



## 12-86-0000 POCSAG Keyring Paging Transmitter



### PRODUCT INFORMATION

SEA AIR & LAND COMMUNICATIONS LTD, CHRISTCHURCH, NEW ZEALAND

## 12-86-0000 POCSAG Keyring Paging Transmitter

### GENERAL

The 12-86-0000 is an extremely small, low cost keyring or pendant POCSAG paging transmitter, by default supplied with 4 buttons, but 1,2,3 and 5 button versions are available by negotiation. Powered by a standard CR2032 coin cell, the transmitter will operate for more than 1000 transmissions under normal conditions before needing to be replaced.

The transmitter is ideally suited to retail assistance and rest home emergency applications. Using a POCSAG receiver the 12-86-0000, as with all paging transmitters, can also be used for any general remote control application (turning on lights, disabling alarms etc.).



The 12-86 range of products are POCSAG direct to pager transmitters, allowing low cost systems to be developed since intermediate receivers and transmitters are not required for short range applications.

12-86 transmitters support up to 5 inputs, each of which can be programmed with up to a 35 character message. Programming can be either with a serial programming cable that can be purchased separately or preprogrammed when supplied. Once operating frequency has been set the 12-86-0000 messages can be changed using programming software with an optional programming lead, or without programming leads using a PC with LCD monitor. Programming software when used with an LCD monitor can be used to transmit data as a low rate flashing sequence detected by a light sensor within the transmitter. This visual programming method works well with most modern high contrast LCD panel monitors without needing the transmitter case being opened.

Although the 12-86 is a low power transmitter, a direct line of sight transmission range of up to 200 metres can be expected. Transmit range within buildings is reduced, but still considerable having proven to be effective in some cases between floors and across buildings.

The transmitter is provided in either a grey or red translucent case, as requested when ordered.

### OPERATION

Pressing any button will result in the red transmit LED illuminating, and a preprogrammed POCSAG message being transmitted. The red transmit LED can also be used as an indication of battery health, and should the LED be dim or fail to light, the CR2032 button cell should be replaced.

## SERIAL PROGRAMMING

In order to program 12-86-0000 programming software should be downloaded from the Salcom website ([www.salcom.co.nz](http://www.salcom.co.nz)).

A Salcom 12-47 programming lead is required to program the 12-86 transmitters (same lead used to program the 11-85 transmitters), together with a 4 pin header. This may be purchased separately. The 12-47 programming lead requires the availability of a PC with a serial port, running windows XP.

Connect the 12-47 as shown below, with the dot on the 12-47 socket (circled in yellow in the photograph below) towards the center of the PCB (mating with the square pad).



The 12-86 Programming Software allows the transmitter frequency and button messages to be set.

- 1 Press "Connect". The red LED will light, as a message is transmitted - this occurs when entering program mode. After the message has been sent, the green LED will light for approximately 1 second (visible on same side as buttons). The status at the bottom of the 12-86 PSD will indicate if successfully connected.
- 2 Press "Read". The current configuration is read from the 12-86.
- 3 Make any required changes.
- 4 Press the "Program" button.
- 5 Press "Disconnect", then remove programming lead.

### General Configuration

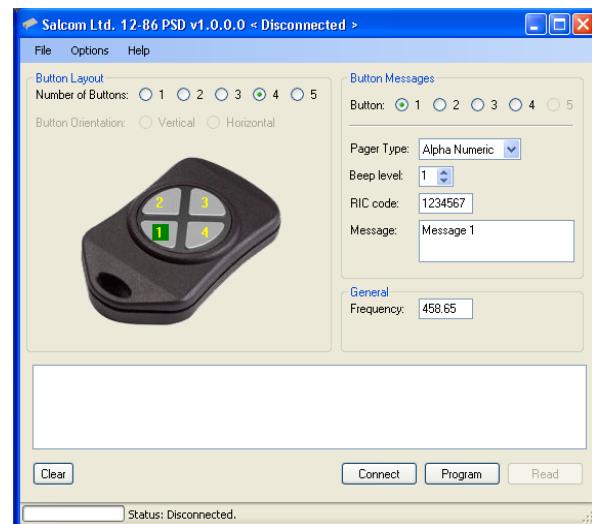
**Button Messages:** Select the button to view the message, RIC and beep level assigned to that button. New button settings can be entered, but will not be written until the program button is pressed. The program button only needs to be pressed after all button details have been populated.

