Introduction

The Remote Input/Output (RIO) Modules extend the Input and output capabilities of Comfort. Each RIO Module has 8 Input/ and Output points. Up to 15 RIO Modules can be connected to a Comfort II ULTRA system providing a further 120 non-alarm inputs and 120 outputs.

RIO Input functions;

- receives Comfort IR codes (with the same function as the KP03/KP04 IR receiver) from the RC01 remote control or universal learning remote controls like Philips Pronto or Logitech Harmony to trigger Comfort Responses. Infrared Receiver modules (IRR01) or the IRD01 IR Dome must be connected to the input to receive IR signals.
- receives X10 IR codes from the X10 UR24 RF/IR Remote control or Philips Pronto to activate X10 codes directly.
- Receives CBus2 IR codes from the Clipsal 5088TX handheld IR remote control (8 buttons, 4 sets A, B, C, D)
- accepts a switch contact (or digital 5V logic level signal) to trigger Responses when the contact is opened and/or closed.

RIO Output functions;

- Provides digital 12V/0V open collector outputs
- Drives LEDs (with a series resistor) for indication purposes.
- Transmits Infrared remote (IR) control signals by connecting an Infrared LED transmitter (IRM01, IR01W, IR02W)
- Drives 8 reed relays on the RLY02 module to provide dry contacts for external triggering.

The combination of inputs and outputs can be used as Scene Switches, providing status indication via the RIO outputs.

These inputs and outputs are not part of the 64 Inputs and 64 Outputs of the Comfort Control panel, LEMs and SEMs. They are numbered as input/output 129 to 248.

☎ RIO Inputs cannot be used as Alarm Inputs. They have no alarm function, and are used to activate Responses via switch contacts or infrared signals.

The IRD01 IR Dome is a combination IR Receiver and Transmitter which can be mounted on the ceiling to be used with the RIO.

The IRD01 transmits IR signals through 8 infrared LEDs, as well as receives Comfort IR signals send from a handheld remote control like the RC01 and Philips Pronto. The IRD01 is connected to the RIO, replacing IRR01 IR receivers and IRW01 IR transmitters.

Applications of RIO

- Scene Switches with buttons and LED indicators
- Infrared Transmitters can be connected to RIO outputs
- Infrared receivers (IRR01) can be connected to RIO inputs to activate any Comfort response from handheld remote control, e.g. Philips Pronto, or the UR24 X10 remote control for X10 commands, or Clipsal 5088TX handheld IR remote control
- The IRD01 IR Dome can be connected to RIO input and output to send and receive IR signals.
- Mimic Panel LED drivers.
- Two way switch input/outputs (used with TWS01/02 Lighting Modules)

RIO Specifications

- Printed Circuit Board Dimensions: 108 x 88 mm
- Current consumption: 12V @ 25 mA max, 15 mA typical with all outputs off.
- Combined Current Limitation of 300 mA for all 8 outputs to protect the outputs for overcurrent

Inputs:

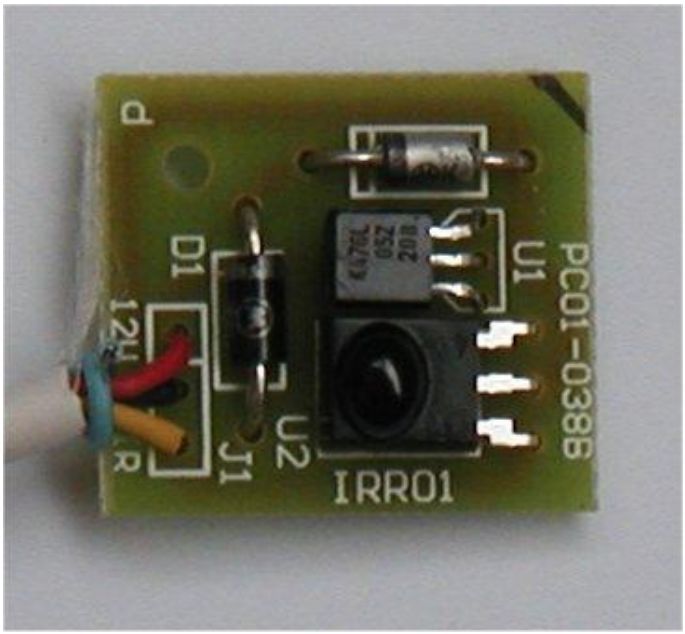
Logic ‘0’ : 1.0 V Max

Logic ‘1’ : 2.0 V Min

Input overvoltage protection up to 25V continuous.

All Inputs have internal pull-up resistance of 100 K.

Infrared Receiver (IRR01)



Each Input on the RIO can be connected to an Infrared Receiver (IRR01) to receive Comfort Infrared Codes or X10 IR codes (from the X10 IR/RF handheld remote control UR24). The IRR01 IR receiver is connected by 3 wires to the RIO; 12V, Ground, and IR signal. The IRR01 can be located up to 100 meters from the RIO. Use CAT5 cable with separate cable for each IRR. No programming is required to configure the RIO Input as an Infrared receiver. The RIO

automatically detects if the incoming signal is a valid IR signal in Comfort or X10 format, or an open/close switch.

The IR codes which can be recognised are:

- Comfort IR codes: 0 to 127. These are the same codes recognised by the KP02.
- UR24 X10 IR signals: Housecodes A to P, unit Codes 1 to 16.
- CBus2 IR Codes, mapped to Comfort IR Codes 0 to 31 (RIO firmware 1.04)

Outputs:

Logic '1': 12V nominal

Logic '0': 1.8V max

Outputs are open-collector which pull down to ground when active with common 12V on the centre pin of the 3-pin terminal block. This is the same configuration as Comfort Control Panel, SEM and LEM01.

Sink Current: 100 mA max per output, 300 mA combined.

