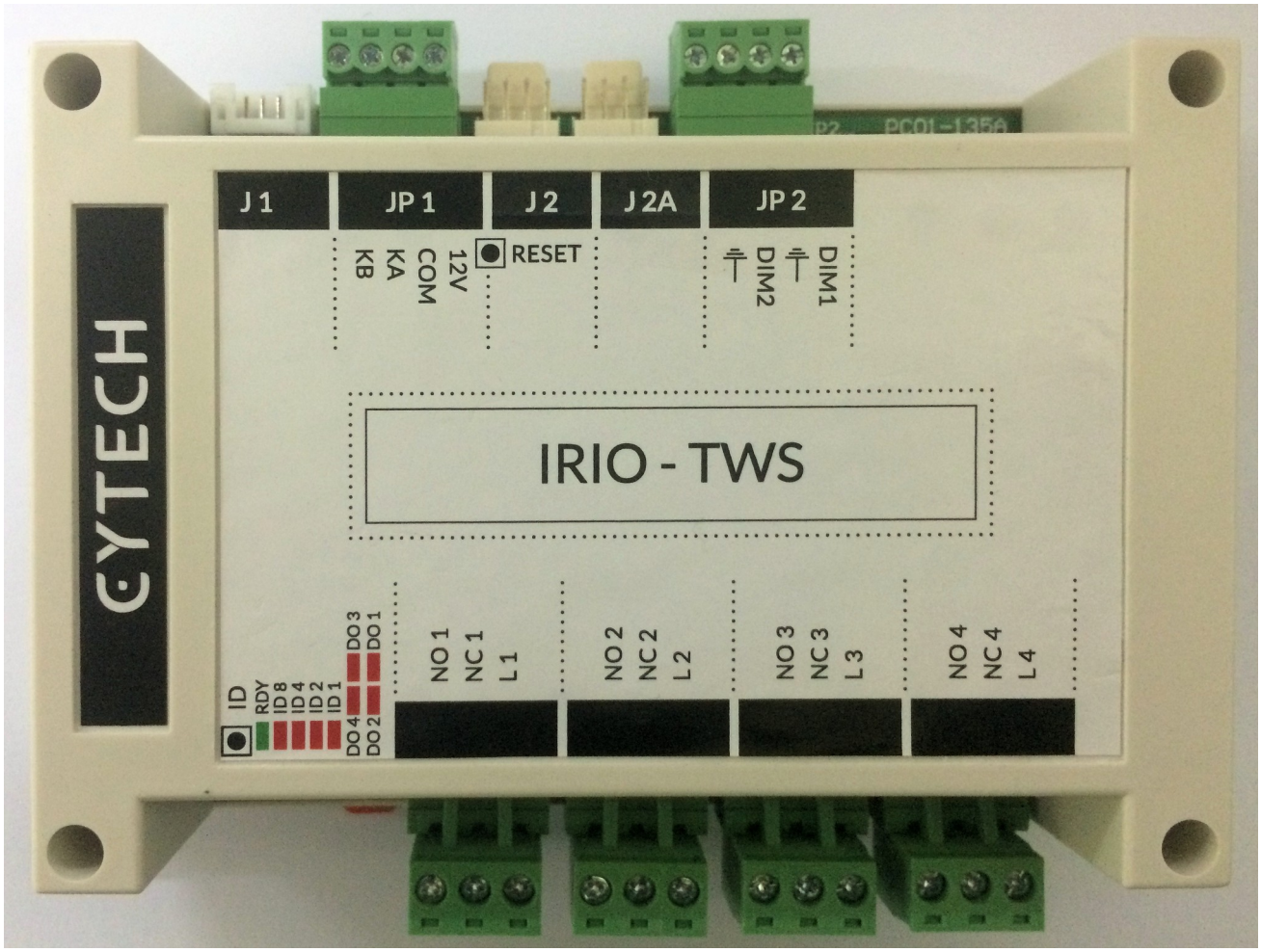
IRIO-TWS



IRIO-TWS has 4 ON/OFF lighting control circuits for on/off lighting control using Two Way Switches and 2 x 0-10V outputs for dimming. Each Lighting circuit consist of a Latching Relay to switch the light on/off and an internal Current Sensor to sense the state of the light when connected to a two way switch. Latching Relays remain at the last Open/Close state without requiring current in the relay coil, and saves energy.
The advantage of this method of control is the ability of the mechanical two way switch to control the light even if the Comfort or IRIO is not working, as conventional Electrical/switch wiring is used.
The sensitivity of the current sensor can be set to High Sensitivity (for energy efficient lights like LED bulbs) or Low sensitivity for incandescent or halogen bulbs) in order to cater for all typwes of lights.

Current Switching Specifications

Each TWS Submodule has 2 Latching Relays

Relay Arrangement	1 Form C
Breakdown Voltage (Contact – Coil)	4400VAC 1 min
Switching Capacity	277VAC, 6A
Mechanical Life	3 milllion cycles
Electrical Life	50,000 cycles
Coil Current	33 mA when switching state. 0 when stable

Current Sensor Sensitivity

The Current sensor can be set to 2 sensitvity levels.

