SCR+

SINGLE CHANNEL RECEIVER
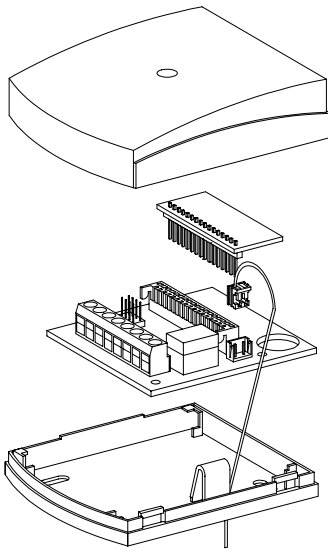
NESS SCR PLUS
Flexible Receiver

Product Part No. 106-179 (304MHz)

- Receives ARM / Disarm / PANIC / AUX / Low Batt channels from Ness Radio Keys or Radio PIRs / Radio Reeds.

- Supports up to four transmitters.

- Simple "Learn Mode" programming for radio devices.

- 1 x Relay output with selectable Toggle/ Pulse, selectable

- 4 x Open Collector outputs for Panic/ Tamper, On/Alarm, Aux, Low Battery

INTRODUCTION

The Ness SCR+ Flexible Standalone Receiver is a unique high performance radio receiver designed to operate with any Ness proprietary radio transmitting device including Ness Radio Keys, Radio Key pendants, Radio Reed switches, Radio Smoke Detectors and Radio PIRs.

The SCR+ is ideal for connecting to alarm panels which do not provide a wireless facility and can be used for connecting wireless devices for zone alarms, Panic buttons or Radio Keys for Arming and Disarming the Panel.

The Inhibit input gives the receiver the unique ability to identify the Armed/Disarmed status of an alarm panel. When used with a Ness radio key it allows the receiver to always correctly Arm or Disarm the Panel.

The SCR+ is also ideally suited for applications that require a remotely switched relay output for low voltage switching applications e.g. garage door opening.

The Relay output can be selected to be Pulsing or Latched for alarm signals or a Pulsing output for Panic/Tamper, Aux or Low Batt signals.

The SCR+ will accept up to four individual Radio Keys and Panic Buttons or up to four alarm transmitting devices (Radio Reed Switches or PIRs).
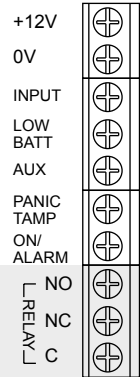
SCR+ is designed as a two-in-one solution to replace both the SCR Single Channel Receiver and the AUX Receiver.

RELAY OUTPUT

RELAY - The relay output can be programmed to provide an On/Off/Alarm output or it can duplicate one of the open-collector outputs.

THE RELAY OUTPUT CAN BE PROGRAMMED TO PROVIDE ONE OF THE FOLLOWING TYPES OF OUTPUT:

- A latching On/Off, Alarm/Restore, or Low Battery output.

- A toggling Panic or Aux Output.

- Pulsed On/Alarm, Panic/Tamper, Aux, or Low Battery output

+12V	⊕
0V	⊕
INPUT	⊕
LOW BATT	⊕
AUX	⊕
PANIC TAMP	⊕
ON/ ALARM	⊕
Programmable Relay Output. Single pole changeover dry contact rated 1A @ 28V. — NO	⊕
RELAY — NC	⊕
— C	⊕

OPEN COLLECTOR OUTPUTS

ON/ALARM - Open collector output pulses for two seconds when a valid ON signal or ALARM signal is received.

PANIC/TAMPER - Open collector pulses for two seconds when a Panic or Tamper alarm is received.

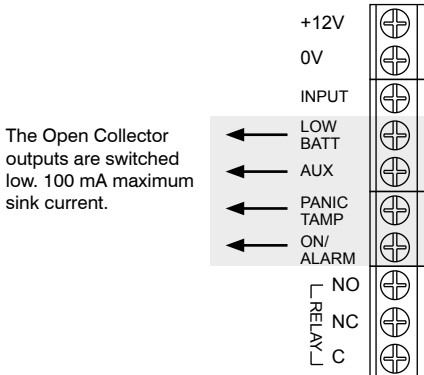**AUX** - Open collector pulses for two seconds when an AUX signal is received from a four button radio key.

