



11-85-0000

VHF / UHF Hand Held Transmitter



PRODUCT MANUAL

Version 1.04

March 2020

Salcom Product Documentation

This document is designed to familiarise you with Salcom products and guide you through the hardware, configuration, installation and overall system management.

Salcom is an environmentally conscious company and in an effort to conserve paper no longer prints manuals with shipped products. All relevant documentation can be downloaded in PDF form from our website www.salcom.com

Warranty and Disclaimer

Salcom products are warranted for a period of 12 months from the 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 unauthorised alterations or repairs will invalidate the warranty.

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

Product Overview

The 11-85 range offers UHF and VHF low power paging transmitters with an in-built encoder. Buttons or serial commands initiate transmissions to provide numeric, alpha-numeric and tone-only POCSAG paging, enabling a user to call a pager (approximately 2,000,000 codes), append a priority level (1 of 4), and add a numeric or alpha-numeric message.

In addition to the front panel buttons, there are four discrete inputs with unique reprogrammed messages on low input transition. Messages can be transmitted more than once with programmable time between transmissions.

The 11-85 supports multiple message queuing, and will queue up to five 40-character messages, or as many smaller messages that will fit into the memory buffer (up to 12). Predefined action messages are limited to a maximum length of 40 characters which may be configured using the Salcom programming software. ASCII character commands provide control via the serial port.

'Beep' Indicator: Audible 'beeps' accompany each key-push and all successful transmissions. There are different beeps for an 'out of lock' transmission failure and a distinctive beep for low battery accompanies each transmission. Two beeps for a successful transmission, three for an 'out of lock' transmission failure and a dual high-low beep & flashing LED for a low battery (set to approx 6.5V).

Aerial: The 11-85 has a fixed external quarter wave helical aerial but in addition the 11-85-0150 VHF Model has a variant with internal aerial, the 11-85-1150.

Note: *The 11-85 should not be used for industrial machinery control where a fail-safe mode of operation is essential. Contact Salcom for advice if this is a requirement.*

Installation and Connections

The unit can be attached to a wall or carried in a pocket. It should be mounted away from sources of heat, damp or vibration. It can be powered by an internal 9-volt battery, or an external power source. The supply input is protected against reversed connection damage.

Wire connections can be made to the internal connectors, and the wires can pass through the battery access hole, or provision for a hole can be made in the side of the case.

Operation

To operate the unit press the front panel button until the LED indicates transmitter operation. The LED will flash rapidly if a low supply is detected.

A number of factors can influence the range of the unit. The range can be optimised by applying the following recommendations:

- Ensure the path between 11-85 and receiver is as clear from obstructions as possible
- Replace batteries when the flashing LED indicates low battery
- If handheld, hold the unit in the open with one hand as far from the body as possible
- Do not fix the unit to metal surfaces so that it screens the radio signals. The aerial must be clear of metal obstruction or plant vegetation
- Some pager receivers do not respond as well as fixed receivers with external aerials

Types of Paging Message

The 11-85 can transmit 3 types of POCSAG message, with any one of 4 function levels:

- Alphanumeric transmissions. Message can contain any alphanumeric 'ASCII' character
- Numeric transmissions. Message contains only Numeric characters and some symbols.
- Tone Only transmissions (Alphanumeric or numeric with no message)

Alphanumeric Transmissions

Messages can contain any alphanumeric character. The 11-85 will accept the standard ASCII 7-bit character set.

Numeric Transmissions

Messages can contain numeric characters and some symbols. These can convey a telephone number, or other numerically coded information. The transmitted message is shorter, and therefore there is a smaller chance of errors received by the pager.

The numeric character set is as follows:

0 1 2 3 4 5 6 7 8 9 [] - E U <space>

*Note. The E may be displayed as P or * on different pagers*

Tone Only Transmissions

Any numeric or alphanumeric paging message without an actual text message is also considered 'Tone Only'. A function level will control the number of beeps on the receiver (four different function levels can be sent).