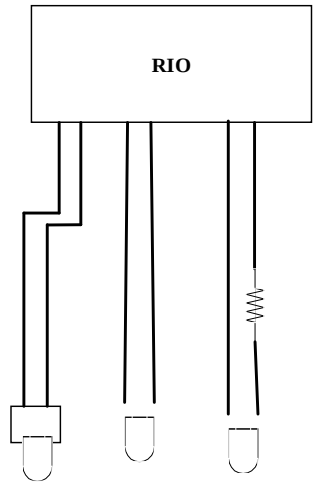
Pulse current: 350 mA from each output.

Overcurrent protection: 300 mA from all combined causes shutdown of the resettable fuse and shuts down the output.

Output Breakdown Voltage: 35 V minimum.

Internal reverse clamp diodes to ground at each output to protect against output transients when driving inductive loads e.g. Relays.

The figure below shows the connection of visible light and infrared transmitter LEDs to RIO outputs. The IRM01 Infrared Transmitter Modules are used as an IR "blaster" with a range of up to 8 meters and with series Resettable fuse protection. IRW01 and IRW02 are infrared Transmitter LEDs with built-in resistor and cable assembly which are for short range, up to 1 meter. They have a larger series resistance and do not need Resettable fuses. IRW01 has a round IR transmitter LED and IRW02 has a flat IR transmitter LED. Note that polarity of connection to infrared transmitters. The Positive terminal of the IR transmitter must be connected to 12V and negative of the IR transmitter to the Output terminal of the RIO.



Connection of Infrared and Visible LEDs to RIO Outputs

☎ Use separate CAT 5 cables for the IR Transmitters. Do not share the same CAT5 cable with several IR transmitters so as to avoid the possibility of IR signals leaking to other cables and transmitters

Infrared Transmission

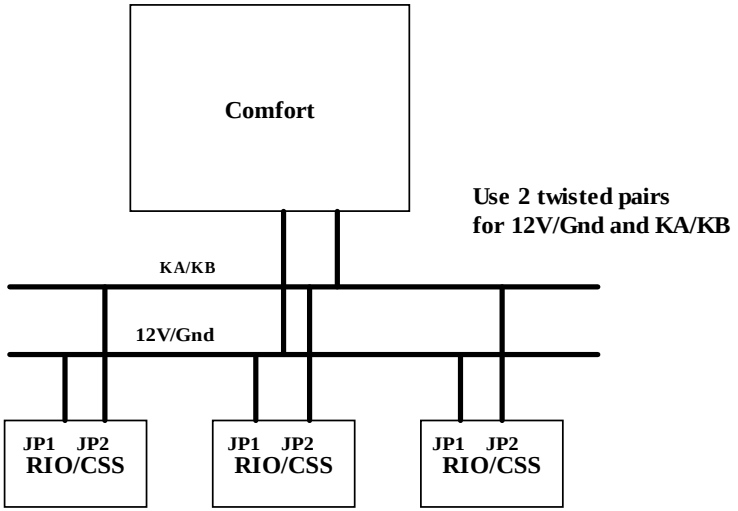
Each output is capable sending Infrared signals from Comfort's IR signal library. IR transmitter LEDs (IRM01, IRW01/02) should be connected to the output.

☎ The RIO IR Transmission is limited to 96 bytes of IR codes which is less than for Comfort outputs which is 128 up to Ultra 5.122. Comfort Ultra II 5.134 increases this to 245 bytes. The number of bytes in an IR code can be found in the IR Transmit Codes Screen in Comfigurator > Modules & Settings

System Requirements

- Comfort Control Panel with firmware "Outside 4.160" or Comfort II Ultra

Settings



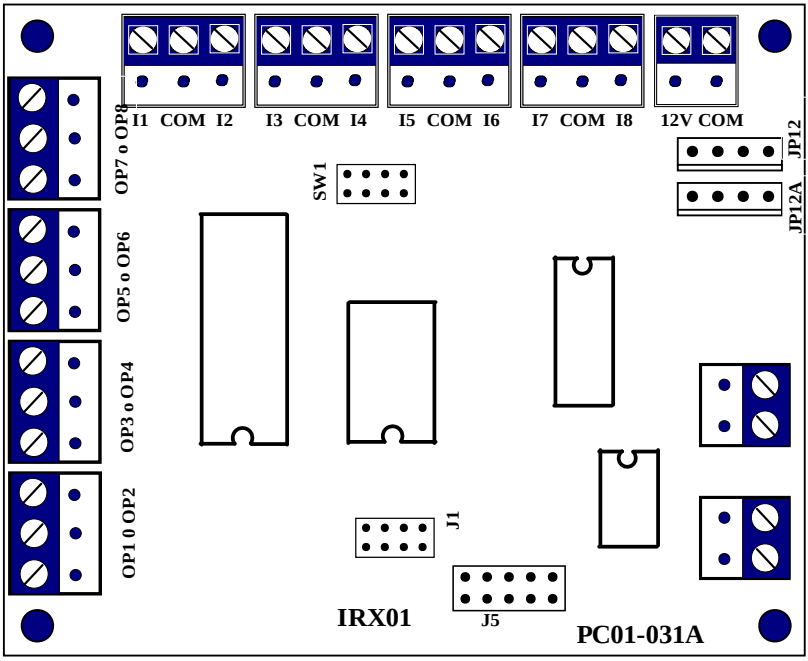
Connections between RIO and Comfort

The RIO modules are connected to the Comfort panel by 4 wires, 12V/COM, for power supply, and KA/KB for RS485 data.

