

# *Application Note - Comfort to LightwaveRF*

## **INTRODUCTION**

This Application Note shows how Comfort can be interfaced to LightWaveRF Connect products via Comfort's UCM/Universal and The LightWaveRF Wifi-Link (JSJSLW500).

**Note:** Only 1-way control is possible from Comfort to LightWaveRF devices because LightwaveRF does not support 2-way communications.

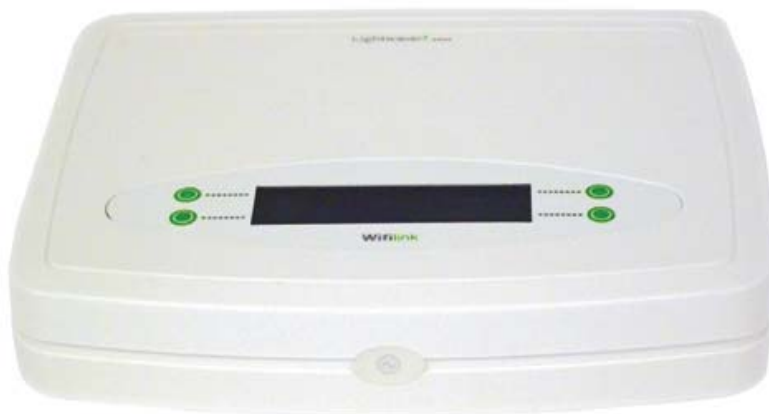
## **Equipment**

- 1 Comfort CP9000 Controller Firmware 6.xxx
- 2 UCM/Universal (firmware 6.023 or higher) + ETH02 (Ethernet plug-in module).

## **Reference Manuals**

Please refer to the Universal UCM Manual which can be downloaded from [http://www.cytech.biz/universal\\_ucm\\_manual.html](http://www.cytech.biz/universal_ucm_manual.html) for detailed instructions on the UCM/Universal.

## **Connections**



*LightWaveRF Wifi-Link*

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### UCM/Universal + ETH02 submodule

- 1 Before connecting, set the ID on SW7 to the ID of the UCM according to the table below and according to the number of other UCMs in the Comfort Network. If there is only 1, set the ID to 2. By convention, ID 1 is reserved for the UCM used to upload/download from Comfort. Communications Failure is not reported for ID=1. Up to 8 UCMs of different types (e.g. C-Bus, KNX) can be connected to the Comfort network.

| ID | SW7-A | SW7-B | SW7-C | SW7-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 |

- 2 The UCM is connected to Comfort via the supplied 4-way white cable from 4-pins header JP2/2A to Comfort's header J7 ("RS485"). It is not necessary to switch off the power to Comfort before plugging in this connection.
- 3 The Green RDY LED on the UCM (D1) should light up and remain on.
- 4 The LEDs D9 (red) and D10 (green) should blink rapidly showing that RS485 communications has been established between Comfort and the UCM. D9 (green) flashing shows that it is receiving communications from Comfort (poll). D10 (red) comes on when the UCM responds to a poll from Comfort.
- 5 Connect a straight network cable (RJ45) from MJ101 connector of ETH02 to the network where the LightWaveRF Wifi-Link is connected.
- 6 When sending commands to LightWaveRF, D12 (red) should blink. This shows that a message has been sent.

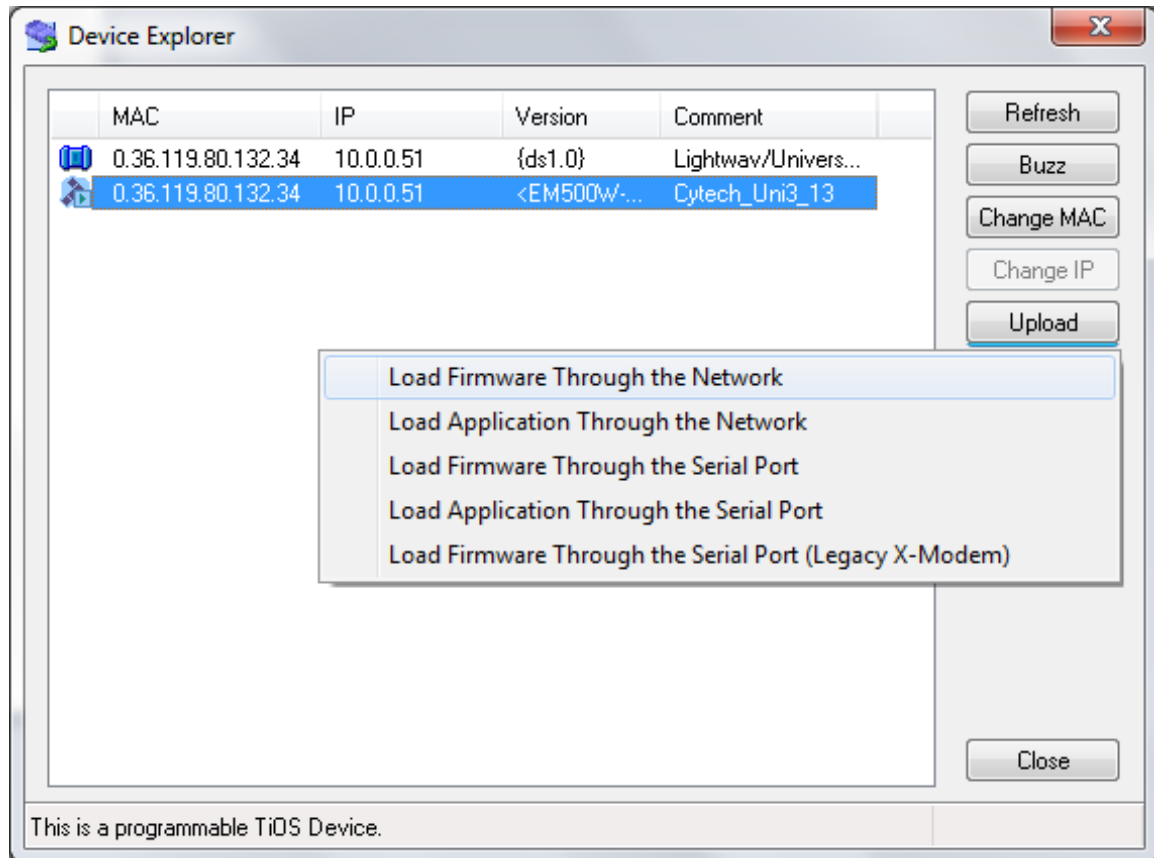
### ETH02 Firmware for UCM/Universal

The ETH02 Ethernet module, if ordered separately will be pre-installed with firmware cytech3\_13.bin which can be used for UCM/ETH02 but NOT for LightwaveRF because it cannot support the UDP protocol. The ETH02 firmware