Note 1: Ness radio keys which have an AUX button include:
100-067 RK4 Radio Key
106-167 RK4B Radio Key
106-299 RK4P Prox Radio Keys.

Note 2: The AUX button on the grey 106-178 RK3+1 radio key sends an ON signal not an AUX signal.

LOW BATT - Open collector output pulses for two seconds when a Low Battery signal is received from either a Radio Key or an Alarm Device. Connect a 12V beeper or optional relay for connection to an alarm zone if required.

Note: SCR+ does not identify which device has caused the Low Battery alarm. The batteries of all the transmitting devices should be checked.

The Open Collector outputs are switched low. 100 mA maximum sink current.

```
+12V      ⊕
0V        ⊕
INPUT     ⊕
LOW       ⊕  ←
BATT
AUX       ⊕  ←
PANIC     ⊕  ←
TAMP
ON/       ⊕  ←
ALARM
      NO  ⊕
RELAY NC  ⊕
      C   ⊕
```
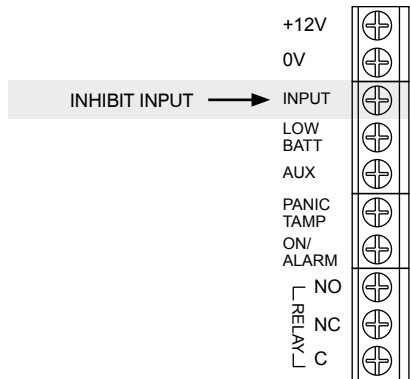
NOTE: The Open Collector outputs require no programming and are always active. The dipswitch settings mentioned in this manual apply only to the Relay Output.

INHIBIT INPUT

The Inhibit Input can be used with an output from a control panel to synchronise the relay and the On/Off buttons of a radio key to the state of the control panel.
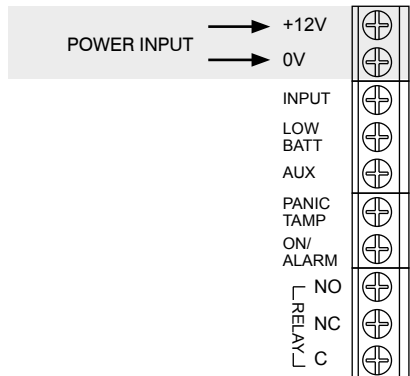
The Inhibit Input is only active when the relay is set for Pulse mode for On/Off signals, see Operation Table 2, page 6.

The input should be pulled below 0.5V to be Low and above 1V to be High. The input is high when left open.

```
              +12V   ⊕
              0V     ⊕
INHIBIT INPUT →INPUT ⊕
              LOW    ⊕
              BATT
              AUX    ⊕
              PANIC  ⊕
              TAMP
              ON/    ⊕
              ALARM
            NO       ⊕
      RELAY NC       ⊕
            C        ⊕
```

POWER INPUT

Power requirement is 12VDC (10-15VDC).

```
POWER INPUT  →  +12V   ⊕
             →  0V     ⊕
                INPUT  ⊕
                LOW    ⊕
                BATT
                AUX    ⊕
                PANIC  ⊕
                TAMP
                ON/    ⊕
                ALARM
              NO       ⊕
        RELAY NC       ⊕
              C        ⊕
```

LED OPERATION

In Normal Mode	
SLOW FLASH	Normal operation.
ON FOR 2 SEC	Valid radio signal received from a programmed device.
In Program Mode	
FAST FLASH	Program Mode.
ON	The selected code slot is programmed with a radio device.
FAST FLASH	The selected code slot is empty.
SINGLE FLASH	A learn message has been received. When three learn messages or a valid learn message has been received the LED will stay on.
TRIPLE FLASH	The device being programmed already exists in another code slot.