Sensitivity Level 0

Minimum Current detected 0.4 mA RMS = 1 count in Sensor Register
Maximum Current detected 100 mA RMS = 255 counts in Sensor Register

Current > 100 mA will be limited to 255 Counts in Sensor Register

Sensitivity Level 1

Minimum Current detected 1.7 mA RMS = 1 count in Sensor Register
Maximum Current detected 430 mA RMS = 255 counts in Sensor Register

Current > 430 mA will be limited to 255 Counts in Sensor Register

ID Settings

Up to 15 IRIOs which may include IRIO TWS and IRIO-BLIND may be installled in a system. The ID of the IRIO can be seen via the state of LEDs ID1, ID2, ID4, ID8 according to the table below. For Default ID=1, ID1 is on, others are off.
To change the ID, press and Hold the ID button for 4 seconds. Press and release to increment the ID to the next value 1 to 15. Release the button to end. The IRIO will automatically reset.
The ID LEDs shows the ID according to the table below. If there are more than 1 **IRIO or SCS** in the system, the Ids must be unique and consecutive, eg 1,2,3, etc. Otherwise the system will report "Communications Failure"

ID #	ID8	ID4	ID2	ID1	ID#	ID8	ID4	ID2	ID1
1	Off	Off	Off	On	9	On	Off	Off	On
2	Off	Off	On	Off	10	On	Off	On	Off
3	Off	Off	On	On	11	On	Off	On	On
4	Off	On	Off	Off	12	On	On	Off	Off
5	Off	On	Off	On	13	On	On	Off	On
6	Off	On	On	Off	14	On	On	On	Off
7	Off	On	On	On	15	On	On	On	On
8	On	Off	Off	Off					

Buttons

- RESET. This button between JP1 and J2 resets the IRIO. It does not change any other settings.

LED Indicators

- ID1, ID2, ID4, ID8: ID indicators
- DO1, DO2, DO3, DO4: These LEDs correspond to Relay Outputs 1 to 4 but they do not indicate that the corresponding Light is on or off because of the two way switch mechanism.

Connections

Warning: This work should be done by a qualified electrician. Refer to the label on IRIO-TWS

J1 – 5 way Header

Reserved – Do not connect

JP1 – 4 way Pluggable connector (Green)

12V/COM – Power Supply 12V from Controller (Comfort, LGX01, UCM/Log)
KA/KB – RS485 Bus from Controller (Comfort, LGX01, UCM/Log)

J2/J2A – 4 way header (White)

12V/COM/KA/KB – 4 way cable from Controller (Comfort, LGX01, UCM/Log). Use the white 4 way cable if the IRIO-TWS is mounted close to the Controller. This is an alternative connection point to JP1. JP2 and JP2A have the same xisgnals and can be used for Daisy chaining to other modules.

