

Comfort, the Intelligent Home System

Comfort To Dupline Interface

Comfort to Dupline Interface

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Introduction to the SmartHouse/Dupline Interface

The Comfort system can be interfaced to Smart-house (also known as Dupline) by Carlo Gavazzi. This allows Comfort to control and monitor any of the 128 Dupline addresses (A1 to A8, B1 to B8, ..., P1 to P8) by connecting to the CTRLX Smart-house controller (may also be known as Dupline Master Generator). This manual will refer to Dupline from now on for simplicity. This provides the following benefits to a Dupline system:

- telecontrol through any telephone inside or outside the premises to control and monitor the status of Dupline devices
- Able to send a commands to Set Output On/OFF, Set Input On/Off or activate Momentary Input for all Dupline addresses.
- allows alarm inputs and alarm conditions to be linked to Dupline for full integration of alarm and lighting.
- allows Dupline switches to trigger Comfort Responses, allowing control of non-Dupline appliances like air-conditioners, home entertainment systems, and linking to all of Comfort's security and control functions.
- Acts as a gateway to other systems e.g. KNX, C-Bus, Z-Wave, Velbus etc.
- functions as a central controller for Dupline. Comfort is able to take action based on conditional logic, for example, when the time is between 7 PM and 7 AM and the security system is armed, and when the front door is opened, turn on the Living Room lights for 3 minutes.

Dupline Basics

There are 128 Addresses in Dupline;

A1 to A8, B1 to B8, C1 to C8,, until P1 to P8

The Dupline Controller implements the Modbus protocol through the external RS232 or RS485 Interface, which is often used in Industrial applications. Hence the UCM/Dupline talks to the Dupline Controller using Modbus (in technical terms, Modbus RTU). The Dupline controller acts as a Modbus Slave and the UCM/Dupline is a Modbus Master. A Modbus Master polls or requests a reply from a Modbus Slave. Modbus Slave addresses range from 1 to 247 with 248 to 255 reserved. Modbus address 0 is the Broadcast address.

The Dupline Controller should be assigned Modbus Slave address 1

Each Dupline address can be controlled as an Output and Input by Comfort. The command Input A1 On is equivalent to pressing the Switch A1. The command Input A1 off is equivalent to releasing the A1 switch. The command Momentary A1 is equivalent to pressing and releasing the A1 switch. The effects will depend on the programming of Dupline. The command Output On and Off will directly switch On or Off the Dupline output channel regardless of the programming of the switches.

The Modbus/RTU protocol includes a CRC16 error correction code in the message. This is automatically calculated and verified for each incoming and outgoing message by the UCM/Dupline

Dupline Controller/Master Generator

The Smart-house/Dupline Controller may be available in different models around the world. This manual shall refer to the BH8-CTRLX-230 shown below.



BH8-CTRLX-230 Dupline Controller

The BH8-CTRLX-230 has an RS232 port for external device interface accessible on terminal blocks.

Baud Rate: 9600 to 11500

The UCM / Dupline baud rate is fixed at 9600, so the Dupline controller RS232 baud rate should also be programmed at 9600 baud.

RS232 Pins on BH8-CTRLX-230

- TxD - Pin 12
- RxD - Pin 13
- GND - Pin 14

The UCM/Dupline232 has an RS232 DB9 connector so the installer must make up a cable connecting from the DB9 connector to the terminal blocks.

UCM/Dupline RS232 Pins	Dupline BH8-CTRLX pins
TxD - Pin 3	TxD - 12
RxD - Pin 2	RxD - 13
GND - Pin 5	GND - 14

UCM/Dupline to BH8-CTRLX RS232 connections

Other Dupline Controller models may have RS485 interface (which can be connected to UCM/Dupline485). **Hence the UCM / Dupline comes without any RS232 or RS485 Interface, and a RS232F or AUX485 Submodule must be bought separately.**

UCM/Dupline

Part Numbers

- UCM/Dupline- : Dupline Interface Module with firmware version UCM/Dupline 6.022 or above. UCM/Dupline cannot be used to program Comfort using Comfigurator. The function of this UCM is only to communicate with the Dupline. Add RS232F or RS485 Interface depending on the physical interface required for the Dupline Controller/Master Generator
- RS232F : RS232 Interface with DB9 (female)

Comfort to Dupline Interface

- AUX485 :RS485 Interface (half-duplex)