TABLE – DIPSWITCHES

SWITCH	OFF	ON
1	NORMAL OPERATING MODE	PROGRAMMING MODE

	OFF in NORMAL MODE	ON in NORMAL MODE	ON in PROGRAM MODE
2	ON/OFF/ALARM/RESTORE signals LATCH the relay	ON/ALARM signal PULSES relay	Program Code 1
3	PANIC/TAMPER signal TOGGLES relay	PANIC/TAMPER signal PULSES relay	Program Code 2
4	AUX signal TOGGLES relay	AUX signal PULSES relay	Program Code 3
5	LOW BATTERY signal LATCHES relay	LOW BATTERY signal PULSES relay	Program Code 4

NOTE 1: When selecting switches 2–5 the remaining switches must be switched to the opposite position. See Operation Tables 1–8 for examples.

NOTE 2: The Relay can be controlled by one signal type only. Not, for example, by AUX signals and ALARM signals at the same time.

NOTE 3: Dipswitches 2–5 only control the operation of the RELAY output. The Open Collector outputs require no programming and are always active as Pulse outputs.

The SCR+ can accept up to four Ness transmitters such as Radio Keys, Radio Reed Switches, Radio PIRs, Radio Smoke Detectors and other devices.

In Program Mode, the SCR+ will learn the radio code of up to four transmitters into four code 'slots'. The data is stored in non-volatile memory and is retained even if power is removed.
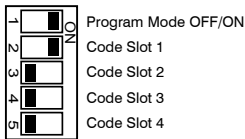
PROGRAMMING STEPS

1 To enter program mode set switch 1 to the ON position.
Set switches 2-5 to the OFF position.
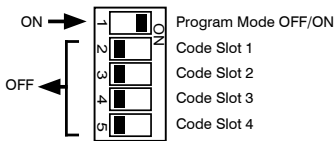
The LED will flash fast to indicate program mode.

2 Turn ON only the switch for one of the four code slots to be programmed.

Example.
Code Slot 1 is ready for programming.

If the selected code slot is blank the LED will remain flashing fast. If the code slot already has a device programmed the LED will be ON. The existing radio device must be erased before programming a new one. See How To Erase a Code.

3 Send a Learn signal from the radio device to be programmed.

To send a Learn transmission:

RADIO KEYS, unencrypted - Press the OFF Button 3 times.

RADIO KEYS, encrypted - Press and hold Panic for at least 8 seconds.

RADIO PIRS - Insert the battery.

RADIO KEY PENDANT - Press the Panic button 3 times (be aware of the 1.5 second delay on the button press).

RADIO REED SWITCH - Insert the battery.

If the device being programmed already exists in another code slot the LED will triple flash on receiving the learn signals. If so the device does not need to be programmed.

To program more devices repeat steps 1 and 2 for the remaining code slots.

4 When finished programming set switch 1 OFF.

The LED will flash slowly indicating normal operating mode.

5 Set switches 2 to 5 to the required position to select toggle or pulse modes for the relay output. See the Dipswitches Table.

HOW TO ERASE A CODE

To erase a programmed code slot.

1 Enter program mode by setting switch 1 to the ON position.

2 Turn ON the switch for the code slot to be erased.

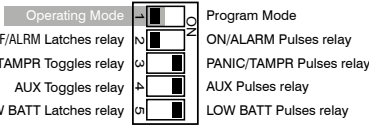*The LED will be ON indicating the slot is programmed.*

3 Press the ON button on any Ness radio key.

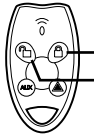*The LED will flash fast indicating the code slot is blank.*

RELAY OUTPUT OPERATION

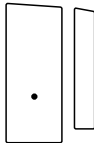To program the RELAY OUTPUT to operate by ON/ALARM/OFF/RESTORE signals.