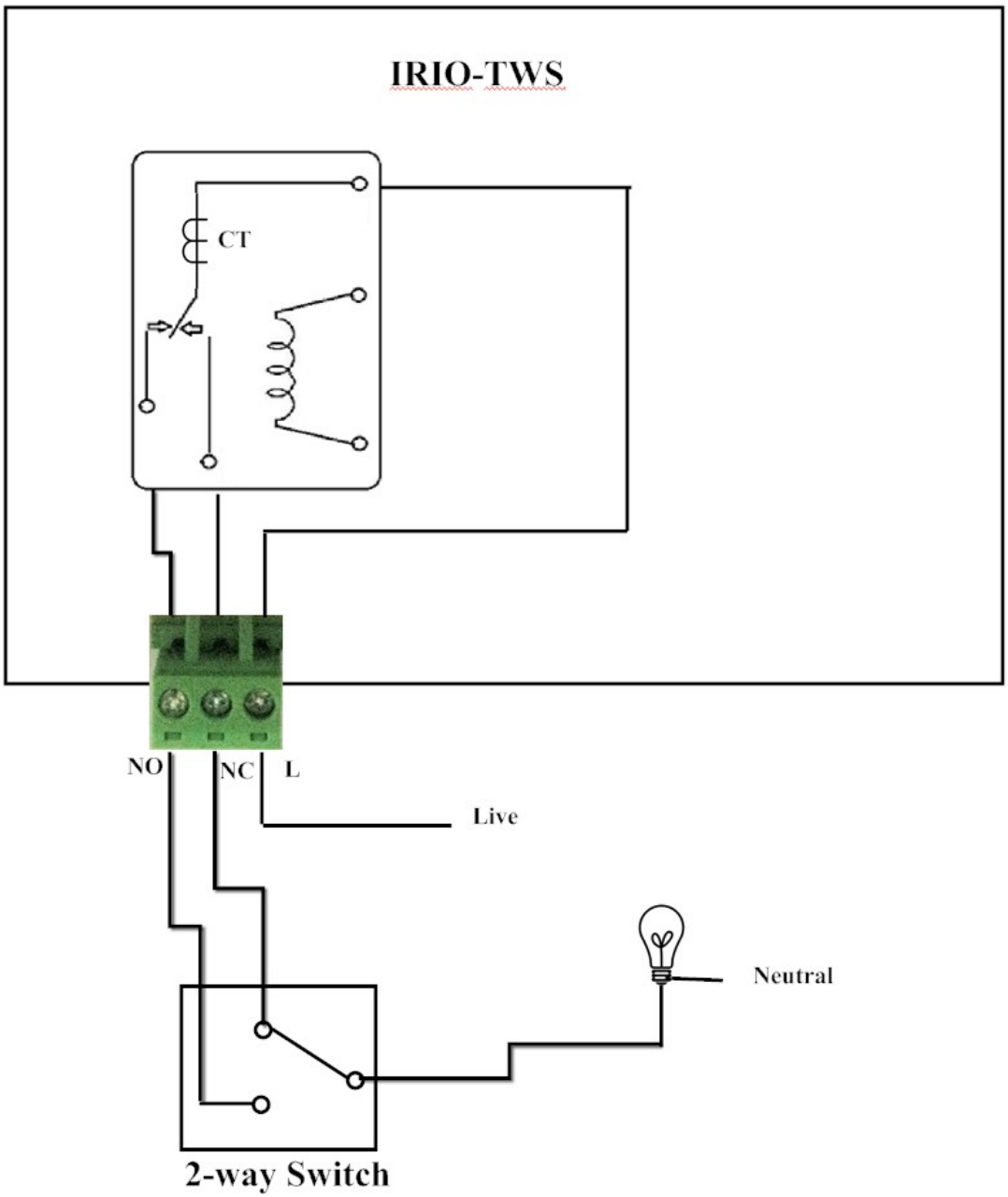
JP2 – 4 way Pluggable connector (Green)

Connections for 2 x 0-10V Outputs
DIM1/COM: 0-10V output 1
DIM2/COM: 0-10V output 2

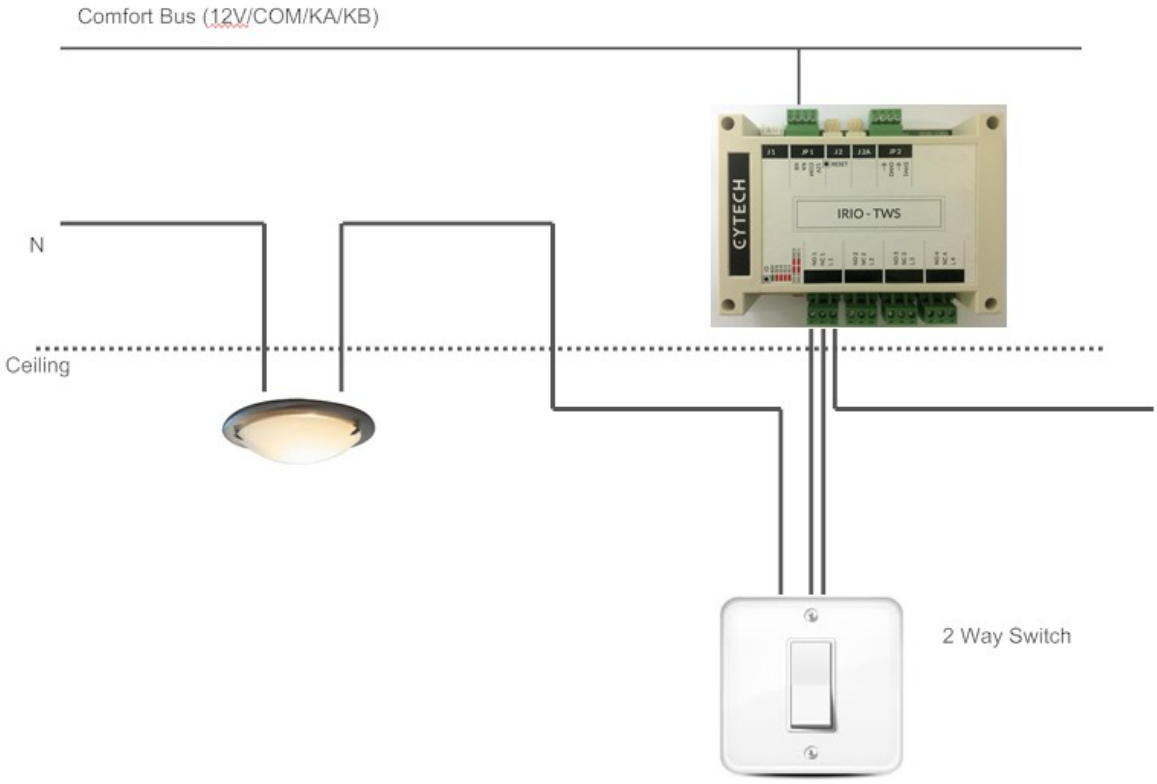
To Two Way Switch – 3 way 5 mm Pluggable connectors (Green)