**Frequency:** The transmit frequency between 440 and 470MHz to be set using 25kHz channel spacing.

**Pager Type:** If set to "alphanumeric", then any message can be set into the message box, and can only be used with pagers that support alphanumeric messages. When "numeric" is set then only 0,1,2,3,4,5,6,7,8,9,0,.,-,E and U characters can be used. Tone only pagers are supported by leaving the message box empty.

**Beep Level:** Pager beep priority set - 1 highest, 4 lowest.

**RIC Code:** Pager ID. Valid codes are 0000008 to 2000000



## VISUAL PROGRAMMING

Using the same programming software as the serial programming method described above the 12-86-0000 can be programmed using an windows XP computer with an LCD monitor. In this mode, the data is transmitted to the transmitter by flashing the screen from white to black as can be seen in the photographs below.

This method is slower than the serial method and only programs a single button at a time, but does not require the transmitter to be opened or the user to possess a serial programming lead. Visual programming will only work well in areas without large levels of ambient light and using LCD monitors with sufficient brightness and contrast, although typical monitor settings are usually fine. This method will not work using CRT monitors.

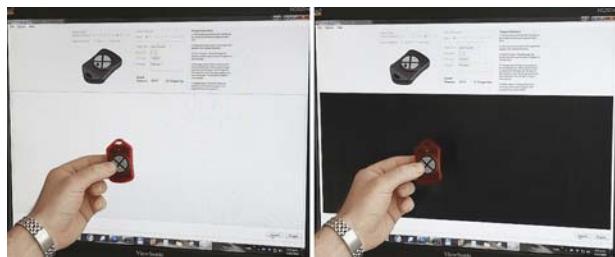
**The 12-86 should be held as still as possible during the entire programming sequence.**

In order to use the visual programming interface it must be first selected from the options menu. The feature must be enabled first from the "Options->Config" item and the "Programming Mode" set to either "Light", or "Serial".

**Programming Instructions:**

1. Hold the 12-86 with the label side facing the screen at a distance of approximately 5 cm.
2. Press and hold any button. The red LED will light as a message is transmitted, and then a green LED will light (12-86 is now in program mode). When the green LED lights, release the button.
3. Press "Connect". Once the green LED on the 12-86 flashes rapidly then stays on, press "Program" (within 2 seconds) to begin programming.
4. The green LED will flash once a second while programming. When programming is complete, both the red and green LED will light together to indicate that programming was successful. The red LED will flash if programming was unsuccessful.
5. Repeat steps 2-4 for all other buttons, or if a previous programming attempt failed.
6. To program the frequency check "Program Freq" and repeat steps 1-4.

**NOTE:** Numeric messages can be programmed in half the time as the same length alphanumeric message



## SPECIFICATION

RF Frequency	UHF: 440-470MHz Synthesized.
Dimensions.	61mm x 31mm x 6mm.
Supply Voltage	3 volt CR2032 button cell.
Power Consumption	Sleep:100nA Transmit:45mA
Battery Life	Approx 1000 transmissions. Approx 10 years standby.
Temperature limits	-10 to +55deg, -30 to +60 on request.
Environmental protection	Needs protection from weather and should be mounted in an enclosure. When used without an enclosure the unit can be damaged by ESD.
Channel Spacing	25kHz
Output Power	-5dBm
Modulation	Carrier FSK with NRZ data
Deviation	+/-4.5kHz
Transmit Duty Cycle	Up to 20%, 30 seconds continuous
Baud Rate	512 Baud
Type Approvals	AS/NZS 4769.1:2000 and EN 300 224-2. Tested to and meets FCC Part 90.
Aerial	Integrated PCB

## BATTERY REPLACEMENT

Care must be taken when replacing the CR2032 coin cell. The battery must be fitted with the '+' up and the '-' touching the PCB. Incorrect battery installation will rapidly discharge the coin cell, and may damage the transmitter.