Initiating Transmissions

There are four ways of initiating a paging message transmission:

- Button Press
- Using the external discrete inputs
- Watchdog
- RS232 Serial commands

Button press

The 11-85 will remain in a sleep mode, with zero supply current, until a button is pressed. This action will initiate a transmission as per the configuration. Note that on single button units, only button 2 is used.

External Discrete Inputs

A transmission can be initiated from one of the four external inputs with an input transition to LOW (connection to GND).

Watchdog

The watchdog feature will initiate an action after a predetermined period. The watchdog also optionally allows the transmission of the current state of selected inputs.

Note: to use the watchdog feature a jumper must be fitted across pins 3 and 4 of connector P8, or have a serial lead connected and in use. When used in this fashion an external power supply should be used because the unit does not power down between transmissions.

Using the RS232 Serial Commands

Serial commands can be “manually” issued to an 11-85 from a PC via a Salcom 11-46 Programming Adaptor cable using a terminal program such as PROCOMM or Hyperterminal.

Protocol Command Set

Tone only, numeric and alphanumeric pagers can be called using serial commands. These commands will be processed in parallel with other actions for transmission.

CA	(512 baud)
Usage	CA<pager#>[<space>]<level>[<space>]<message><CR>
Description	Call alphanumeric pager
Example	CA1234567 1 Please return to reception<CR>
Response	Page Sent<CR>

ca	(1200 baud)
Usage	ca<pager#>[<space>]<level>[<space>]<message><CR>
Description	Call alphanumeric pager
Example	ca1234567 1 Please return to reception<CR>
Response	Page Sent<CR>

CN	(512 baud)
Usage	CN<pager#>[<space>]<level>[<space>]<message><CR>
Description	Call numeric pager
Example	CN1234567 1 777<CR>
Response	Page Sent<CR>

cn	(1200 baud)
Usage	cn<pager#>[<space>]<level>[<space>]<message><CR>
Description	Call numeric pager
Example	cn1234567 1 777<CR>
Response	Page Sent<CR>

SN	
Usage	SN?<CR>
Description	The 11-85 will respond with a sign-on string
Example	SN?<CR>
Response	SALCOM Data Transmitter 11-85-000SE V1.1<CR>

Error Codes/Reports

- ER1 SYNTAX** You entered an invalid command
- ER3 OPERND** You entered a valid command with invalid values
- ER6 BUSY** 11-85 is too busy to process the entered command, try again later.

Battery Maintenance

9-volt alkaline battery should have capacity for 2.5 hours of transmission, or about 2500 messages of 3 seconds each.

If the battery voltage drops below 7 volts, the LED will flash rapidly when operated.

No battery monitoring takes place in the sleep mode.

The internal 9-volt battery can be accessed by sliding back the battery cover on the rear of the unit.



Recommended Battery: PP3, N1604 or 6F22 – 9-volt Alkaline

Initiating Transmissions

If the 11-85 does not perform as required, the following points may assist:

Fault	Possible Causes
No LED illumination when button pressed	Bad power supply connection
Unit activates but no transmission	Configuration incorrect. Input not present for the required de-bounce period.
Unit transmits but nothing received	Wrong RIC or POCSAG baud-rate. Supply too low. Too much vibration. RF interference at receiver.
LED flashes rapidly during transmission	Indicates low battery voltage
3 beeps at the beginning of a transmission	Voltage Controlled Oscillator (VCO) out of lock

Programming

The 11-85 can be programmed using the 11-85 configuration software (available free of charge) from the 11-85 product page on our web site (www.salcom.com). The software allows the user to configure input actions, POCSAG and transmission settings, pre-defined messages, and RF frequency.

