CR> *to change the RX frequency*

Via the USB

If the connection is via the USB then the 12-38 will appear as a drive on the computer. The configuration information is held in the config.ini file which can be opened and edited using a standard text editor. Once the required parameter has been changed save the file back to the original location.

Whilst the USB is connected the Green LED will flash faster.

Parameter format

Each parameter follows the same format. An example is given below:

;Tx Frequency set the Transit Frequency in Hz *the command description*
 ;+20=456675000 *an example for the correct format*
 ;+20=456675000 *the actual parameter set*

ANALOGUE TRANSMISSIONS VIA EXTERNAL MODULATON SOURCE

Connect the External Modulation Source to Pin 3 of connector S10. This input is configured for a fixed amplitude input source of 100mV rms , or 280mV p-p. Monitor the RF output on a FM modulation on a meter and adjust the deviation to ±4kHz. Adjust the deviation by fine adjustment of the input signal, or via the PSD by changing the DAC setting within the 'Audio in Atten' box. Do not click 'Enable Calibration' tick box for this adjustment. It is important to 'Read' first, then alter the settings, a higher number gives more deviation and lower number less deviation.

It is also important to keep the deviation to ±4kHz to avoid getting into the compression range. Then press 'Program' in the 'Configuration' section to save the settings.

TROUBLESHOOTING

The following table may help in problem solving where necessary.

Fault	Check
No illumination of Green LED	Bad power supply connection
Input activated but no transmission	Software configuration incorrect
Unit transmits but nothing received	Poor aerial Wrong frequency Incorrect RIC Incorrect baud-rate Power too low Unit too hot (<i>the unit will also send out an alter via the serial port</i>) Too much vibration
No RS232 serial communication	Incorrect COM port connection selected Software configuration incorrect Cable faulty
Unit starts, but does not complete transmission	Poor supply voltage RF interference (<i>the unit will also report an error on the terminal port</i>)

WARRANTY

Our Products are warranted for a period of 12 months from date of purchase against faulty materials and workmanship. Should any fault occur the unit should be returned to the vendor, freight pre-paid. Please include a description of the fault to assist with prompt return. Any unauthorized alterations or repairs will invalidate the warranty.

DISCLAIMER

All information provided in this document is carefully prepared and offered in good faith as a guide in the installation, use and servicing of our products. Installers must ensure that the final installation operates satisfactorily within the relevant regulatory requirements. We accept no responsibility for incorrect installation. We reserve the right to change products, specifications, and installation data at any time, without notice.

COMPLIANCE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Any unauthorised changes or modifications to the product may void the user's authority to operate the equipment within a regulatory environment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate

radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

SPECIFICATIONS

Power Supply	13.8V DC
RF Frequency	VHF: 136 - 174 MHz UHF: 440 – 470 MHz
RF Output Power	Variable up to 5W ± 1dB 50Ω (with quarter wave whip antenna with a gain of 2.14dBi)
Input Current	Standby: 150 mA Transmit: 2A approx.
Channel Spacing	6.25kHz, 12.5kHz or 25kHz
Modulation	FSK & True FM for Audio
Audio modes	Analogue FM transmission and reception
Receiver sensitivity	Better than -119dBm @ 1kHz, 12kHz SINAD
Audio conditioning	300Hz – 3kHz passband software defined pre-emphasis DTMF and CTCSS (<300Hz)
Muting	Software defined muting level
Spurious emissions	-36dBm max
Baud rate RS232 I/O	9600 baud
Transmit Duty Cycle	Up to 100%
Enclosure	Aluminium casing. 77 x 101 x 30mm.
Environmental Protection	Requires protection from weather
Operating temperature	-10 to +50 degC

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