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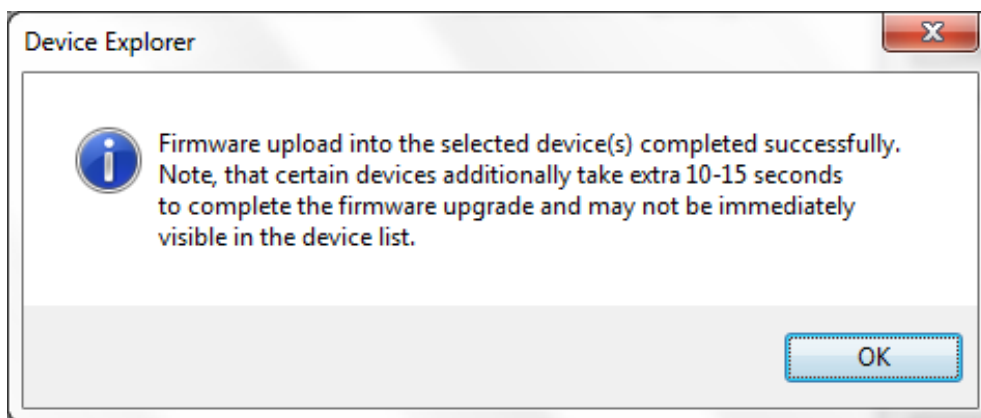
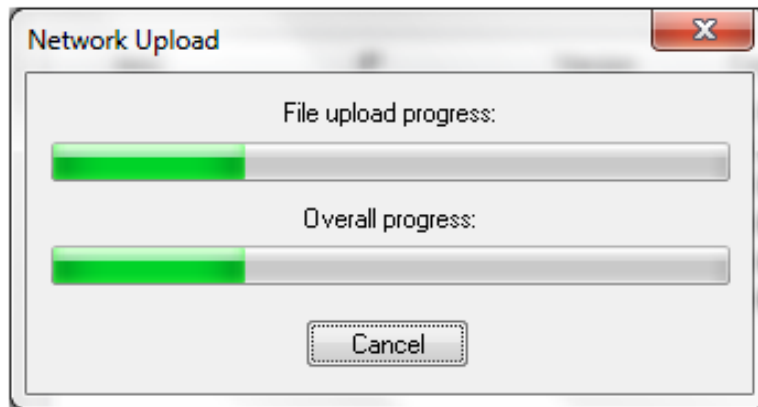
must be changed to firmware **Cytech\_Uni3\_13** (as of time of writing). This can be downloaded from the Cytech website at [http://www.cytech.biz/product\\_details.php?item\\_id=334](http://www.cytech.biz/product_details.php?item_id=334)

The firmware name can be seen in the Comment field of the Device Explorer software which is available for download from <http://www.cytech.biz/software.html>



Should there be a new firmware release, the ETH02 firmware can be upgraded using this Device Explorer software. **Note that the ETH02 firmware cannot be upgraded using the Device Manager software included in Configurator 3.5.** Select the one with the Cytech\_Uni3\_13 comment. Press the Upload button and select 'Load Firmware Through the Network' option. Select the new firmware file and the progress bar should be seen followed by notification that the firmware upload has been completed successfully.

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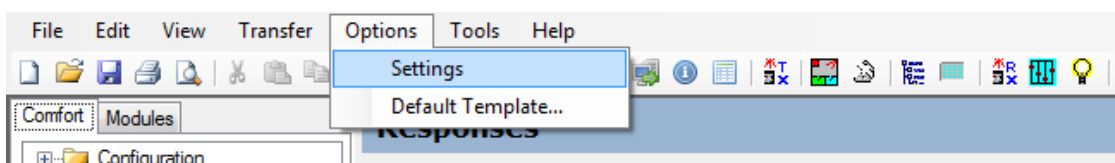
After the upgrade the name Cytech\_Uni3\_13.bin can be seen in the Comments field of Device Explorer.

**The ETH02 Firmware Upgrade may be prevented by Firewall software. If the upgrade progress bar does not start, disable all firewall software like Zone Alarm.**

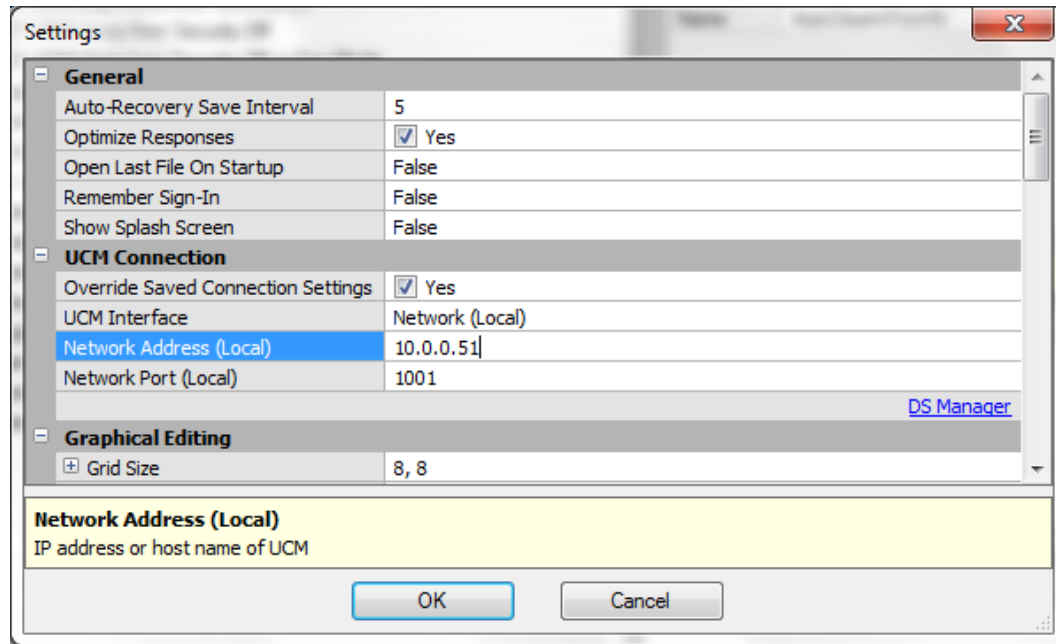
### Universal ETH02 Settings

The ETH02 Ethernet module must be configured so that it can talk to the LightwaveRF wifi-Link as follows;

Ensure your computer is connected to the same physical network as the UCM/Universal. Use Configurator 3.5.4 or above and go to the menu 'Options >> Settings'



