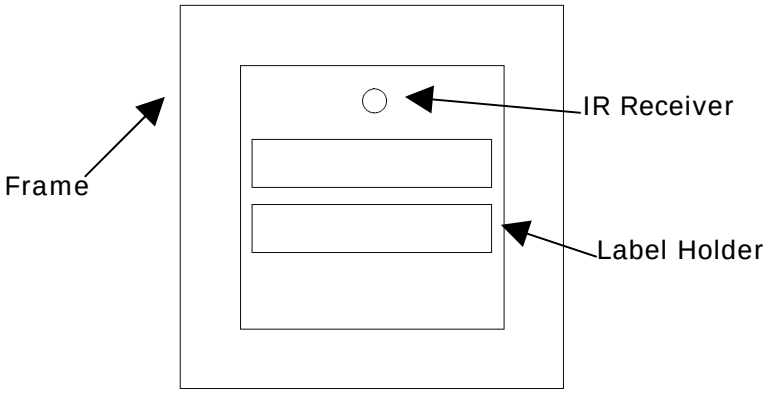
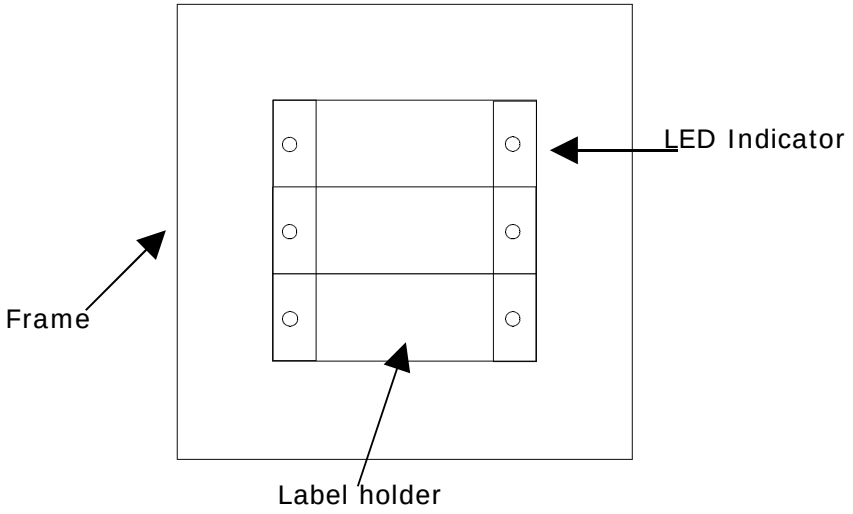
Comfort, the Intelligent Home System

Comfort Scene Control Switch

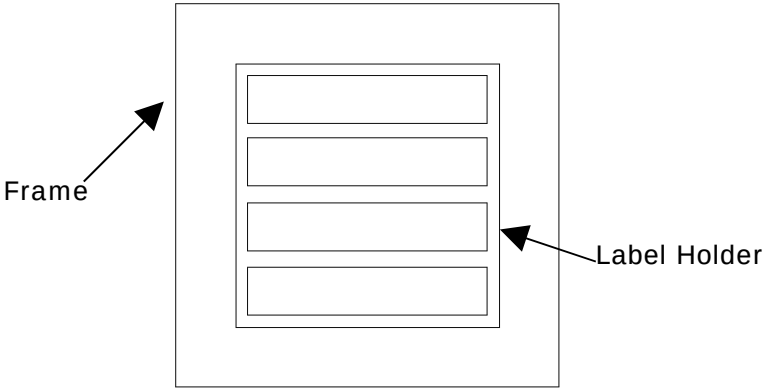
Introduction



SCS04 (with IR Receiver shown)



SCS06 (6 buttons)



SCS08 (8 buttons)

This manual refers to the new series Scene Control Switch models SCS04, SCS06, SCS06, which replace the older SCS01 models

The Comfort Scene Control Switch is a multipurpose switch with 4/6/8 buttons, each with its own LED indicator. They consist of a central switch panel and a frame, each of which is available in several styles and colours. Dual-gang and triple gang frames are available, providing up to a maximum of 24 buttons (using 8 buttons SCS). A matching range of conventional electrical and light switches are also available.