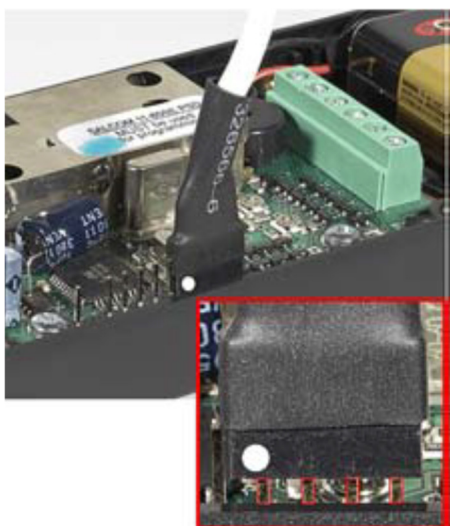
Preparation Requirements

To change the programmable options, connect the 11-85 via a SALCOM 12-47 serial programming adaptor from the programming plug P8 to the serial port of a computer running Salcom 11-85 configuration tool.

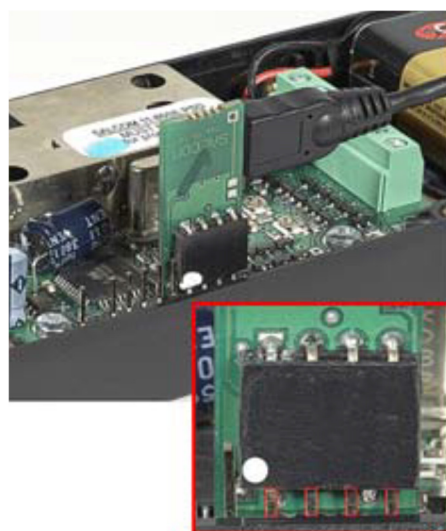
Should you have the 12-48 USB programming adaptor which supersedes the 12-47, this inserts into the programming plug P8 and connects to any USB port on the computer via a mini USB device cable.

Preparations for using the Programming Software

1. Remove the 4 case screws and the rear cover of the case.
2. Insert the four-pin socket of the Salcom 12-47 programming header into the 11-85 plug P8. (see photo).
3. Connect the Salcom 11-46 DB25 plug to the PC com port.



Connecting the 12-47 Programmer



Connecting the 12-48 Programmer

4. Connect a good 9 volt battery to the 11-85 battery connector.
5. Ensure that the 11-85 configuration tool has the correct com port selected and configured.
6. Press connect. The status at the bottom of the 1185 configuration tool will indicate if successfully connected.
7. Press the read button, or load a configuration tool configuration file. This will load all settings of the 1185, which is required before any changes can be programmed.

Note: The 11-85 configuration tool will provide feedback if the user selected operations are successful.

Using the Programming Software

The 11-85 configuration tool allows the user to configure the following characteristics:

- Input actions, watchdog and POCSAG transmission settings
- Pre-defined messages
- RF frequency

Once the program is running, the opening screen appears . Use the mouse to select the configuration fields for each feature.

configuration tool Action Configuration

All actions may be configured in a similar fashion.

The action drop down box provides support for the 4 inputs available on P5 and P4 (see section 14 for button and input to action mappings).

Action parameters may be configured as follows:

Pager type: Numeric or Alpha numeric. Tone only pagers are supported by ensuring that the message field is left blank.

Beep Level: Page beep levels 1 to 4.

RIC Code: Pager ID.

Valid Codes are:

000008 to 2007663

2007672 to 2045055

2045064 to 2097143

Note: 0000000 may be used as a “drop” code. This may be used for the watchdog when the watchdog is used, but a watchdog message is to be suppressed.

Message: User message, up to 40 characters in length.