Connections

- JP1: 12V/COM terminal block for Supply Voltage from Comfort.
- JP2: KA/KB terminal block for RS485 data, in parallel to KA/KB on JP12/JP12A. KA/KB is connected to KA/KB on Comfort. Twisted pair wire should be run to Comfort for KA/KB.
- JP12: 4 way header (12V/Com/KA/KB). This is connected to Comfort J15 connector via the supplied cable. This connection to Comfort is used instead of JP1 and JP2 when the distance is within 3 meters, i.e. when the RIO module is mounted right next to Comfort. It cannot be used for longer distances, as the KA/KB wires are not twisted.
- JP12A: Auxiliary 4 way header (12V/Com/KA/KB). This can be connected to other RIOs or UCM. The signals on JP12A are identical (in parallel) to those on JP12.
- JP3 - JP6: Outputs 1 to 8. Each 3-pin terminal block has 2 adjacent outputs with a center common 12V.
- JP7 - JP10: Inputs 1 to 8. Each 3-pin terminal block has 2 adjacent Inputs with a center common ground

- JP13: For connection of 5V buzzer, in parallel with D1 LED
- JP11: 2 way 12V terminal block
- J5: 2 x 5 connector is for future use



RIO PCB

Buttons

- SW1 - Fault RESET. This resets the Output drivers after a Fault condition has occurred, as shown by the D5 Fault LED.

LED Indicators

- D1 (Red). The LED is normally off. It will blink once when one of its inputs change state, or a valid IR code is received by one of its inputs, an IR code is transmitter from one of its outputs, and after reset. The LED will flash continuously when communication with Comfort is lost for 20 seconds.
- D5 (Fault). Not used

ICs

- U1 - Microcontroller IC

- U3 - RS485 Interface
- U4 - Output Driver

Jumper Settings

ID Switch (J1)

Comfort II Ultra is able to support up to 15 RIOs. J1 is a set of 4 headers which determines the UCM ID, according to the table below:

ID	J1- A	J1 - B	J1 - C	J1 - D
1	Short	Short	Short	Short
2	Open	Short	Short	Short
3	Short	Open	Short	Short
4	Open	Open	Short	Short
5	Short	Short	Open	Short
6	Open	Short	Open	Short
7	Short	Open	Open	Short
8	Open	Open	Open	Short
9	Short	Short	Short	Open
10	Open	Short	Short	Open
11	Short	Open	Short	Open
12	Open	Open	Short	Open
13	Short	Short	Open	Open
14	Open	Short	Open	Open
15	Short	Open	Open	Open

Table 1 - RIO ID Switch Settings

☎ The Scene Control Switches (SCS) share the same ID space with the RIO modules. Do not set any RIO and SCS with the same ID, as this will cause a conflict and lead to a "communications failure" trouble alarm.

☎ After changing the ID settings, remove and reapply power through the 12V/COM terminal block or JP12.

Function Selector (J2)

4 shunts on J2 marked P,Q,R,S determine the following function settings:

J2-P

Closed: Each input will report ON and OFF codes to Comfort when it is closed and opened respectively. This setting is for two position switches (rather than momentary switches)

Open: Each switch will report the ON transition when the switch input is closed, but not the OFF transition when the switch is opened. This is for momentary switches. However, if adjacent input pairs (1 and 2, 3 and 4 etc.) turn on at the same time, the On transition is not reported.

J2-Q

Closed: Outputs will not blink when a valid IR signal (Comfort or X10 code) is received at the corresponding input

Open: The Outputs will blink once when a valid IR signal (Comfort or X10 code) is received at the corresponding input. This is used for an indicator LED in conjunction with the corresponding IR receiver input.

J2-R

Closed: The Outputs will not flash continuously when the corresponding Input changes state.

Open: The Outputs will flash continuously when the corresponding Input changes state, until a new output command is sent to the affected output.

J2-S

Not in use, should be closed.

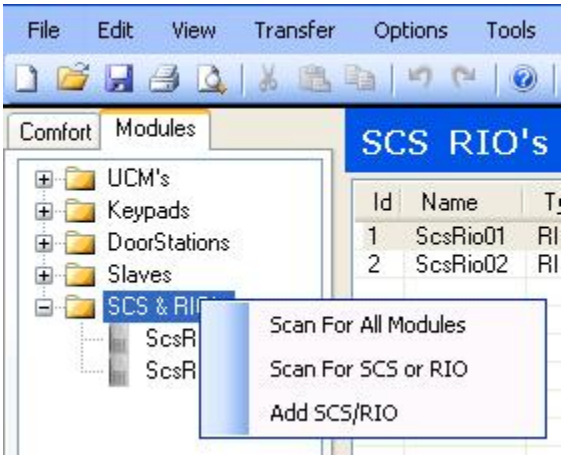
Programming the RIO

Scanning for SCS/RIO

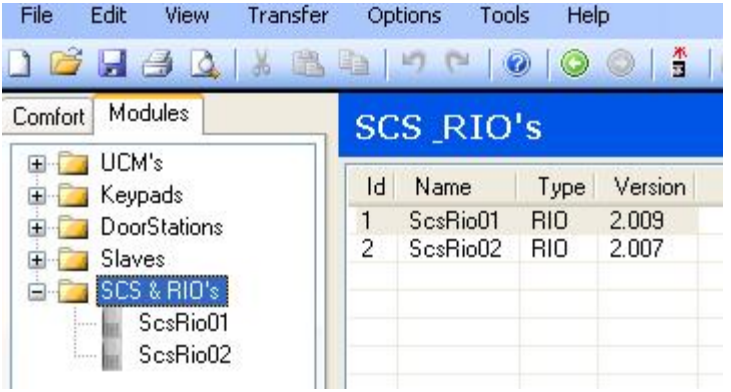
Run Comfigurator software, and set up the Communications with the UCM in Options > Settings > UCM Interface as USB, RS232 or Ethernet as described in the UCM Manual.

Go to the Modules Tab, right clock on SCS & RIOs and select Scan for SCS/RIO as shown below.