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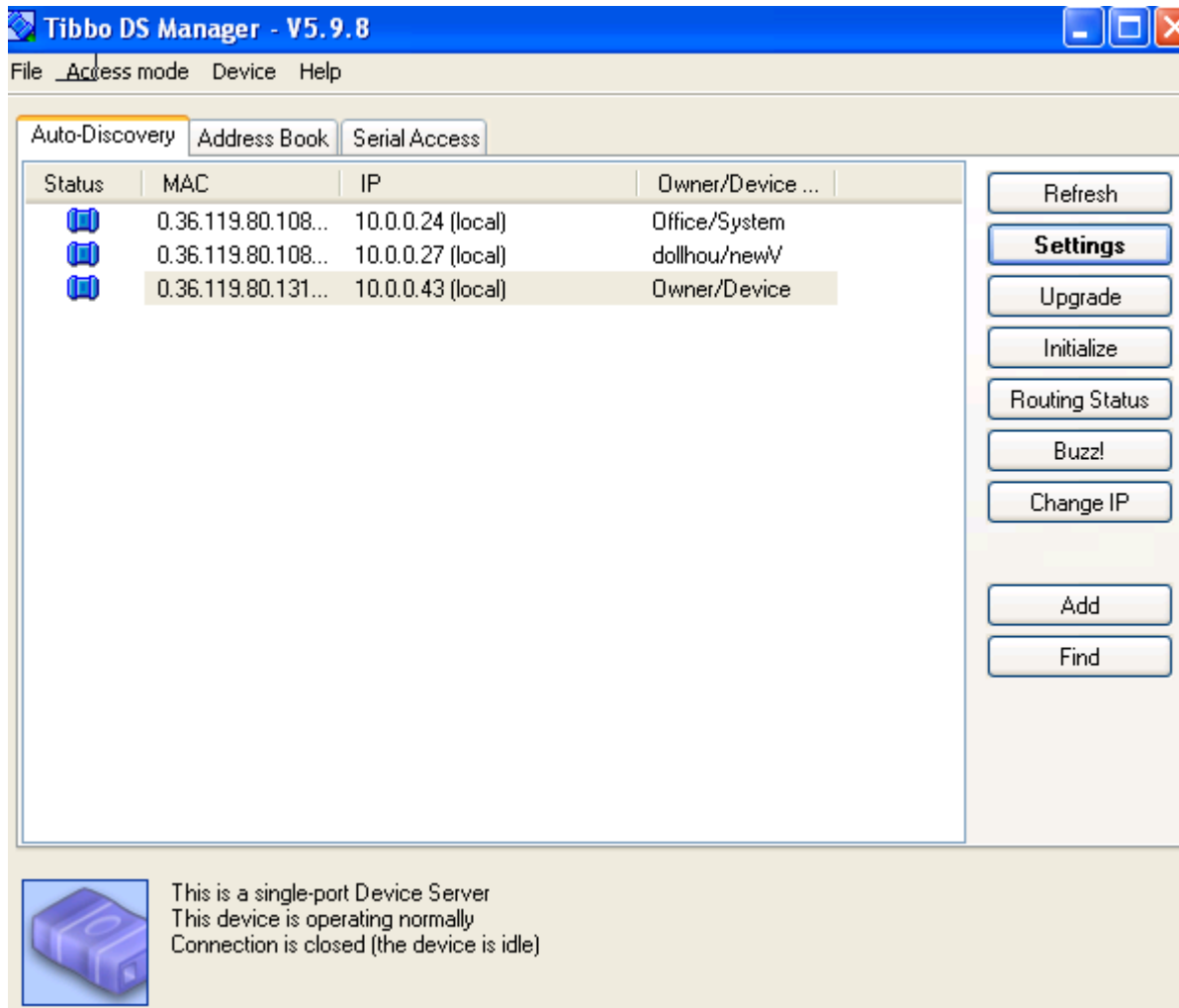


The Settings window will appear under the UCM Connection section:

Check Override Saved Connection settings and set UCM Interface to Network. Ignore the IP address and port settings for now. These numbers should be entered after setting the IP Address and Port using DS Manager.

Click on the [DS Manager](#) to launch the DS Manager application

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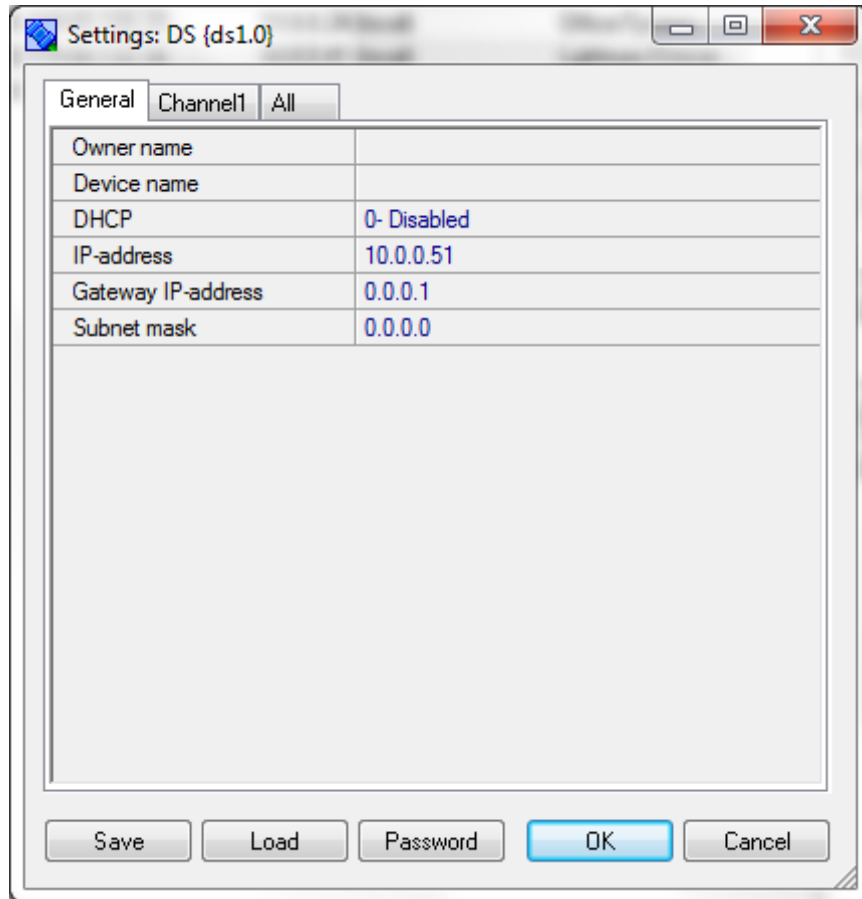


The DS Manager will auto-detect the ETH02 module on the UCM/Universal. If there are other UCM/Ethernets in the network, they should be visible in DS Manager.

Select the UCM/Universal Ethernet address and click the 'Settings' button. If the module is not detected, switch off any firewalls on the computer as this may be blocking the information.

Note If there is also a new UCM/Ethernet on the network which have not had their IP addresses changed, both may be set to the same default IP address 10.0.0.51.