NO1	To Two Way Switch L1
NC1	To Two Way Switch L2
L1	230VAC Live wire
NO2	To Two Way Switch 2
NC2	To Two Way Switch 2
L2	230VAC Live wire
NO3	To Two Way Switch 3
NC3	To Two Way Switch 3
L3	230VAC Live wire
NO4	To Two Way Switch 4
NC4	To Two Way Switch 4
L2	230VAC Live wire

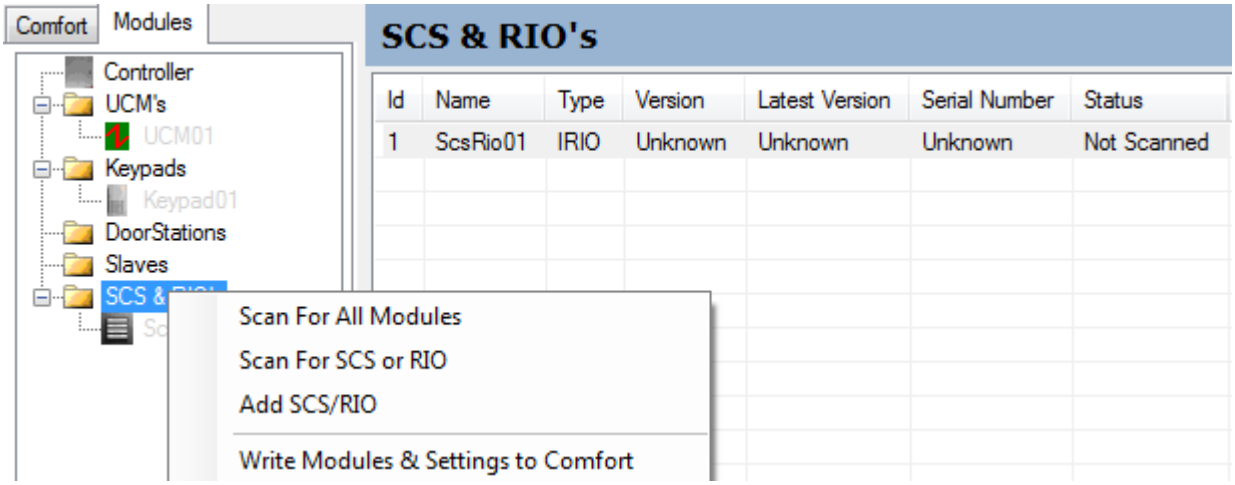
The Live wire will go through the built-in Current Sensor before terminating at the L1 (or L2) terminals of the TWS submodule.
The NO1 and NC1 (or NO2 and NC2 for 2nd circuit) wires should be connected to the Two Way Switch terminals as shown below



The diagram below shows how IRIO-TWS can be mounted in the ceiling and connected to the Two Way Switch. The IRIO TWS is connected to the Controller (CM9000, UCM/LOG or LGX01) by the Comfort Bus (cat 5 cable)