This will detect the SCS and RIO installed in the system with different Ids. Ensure that the Ids for SCS and RIO in the system are unique. SCS and RIO share the same address space e.g. if ID 1 is SCS, RIOs cannot have that ID



The result of the scanning is shown in the example below where 2 RIOs are detected;



Note that only RIO with firmware 2.007 can be identified by the Scanning method as described here. If the RIO is not found even though it has been connected with the correct ID, select ADD SCS/RIO instead of Scan for SCS/RIO to manually ADD the RIO to the system.

Setting Number of RIOs by Keypad/Phone Menu

If Comfigurator cannot be used, to program this using the keypad/phone voice menu, set Location 1676 to the number of SCS/RIOs connected. Press RESET on Comfort after doing this.

Communications Failure Reporting

If any RIO Module loses communications with Comfort, it will be reported as “Communications Failure ID#” where ID# is 81 for RIO ID 1, 82 for ID 2, 83 for ID 3 and so on .

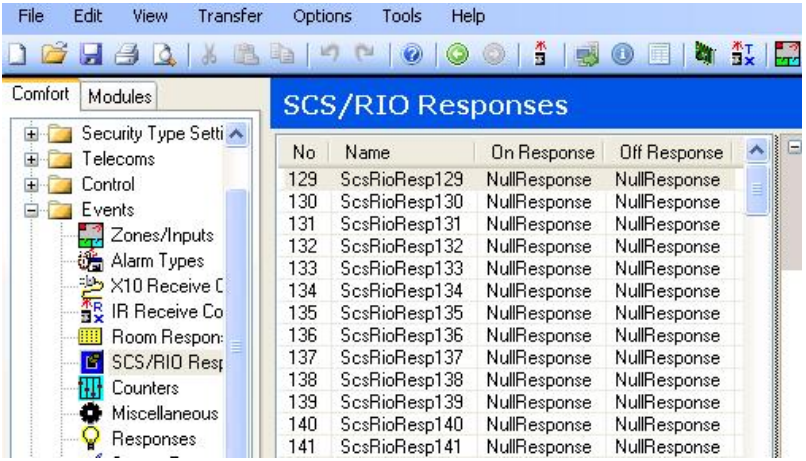
When the RIO module loses communications with Comfort, the onboard D1 red led will flash continuously until communications is restored. The D1 LED will not flash if it is able to receive data via KA/KB (RS485) even if its ID is not polled due to incorrect ID settings

RIO Inputs

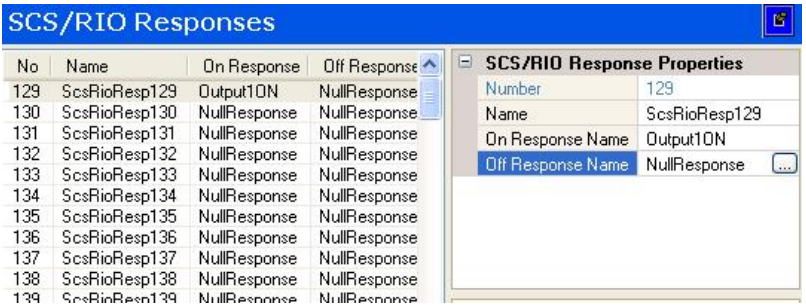
Each Input can accept a normally open switch contact, or a digital 5V/0V input. Closing and opening the switch on an input causes Responses in Comfort to be activated. The inputs can be programmed to turn on individual lights or appliances, or to activate Scenes (combination of behaviours). The corresponding outputs can be connected to an LEDs as indication of the scene or appliance status.

When each Input changes its state, it will activate a programmed Response depending on the RIO Module ID (1 to 15) and its number (1 to 8), and whether it is ON (0V) or OFF (5V). This can be programmed in Comfigurator by selecting Events > SCS/RIO Responses (called “Switch Responses” in some versions). Each RIO has 8 inputs. RIO ID=1 has Input 129 to 136, ID=2 has Input 137 to

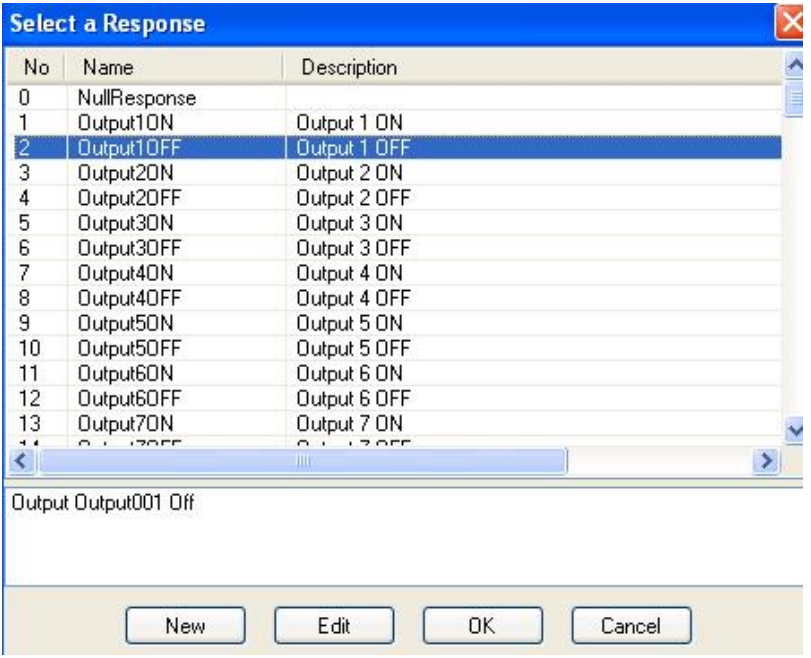
144, and so on. Each Input has a corresponding ON Response and OFF Response just like Comfort's regular Inputs. A Name (2nd column of table below) can be assigned to each Input to identify it.