OPERATION TABLE 1

SIGNAL TYPE	ON/OFF ALARM/RESTORE
RELAY MODE	LATCHING
RELAY ACTION	
On/Alarm signal:	Latch On
Off/Restore signal:	Latch Off
SWITCH SETTINGS	All off

| Operating Mode →	Program Mode
0N/0FF/ALRM Latches relay	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	PANIC/TAMPR Pulses relay
AUX Toggles relay	AUX Pulses relay
LOW BATT Latches relay	LOW BATT Pulses relay

OPERATION

ON Button > Relay On
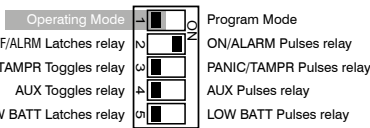OFF Button > Relay Off

Alarm > Relay On

Restore > Relay Off

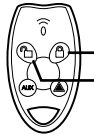When using multiple radio reed switches, the relay will turn off when all reed switches have closed
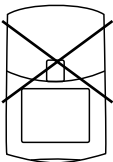
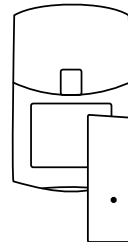This mode is not recommended for radio PIRs.

OPERATION TABLE 2

SIGNAL TYPE	ON/ALARM
RELAY MODE	PULSE
RELAY ACTION	
On/Alarm signal:	Relay Pulses 2 sec (When Inhibit input is open or pulled high)
Off/Restore signal:	*Depends on the state of the Inhibit Input, see below
SWITCH SETTINGS	Switch 2 on

Operating Mode →	Program Mode
0N/0FF/ALRM Latches relay	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	PANIC/TAMPR Pulses relay
AUX Toggles relay	AUX Pulses relay
LOW BATT Latches relay	LOW BATT Pulses relay

OPERATION — Inhibit input is open or pulled high.

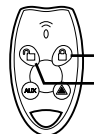ON Button > Relay Pulses 2 sec
OFF Button > No action

Alarm > Relay pulses 2 sec

This applies to radio PIRs, radio reed switches and radio smoke detectors

OPERATION — Inhibit input is pulled low.

ON Button > No action
OFF Button > Relay Pulses 2 sec

RELAY OUTPUT OPERATION

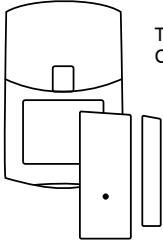To program the RELAY OUTPUT to operate by PANIC/TAMPER signals.

OPERATION TABLE 3

SIGNAL TYPE	PANIC/TAMPER
RELAY MODE	TOGGLE
RELAY ACTION	
Panic/Tamper signal:	Toggle On/Off
SWITCH SETTINGS	Switch 3 off, Switches 2, 4, 5 must be on

Operating Mode		Program Mode
0N/0FF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

OPERATION

PANIC Button > Relay toggles On/Off

TAMPER > Relay toggles On/Off

This applies to Ness transmitters with a tamper switch, such as LUX Radio PIR, RR1 Radio Reed

OPERATION TABLE 4

SIGNAL TYPE	PANIC/TAMPER
RELAY MODE	PULSE
RELAY ACTION	
Panic/Tamper signal:	Pulse
SWITCH SETTINGS	Switch 3 on, Switches 2, 4, 5 off

Operating Mode		Program Mode
0N/0FF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

OPERATION

PANIC Button = Relay Pulses 2sec

TAMPER > Relay Pulses 2sec

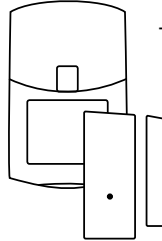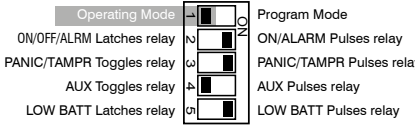This applies to Ness transmitters with a tamper switch, such as LUX Radio PIR, RR1 Radio Reed
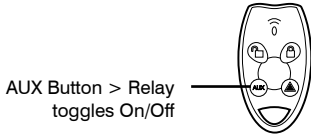
RELAY OUTPUT OPERATION

To program the RELAY OUTPUT to operate by an AUX signal from RK4 radio keys.

OPERATION TABLE 5

SIGNAL TYPE	AUX
RELAY MODE	TOGGLE
RELAY ACTION	
AUX signal:	Toggle On/Off
SWITCH SETTINGS	Switch 4 off, Switches 2, 3, 5 on

		Program Mode
Operating Mode	1	Program Mode
0N/0FF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

OPERATION

AUX Button > Relay toggles On/Off

Ness radio keys with an AUX button include:
100-067 RK4 Radio Key
106-167 RK4B Radio Key
106-299 RK4P Prox Radio Keys.