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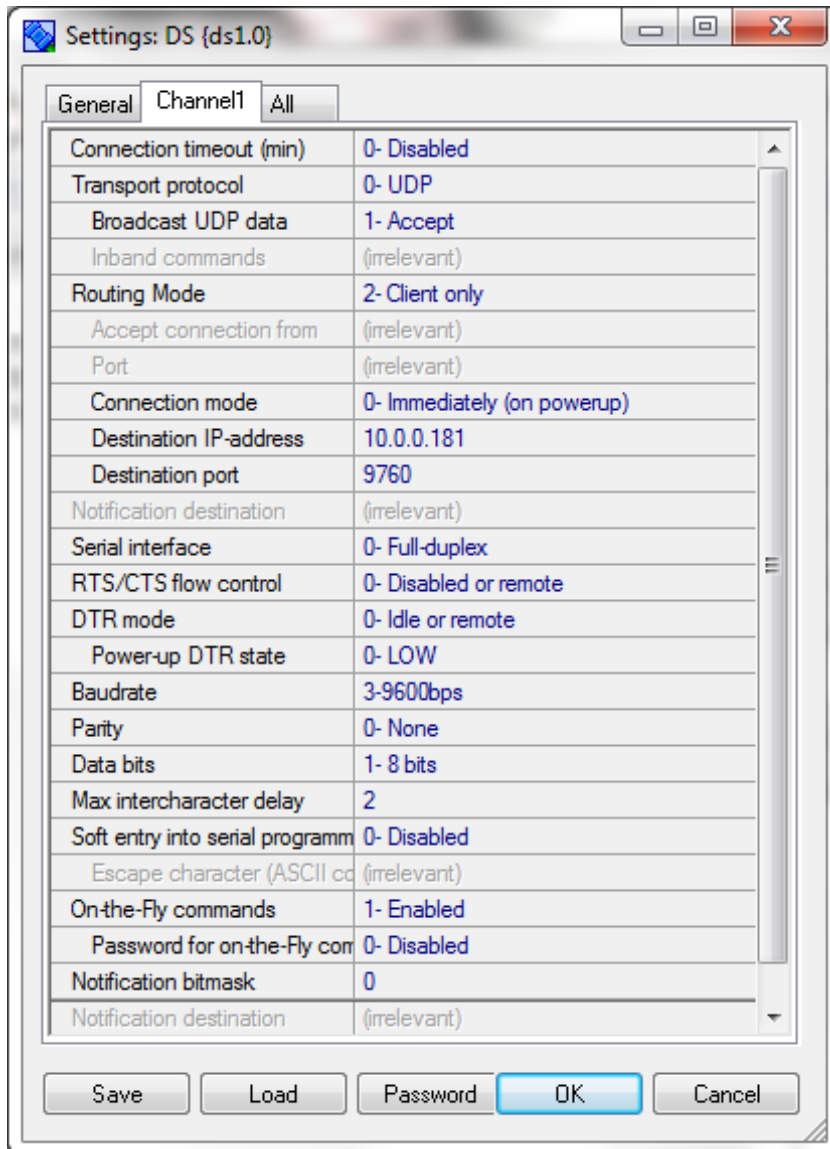


In the General tab;

- Owner name and Device name are for description only.
- DHCP: Disable. A fixed IP address should be assigned to the device. Use an IP address that is not in the DHCP range of the router.
- IP-address is the local IP address of the device.
- Gateway IP Address and Subnet mask can be ignored.

The next step is to find out the IP Address of the LightwaveRF wifi-Link. This can be done by entering the setup mode on the wifi-Link and selecting Change IP/MAC Address on the LCD Menu. The LCD shows the IP Address of the wifi-Link. The Port on wifi-Link for accepting commands is fixed at 9760.

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In Channel1 tab, enter/select according to the instructions below

- Connection time-out (min) :Disabled
- Transport protocol :UDP
- Broadcast UDP data :Accept
- Routing Mode :Client only
- Connection mode :Immediately
- Destination IP-address : (Wifi-Link IP address)
- Destination port :9760 (fixed)
- Serial Interface :Full Duplex
- RTS/CTS flow control :Disabled or remote
- DTR mode :Idle or remote
- Power-up DTR state :Low
- Baudrate :9600
- Parity :None
- Data bits :8 bits
- Max intercharacter delay :2

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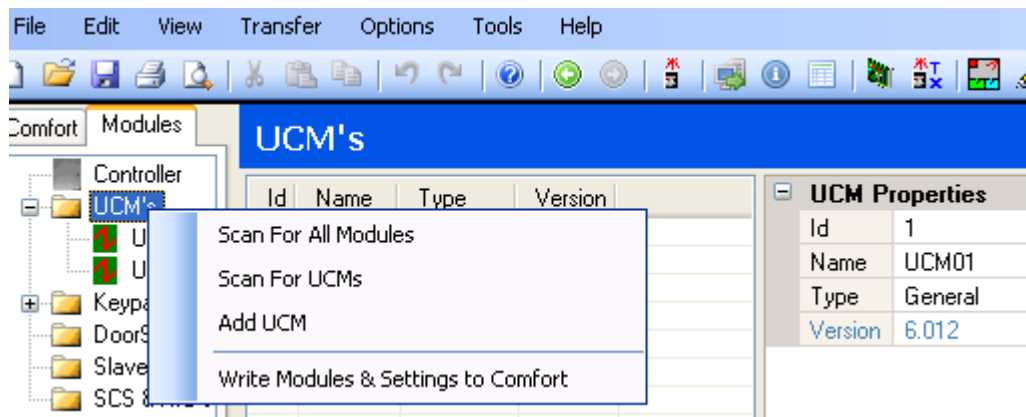
- Soft entry into serial program mode : Disabled
- On-the-Fly commands : Enabled
- Password for the on-the-Fly commands : Disabled
- Notification bitmask : 0

Click 'OK' button to apply the settings.

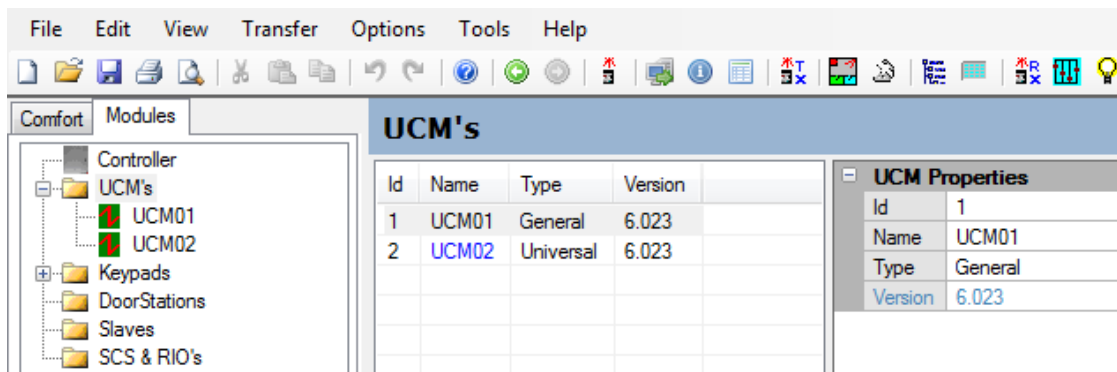
For the Client Routing mode, the Destination IP and Port is the Ethernet address to send commands to Wifi-Link. This is different from the IP address used to configure the ETH02 module via DS Manager.

### Configurator Programming

Use Configurator 3.5.4 or above.