Select a SCS/RIO number and program the On Response or Off Response in the right pane



Click on the … Icon at On Response and Off Response and select the Response from the Response Window and click OK



You can also select “New” to add a new Response to be assigned to ON Response or OFF Response.

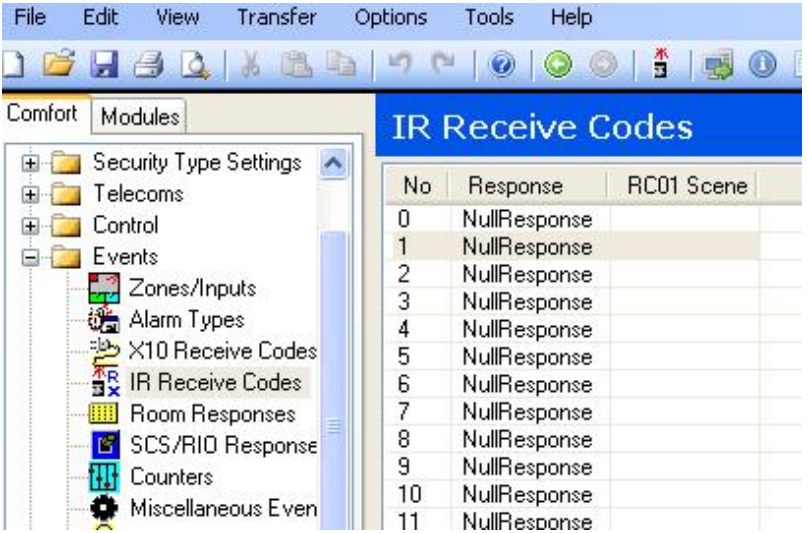
If J2-P shunt is Open, i.e. only switch ON is reported, the OFF Response ha no effect. If J2-P shunt is closed, both ON and OFF Responses will be valid.

To program the Switch (SCS/RIO) Responses using the keypad or telephone voice menu, the Location for each RIO ID switch on and off response is shown in the appropriate Program Worksheet table 36B for the File System (File System 34 for Comfort II Ultra)

☎ RIO Inputs are NOT alarm inputs; they are meant for receiving switch contacts or IR signals and triggering Responses. Only Slave (SEM) and Local Expansion Modules (LEM) or Comfort Main panel Inputs can act as alarm inputs.

Receiving Infrared Codes

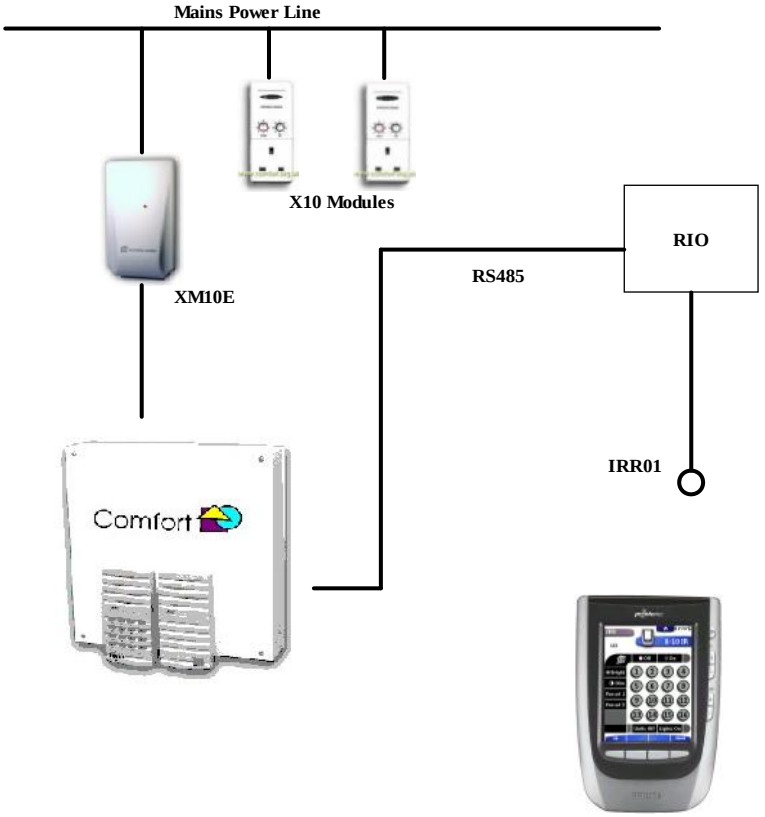
The RIO, as in the KP03/KP04 keypad will recognise a set of 128 Comfort IR codes, numbered 0 to 127. Each of these IR codes can trigger a response to be activated. To select the Responses to be activated by each IR code in Comfigurator, select Events > IR Receive Codes as shown in the screenshot below;



For keypad/phone voice menu programming, refer to the table of Locations for IR received Responses in the relevant Programming Worksheets for the File system

X10 IR Codes

Each RIO Input can also receive IR Codes from the X10 RF/IR remote control UR24 or from a Philips Pronto programmed with the X10 Ircodes. The RIO can recognise X10 IR codes for all 16 housecodes, and will transmit the X10 signals onto the Powerline through the XM10E or TW7223 X10 Power Line Interface (Not Supplied). No programming is required. Comfort simply transmits the X10 commands to the Power Line.



