# 12-84-7000

## Relay Output Receiver

# PRODUCT MANUAL

Version 1.00

April 2017

# 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 12-84-7000 Relay Output Receiver is available in two versions, a VHF 12-84-7150 and a UHF 12-84- 7450 both of which provide four outputs (2 relay and 2 open collector) which can be controlled remotely via SALCOM transmitters or wide area paging networks.

The unit can also be used as a programmable general purpose channel busy output module. When used as a channel busy output module, it can also be used on any non-paging channel.

Suitable for site monitoring as network activity is delivered by the serial port of the 12-84.

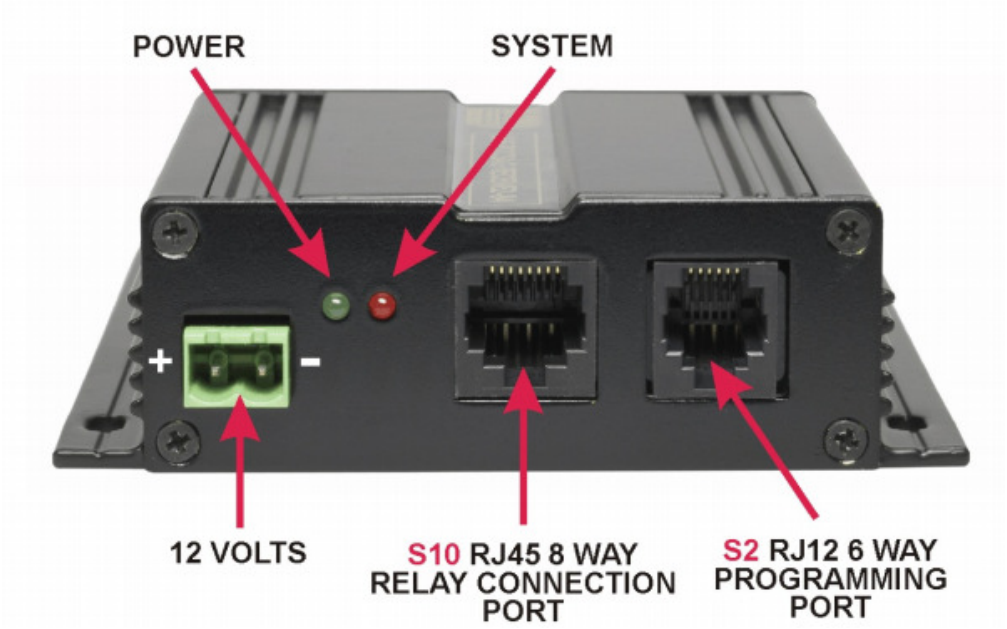
## Installation and Connections

Situate the 12-84 away from direct sunlight, vibration and strong heat sources and avoid close proximity to radio transmission equipment. The unit is not certified as intrinsically safe.

In good coverage areas fit the aerial directly to the aerial socket. An external aerial may be needed where reception is poor.

Connect a 12 volt DC power supply to the power terminals (see figure 1). The 12-84 is protected against reversed supply connection. The power source must be reasonably noise free.

Relays are not to be connected directly to mains voltages. Open collector outputs are best suited to drive external relays, as indicators or to drive inputs that have moderate to low current requirements.



Pin numbering: looking into the sockets with the power connector on the left, pin 1 is on the left.

| S2 RJ12<br>6 Way Programming Port | |
|---|---|
| **Pin** | **Description** |
| 1 | Ground |
| 2 | System LED |
| 3 | + 12V |
| 4 | Not Used |
| 5 | RS232 Out |
| 6 | RS232 In |

| S10 RJ45<br>8-Way Relay Connection Port | |
|---|---|
| **Pin** | **Description** |
| 1 | Open Collector Output 4 |
| 2 | Open Collector Output 3 |
| 3 | Relay 2 Normally Open |
| 4 | Relay 2 Normally Closed |
| 5 | Relay 2 Common |
| 6 | Relay 1 Normally Open |
| 7 | Relay 1 Normally Closed |
| 8 | Relay 1 Common |

# Operation

The unit receives and decodes a numeric or alphanumeric pager call. If the received unit number matches the 12-84 unit number or group number, the outputs are switched according to the ON/OFF fields of the message.