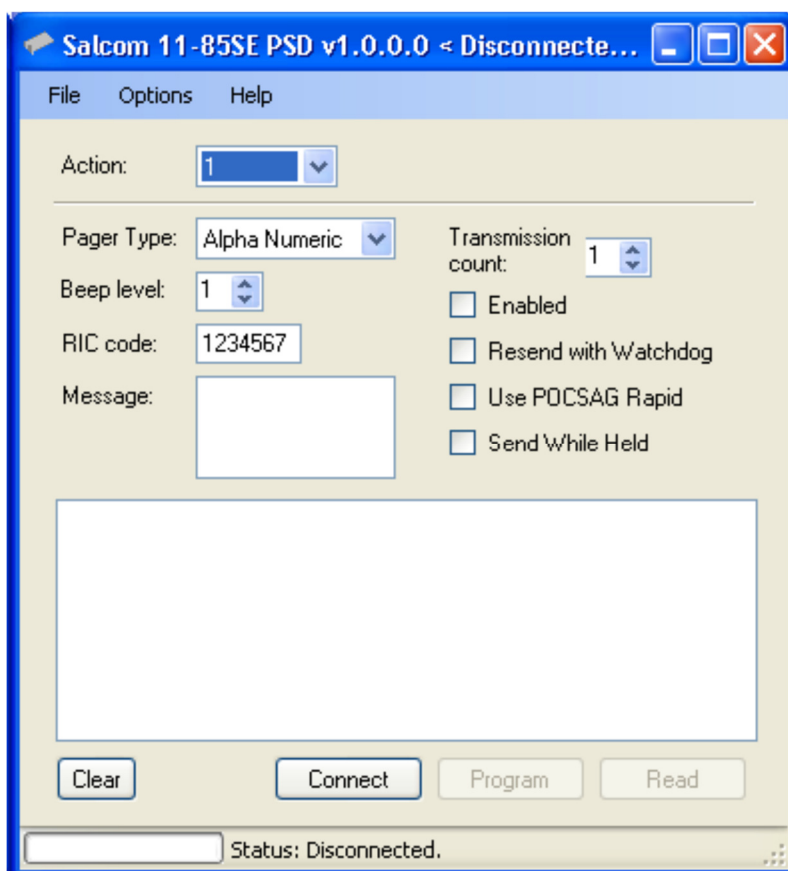
Transmission Count: How many times that message will be sent if triggered.

Enabled: When selected, the configured message will be sent when triggered.

Resend with Watchdog: When the watchdog is enabled, the action message will be sent periodically as configured if in the enabled state.

Use POCSAG Rapid: Allows the use of the “POCSAG Rapid” Salcom proprietary shortened paging format, used in conjunction with a Salcom receiver.

Send While Held: Sends and resends the paging message for that action repeatedly, without resending message preamble, useful for momentary relay control when used with Salcom paging receivers.



Configuration Tool - General Configuration

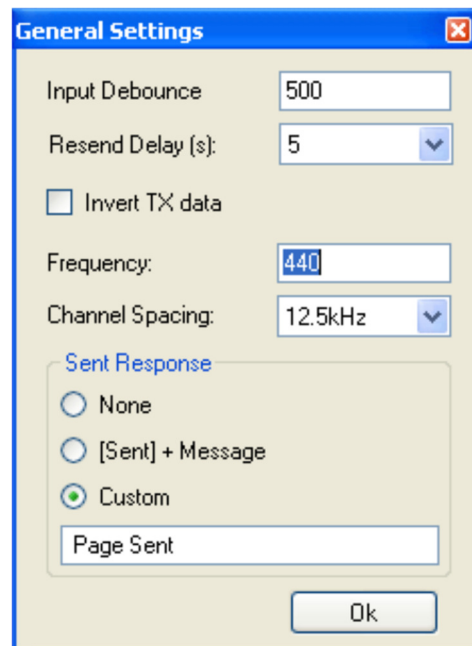
Selecting **Options->General** will display the general configuration screen as shown. The following items may be set here:

Baud Rate: Changing this setting will result in all configured messages to be sent at the selected baud rate (512 or 1200 Baud).

Input Debounce: The time delay between the input being triggered and the message being sent.

Invert Tx Data: Internally generated data is inverted when internal modulation is selected. The Invert Tx Data option is unavailable when external modulation is selected.

Resend Delay: When an action has been configured with a transmission count greater than 1, then the resend delay is the delay in seconds before sending the message again.