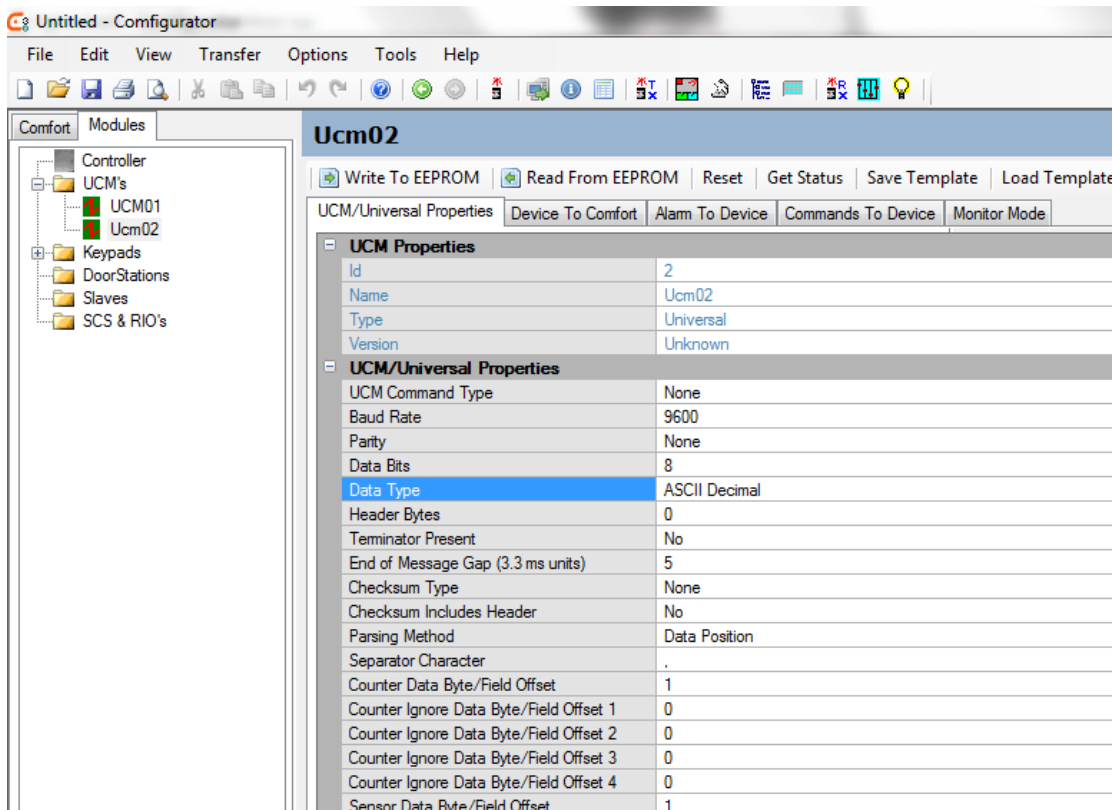


In Modules Tab, right click and select Scan for UCMs or Scan for All Modules. The result of the scan should be 2 UCMs, UCM #1 which is the programming UCM and UCM #2 which is the Universal UCM.



Select UCM02 on the left pane to show the Universal UCM properties.

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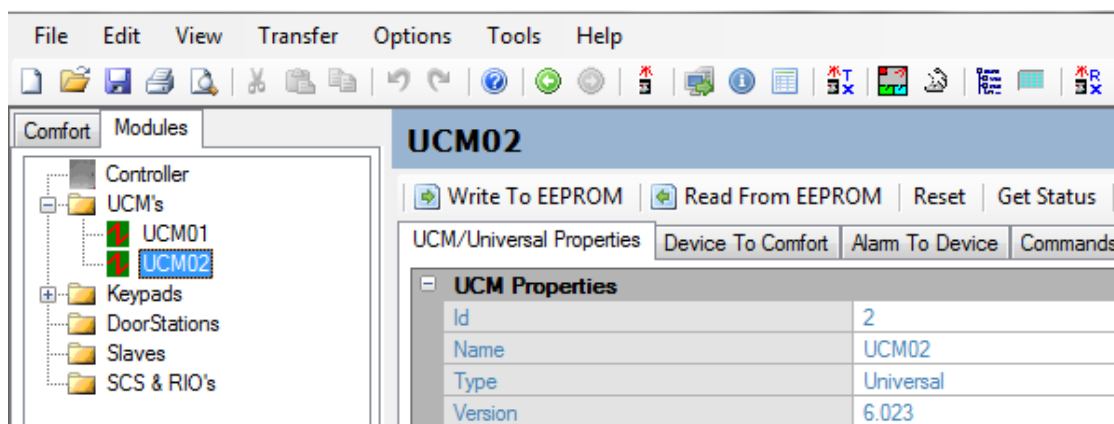
In UCM/Universal Properties, follow the default settings on the screen with 2 changes as follow:

- Data Type = ASCII Decimal
- End of Message (3.3 ms units) = 5
- Checksum Type = None

The other parameters are not important for the LightWaveRF Wifi-Link.

### Write to EEPROM

When the Universal UCM configuration is completed, a WRITE to EEPROM is needed. Click the Write to EEPROM button shown below.



### Read from EEPROM

Read from EEPROM reads the programmed information in the Universal UCM to

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Configurator

## Reset

This button resets the EEPROM to Factory Default

## Get Status

This reads the status of the Universal UCM to be displayed on the Status bar. Refer to the Universal UCM Manual for details

## Load Template/Save Template

The Universal UCM configuration that you have programmed can be saved as a template. Press the Save Template button to save as a .uutx file. The Load Template button loads the saved template into a new configuration file.

## Device to Comfort

This tab is not in use for LightWaveRF application as the LightwaveRF is one way only - it does not provide feedback.

## Alarm to Device

The screenshot shows the 'Ucm02' configurator interface. At the top, there are buttons for 'Write To EEPROM', 'Read From EEPROM', 'Reset', 'Get Status', 'Save Template', and 'Load Template'. Below these are tabs for 'UCM/Universal Properties', 'Device To Comfort', 'Alarm To Device' (which is selected), 'Commands To Device', and 'Monitor Mode'. The 'Alarm To Device' tab contains a table with two columns: 'Event Type' and 'Message Text'. The table lists various alarm events, with 'ZoneNotReady' selected. To the right of the table, there is a preview of the 'Alarm To Device' configuration, showing the selected event type and its corresponding message text.

| Event Type         | Message Text |
|--------------------|--------------|
| ZoneNotReady       |              |
| ZoneReady          |              |
| ArmedStateOn       |              |
| ArmedStateOff      |              |
| AlarmStateOn       |              |
| AlarmStateOff      |              |
| PanicStateOn       |              |
| PanicStateOff      |              |
| LineCutStateOn     |              |
| LineCutStateOff    |              |
| AcFailureStateOn   |              |
| AcFailureStateOff  |              |
| ArmFailureStateOn  |              |
| ArmFailureStateOff |              |
| LowBatteryStateOn  |              |
| LowBatteryStateOff |              |
| SecurityOff        |              |
| ArmedAway          |              |
| ArmedNight         |              |
| ArmedDay           |              |
| ArmedVacation      |              |

**Alarm To Device**

| Event Type   | Message Text |
|--------------|--------------|
| ZoneNotReady |              |

This tab is used to link Comfort alarm events to LightWaveRF devices. For each event, a fixed text string can be sent when the event occurs, and another text string can be sent when the event is restored (off).