Each button activates a Comfort Response which can send X-10 signals through the power line, or infrared signals to home entertainment equipment and air-conditioners, activate comfort outputs in pulsed or latched modes, dim external lighting systems or perform any combination of functions programmable in Comfort, for example, arm the security system into Night mode and turn off the downstairs lights, close the garage door and turn on external lights.

The SCS04/IR model has an infrared receiver is able to receive any of 128 Comfort IR codes to activate any Response, similar to a KP03/04, or any X-10 Infrared signal from a handheld remote control like the Philips Pronto®. This is only available as an option for the 4 buttons SCS.

The corresponding LED indicator can be programmed to indicate status of an appliance, light or scene.

The SCS includes temperature sensors to measure the surrounding temperature Note that older SCS01 models do not have temperature sensors.

Scene Control Switches consist of two parts which are ordered separately – a Scene Control Switch panel with 4, 6, or 8 buttons and LEDs; and a Frame

Specifications

- Dimensions: 80L x 80W x 30D mm (standard UK wall switch).
- Current consumption: 12V @ 25 mA max, 15 mA typical with all LEDs off.
- Power Supply: 12V @ 500 mA if full output current of 500mA for 8 channels is to be used.
- Comfort IR codes received: 0 to 127
- UR24 X10 IR signals: Housecodes A to P, Unit Codes 1 to 16.

Equipment

The following equipment is required

- Comfort system with firmware version "Outside or Action 4.226" or ULTRA 5.xxx and above. **Comfort ENTRY, ENTRY II, and OPTIMUM systems cannot be used with the SCS.**
- Comfort ULTRA 5.074 and above is needed for temperature sensing.

Part Numbers

- SCS04-WH – Scene Control Switch Panel, 4 way, White
- SCS04-AL – Scene Control Switch Panel, 4 way, Aluminium
- SCS04-AN – Scene Control Switch Panel, 4 way, Anthracite
- SCS04/IR-WH (*) – Scene Control Switch Panel, 4 way, White
- SCS04/IR-AL (*) – Scene Control Switch Panel, 4 way, Aluminium
- SCS04/IR-AN (*) – Scene Control Switch Panel, 4 way, Anthracite
- SCS08-WH – Scene Control Switch Panel, 8 way, White
- SCS08-AL – Scene Control Switch Panel, 8 way, Aluminium
- SCS08-AN – Scene Control Switch Panel, 8 way, Anthracite
- SCS06-ES – Scene Control Switch Panel, 6 way, Eesprit
- FR1-EV-AL – Frame single gang, Event Aluminium
- FR1-EV-AN – Frame single gang, Event Anthracite
- FR1-EV-WH – Frame single gang, Event White
- FR1-E2-AL – Frame single gang, E2 Aluminium
- FR1-E2-AN – Frame single gang, E2 Anthracite

- FR1-STD-WH – Frame single gang, Standard White

* nonstandard items – longer lead time applies

Identifying the SCS Version

The SCS Firmware version can be identified by opening up the case of the SCS' switch block. There, a label indicating the firmware version, e.g. 2.0.1 should be seen.

Contents

The SCS04/SCS06/SCS08 switch panel consists of the following*:

- Switch Block
- Label Holders
- Back Plate for mounting
- Switch Adapter PCB
- Back Box
- SCS Manual (this booklet)
- 2 x 2 way removable terminal blocks

*Subject to change without prior notice

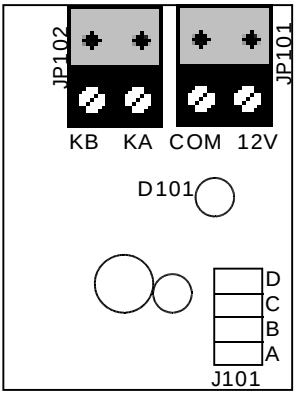
One of the Frames must be used with a SCS panel (ordered separately)

Assembly

The SCS should be installed in an indoor location.

1. Screw the metal back plate to the back box via the mounting holes using flush M3 screws (not supplied).
2. Position the frame onto the metal back plate so that it fits against the 4 stoppers on the metal back plate.
3. Plug in the Switch adapter board to the switch block via the 10 way connector (JP103). Terminate the 4 wires KA, KB, 12V, and COM from inside the back box to the JP101 and JP102 terminal blocks.
4. Insert the label holders with the labels onto the slots in the front of the switch block.
5. Snap in the switch block with the switch adapter board through the metal back plate with the 4 metal tongues on back of the switch block going through the 4 slots. This will also hold the frame in place.