Receiving Comfort and X10 IR Codes

C-Bus2 IR Codes

The RIO can receive IR codes from the C-Bus2 IR 5088TX 8 button remote control. The remote control has 8 buttons which can be addressed by a switch as A, B, C, D giving a total of 32 IR codes. These 32 IR codes are mapped to IR Receive Codes 0 to 31 in Comfort. This applies to RIO Firmware 2.0.4 and later

Outputs

RIO Input/output Numbering and Actions

RIO Inputs and Outputs share the same numbering system as Comfort's regular inputs and outputs from the Main panel, LEMs and SEMs, but they start from output 129, while Comfort regular inputs and outputs range from 1 to 64, The table below shows RIO Input and Output numbering:

RIO ID	Input/Output No
1	129 to 136
2	137 to 144
3	145 to 152
4	153 to 160
5	161 to 168
6	169 to 176
7	177 to 184
8	185 to 192
9	193 to 200
10	201 to 208
11	209 to 216
12	217 to 224
13	225 to 232
14	233 to 240
15	241 to 248

Table 4 - RIO Input/Output Numbering System

This allows the same Output actions used to control regular outputs (on Comfort, LEMs and SEMs) to be also applicable to RIO outputs, for example;

Action 128, output #, parameter

Parameter can be 0 for OFF, 1 for ON, 2 for Invert state, 3 for Pulse output 1 second, 4 for Flash output at 1 second on/off rate.

Example,

128,135,2 RIO ID 1 Output 7 Toggle

128,157,3 RIO ID 4 Output 5 Pulse 1 second

128,181,4 RIO ID 7 Output 5 Flash at 1 second rate

Action 78, output#

This action also changes the state of the specified output similar to 128,output#, 2. Both actions can be used, but action 78 requires one less parameter.

Action 129, irno, output#

This action sends an IR code to the specified output

Example:

129,20,177 IR No 20 to RIO ID 7, output 1

129, 45, 171 IR No 45 to RIO ID 6, output 3

Action 130, duration50ms, output#

This action pulses an output for the specified duration in 50 ms units, but it does not work for RIO Outputs for RIO Firmware < 2.06 Action 130 has been implemented in RIO Firmware 2.06 (December 2007).

Action 77, output#

This action checks the state of the specified output. It will return 0 for OFF and 1 for ON

Example:

77, 138 Check state of RIO ID 2, output 2, return 0 for OFF, 1 for ON

RIO Inputs numbered 129 onwards do not activate Alarms like Comfort's regular Inputs (on Main Panel, LEMs and SEMs), but they can be interrogated like regular Inputs using Action codes.

Action 79, Input#

This actions returns the state of the Input, i.e.. 0 for off, 1 for On

Example:

79, 130	Return state of RIO ID 1 Input 2
13	Skip if NZ (i.e.. Skip if Input is On)
78,130	Change state of RIO ID 1 Output 2
255	Terminator

The above example is the code for two way switch control of a light.

Action 1 - Announce Zone Name

This action is not applicable to RIO Inputs, it will not cause the RIO Input name to be announced. In any case, the RIO Input cannot be assigned to words like a regular Input

Action 89, Input#

This action returns the analog value of Comfort Inputs, but it does not apply to RIO inputs, which are strictly digital inputs.

UCM RS232 Commands

UCM RS232 commands can be used to control and monitor the RIO Inputs and Outputs just like Comfort's regular inputs and outputs.

O! - Output Activation Command

PC: O!*nnss*
UCM: OK

nn is the output number 81 to C0 (Hex) for RIO outputs 129 to 192

ss is the output status 00=off, 01=on, 02=change state , 03 = Pulse Output for 1 second, 04 - Flash Output at 1 sec On/Off rate

OP - Output activation Report

UCM: OP*nnss*
UCM sends the OP report when the RIO outputs turn on or off

O? - Output status request

PC: O?*nn*
UCM: O?*nnss*
nn is the output number 81H to C0H for RIO Outputs
ss is the output status 00=off, 01=on

P! - Pulsed Output Command

PC: P!*nnpp*
UCM: OK
nn is the output number 81-C0H for RIO Outputs
pp is the pulse width 0 to 0FFH in 50 ms units

If the output is in the Comfort main panel, not slave, the UCM sends the PT Report in the same format when the command is carried out

UCM: PTnnpp

If the output is on a slave or RIO, the UCM does not send the PT command, it sends Output reports when the output is turned on and off

UCM: OP*nn*01
UCM: OP*nn*00

I? - Input Status Report/Request

PC: I?*nn*
UCM: I?*nnss*
nn is the input number 81-C0H for RIO Inputs
ss is the status 00 = Off, 01 = ON

IP - Input activation report

UCM: IP*nnss*
nn is the input number 81-C0H for RIO Inputs
ss is the state 0 = Off, 1 = ON
UCM sends the message when an input is activated or restored

IR - IR Activation Command/Report

PC: I*Rnnrr*
UCM: OK
UCM: IR*nnrr*
nn is the output number 81-C0H for RIO Outputs
rr is the IR number 01 to the maximum IR number. If IR number 00 is reported, it means that the IR code is undefined or has an error.

UCM sends the IR report when an IR code is activated by master or slave. If the IR is not activated, there is no report

IX - IR Code Received

UCM: IXnn

IX reports an IR code received by Comfort through a keypad or IR receiver. NN is the code number 00 to 7F

Cold Start/Warm Reset Behaviour

A Cold Reset is defined as operation of RIO when Power is first applied, or reapplied after a complete power off. A Warm Reset is defined as operation when a reset command is sent from Comfort or the RESET button is pressed on Comfort.

After a Cold Reset, all Outputs will be reset to 0V, or the off state. And the ID settings from the shunts are read. After a Warm Start the outputs remain in their previous state.