After battery replacement, test that the 12-86 is functional by sending a test message and verifying the red LED lights. If the unit fails to operate, remove battery, confirm correct battery orientation and reinsert.

**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.. 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.

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## 12-86-5000 POCSAG Miniature Paging Transmitter PCB



### PRODUCT INFORMATION

SEA AIR & LAND COMMUNICATIONS LTD, CHRISTCHURCH, NEW ZEALAND

## 12-86-5000 POCSAG Miniature Paging Transmitter PCB

### GENERAL

The 12-86-5000 is a small, high specification, low cost Paging transmitter PCB measuring 60mm by 31mm and only 6mm deep with battery fitted.

The 12-86-5000 has been tested and type approved as a bare PCB, allowing integration into other products without further type approval testing being required.

The 12-86 range of products are POCSAG direct to pager transmitters, allowing low cost systems to be developed since intermediate receivers and transmitters are not required for short range applications.

12-86 transmitters support up to 5 inputs, each of which can be programmed with up to a 35 character message.

Programming can either with a serial programming cable that can be purchased separately or preprogrammed when supplied.

A "Flash and Cancel" feature allows the 12-86-5000 to be programmed to flash the red LED for a period of time after each transmission. This allows the originating transmission source to be easily identified.

Although the 12-86 is a low power transmitter, a direct line of sight transmission range of up to 200 metres can be expected. Transmit range within buildings is reduced, but still considerable having proven to be effective in some cases between floors and across buildings.

### OPERATION

Pressing any button will result in the POCSAG transmission of a pre-programmed message assigned to that button. The red transmit LED will illuminate for the duration of the transmission.

The red transmit LED can also be used as an indication of battery health, and should the LED be dim or fail to light, the CR2032 button cell should be replaced.

## PROGRAMMING

In order to program the 12-86-5000, programming software should be downloaded from the Salcom website ([www.salcom.co.nz](http://www.salcom.co.nz)).

A Salcom 12-47 programming lead is required to program the 12-86 transmitters (the same lead used to program the 11-85 transmitters). This may be purchased separately. The 12-47 programming lead requires the availability of a PC with a serial port, running windows XP.

Connect the 12-47 as shown below, with the dot (circled in yellow) on the 12-47 socket towards the centre of the PCB (mating with the square pad).



The 12-86 Programming Software allows the transmitter frequency and button messages to be set.

- 1 Press "Connect". The red LED will light, as a message is transmitted. After the message has been sent, the green LED above the 4<sup>th</sup> button will light for approximately 1 second. The status at the bottom of the 12-86 PSD will indicate if successfully connected.
- 2 Press "Read". The current configuration is read from the 12-86-5000.
- 3 Make any required changes.
- 4 Press the "Program" button.
- 5 Press "Disconnect", then remove programming lead.

## General Configuration

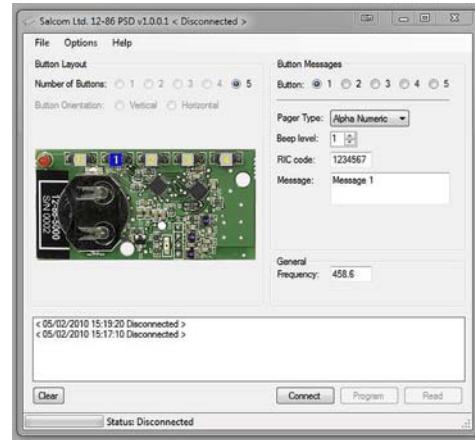
**Button Messages:** Select the button to view the message, RIC and beep level assigned to that button. New button settings can be entered, but will not be written until the program button is pressed. The program button only needs to be pressed after all button details have been populated.