Settings



SCS Switch Adaptor

Connections

- JP101 – 12V/COM connector. Connected to 12V/COM on Comfort.
- JP102 – KA/KB connector. Connected to KA/KB on Comfort. Twisted pair wire recommended.
- JP103 – 10 way connector. Used to connect the switch block to switch adaptor.

Jumper Settings

- J101 – set according to the ID of the SCS (see “SCS ID Switch” settings).

LED Indicators

- D1 (Red) - The LED on the switch adapter PCB is normally off. It will blink once when one of the buttons is pressed, or when a valid IR code is received by the built-in IR receiver, and after reset. The LED will flash continuously when communication with Comfort is lost for 20 seconds.
- Button indicators - The 4-8 LED indicators associated with the buttons are controlled by the Comfort program. They can be programmed to indicate status of a scene or individual light or equipment, or the state of the security system (armed). The LED automatically starts flashing when a button is pressed. This continues until the LED output state is changed by Comfort, i.e. either turned on or off. If there is no command from Comfort to the LED, it will continue to flash, providing an indication of loss of communication or trouble condition.

SCS ID Switch

Comfort is able to support up to 8 SCS and RIOs (with PRO and ULTRA) or 15 SCS and RIOs (with ULTRA II) in any combination. J101 is a set of 4 headers which is used to determine the ID, in accordance to the table as follow:

ID	J101-A	J101-B	J101-C	J101-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

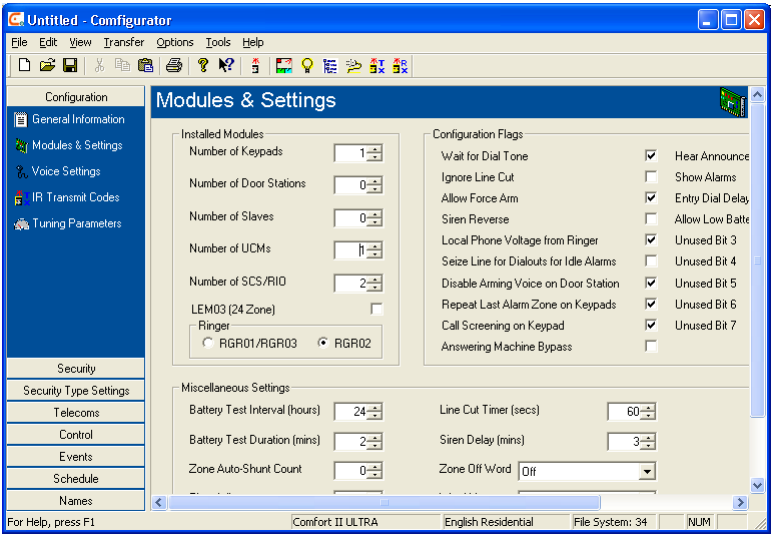
In the Comfigurator software, the number of SCS/RIOs must be set to equal the maximum (ID) number of SCS and RIOs in the system. **Note that Comfigurator 2.1.2 and above is needed to define 9 to 15 SCS/RIOs in the system.**

The SCS and RIOs share the same ID space. Do not set SCS and RIOs with the same IDs as this clash of IDs will result in communication failure.

After changing the ID of the SCS, remember to reset the SCS by unplugging and plugging the 12V/COM terminal block.

After setting the IDs of the various SCS and RIOs in the system, the total number of SCS/RIOs must be set in the system.

To do this, set the number of SCS/RIOs in Comfigurator to the correct number. This can be found under “Configuration”->”Modules and Settings”->”Number of SCS/RIO”.



Alternatively, the number of SCS/RIOs may be set using the keypad. To do so, login to Engineer Menu 7, 4, 1 and set **location 1676** to the number of SCS/RIOs.

The system must be reset in both cases for the changes to take effect

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

When communications with Comfort is lost, the SCS’ onboard red D101 LED will be flashing continuously until communications is restored.

SCS Input/Output Numbering

SCS 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 SCS Input and Output numbering.