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### Some Commonly Used Command Strings

| Command                      | Operator | Example    |
|------------------------------|----------|------------|
| Turn on Room1 Device1        | F        | !R1D1F1    |
| Turn off Room1 Device2       |          | !R1D2F0    |
| All off in Room1             | Fa       | !R1Fa      |
|                              |          |            |
| Dim Device (Dim levels 1-32) | FdP      | !R1D1FdP32 |
|                              |          |            |
| Recall Room 3 Mood 1         | FmP      | !R3FmP1    |
|                              |          |            |

### Commands to Device

| No | Name         | Command Text |
|----|--------------|--------------|
| 1  | Room1Dev1On  | 001,!R1D1F1  |
| 2  | Room1Dev1Off | 002,!R1D1F0  |
| 3  | Room1Dev2On  | 003,!R1D2F1  |
| 4  | Room1Dev2Off | 004,!R1D2F0  |
| 5  | Room1Dev3On  | !R1D3F1      |
| 6  | Room1Dev3Off | !R1D3F0      |
| 7  | Room1Dev4On  | !R1D4F1      |
| 8  | Room1Dev4Off | !R1D4F0      |
| 9  | Room1Dev5On  | !R1D5F1      |

| Commands To Device |             |
|--------------------|-------------|
| No                 | 1           |
| Name               | Room1Dev1On |
| Command Text       | 001,!R1D1F1 |

Enter the commands to be sent out to LightWaveRF devices. A maximum of 150 commands can be entered on the Commands to Device Table.

A sample configuration file called LightWaveRF.cclx which is available from the Cytech website contains commonly used commands. Other commands not listed here can be added manually by pressing the 'Add Command' button and assign the appropriate Name and Command Text. However, delete unused commands from the table before adding new commands in order to keep within the maximum commands limit of 150.

The Execute button will send the selected command to LightwaveRF for testing.

**Note:** The UCM/Universal must be **registered** to the LightWaveRF Wifi-Link; this can be done on the LightWaverRF Wifi-Link unit when the first command with sequence number is sent out from Comfort. The LightWaveRF Wifi-Link will display an option to register, just press OK button on the unit. Up to 6 devices including iPhone and the UCM/Universal can be registered to the Wifi-Link. The sequence number in front of the command (001,002,003,004...etc) is not important and can normally be omitted, it is only useful for the one-time registration.

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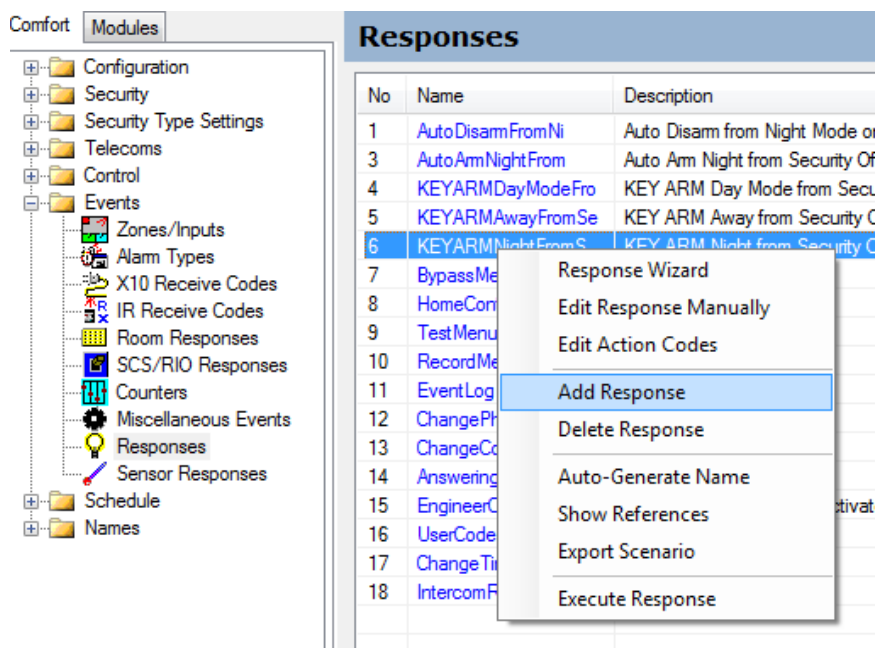
Other Commands that can be used with LightWaveRF devices are:

| Command                         | Operator | Example |
|---------------------------------|----------|---------|
| Room 1 Device 3 Manual Lock     | Fk       | !R1D3Fk |
| Full Lock (Manual and Radio)    | FI       | !R1D3FI |
| Set timer                       | FiP      |         |
| Delete timer / sequence         | FxP      |         |
| Store sequence                  | FeP      |         |
| Start sequence                  | FqP      |         |
| Cancel running sequence         | FcP      |         |
| Cancel ALL sequences and timers |          | !FcP"*" |
| Delete ALL sequences and timers |          | !FxP"*" |
| Open Room 3 Device 2            | F)       | !R3D2F) |
| Stop Room 3 Device 2            | F^       | !R3D2F^ |
| Close Room 3 Device 2           | F(       | !R3D2F( |

**Note:** Ensure that the LightWaveRF devices support the commands. Please refer to the appropriate LightWaveRF device manual or documentation when in doubt.

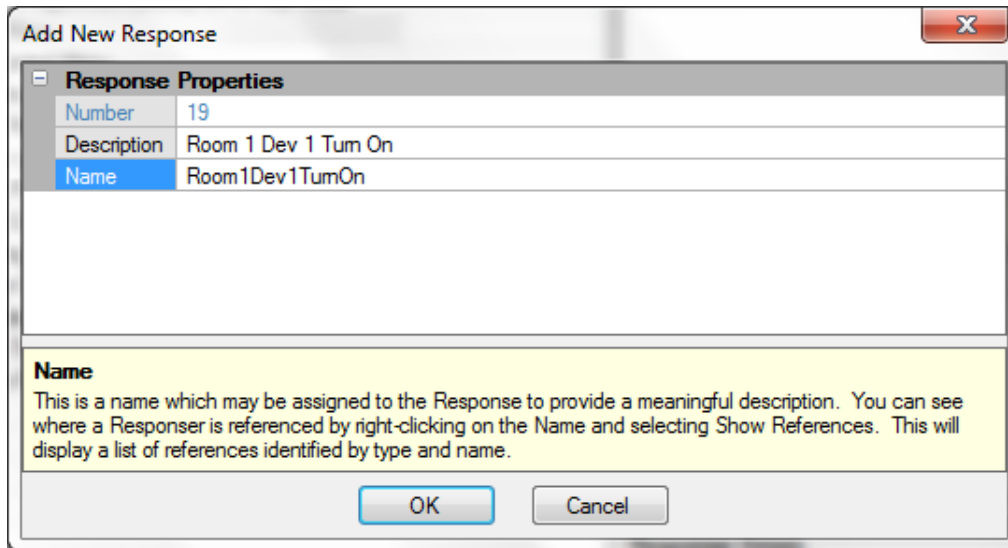
## Sending Commands to LightWaveRF using Response Wizard

The Response Wizard is used to send Commands to LightWaveRF Wifi-Link which have been defined in the Commands to Device Table. In Events > Responses, right click and select ADD RESPONSE. A Response is a small program in Comfort consisting of Actions which are commands in Comfort's programming language.