Note: This does not include the 106-178 RK3+1 radio key (grey body). The AUX button on this model sends an ON signal not an AUX signal.

OPERATION TABLE 6

SIGNAL TYPE	AUX
RELAY MODE	PULSE
RELAY ACTION	
AUX signal:	Pulse
SWITCH SETTINGS	Switch 4 on, Switches 2, 3, 5 off

		Program Mode
Operating Mode	1	Program Mode
0N/0FF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

OPERATION

AUX Button > Relay Pulses 2sec
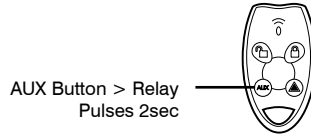
RELAY OUTPUT OPERATION

To program the RELAY OUTPUT to operate by a LOW BATTERY signal from transmitters.

OPERATION TABLE 7

SIGNAL TYPE	LOW BATT
RELAY MODE	LATCHING
RELAY ACTION	
LOW BATT signal:	Latch On
SWITCH SETTINGS	Switch 5 off, Switches 2, 3, 4 on

Operating Mode	→	Program Mode
0N/0FF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

OPERATION

LOW BATT from any programmed device > Relay Latches On

The relay will latch off when all devices send a battery restoral signal

OPERATION TABLE 8
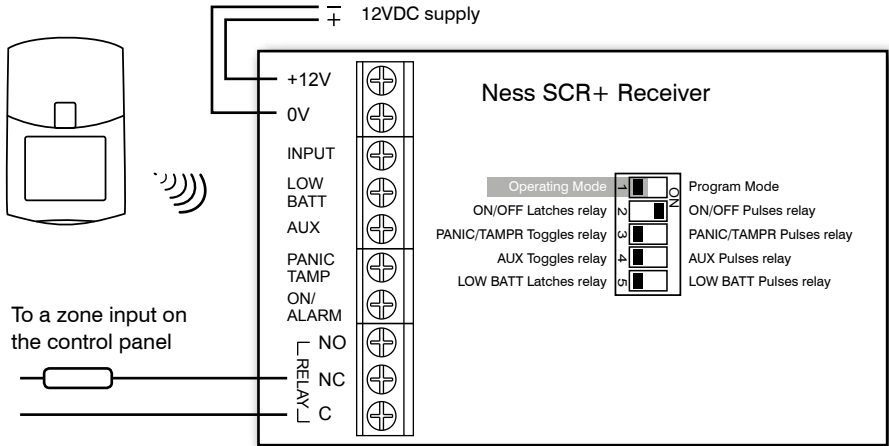
SIGNAL TYPE	LOW BATT
RELAY MODE	PULSE
RELAY ACTION	
LOW BATT signal:	Pulse
SWITCH SETTINGS	Switch 5 on, Switches 2, 3, 4 off

Operating Mode	→	Program Mode
0N/0FF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

OPERATION

LOW BATT from any programmed device > Relay Pulses 2sec

TABLE - RELAY OPERATION WITH INHIBIT INPUT

ACTION	SWITCHES 2-5	INHIBIT INPUT	RELAY
Radio Key or Reed Switch On/Off/Alarm	All Off	Input Ignored	Latch
Device Alarm, PIR or Reed Off/Restore	Switch 2 On	Input Ignored	No Change
Device Alarm, PIR or Reed On	Switch 2 On	Input Ignored	Pulse
Key ON	Switch 2 On	Low	No Change
Key ON	Switch 2 On	High	Pulse
Key OFF	Switch 2 On	Low	Pulse
Key OFF	Switch 2 On	High	No Change

CONNECTION EXAMPLES

NESS RADIO PIRS ON ANY CONTROL PANEL

12VDC supply

Ness SCR+ Receiver

+12V
0V
INPUT
LOW BATT
AUX
PANIC TAMP
ON/ALARM
NO
NC
C
RELAY

Operating Mode		Program Mode
ON/OFF Latches relay	2	ON/OFF Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

To a zone input on the control panel

Note: For fully integrated radio operation on Ness control panels use the Ness 100-200 Radio Interface.