### Correct Operation

Normal operation of the unit is indicated by the green system LED flashing. If the LED does not light, check the voltage on the supply terminal block.

During the reception of a valid command with the correct RIC code, the system LED will stay on for approximately one second.

### Unit Number

Each unit will respond only to messages containing a matching Unit Number. Up to 99 unique unit numbers are available. Any number of units can be programmed with the same unit number. The Unit Number comprising of 2 digits is selected using the configuration software.

### Monoshot

Output mono-shot (momentary) operation can be enabled by using the configuration software. Each output can have its own mono-shot time, ranging from 25mS to 30 minutes in 25mS steps. Setting the value to 0 disables the mono-shot timer altogether, and the output is latched until commanded off.

# Commands

The outputs of the 12-84-7000 are controlled by a series of numeric commands sent in the form of a numeric or alphanumeric pager message. Note: Control strings can be sent as numeric or alpha-numeric messages. Numeric messages are shorter, and are therefore more efficient to transmit.

The control string can be embedded anywhere within the message e.g. "TEST MESSAGE 01109". Multiple control strings can be present in the message if desired. E.g. "PUMP ON 01209 23209". By allowing multiple control strings, a12-34 output module(s) can be connected for simple control of any number of relay outputs.

**Command Format:**

***UUx..x0y..y9***

***UU*** ***Unit number:***
This must be entered as 2 digits 00 - 99.

***x*** ***Output to go ON:***
This digit can be 1-4 (represents output). Any combination of digits 1-4 before the '0' can be entered in any order. If no digits are entered before the '0' then no outputs are turned on.

***0*** ***End entry of Output ON values***:
This terminates the list of outputs to turn on. This character in mandatory.

***y*** ***Output to go OFF:***
As per "Output to go ON" above, but this designates the output to go OFF instead.

***9*** ***End entry of Outputs OFF values***:
This terminates the list of outputs to turn OFF. This terminating digit is required to consider this as a valid control string