ID	4-way	6-way	8-way
1	129-132	129-134	129-136
2	137-140	137-142	137-144
3	145-148	145-150	145-152
4	153-156	153-158	153-160
5	161-164	161-166	161-168
6	169-172	169-174	169-174
7	177-180	177-182	177-184
8	185-188	185-190	185-192
9	193-196	193-198	193-198
10	201-204	201-206	201-208
11	209-212	209-214	209-216
12	217-220	217-222	217-224
13	225-228	225-230	225-232
14	233-236	233-238	233-240
15	241-244	241-246	241-248

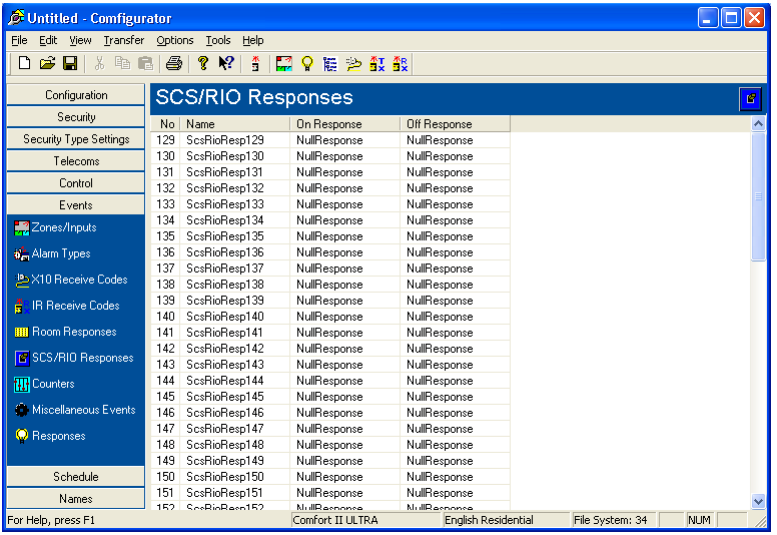
Note that the model of the SCS does not affect the base address of the inputs and outputs of that particular, rather it is dependent on the SCS' ID, e.g. a SCS assigned to ID 10 will always have its inputs and outputs starting from 201, regardless of whether it is SCS04, SCS06 or SCS08.

SCS Button Responses

Pressing one of the buttons on the SCS causes a Response in Comfort to be activated. Buttons can be programmed to turn on individual lights or appliances, or to activate Scenes (combination of behaviours). The corresponding outputs can be connected to a LED as indication of the scene or appliance status.

SCS Responses can easily be programmed using Comfigurator. Select Events -> SCS/RIO Responses. SCS and RIO (Remote Input/Output) will activate these Responses.

The following screen will show SCS/RIO numbers from 129 onwards



For SCS versions **prior to 2.0.1** (refer to "Identifying the SCS Version"), only ON Responses are available for SCS buttons when the buttons are pressed. Off Responses are not applicable, i.e. when the SCS button is released, it does not activate an Off Response. Off Responses are only applicable for RIO inputs.

SCS Responses can also be programmed using the Locations Menu (Engineer Menu 7, 4, 1). Refer to Table 36B in the respective Worksheet for File System 18 (Pro) or 24 (Ultra) or 34 (Ultra II).

For SCS versions 2.0.1 and later, both ON and OFF Responses are available for SCS buttons, i.e. the ON Response is triggered when the button is pressed and the OFF Response is activated when the button is released. Similarly, the SCS Responses may be programmed via locations as in above.

As with RIO inputs, SCS 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.