Comfigurator Programming



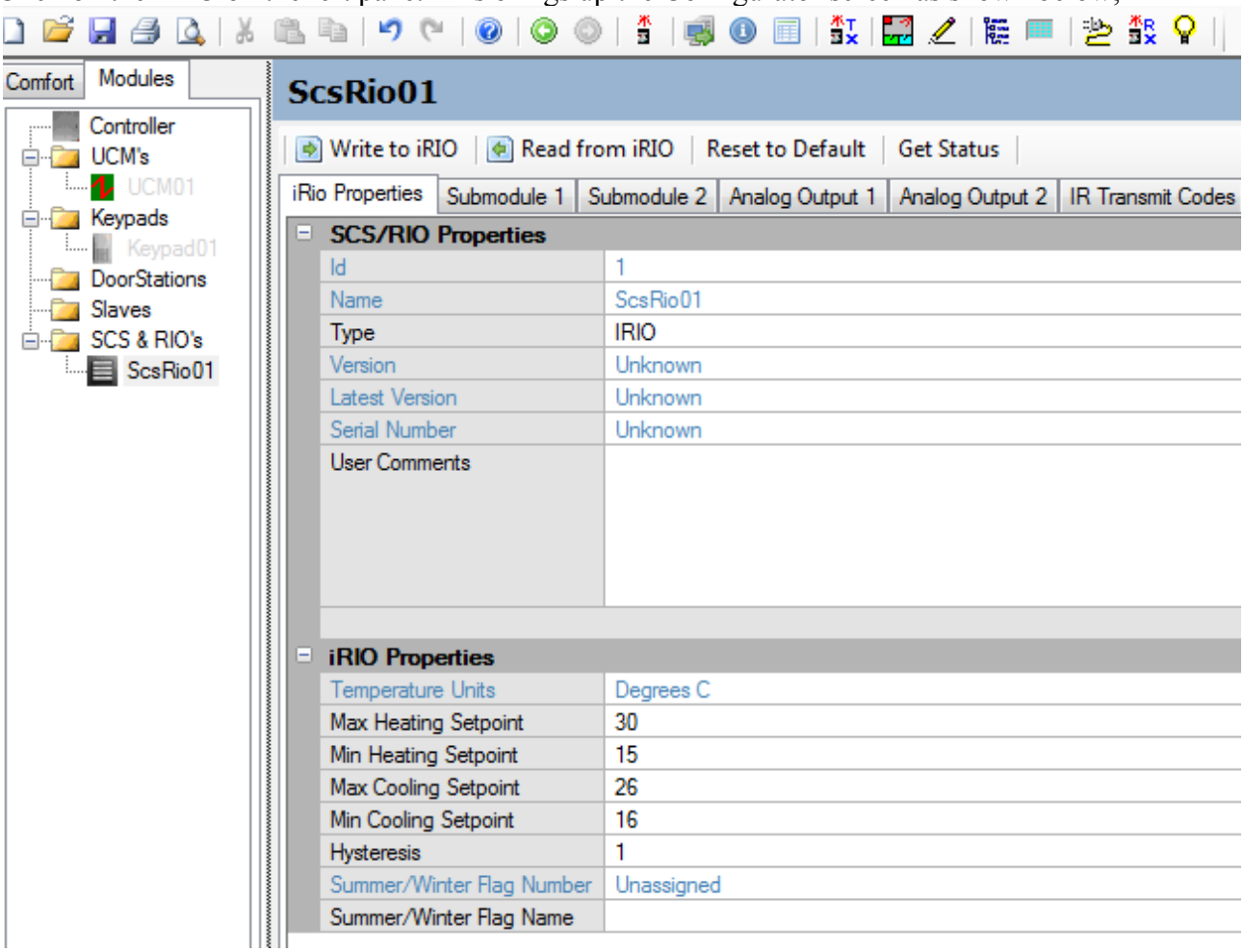
If there are more than 1 IRIO or SCS in the system, set the ID of the IRIO so that it is unique and consecutive among IRIO, RIO and SCS modules. Go to the Modules Tab, Right click and "Scan for All Modules" or "Scan for SCS or RIO". This will automatically detect all IRIO if the IDs are set correctly without any conflict with other IRIOs, RIOs and SCS.
"Add SCS/IRIO" allows you to manually add an IRIO if not currently connected to Comfort, i.e. when doing programming off-line.
If the IRIO ID is detected during the module scan its properties should be displayed.

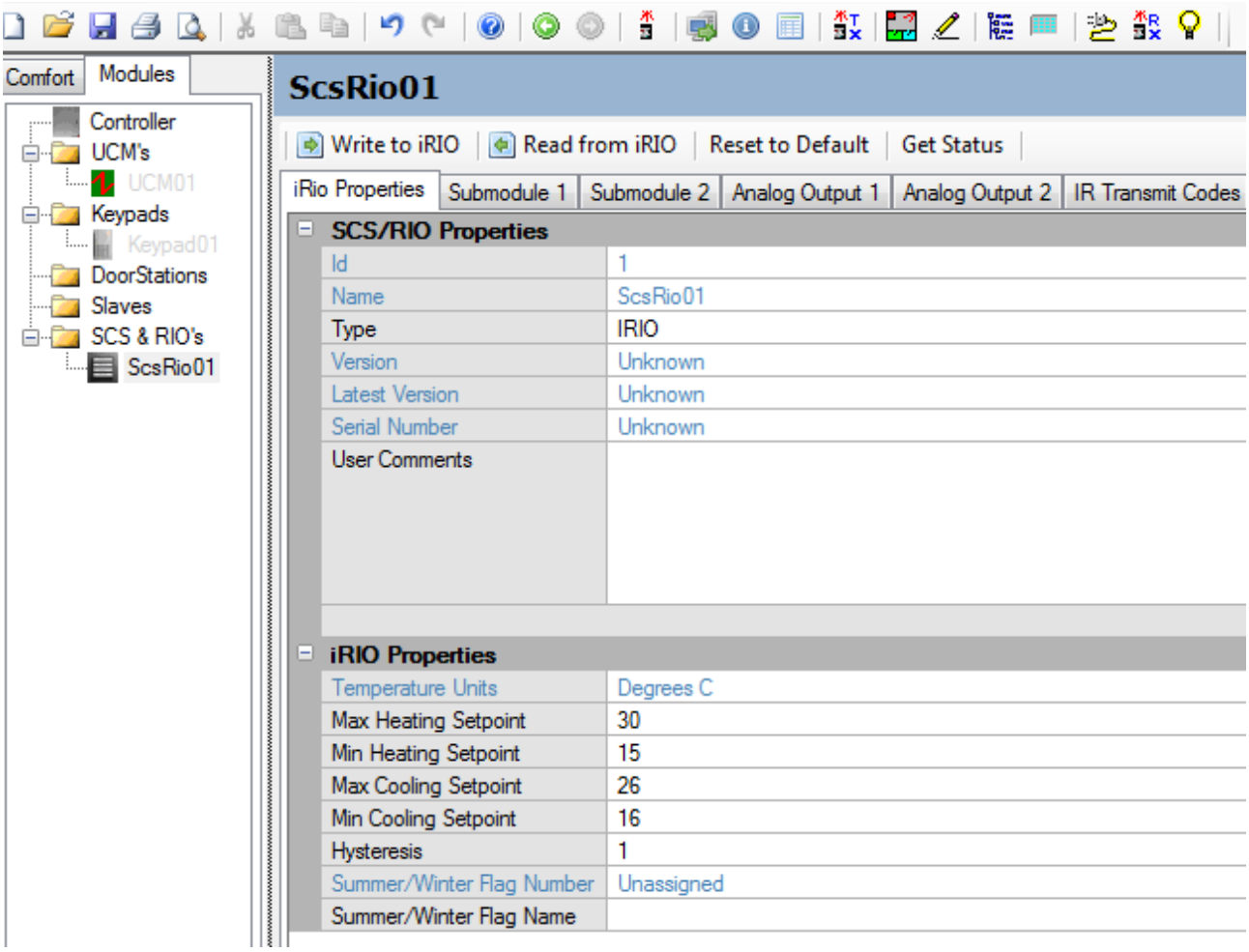
Type, Version, Latest Version , Serial Number are described below.