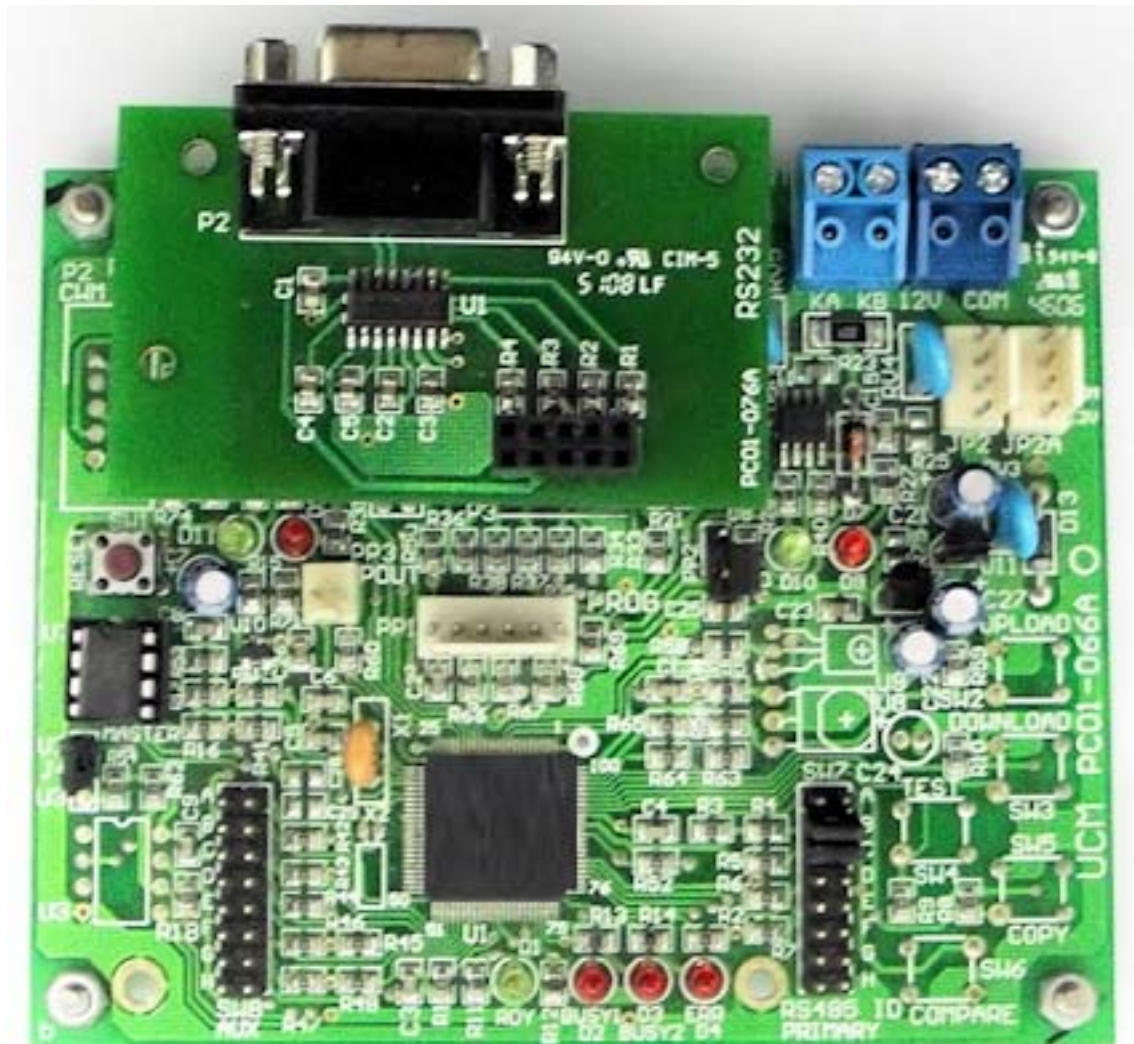
Comfort Requirements

- Applicable to Comfort II, for all firmware versions although it is recommended to upgrade to the latest Comfort firmware 6.xxx.

Specifications

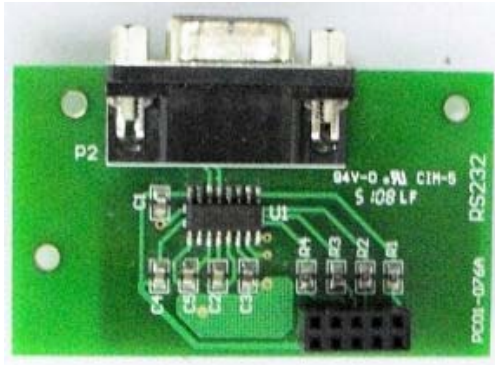
- Size 108 x 88 mm UCM baseboard with RS232 or RS485 plug in submodule depending on the Dupline Controller or Master Generator
- Power Supply: 12V 30 mA (supplied from Comfort)
- Baud Rate 9600.
- Sends Output and Input control messages to 128 Dupline addresses
- Dupline Outputs are mapped to 128 Comfort Counters for status monitoring and to trigger Counter Responses