SCS LED Indicator Programming

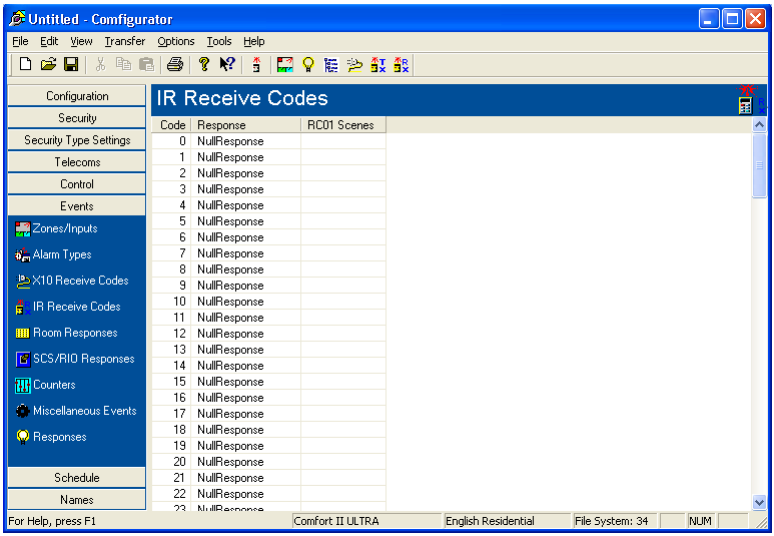
Each of the SCS has LED indicators, which may be used to display status of a particular device, to indicate a scene is active, etc. Controlling the LED indicator is similar to that of controlling the Outputs on Comfort regular outputs. **However, pulsing an output will not work on the SCS, unlike that on regular outputs.**

Infrared Receiver

On the SCS/IR, an Infrared Receiver on the switch can receive Comfort Infrared Codes or X10 IR codes (from the UR24). When a valid IR signal is received, the LED indicator on button 1 flashes once, as well the D1 on the back of the Switch adapter board.

Comfort IR Codes

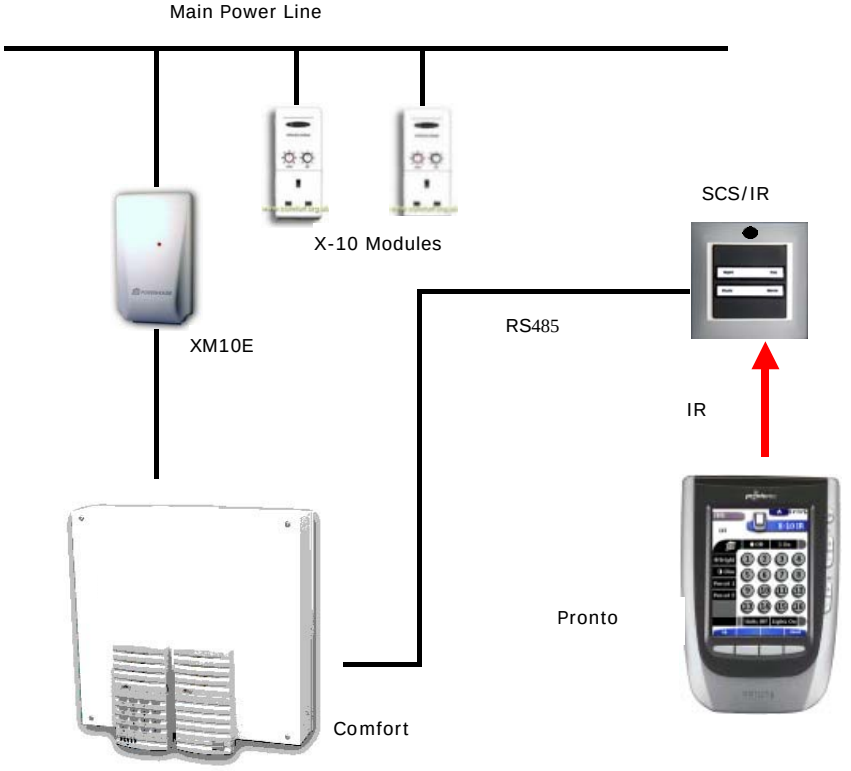
SCS/IR just like the KP03/KP04 IR keypad will recognise a set of 128 Comfort IR codes, numbered 0 to 127. Each of these IR codes can trigger a response to be activated. In Comfigurator, go to Events > IR Receive Codes. For each IR code number a Response can be selected for activation when the IR code is received.



The IR Responses can also be programmed in the Locations Menu (Engineer Menu 7, 4, 1). Refer to Table 36A in the relevant Worksheet for File System 18 (Pro), 24 (Ultra), or 34 (Ultra II).

X-10 IR Codes

The SCS/IR Infrared input can also receive IR Codes from the X10 RF/IR remote control UR24 or from a Philips Pronto programmed with the X10 IR codes. The SCS/IR 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.



Cold Start / Warm Start Behaviour

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

After a Cold Start, all Outputs will be reset to 0V, or the off state. After a Warm Start the outputs remain in their previous state.