Frequency: Configures the transmission frequency. Note that the selected frequency must be evenly divisible by the channel spacing.

Channel Spacing: Defines the frequency step resolution.

Sent Response: Controls the serial response when a page has been transmitted.

Historically "Page Sent" would be sent by Salcom products to the serial port to provide a controlling application with feedback that another message may be submitted for transmission. Since the 11-85 may queue many messages "Page Sent" may not describe sufficiently which page has been transmitted.

Selecting "[Sent] + Message" will allow feedback to the user which message has been transmitted, but may introduce backwards compatibility problems with applications supporting other Salcom products.

Selecting "Custom" will allow any user defined response up to 15 characters in length. Selecting "None" will result in no serial feedback on completion of a message transmission.

configuration tool Configuration Files

The current 11-85 configuration can be saved using **File->Save**. Previously saved configuration files can be loaded and edited with, or without a 11-85 connected.

Operating Modes

Sleep Mode

This is the quiescent mode. In this state the unit consumes zero power except for any residual current flowing in the discrete inputs. The unit will stay in this mode until a button is pressed or a discrete input goes low.

Transmit Mode

If an input is activated, the unit will enter the transmit mode to transmit the message(s). The unit will return to the sleep mode after the message has been sent.

If the input or button has been configured to send multiple messages, the unit will stay activated until all action messages have been sent. In this operational mode, the red LED briefly flashes once every second indicating that the unit is active.

Connection to 11-85 Serial Port

To send a paging message to the 11-85 using a serial port a Salcom 11-46 programming adaptor cable must be used. The following lines from the PC or serial device serial port must be connected:

GND
RXD
TXD
RTS
DTR

The 11-85 serial port will only be available if RTS and DTR are set.

The RTS is used to power the 11-85 serial cable. The DTR is used to power on the 11-85.

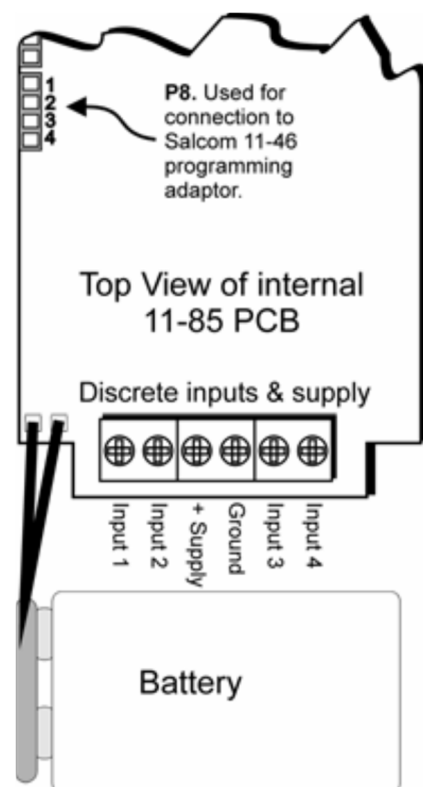
By using the DTR line to control the power ON / OFF the 11-85 can be used for serial paging messages with the internal 9-volt battery.

The sequence for sending a message is as follows:

1. Connect the serial cable to the 11-85
2. Connect the serial cable to a PC or serial device
3. To power on the 11-85 set the DTR line
4. Wait for 1 second
5. Send Salcom Protocol paging message
6. Wait for 500mS
7. Release the DTR line.

If the DTR line is always set the 11-85 will be powered up continuously and will draw approximately 100mA. This will drain a 9 Volt battery very quickly and therefore a regulated 9 Volt supply should be used.

When the DTR line is set the 11-85 red LED will pulse briefly once every second to indicate that the unit is in its powered state.



Button to Action Mapping

The following describes how buttons are mapped to actions. This mapping is required because the 11-85 supports 3 different front panels (8, 4 and single button).

Special care should be taken when configuring actions since configuring unsupported actions for the 4 or single button models will have no effect.