"Status" shows the status of IRIO on the bus. It is 'Polled' when the IRIO is detected and matches the number of IRIOs programmed. 'Not Polled' will be displayed when the IRIO is detected by scanning but the number of IRIOs programmed is less than the IRIO ID. 'Not Found' is shown when

the IRIO is not connected to Comfort when scanning is done.

Click on the IRIO on the left pane. This brings up the Configurator screen as shown below;





IRIO Properties

SCS/RIO Properties

ID	1 to 15 *
Name	as in Modules> IRIO
Type	IRIO *
Version	Firmware version eg 7.001 *
Latest Version	Released version available when internet connection is present.
Serial Number	Electronic serial number of IRIO (if implemented.)
User Comments	Enter comments

If the IRIO was manually added instead of being scanned, the firmware information will not appear.
* means Read Only

IRIO Properties

Max Heating Setpoint	Not Applicable for IRIO-TWS
Min Heating Setpoint	Not Applicable for IRIO-TWS
Max Cooling Setpoint	Not Applicable for IRIO-TWS
Min Cooling Setpoint	Not Applicable for IRIO-TWS
Hysteresis	Not Applicable for IRIO-TWS
Summer/Winter Flag Name	Not Applicable for IRIO-TWS

Menu Bar

The menu items are; Write to IRIO, Read from IRIO, Read Properties, Reset to Default, Get Status.

Write to IRIO

This writes the IRIO configuration in IRIO

Read from IRIO

This reads the data from IRIO and displays the data on screen.

Reset to Default

This clears all the data in the IRIO to default settings, but does not write any data to IRIO (after clearing, prompt “Write to IRIO? “ should be seen”)

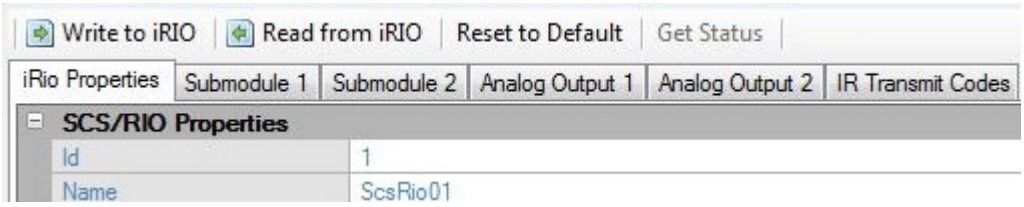
Get Status

The Get status button causes the IRIO Module status to be shown on the status bar on bottom left

"Normal/No error"
"Data Invalid"
“Communication error between baseboard and sub-module 1"
“Communication error between baseboard and sub-module 2"

When the cursor is moved away from the IRIO screen, Get status is automatically turned off, and when the cursor is on the IRIO screen the get status function is turned on if Comfigurator is logged in.