**Examples:**

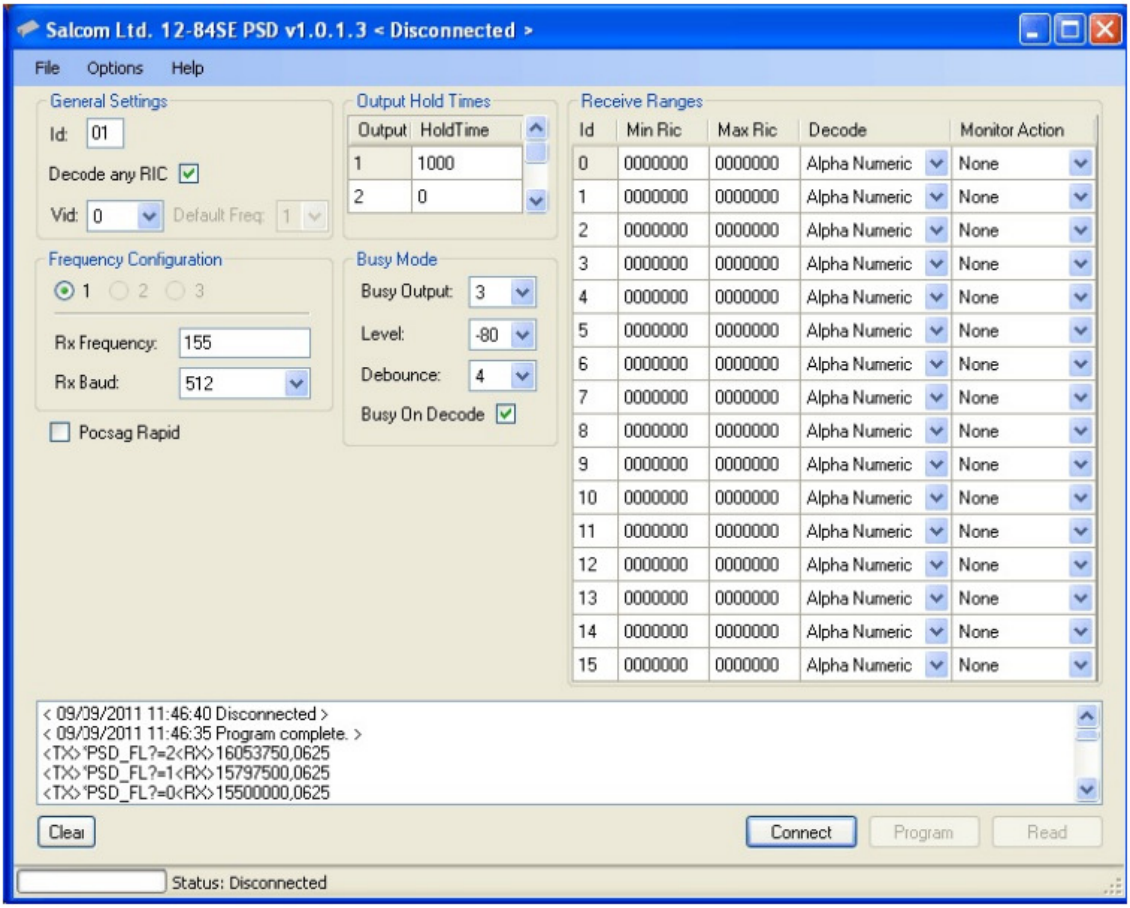
(All examples are for latching relay/output control, so "Hold Time" is set to 0. Examples assume a unit id of 44):

| Action | Message Received |
|---|---|
| To turn output 1 on | 44109 |
| To turn output 1 off | 44019 |
| To turn output 3 on | 44309 |
| To turn output 3 off | 44039 |
| To turn on outputs 1,2 and 4 | 4412409 |
| To turn output 1 on and output 3 off | 441039 |

# Configuration

The programmable parameters of the 12-84 can be configured using the SALCOM 12-45 programming cable (ordered separately) and the 12-84SE PSD software which can be downloaded from the support area of the Salcom web page www.salcom.com.

1. Connect the 12-45 programming cable to the programming connector on the 12-84 and to any PC com port.
2. Apply power to the 12-84.
3. Press the Connect button. If connecting is not successful, ensure that com port settings are correct (9600, N, 8, 1).
4. Once connected, click on the Read button and the current setup of the target unit will be read and displayed.
5. Make any desired changes by entering data or modifying data in the appropriate fields.
6. Reprogram the unit by clicking the Program button to upload the changes to the 12-84.