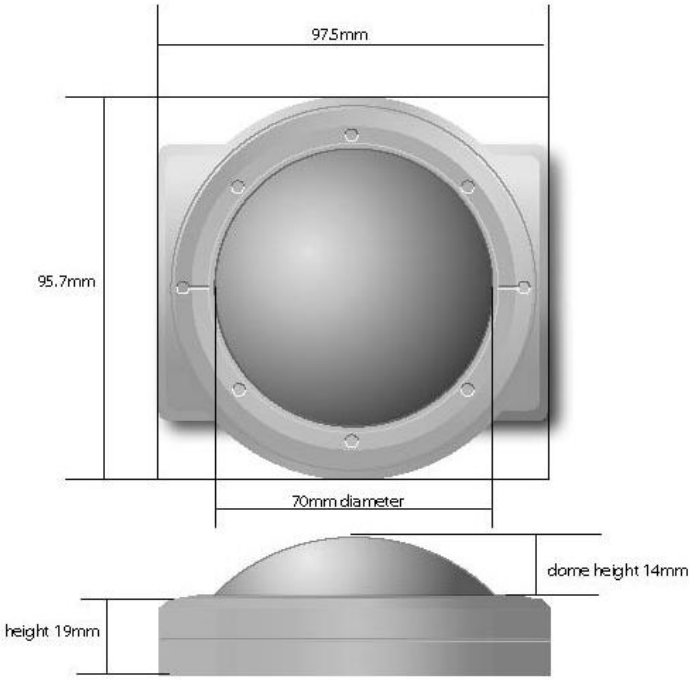
After a Warm or Cold Reset, the Inputs do not activate their programmed Responses regardless of their state is on or off.

After a Warm or Cold SReset the default X10 House code is “A” and the Unit Code is “1” for the X10 IR receive function. Hence if an X10 Function code is sent from UR24 or Pronto, the complete X10 signal transmitted to the power line will include the default A1 code.

☎ Note: From RIO Firmware 2.009 (25 April 2011), all resets are Cold Resets with the same behaviour and ID setting of RIO will be determined.

IRD01 IR Dome

The IRD01 IR Dome contains 8 IR Transmitters and one IR receiver enclosed in an infrared transmissive plastic dome. It takes the place of IR01Ws and IRR01. The IRD01 is connected to an RIO01.



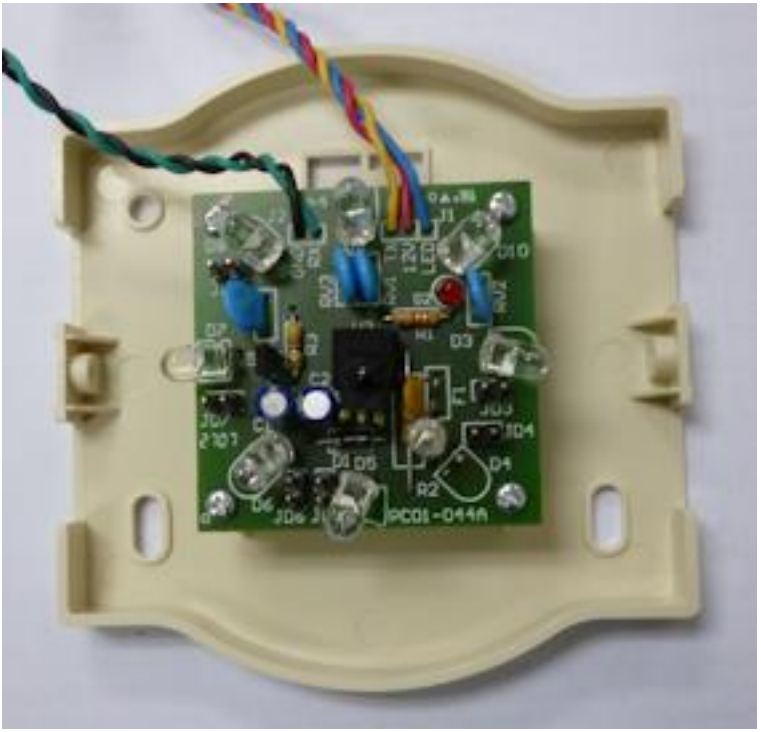
This can be mounted on the ceiling of a room to allow IR signals to be sent to any remote-controlled appliances within the same room on the line of sight. The 8 IR transmitters are positioned around the circumference of the printed circuit board to achieve 360 degrees coverage. The angle of the individual IR LEDS can be adjusted slightly if required to point towards an infrared receiving appliance. In practice, infrared signals can bounce off the walls in a room to reach areas which may not be on the direct line of sight. A single IR receiver in the centre of the printed circuit board allows Comfort IR codes to be received which will activate Received IR Responses to perform any programmed task.

Installation

Remove the top housing from the IR Dome by turning the screw on the flat side. Mount the bottom housing to the ceiling using the two mounting holes which are located diagonally across. There are knock-out holes where the plastic can be cut off to allow cable entry from the bottom and the side.

Replace the top cover with the dome back over the bottom housing and screw in to secure.

Connections



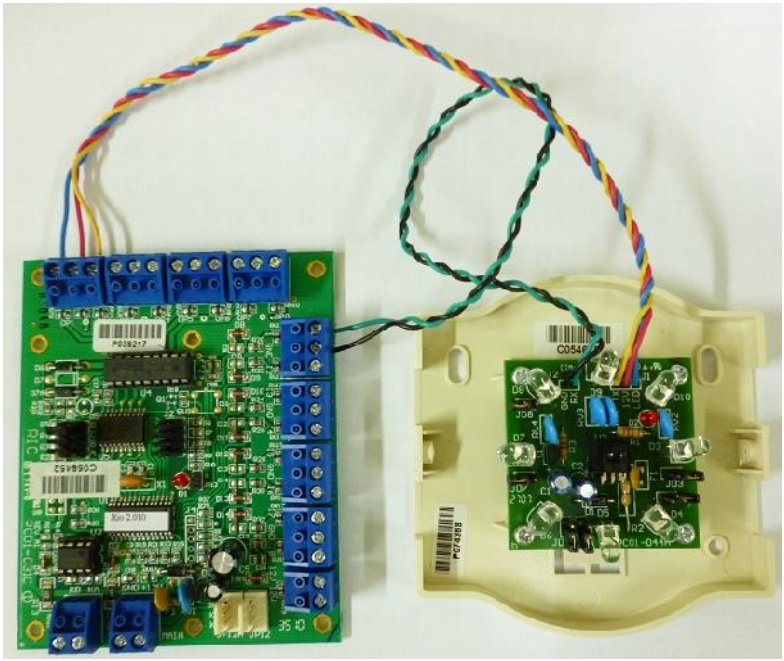
There are 5 colour-coded wires which are to be connected to the RIO.