Enter a Description for the Response and press Enter. The Response name is automatically generated as shown

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The 'Add New Response' dialog box contains a 'Response Properties' section with the following fields:

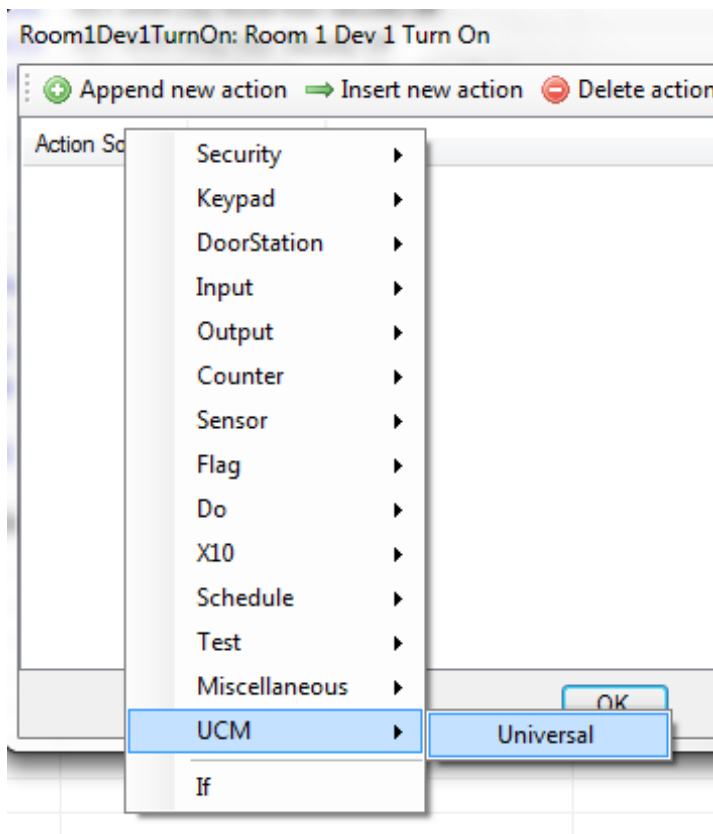
| Response Properties |                      |
|---------------------|----------------------|
| Number              | 19                   |
| Description         | Room 1 Dev 1 Turn On |
| Name                | Room1Dev1TurnOn      |

Below the properties is a text area for the 'Name' field. A yellow tooltip is displayed over the 'Name' field with the following text:

**Name**  
This is a name which may be assigned to the Response to provide a meaningful description. You can see where a Responder is referenced by right-clicking on the Name and selecting Show References. This will display a list of references identified by type and name.

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Press OK. The new action screen appears. Select UCM > Universal.



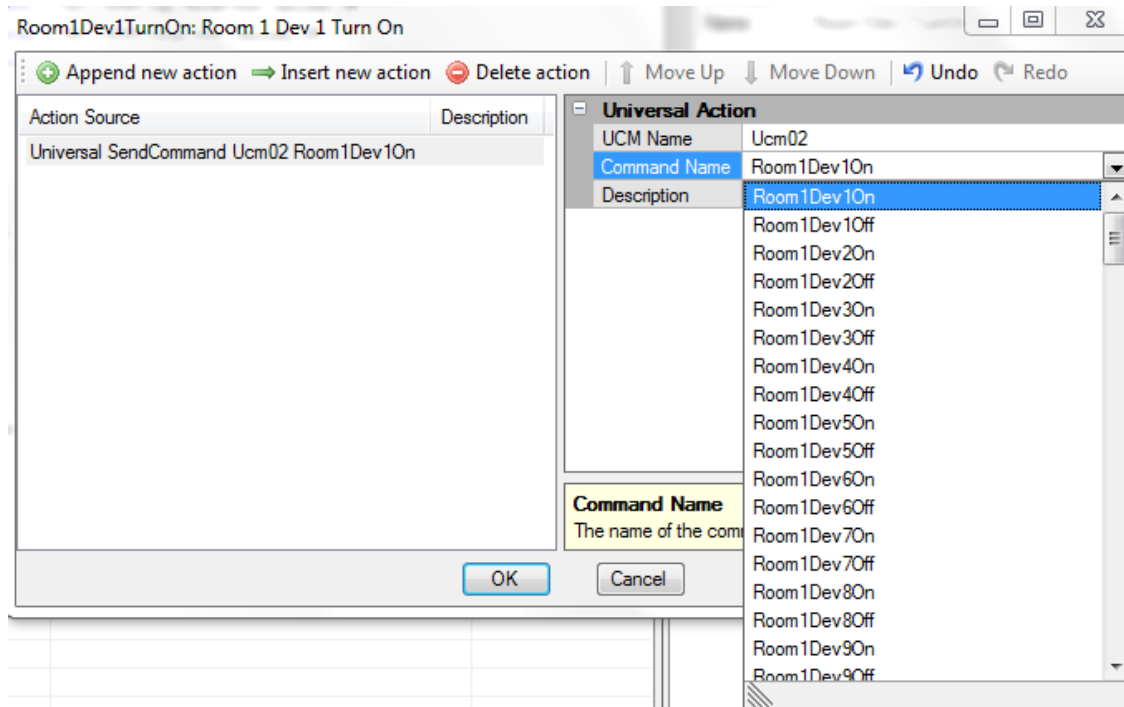
The 'New action' screen shows the title 'Room1Dev1TurnOn: Room 1 Dev 1 Turn On'. Below the title are three buttons: 'Append new action' (with a plus icon), 'Insert new action' (with a right arrow icon), and 'Delete action' (with a minus icon). A drop-down menu is open, showing a list of categories with right-pointing arrows:

- Security
- Keypad
- DoorStation
- Input
- Output
- Counter
- Sensor
- Flag
- Do
- X10
- Schedule
- Test
- Miscellaneous
- UCM**
- If

The 'UCM' option is highlighted in blue. To the right of the drop-down menu, there is an 'OK' button and a 'Universal' button, both of which are also highlighted in blue.

The list of LightWaveRF commands (defined in the Commands to Device Table) is shown in the drop-down list;

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Select a command and the associated parameter and press OK.

Add more actions to the Response if required.

Several commands can be send to LightwaveRF in a single Response, for example

**Room 1 Dev 1 On**  
**Room 3 Dev 2 Dim 16**  
**Room 2 Mood 3**

### Write to Comfort

When the program is completed, write to Comfort. Go to Transfer > Write to Comfort. Also do not forget to Write to EEPROM in Universal UCM if you have not done so already.

### Executing Responses

Responses can be “executed” by clicking “Execute Response” on the right pane of the selected Response as shown below. This causes the Actions in the Response to be executed, and is a good way to test the Response.