NESS RADIO REED SWITCHES ON ANY CONTROL PANEL
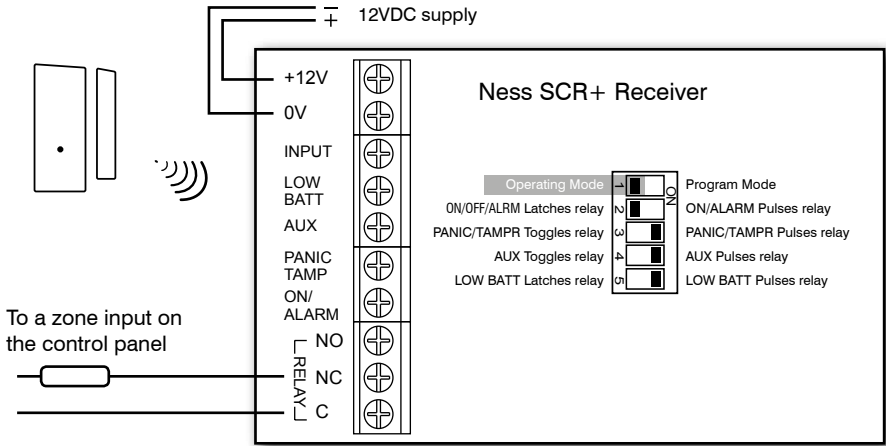
12VDC supply

Ness SCR+ Receiver

+12V
0V
INPUT
LOW BATT
AUX
PANIC TAMP
ON/ALARM
NO
NC
C
RELAY

Operating Mode		Program Mode
ON/OFF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

To a zone input on the control panel

Alarm > Relay On

Restore > Relay Off

When using multiple radio reed switches, the relay will turn off when all reed switches have closed

CONNECTION EXAMPLES

NESS RK4 RADIO KEY AUX BUTTON OPERATING A GARAGE DOOR

12VDC supply

Ness SCR+ Receiver

+12V
0V
INPUT
LOW BATT
AUX
PANIC TAMP
ON/ALARM
NO
NC
C
RELAY

AUX button

To garage door controller input

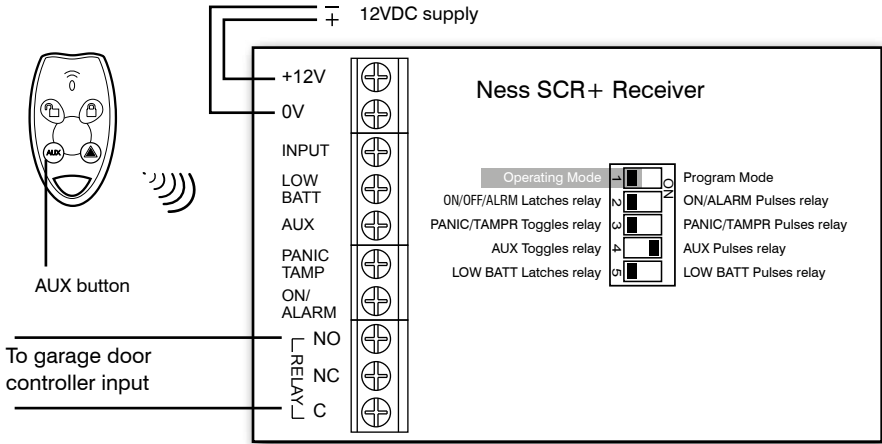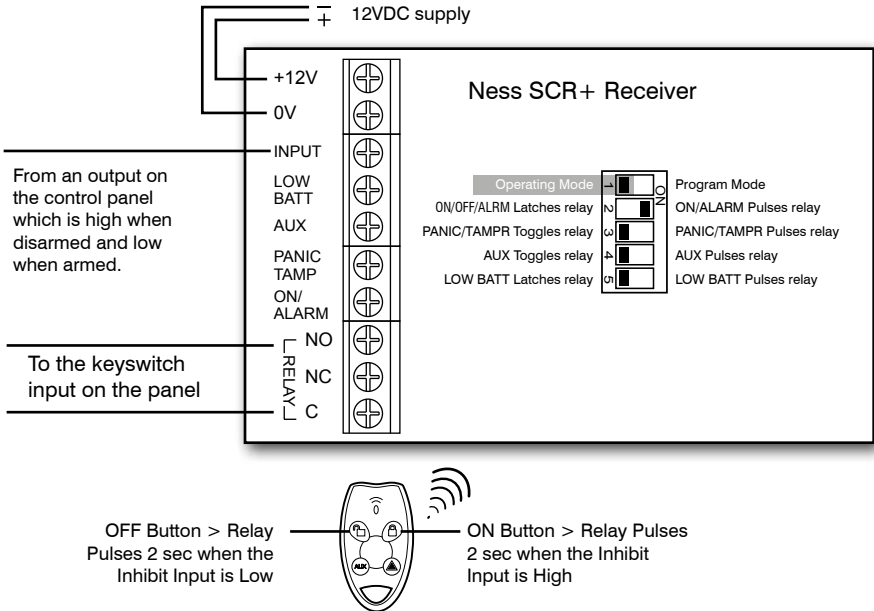| Operating Mode		Program Mode
ON/OFF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