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

After a Warm or Cold Start, 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.

Temperature Sensing

On the SCS, there is an onboard temperature sensor. This temperature allows the surrounding ambient temperature to be measured. The ambient temperature is then stored in sensor registries.

Sensor Registers

There are a total of 31 sensor registers. These are described as follows:

Sensor Register	Device
0	Keypad 1*
1	Keypad 2*
2	Keypad 3*
3	Keypad 4*
4	Keypad 5*
5	Keypad 6*
6	Keypad 7*
7	Keypad 8*
8	SCS 1
9	SCS 2
10	SCS 3
11	SCS 4
12	SCS 5
13	SCS 6
14	SCS 7
15	SCS 8
16	SCS 9
17	SCS 10
18	SCS 11
19	SCS 12
20	SCS 13
21	SCS 14
22	SCS 15
23-31	Future Expansion*

* not implemented

These sensor registers will ONLY work with ULTRA 5.074 and above.

The temperature will be stored in the temperature registers in the Fahrenheit temperature scale and will take values from 0˚F to 255˚F. A simple formula is shown below to convert a temperature from ˚F to ˚C:

$$C = \frac{5}{9}(F - 32)$$

Where C is the temperature in ˚C and F is the temperature in ˚F.

Likewise, to do the reverse (from ˚C to ˚F), simply use the formula:

$$F = \frac{9}{5}C + 32$$

Sensor Response

For ULTRA II (5.074 and above), there are locations for Sensor Responses to be defined. These are defined as follow for the SCS:

Sensor Register	Device	Response Location 1	Response Location 2
8	SCS 1	1868	1869
9	SCS 2	1870	1871
10	SCS 3	1872	1873
11	SCS 4	1874	1875
12	SCS 5	1876	1877
13	SCS 6	1878	1879
14	SCS 7	1880	1881
15	SCS 8	1882	1883
16	SCS 9	1884	1885
17	SCS 10	1886	1887
18	SCS 11	1888	1889
19	SCS 12	1890	1891
20	SCS 13	1892	1893
21	SCS 14	1894	1895
22	SCS 15	1896	1897

Upon a change in register value, the Response defined in the Sensor Register is triggered. This response can be used to beam out various IR signals to change the set-points of air-conditioners or other devices.

Program the desired responses either with the keypad (see “Engineer Menu Programming”) or Comfigurator (see “Programming with Comfigurator”). **Note: Comfigurator 2.1.2 does not support Sensor Responses. This will be supported in a future version.**

Enter Engineer Menu via the keypad and assign the responses in the locations as seen above. Note that two locations need to be programmed, e.g. for Register 8, locations 1868 and 1869. If the response number is less than 256 (e.g. response 10), then assign the response number to location 1868 and 0 to location 1869. If the response number is 256 or greater, then divide the number by 256 to get the quotient and remainder. The quotient should go to the larger location and the remainder in the smaller location, e.g. assigning response 300 to User 4, dividing 300 by 256 would give a

quotient of 1 and remainder of 44; thus location 1868 will take a value of 44 and 1869 will take value 1.

Sensor Register Feedback

In the Home Control Menu, sensor registers may be used as a feedback. To do so, the feedback type must be set to type 7 (which is sensor register) and the feedback value set to the register number. **Note: Comfigurator 2.1.2 does not support the choice of Sensor Register Feedback. This will be supported in a future version.**

The temperature may also be announced in either ˚F or ˚C. The default setting is in ˚C. To change the settings to ˚F, the total value of location 39 (as shown in the "Comfort II Ultra Program Worksheet (FS34)") must add an additional value of 1. This is to be done via the Location Menu in the Engineer Menu on the keypad.

Flag Setting Location 39	Location	Add Value
Fahrenheit Scale announcement	39	1

Note: Changing the value of location 39 only changes the announcement made by the keypads and does not change the value of the registers.