## PSD Settings

| Setting | Description |
|---|---|
| **Com Port** | Serial communication port. |
| **ID** | 2 character id which identifies this unit when the 12-84 relay protocol is used. |
| **Rx Frequency** | The frequency to set receiver to. Note that there is only moderate adjustment (within approximately 10MHz) that can be made until the receiver must be manually aligned again. |
| **Rx Baud** | Baud rate - either 512 or 1200. |
| **Decode any RIC** | Checked: if all messages are to be decoded and sent to serial port. Messages, if not defined within a range are assumed to be alphanumeric. Unchecked: the receiver will only decode messages within valid ranges (not beginning with 0000000) or using the POCSAG Rapid Relay control RIC. |
| **Output Hold Times** | If relay hold times are set to 0, once turned on, a output will stay on until instructed to turn off. If an output hold time is set, an output when turned on will turn off again after the Hold Time (in ms) has elapsed. If POCSAG Rapid is used this Hold Time should not be less than 150ms for reliable operation (otherwise the relays will chatter). |
| **Pocsag Rapid - Relay Control** | When enabled the Relay Control RIC is checked and used if matched. This is the POCSAG Rapid control RIC. This RIC also includes the 7 RIC codes following the one specified. Pocsag Rapid transmitters will use the Salcom relay control protocol that will control the 2 on board relays. Decoded messages matched to the Relay control RIC are not sent out the serial port. |
| **Receive Ranges** | Describes ranges of RICs that should be managed in a similar fashion. To disable a range, set the first RIC in the range to 0000000. |
| **Min RIC** | The RIC code between 8 and 2000000 that identifies the beginning of the range. |
| **Max RIC** | The RIC code between 8 and 2000000 that identifies the end of the range. Max RIC may be the same as the min RIC, but may not be less than the min RIC. Decode Describes how the messages matched in this range will be decoded (alphanumeric or numeric). |
| **Monitor Action** | If a RIC is matched in this Range this action will be performed, either no action, close relay 1 or relay 2. Note: this type of relay control is more vulnerable to false triggering than using the relay control protocol. This |

| | |
|---|---|
| | should not be used for general relay control, using the relay control protocol is the preferred method. |
| **Busy Output** | The output to close when the receiver channel is busy. Setting 0 disables the "Busy Output" feature. If a busy output has been configured, it will operate in preference over any other relay control operations. |
| **Level** | This is the received signal strength that must be exceeded in order to close the configured busy output. The level is configured in dBm. |
| **Debounce** | How long the channel must exceed the configured "Level" before operating the configured output. This debounce setting is in 25ms steps (0 = no debounce, 40 = 1 second). |
| **Busy on Decode** | If this option is checked and a busy output has been set, then the busy output will operate when decoding any POCSAG message regardless of the received signal strength. When checked, the busy output will continue to operate when the busy level has been exceeded. |

# Serial Data Output

If the need arises to monitor paging messages on a network, the 12-84 can provide serial data output (9600 Baud N:8:1) via the programming connector. The 12-84 can be connected to the serial port of a PC using a Salcom 12-45 programming lead. The format of the carriage return terminated output string is as follows: 5

***12.A.S.0.1234567 TXT***

| | | |
|---|---|---|
| ***512/1200*** | **=** | ***Baud Rate*** |
| ***A or N*** | **=** | ***Alpha or Numeric*** |
| ***S or I*** | **=** | ***S) non inverted (I) inverted*** |
| ***0*** | **=** | ***Level*** |
| ***1234567*** | **=** | ***RIC*** |
| ***TXT*** | **=** | ***message*** |

Salcom's "***VisualPET***" paging software can be used to log the received data.

# Technical Specification

| | |
|---|---|
| Power Supply | +10 V to 17 V nom 12 V |
| RF Frequency * | VHF: 148-165MHz<br>UHF: 440-480MHz<br>On request the 12-84-7000 can support other frequency bands from 80MHz to 900MHz. |
| Frequency selection method | Programmable via Salcom 12-84SE PSD |
| Current Drain | Standby 40mA plus 18mA per energised relay |
| Receive Baud Rates | 512 or 1200 baud as configured by user |
| Receiver Sensitivity | Approx -124 dBm (512 baud) |
| Serial input/output | 9600 baud no parity, 8 data bits, 1 stop bit |
| Relay Contacts | 1Amp @24VDC (Not suitable for 240VAC connection) |
| Open Collector Max Current | 100mA |
| Aerial connection | BNC<br>Product is supplied with an aerial |
| Operating Temperature | -10 to +50degC |
| Enclosure | Dimensions: 68mm x 100mm x 30mm<br>Enclosure: Extruded aluminium |
| Environmental protection | Requires protection from weather |

* The frequency of the radio channel is preset at the SALCOM factory.

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