- J2 - RX (GREEN) is connected to any RIO Input. This is the IR Receive signal.
- J2 - GND (BLACK) is connected to the Ground (0V) on the RIO.
- J1 - TX (YELLOW) is connected to an output on the RIO which is programmed to send IR signals
- J1 - 12V (RED) is connected to the 12V output of the RIO
- J1 - LED (BLUE) is connected to the RIO output corresponding to the RIO input which is receiving the IR signal (from J2 - RCS). For example if J2 - RCS is connected to RIO Input 1, J1 - LED should be connected to RIO output 1. This signal is connected to the red LED (D2) which lights up when a valid Comfort IR signal is received by the IR receiver. This is visible through the dark IR lens, and is useful as an indication.

The 5 wires should be connected by twisted pairs to the RIO. The following signals should be twisted together (Rx and GND), (TX and 12V), with J1 - LED being the odd one out which can be twisted with a spare wire.

Hence each IRD01 is connected to 1 input and 2 outputs of an RIO01. This means that an RIO01 can support 4 IRD01s (4 inputs, 8 outputs)

with 4 inputs free. If the LED indicator on the IRD01 is not required or connected (RIO shunts must be set accordingly), then each RIO01 can support 8 IRD01. However, it is recommended that the LED indication on the IRD01 be used since it gives positive confirmation to the user that the IR signal was actually received.



The photo above shows a typical connection between an IRD01 and RIP Inputs/Outputs 1 and 2

IR Transmitters

D3 to D10 are the 8 IR transmitter LEDs arranged 360 degrees around the Dome pointing outwards and downwards. The angle of the LEDs can be adjusted slightly if needed to achieve a better angle to the IR receiver of the appliance to be controller. Shunts D3 to D8 can be used to short out or disable the IR Transmitters D3 to D8 if some of the IR Transmitters are not needed, and to increase the current to the remaining IR Transmitters so as to boost the IR signal.

RIO Shunt Settings (J2) for IRD

J2- P: any position

J2- Q: Open - the outputs will blink once when a valid IR signal (Comfort or X10 code) is received at the corresponding input. The

corresponding output should be connected to the LED signal at the IR Dome

J2- R: Closed

J2- S: Not in use, should be closed.

IR Dome Location Constraints

The IR dome should be mounted in a location which does not have a direct exposure to sunlight, which can interfere with the IR signal reception. In a room where the sun shines directly through the windows, mount the IR Dome in the part of the room away from the source of sunlight. The IR reception in such a location can be improved by closing the curtains

Fluorescent lights are also a source of IR interference. Mount the IR Dome at least 1.5 meters away from fluorescent lights, especially energy saving types which emit more in the infrared range.

Take note that the IRD01 transmits the same IR code through all its 8 IR transmitters. If there are more than 1 appliance in the same room which uses the same IR codes, both will be controlled at the same time. For example if there are two air-conditioners or two TV sets of the same model in the same room, they would be controlled at the same time,

Technical Specifications

Current when Idle:	< 1 mA
Current when transmitting	approximately 500 mA (burst)
Transmission angle for each LED	+/- 45 degrees
Transmission distance	4 meters at +/- 45 degrees
Receiving angle	+/- 45 degrees
Receiving Distance	5 meters with RC01

RIO Firmware History

Version 2.009 (25 April 2011) - Removed Warm Reset. All resets are cold resets now (i.e.. ID is read and all outputs are reset to off). No need to disconnect power when ID is changed, just press Reset button on RIO.

Version 2.008 (17 June 2010) - Support Unknown command (21H)

Version 2.007 (18 December 2007) - Resolved the problem that "When shunt R at J2 is in open position, shorting any input won't make its corresponding output (connected to test bulb) to flash continuously" as it should in normal operation.

2.006 (Dec 2007) Supports Pulse Output action. Previous versions do not support Pulse Outputs

2.004 (March 2007) CBUS2 IR Codes supported, mapped in IR Receive codes 0-31. Adjusted IR Receive algorithm to match new IR Receiver characteristic.

2.002 (May 2005) Fixed Bug in previous versions where noise on an input may cause the RIO to lock up until the input is triggered again

2.001 (June 2004) Fixed IR Transmission can transmit IR 0 to 255. Fixed bug could only transmit 0-15

2.000 (Dec 2003) - Upgraded processor. Transmit IR 0 to 15 only. IR Transmit buffer increased from 64 to 96

Manual History

1.1.5 (21 July 2013) corrected photo of IRD connection page 21

1.1.4 (22 January 2012) Changed to use Comfigurator 3. Changed picture of IRD with correct colour coded wires and added description of JD3 to JD7 shunts. Add Photo of RIO and IRD011 connections. Added Firmware history 2.007 to 2.009.

1.1.3 (29 Nov 2010): Added Note about using separate CAT5 Cables for IR Transmitters

1.1.2 (25 June 2009) : Combined current limitation for 8 output sis 300 ma instead of 500 mA.
1.1.1 (25 Dec 2008) Removed reference to RRM01 module for J5 connection. Output Terminal Blocks re-labelled COM to o
1.0.9 (6 June 2008 - Action 130 works for RIO firmware 2.0.6. Cbus IR codes can be recognised. Removed Location tables, refer to Program Worksheet. Added number of IR transmit codes
1.0.7 (9 Sept 2006) - Added locations for FS24 and FS34
1.0.6 (2 July 2004) - added IR Dome

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