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| Responses |                                  |                                  |
|-----------|----------------------------------|----------------------------------|
| No        | Name                             | Description                      |
| 1         | <a href="#">AutoDisarmFromNi</a> | Auto Disarm from Night Mode onl  |
| 3         | <a href="#">AutoArmNightFrom</a> | Auto Arm Night from Security Off |
| 4         | <a href="#">KEYARMDayModeFro</a> | KEY ARM Day Mode from Securi     |
| 5         | <a href="#">KEYARMAwayFromSe</a> | KEY ARM Away from Security Off   |
| 6         | <a href="#">KEYARMNightFromS</a> | KEY ARM Night from Security Off  |
| 7         | <a href="#">BypassMenu</a>       | Bypass Menu                      |
| 8         | <a href="#">HomeControlMenu</a>  | Home Control Menu                |
| 9         | <a href="#">TestMenu</a>         | Test Menu                        |
| 10        | <a href="#">RecordMemoMenu</a>   | Record Memo Menu                 |
| 11        | <a href="#">EventLog</a>         | Event Log                        |
| 12        | <a href="#">ChangePhoneMenu</a>  | Change Phone Menu                |
| 13        | <a href="#">ChangeCodeMenu</a>   | Change Code Menu                 |
| 14        | <a href="#">AnsweringMachine</a> | Answering Machine Menu           |
| 15        | <a href="#">EngineerCodeEnab</a> | Engineer Code Enable. Activate   |
| 16        | <a href="#">UserCodeMenu</a>     | User Codes Menu                  |
| 17        | <a href="#">ChangeTimeProgr0</a> | Change Time Program              |
| 18        | <a href="#">IntercomRequest</a>  | Intercom Request                 |
| 49        | <a href="#">Room1Dev1TurnOn</a>  | Room 1 Dev 1 Turn On             |
|           |                                  |                                  |
|           |                                  |                                  |
|           |                                  |                                  |

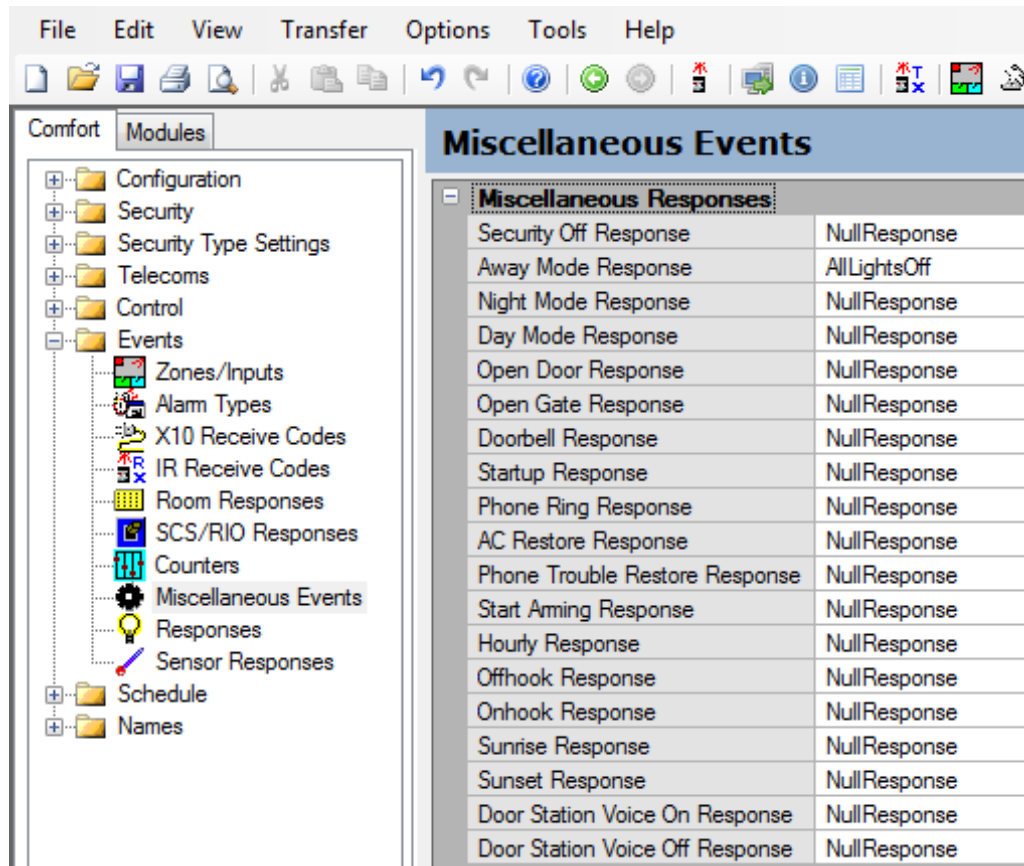
| Response Properties              |                             |
|----------------------------------|-----------------------------|
| Fixed                            | <input type="checkbox"/> No |
| Number                           | 19                          |
| Description                      | Room 1 Dev 1 Turn On        |
| Name                             | Room1Dev1TurnOn             |
| <a href="#">Execute Response</a> |                             |

| Response Source                         |  |
|-----------------------------------------|--|
| Universal SendCommand Ucm02 Room1Dev1On |  |

## Comfort Events

Responses can be triggered by Events in Comfort, e.g. Zone activated and Restored, Alarm Types, Time Programs, Home Control Menu, Doorbell, Phone ring, Sunrise/sunset times, System armed and disarmed and many more. For example the screen below Events > Miscellaneous Events, shows that Away Mode Response is assigned to AllLightsOff Response. This means that when the security system is armed to Away Mode, it will send a command to LightWaveRF to turn off the programmed lights.

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### Sample Configuration File

A sample configuration file called LightWaveRF.cclx is available from the Cytech website.

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### **Technical Notes: Action 197 for LightWaveRF Commands**

For an understanding of the concepts, please refer to the appropriate LightWaveRF documentation. It is beyond the scope of this manual to provide details of LightWaveRF operations.

Comfort interacts with LightWaveRF by sending LightWaveRF commands to control the desired device on the network

The LightWaveRF devices should be programmed beforehand. The list of logic addresses used should be known, e.g. the Room and Device Number, for Comfort to integrate with LightWaveRF. Note that Comfort needs to be programmed separately.

Action 197 is used to send LightWaveRF messages. The LightWaveRF message format is described in the LightWaveRF Command set from LightWaveRF Controls. The format of Action 197 is as follows:

#### **Format**

197, ID, [Room and Device Number]<Operator>, 255

The command is terminated with a carriage return.

#### **ID**

This is the address of the UCM/Universal on the Comfort RS485 bus, i.e. 17 = UCM 1, 18 = UCM 2,...,24 = UCM 8. The UCM must correspond to the ID setting on SW7.

#### **Some Commonly Used Commands**

| Command                      | Operator | Example    |
|------------------------------|----------|------------|
| Turn on Room1 Device1        | F        | !R1D1F1    |
| Turn off Room1 Device2       |          | !R1D2F0    |
| All off in Room1             | Fa       | !R1Fa      |
|                              |          |            |
| Dim Device (Dim levels 1-32) | FdP      | !R1D1FdP32 |
|                              |          |            |
| Recall Room 3 Mood 1         | FmP      | !R3FmP1    |
|                              |          |            |

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