Get Sensor Register Action

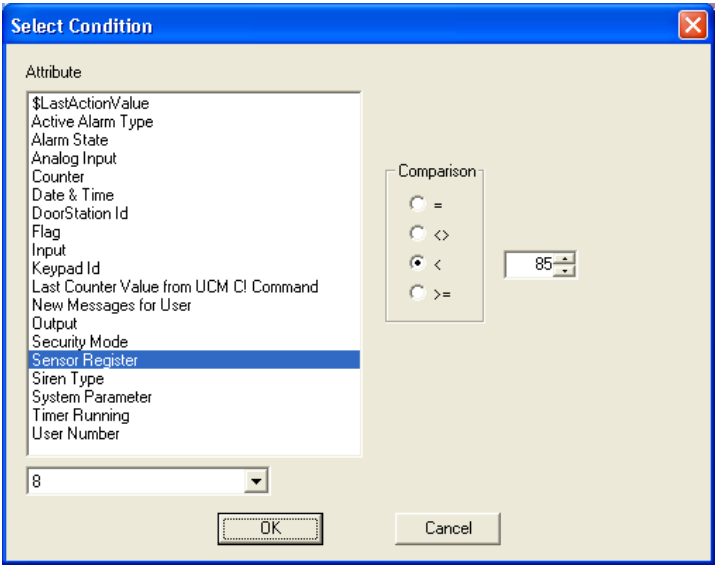
Action 116 is used to get value of the sensor register. Action 116 works in the following manner:

116, register#

Where register# is the sensor register number. For example,

116, 8, 69, 85, 128, 1, 1, 255

This would get the register value of Register 8 (SCS 1) and, if the value is less than 85˚F, output 1 will be turned on.



This may also be done using Comfigurator 2.1.2 and above. To do so, under the "IF" tab, there is an option to select "Sensor Register" and to fill in the value to be compared. For instance, the same action code may be generated using:

```
If SensorRegister 8 < 85 Then
    Output Output01 On
End If
```

This may then be assigned to the sensor responses to trigger when the temperature falls beyond or exceeds a certain value.

Sample Program

A sample program scsdemo.ccl for Comfigurator is supplied which shows the basic programming required. This works with the following setup;

- SCS Scene Control Switch (only 1st 4 buttons will work with this sample)
- Comfort with firmware Outside 4.160 or above, connected with 4 12V lamps connected to outputs 1 to 4
- Optional: X10 two-way interface XM10E and X10 modules with addresses A1 to A3

Operation

Press the Scene Control Switches 1 to 3 to control the lamps on outputs 1 to 3, as well as X10 addresses A1 to A3 respectively. Each press of the switch alternately switches on and off its own led indicator, as well as the respective output and the X10 address (if it is connected). Switch 4 is a Master control switch which controls all 3 outputs and X10 addresses. When any light is switched on, Switch 4 LED will turn on. When all lights are off, switch 4 led will turn off.

The Home Control menu is programmed to control the 3 switches in the same way.

Example - Comfort Programming

The Comfigurator file, scsdemo.ccl (supplied with Comfigurator) contains the following program.

Control Menu Table

Key	Description			Action Key	Action Words	Resp	Comments
				(0 to *)	Description	0-255	
0	All Lights			0	Off	245	All Off
				1	On	247	All On
	Feedback Type	6624	0				
	Feedback Value	4798					
1	Light 1			0	Off	225	Switch 1, O/P 1, A1 Off
				1	On	223	Switch 1, O/P 1, A1 On
	Feedback Type	6625	3				
	Feedback Value	4799	129				
2	Light 2			0	Off	229	Switch 2, O/P 2, A2 Off
				1	On	227	Switch 2, O/P 2, A2 On
	Feedback Type	6626	3				
	Feedback Value	4800	130				
3	Light 3			0	Off	233	Switch 3, O/P 3, A3 Off
				1	On	231	Switch 3, O/P 3, A3 On
	Feedback Type	6627	3				
	Feedback Value	4801	131				

SCS Responses

ID	**1**	
Input	**SCS Response Location**	
	ON - Closed (0V)	
1	6,276	237
2	6,278	239
3	6,280	241
4	6,282	243

When one of the buttons on the Scene Control Switch is pressed, the corresponding Switch Response is activated. There is an Off Response for each switch button, but this is not used for in this case.