8 Button Model

Button	Action
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

External Input	Action
1	2
2	4
3	6
4	8

4 Button Model

Button	Action
A	1
B	3
C	5
D	7


External Input	Action
1	2
2	4
3	6
4	8

Single Button Model

Button	Action
A	3

External Input	Action
1	2
2	4
3	6
4	8

Technical Specification

Technical Specification 11-85-0000 – VHF / UHF Hand Held Transmitter		
Frequency Range	148 - 164MHz - VHF (Model No. 11-85-0150 / 11-85-1150) 445 - 465MHz - UHF (Model No. 11-85-0450)	
Frequency Selection	User configurable	
Power Supply	9V PP3 lithium battery	
Battery Life	Approx 2,500 transmissions	
Power Consumption	Standby: 0mA Transmit: 100mA Inputs = 90uA per press	
Transmit Power	VHF (Model No. 11-85-0150 / 11-85-1150) - 50mW UHF (Model No. 11-85-0450) - 100mW (USA) - 50mW (Australasia & Europe)	
Channel Spacing	15kHz - VHF (Model No: 11-85-0150) 10KHz, 12.5 KHz, 25 KHz - UHF (Model No: 11-85-0450)	
Modulation	FSK with NRZ data	
Deviation	±2.25kHz or ±4.5kHz	
Transmit Duty Cycle	Up to 100%	
Baud Rates	512, 1200	
Message Format	POCSAG	
Configuration Application	11-85 configuration tool	
Programming Cable	12-47-0000 (Board header to DB9) Can be used with a USB to RS232 DB9 Serial Adapter Cable 12-48-0000 (Board header to mini USB)	
Serial Port	9600 , N, 8, 1; RS232	
Discrete Inputs	1, 2, 4 or 8 button options	
Other I/O		
RF Connector	120mm external aerial - VHF (Model No. 11-85-0150) Internal aerial - VHF (Model No. 11-85-1150) 30mm external aerial - UHF (Model No. 11-85-0000)	
Environmental Protection	Not suitable for outdoor use and should be protected from adverse environmental conditions	
Operating Temperature	-10°C to +55°C (+14°F to +131°F)	
Indicators	Status LED (Red) - Solid On = Transmitting - Slow Flashing = Transmitting Multiple Messages - Rapid Flashing = Low Battery <i>Note: The unit needs to be configured to send Multiple Messages</i>	
Weight	170g	
Enclosure Dimensions	65 x 130 x 25mm (WxDxH) excluding aerial	
Enclosure Material	Plastic	
Colour	Black with blue & White fascia (Salcom logo'd) or Black with black & red fascia (unbranded)	

Type Approvals

VHF (Model No. 11-85-0150):

- AS/NZS 4769.1:2000 + Amendment 1:2002 (RF)

UHF (Model No. 11-85-0450):

- EN 300 224-2 V1.1.1 (RF)
- FCC CFR47 Part 90 (RF)
- EN 301 489-2 V2.1.0 (EMC)
- EN 60950-1:2006 (Safety)

How to Contact Us

Sea Air and Land Communications (Salcom) Ltd
10 Vanadium Place
Addington
Christchurch 8024
New Zealand
T: +64 (0)3 379 2298
W: www.salcom.com
E: sales@salcom.com

Salcom is pleased to confirm that it is a New Zealand FernMark Licensee. The FernMark Licence Programme is the Government's official 'country of origin' accreditation programme, designed to protect and promote New Zealand products to the world.

- From now on, you should see the 'FernMark' (the Government's trademarked Silver Fern) appear on some or all of our products. The FernMark acts as a 'tick of approval' from the New Zealand Government.
- This 'tick of approval' means we've met all the New Zealand Government's eligibility criteria, which should give you huge amounts of confidence in what you're buying.
- The Programme employs a global monitoring service, Yellow Brand Protection, that trawls the web for illegitimate use of the FernMark. This means that when you see the FernMark on a product, you know it's an authentic New Zealand product.