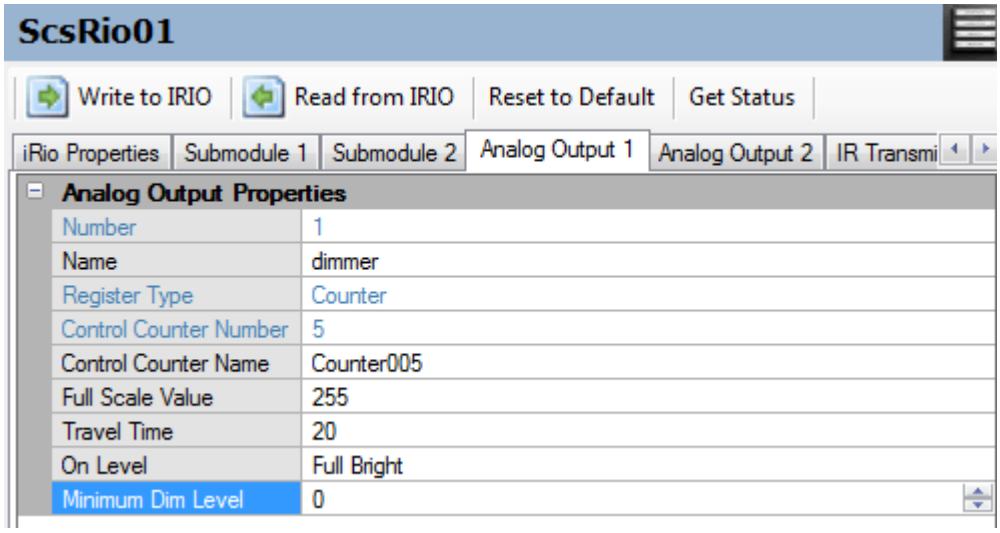
IRIO Tabs



- IRIO Properties – described above
- Submodule 1 – properties of 1st submodule
- Submodule 2 – properties of 2nd submodule
- Analog Output 1 – properties of 1st Analog Output
- Analog Output 2– properties of 2nd Analog Output
- IR Transmit Codes – Assign IR transmit codes to ISM03 IR Submodule

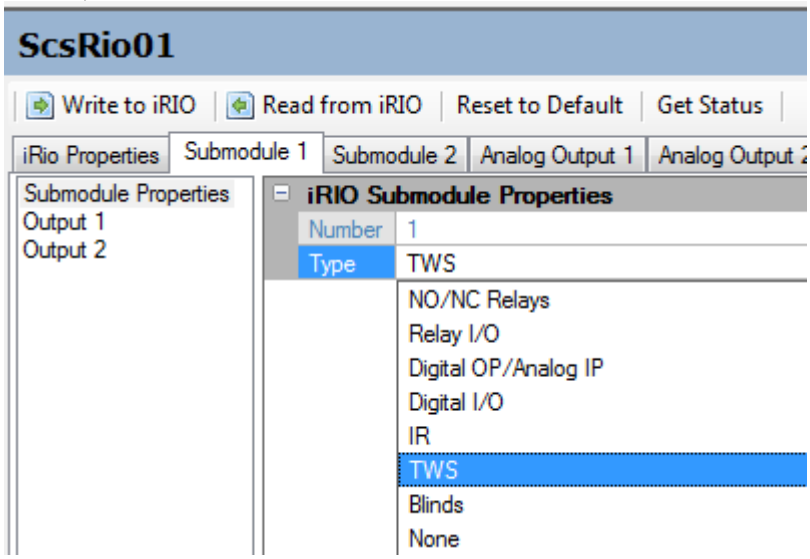
Analog Outputs

The IRIO has 2 built-in Analog Outputs on the baseboard which do not require submodules. Click on the Analog Output 1 or Analog Output 2 to configure.