UCM/Dupline Settings



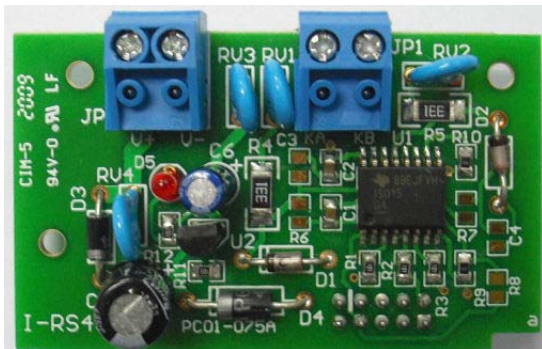
UCM/Dupline with RS232F submodule

Mount the RS232F or AUX485 submodule onto the UCM/Dupline- baseboard using the supplied metal stand-offs and screw in the submodule.



RS232F Plug in Submodule

If the RS232 interface is used, connect the RS232 port to Dupline Controller BH8-CTRLX RS232 pins on the terminal block. You will have to make up a special cable between the RS232 connector to the terminal block according to the table in the section on Dupline Controller/Master Generator.



AUX485 Submodule

The AUX485 is an isolated RS485 half-duplex Interface which can be connected to the Dupline Controller if it comes with a RS485 Interface. Connect the 12V and COM terminals on the AUX485 to the 12V power supply in the Dupline Controller. Connect the KA and KB terminals on AUX485 to the corresponding A and B terminals on the Dupline Controller.

UCM Connections to Comfort

- JP3 - 12V/COM terminal block. Connect to 12V/COM on Comfort. (JP3 may not be available in later models, JP2 4-way header is used for KA/KB/12V/GND).
- JP4 - KA/KB terminal block. Connect to KA/KB on Comfort. (JP4 may not be available in later models, JP2 4-way header is used for KA/KB/12V/GND).
- JP2 -and JP2A 4-way headers (12V/COM/KA/KB). Either connector can be connected to Comfort "RS485" 4-way connector via the supplied 4-way cable when JP3 and JP4 are not used. This plug-in cable connection is used when the distance between Comfort and UCM is less than 1 meter. For longer distances, use the JP3 and JP4 terminal blocks.

Jumper Settings

- SW7 (RS485 ID Primary) - set according to ID of the UCM (see “UCM ID Switch” settings below) Comfort is able to support up to 8 UCMs. SW7 is a set of 3 headers which determines the UCM ID, according to the table below:

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

By convention, UCM ID=1 is used for UCM for Configurator. The Dupline UCM should be set to ID 2 or above so that any Comfort RS485 communications failure can be reported.

Press RESET on the UCM after changing the ID settings.

The Number of UCMs in Configurator Modules and Settings should be programmed according to the number of UCMs connected.

- SW8 - Not used

Buttons

- SW1 - RESET. This button resets the UCM/Dupline. It does not change any parameters in Comfort or Dupline.

LED Indicators on UCM

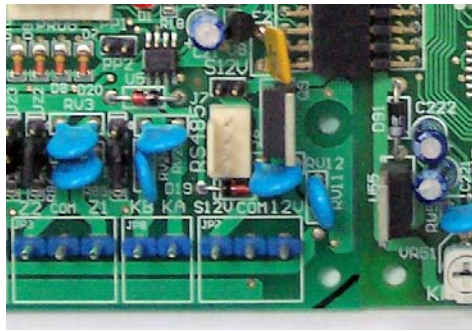
- D1 “RDY” (Green) should be on at all times.
- D2 “BUSY1” (Red) blinks if there is an incoming message from Dupline.
- D3 “BUSY2” (Red) blinks when the UCM transmits a message to Dupline.
- D9 (Red) RS485 Transmit to Comfort
- D10 (Green) RS485 Receive from Comfort
- D11 (Green) RS232 Receive Data from Dupline.
- D12 (Red) RS232 Transmit Data to Dupline.

ICs

- U1 - Microcontroller IC. Label indicates the firmware version number “UCM/Dupline 6.xxx”.

Setup

- Before connecting the UCM to Comfort, set the ID on SW7 to the ID of the UCM according to the table in the previous section. If there is only 1 UCM, set the ID to 2. By convention, UCM 1 is for upload/download from Comfort, which is not reported when there is a Communications Failure. Up to 8 UCMs can be connected to the Comfort network.
- The UCM is connected to Comfort via the supplied 4 way white cable from 4 pin header JP2 to Comfort’s “RS485” 4-way header . This supplies power to the UCM, as well as allowing communications between Comfort and the UCM. 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. 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.
- 4 The Green LED D11 flashes when there is data transmitted from the Dupline, which will happen when there is any Dupline activity, i.e. when a switch is pressed. The Red D12 LED flashes when there is data from Comfort to the Dupline. D11 and D12 monitor raw communications with the Dupline.
- 5 D2 (BUSY1) LED blinks when there is an incoming message from the Dupline which corresponds to one of the addressable Group addresses according to the settings in SW8. D3 (BUSY2) LED blinks when a message is sent to the Dupline.