**Frequency:** The transmit frequency between 440 and 470MHz to be set, 25kHz channel spacing.

**Pager Type:** If set to "alphanumeric", then any message can be set into the message box, and can only be used with pagers that support alphanumeric messages. When "numeric" is set then only 0,1,2,3,4,5,6,7,8,9,0[,],-,E and U characters can be used. Tone only pagers are supported by leaving the message box empty.

**Beep Level:** Pager beep priority set - 1 highest, 4 lowest.

**RIC Code:** Pager ID. Valid codes are 0000008 to 2000000



**"FLASH AND CANCEL" OPERATION**

The 12-86-5000 supports a feature that can be enabled if required to provide indication when a transmission has been sent. This may be desired in an application, such as a restaurant table top transmitter, to easily determine who was seeking assistance.

The "Flash and Cancel" feature allows a flash duration to be set when a button is pressed, and also allows a button to be set as a "cancel" to stop any further flashing (for when service is no longer required, or call has been serviced). When the feature has been enabled further transmissions are not possible until the cancel button has been pressed, the programmed flash period has expired or the LED has been flashing for at least 30 seconds - this is to prevent transmitter misuse.

To use this feature:

Programming the message for any button as "\*\*\*\*" will set the button as a flash cancel button. Any number of buttons can be set as a "cancel". When a cancel button is pressed the red LED will flash twice slowly, stopping any further flashing.

"Flash and Cancel" operation is enabled by prepending the set message with [NNN] (where N is exactly 3 digits enclosed in square brackets) e.g. to send the message "Service Required" and then flash the LED for 90 seconds the button message should be programmed with "[090]Service Required". The "[090]" part of the message would not be transmitted. The message "[999]Service Required" would flash the LED for up to 999 seconds.

Attempting to retransmit a message before pressing "cancel" within 30 seconds of the last transmission will result in the red LED rapidly flashing for approximately 1 second.

Using this feature will decrease battery life only when actively flashing. A typical CR2032 coin cell will operate the 12-86-5000 for up to 200 hours of constant flashing (or approximately 1000 transmissions).

**SPECIFICATION**

RF Frequency	UHF: 440-470MHz Synthesized.
Dimensions.	61mm x 31mm x 6mm.
Supply Voltage	3 volt CR2032 button cell.
Power Consumption	Sleep:100nA, LED flashing:1mA, Transmit:48mA
Battery Life	Approx 1000 transmissions. Approx 10 years standby.
Temperature limits	-10 to +55deg, -30 to +60 on request.
Environmental protection	Needs protection from weather and should be mounted in an enclosure. When used without an enclosure the unit can be damaged by ESD.
Channel Spacing	25kHz
Output Power	-5dBm
Modulation	Carrier FSK with NRZ data
Deviation	+/-4.5kHz
Transmit Duty Cycle	Up to 20%, 30 seconds continuous
Baud Rate	512 Baud
Discrete Inputs	5 Push buttons factory fitted. Can be grounded to remotely operate.
Type Approvals	AS/NZS 4769.1:2000 and EN 300 224-2. Tested to and meets FCC Part 90.
Aerial	Integrated PCB

### BATTERY REPLACEMENT

Care must be taken when replacing the CR2032 coin cell. The battery must be fitted with the '+' up and the '-' touching the PCB. Incorrect battery installation will rapidly discharge the coin cell, and may damage the transmitter.

After battery replacement, test that the 12-86 is functional by sending a test message and verifying the red LED lights. If the unit fails to operate, remove battery, confirm correct battery orientation and reinsert.

### 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

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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.

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