NESS RADIO KEYS ARMING/DISARMING ANY CONTROL PANEL USING INHIBIT INPUT

Requires an output from the control panel which is high when disarmed and low when armed.

12VDC supply

Ness SCR+ Receiver

+12V
0V
INPUT
LOW BATT
AUX
PANIC TAMP
ON/ALARM
NO
NC
C
RELAY

From an output on the control panel which is high when disarmed and low when armed.

To the keyswitch input on the panel

Operating Mode		Program Mode
ON/OFF/ALRM Latches relay	2	ON/ALARM Pulses relay
PANIC/TAMPR Toggles relay	3	PANIC/TAMPR Pulses relay
AUX Toggles relay	4	AUX Pulses relay
LOW BATT Latches relay	5	LOW BATT Pulses relay

OFF Button > Relay Pulses 2 sec when the Inhibit Input is Low

ON Button > Relay Pulses 2 sec when the Inhibit Input is High

SPECIFICATIONS

OPERATING VOLTAGE	10–15V DC
QUIESCENT CURRENT DRAW	25mA (with relay activated)
RELAY OUTPUT	C.O. contacts rated 1A @ 28V max.
OPEN COLLECTOR OUTPUTS LOW BATT, AUX, PANIC/TAMP, ON/OFF	Open Collector 100mA @ 12V (low on alarm)
RADIO FREQUENCY	304MHz / 868MHz depending on region
RADIO TYPE	Superhetrodyne
BANDWIDTH (3DB)	300Khz
SENSITIVITY	> -100db
COMPATIBILITY	All Ness 304MHz & 868MHz transmitters
MAX. RADIO DEVICES	4
DIMENSIONS	73(h) x 73(w) x 27(d) mm
WEIGHT	73g

Ness Corporation manufacturing processes are accredited to ISO9001 quality standards and all possible care and diligence has been applied during manufacture to ensure the reliable operation of this product. However there are various external factors that may impede or restrict the operation of this product in accordance with the product's specification.

These factors include, but are not limited to:

1. Erratic or reduced radio range. Ness radio products are sophisticated low power devices, however the presence of in-band radio signals, high power transmissions or interference caused by electrical appliances such as wireless routers, cordless phones, computers, TVs and other electronic devices may reduce the range performance. While such occurrences are unusual, they are possible. In this case it may be necessary to either increase the physical separation between the Ness receiver and other devices or if possible change the radio frequency or channel of the other devices.

2. Unauthorised tampering, physical damage, electrical interruptions such as mains failure, electrical spikes or lightning.

NESS CORPORATION

Quality
ISO 9001
NSW Head Office only

www.nesscorporation.com

National Customer Service Centre
Ph: 1300 551 991

MADE IN AUSTRALIA

Ness SCR+ FLEXIBLE SINGLE CHANNEL RECEIVER
Installation Notes
Rev 1. Jan 2016

Document part number 890-441
For the products:
106-179 SCR+ Receiver 304MHz
106-180 SCR+ Receiver 868MHz

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Specifications may change without notice.