Responses

No	Description	Action Codes					
		1	2	3	4	5	6
1	Output 1 ON	128	1	1	255		
2	Output 1 OFF	128	1	0	255		
3	Output 2 ON	128	2	1	255		
4	Output 2 OFF	128	2	0	255		
5	Output 3 ON	128	3	1	255		
6	Output 3 OFF	128	3	0	255		
7	Output 4 ON	128	4	1	255		
8	Output 4 OFF	128	4	0	255		
33	X10 A1 ON	195	65	1	5	255	
34	X10 A1 OFF	195	65	1	7	255	
35	X10 A2 ON	195	65	2	5	255	
36	X10 A2 OFF	195	65	2	7	255	
37	X10 A3 ON	195	65	3	5	255	
38	X10 A3 OFF	195	65	3	7	255	
128	Output 129 ON	128	129	1	255		
129	Output 129 OFF	128	129	0	255		
130	Output 130 ON	128	130	1	255		
131	Output 130 OFF	128	130	0	255		
132	Output 131 ON	128	131	1	255		
133	Output 131 OFF	128	131	0	255		
134	Output 132 ON	128	132	1	255		
135	Output 132 OFF	128	132	0	255		
136	Check Master Off	77	129	16	77	130	16
137		77	131	16	74	135	255
138	Delay & Check Master Off	194	1	0	2	136	255
223	Switch 1 On (O/P 1, O/P 129, X10 A1 On)	71	1	74	33	74	128
224		74	134	255			
225	Switch 1 Off (O/P 1, O/P 129, X10 A1 Off)	71	2	74	34	74	129
226		74	138	255			
227	Switch 2 On (O/P 1, O/P 129, X10 A1 On)	71	3	74	35	74	130
228		74	134	255			
229	Switch 2 Off (O/P 1, O/P 129, X10 A1 Off)	71	4	74	36	74	131
230		74	138	255			
231	Switch 3 On (O/P 1, O/P 129, X10 A1 On)	71	5	74	37	74	132
232		74	134	255			
233	Switch 3 Off (O/P 1, O/P 129, X10 A1 Off)	71	6	74	38	74	133
234		74	138	255			
237	Switch 1 Response (if O/P 129 off, switch 1 On, else Switch 1 off)	77	129	16	74	223	193
238		74	225	255			
239	Switch 2 Response (if O/P 130 off, switch 2 On, else Switch 2 off)	77	130	16	74	227	193
240		74	229	255			
241	Switch 3 Response (if O/P 131 off, switch 3 On, else Switch 3 off)	77	131	16	74	231	193
242		74	233	255			
243	Switch 4 Response (if O/P 132 off, All On, else All off)	77	132	16	74	247	193

No	Description	Action Codes					
		1	2	3	4	5	6
244		74	245	255			
245	All Off (Switch 1, Switch 2, Switch 3. O/P 132 Off)	74	225	74	229	74	233
246		74	135				
247	All On (Switch 1, Switch 2, Switch 3. O/P 132 On)	74	223	74	227	74	231
248		74	134				

The SCS Responses check the state of the corresponding Output led to determine if it is on or off, and then either turns it off or on, so that each time the button is pressed, the controlled outputs and X10 will change state.

Each SCS button controls its own Output LED, as well as Output 1 to 3, and X10 addresses A1 to A3. This example shows how the Scene Control Switch can be programmed.

Control Menu

Control keys 1 to 3 (“Light 1” to “Light 3”) are used to control Switches 1 to 3, outputs 1 to 3 and X-10 addresses A1 to A3 respectively. Control Key 0 is for “All Lights” and controls all lights, just like Switches.

The real time status of each light is announced in the control menu, e.g.

“Light 1 is ON..., press 0 for off, 1 for On”

“Light 3 is on, press 0 for...”

For this feedback in this example, the Output Feedback Type (Type 3) is used, which monitors the state of an output. Outputs 129 to 131 correspond to Switch outputs 1 to 3 respectively

Version History

Note: This manual is subject to changes without notice. Always check for the latest version in
www.cytech.biz/manuals.html

2.0.6 (5 March 2008): correction : SCS 2.01 and later have On and Off Responses

2.0.3 (6 March 2007): SCS included 6 and 8 gangs; SCS included temperature sensor; ON and OFF Responses both supported

1.0.4 (17 September 2002): Initial Release.

Document Title:	Comfort Scene Control Switch
SCS Version:	2.0.4
Filename	SCSman.doc
Date Last Modified:	16 Apri
Comfort Version:	Ultra/Outside 4.226. Ultra 5.074 required for Temp sensing