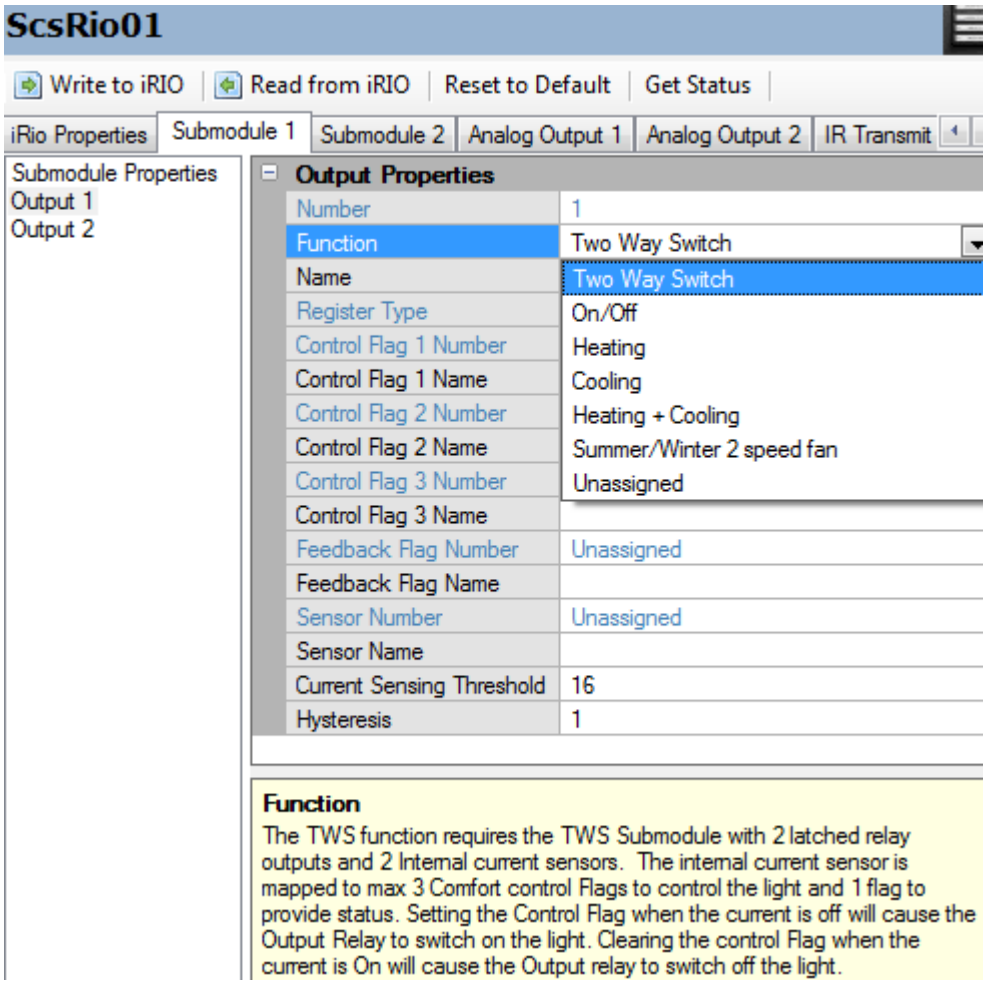
The analog Output is mapped to a Comfort Counter which can be selected from a pulldown list. Setting a value in the mapped counter will set the analog output to the assigned value. “Full Scale Value” is either 255 or 99. Setting the counter to the full scale value will set the output to 10 V. The analog output is limited to 10V, even if the counter value is higher than the full scale value.
“Travel Time” is the time taken to dim or brighten from minimum to maximum level or vice versa when using the Dimmer Switch 0-10V Input function to preess and hold. This does not apply for control by Counter value, which will be immediate.
“On Level” is selected between “Full Bright” and “Last Value”. This refers to the brightness level when the Dimmer Switch 0-10V Input function is used to switch on the light. Either the light turns on to full brightness or to the last level before switching off.
“Minimum Dim Level” is the lowest dimming level (0-255) below which the light is switched off to prevent the light having low dim levels which cannot be seen.

Read from IRIO will detect the TWS Submodules Select the Submodule 1 or 2
The TWS submodule should be automatically displayed after Read From IRIO. If the Comfort system is not connected while programming, select the TWS from the Submodule Types shown below;



Each TWS submodule has 2 outputs for controlling 2 lights via Two Way switches. Select one of the

Outputs 1 or 2. Select the Two Way Switch Function from the dropdown list. The TWS module can also be used for other functions in the list. For the other Output functions (which are common to other submodules) , refer to the main IRIO manual.



Control Flags

3 control flags can be mapped for on/off control of the Light. Setting or clearing any of the control flags turns on and off the Light regardless of the position of the two way switch (up or down).

Feedback Flag

Map to a Flag for Status of the output. The feedback flag can be the same as one of the control flags, or may be different, but cannot be the same as any other function's feedback flag. The feedback flag provides the actual status of the light due to the built-in current sensor.

Sensor

A sensor can be mapped to the measured current. The measured Current is converted to a value from 0 to 255 and saved in the sensor. This can be used for testing purposes or monitoring the current used by the Light so as to be able to set the threshold value. 255 counts in the sensor register corresponds to approximately 100 mA (23W @230VAC) for Sensitity Level 0 and 430 mA (100W @230VAC) for Sensitivity Level 1. For higher currents than 100 mA, the sensor value will be limited to 255. For Sensitivity Level 1, Sensor Count of 255 corresponds to 430mA. Use this sensitivity level for higher current lights. The Sensor count can give an indication of the dimming level.

Threshold

This is the current sensing threshold from 0 to 255 to detect whether the light is on or off. The ability to set threshold ensures that any type of light can be detected by the current sensor when it the light is turned on. For low current lights like LED lamps, For example, for an LED lamp of rating 5 W (@230VAC), the sensor reading when the light is switched on should be around 55 for Sensitivity Level 0. Set the threshold to around 1/2 of this, or 27. Check the sensor reading when the light is off to ensure there is no leakage current and set the threshold above this. For Sensitivity Level 1, 1 count in the sensor register corresponds to 1.7 mA

Hysteresis

This is used in conjunction with the Sensor mapping. The hysteresis value determines the change in sensor value before the change is saved to the sensor, to prevent excessive reporting to Comfort

Programming Example

Feedback Register Type = Flag
Control Flag 1 = Flag 1
Feedback Flag = Flag 1

Response Turn on Light
Set Flag Flag001

Response Turn Off Lighting
Clear Flag Flag001

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