Dupline Configuration

The Smart-House software from Carlo Gavazzi is used to configure and program the Dupline network prior to programming the Comfort to Dupline interface. The list of group addresses used in the network should be provided for the programming of the Comfort system for integration with Dupline. Comfort cannot be programmed with the Dupline programming tools; it needs to be programmed separately. A list of Dupline group addresses used in the Dupline network must be supplied. Comfort will communicate with the Dupline through these addresses.

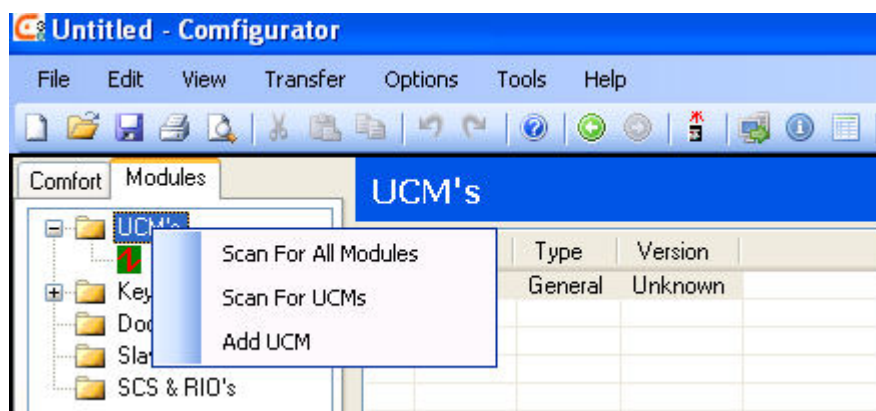
The RS232 baud rate for the external interface should be programmed as 9600 baud for communication with UCM/Dupline.

The Dupline controller Modbus Slave address should be set to 1 for communication with UCM/Dupline which acts as a Modbus master.

Using Comfigurator

Comfigurator 3.5.0 and above is required to support the UCM/Dupline. A UCM/USB or UCM/Ethernet version 6 is required to connect to the computer running Comfigurator.

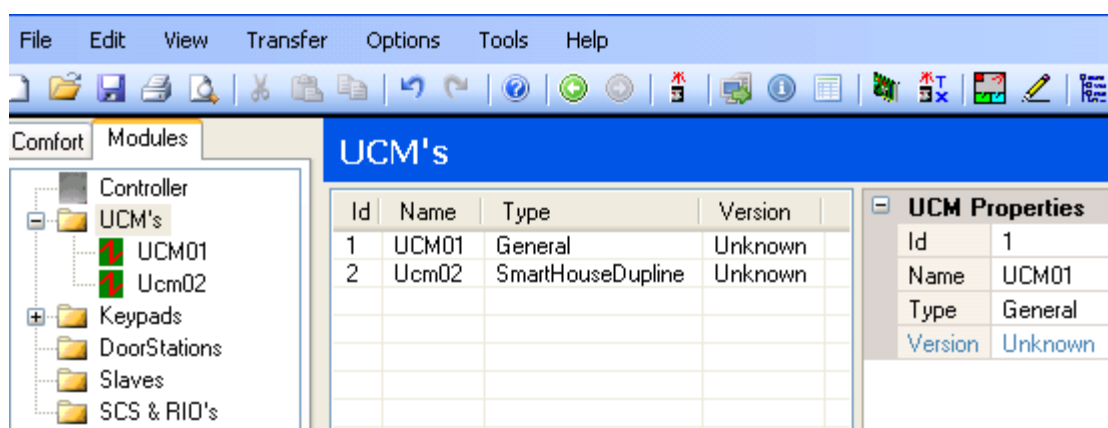
Go to the Modules Tab and right-click on UCMs folder symbol as shown below.



“Scan for All Modules” will automatically detect all UCMs including the UCM/Dupline if the ID is set correctly without any conflict with other UCMs.

“Add UCM” allows you to manually add a UCM/Dupline if not currently connected to Comfort, ie when doing programming off-line.

The result of scanning or adding a UCM/Dupline is shown below for UCM ID 2;



The firmware version of the UCM/Dupline will be shown in the “Version” field after Scanning, but not after Adding manually.

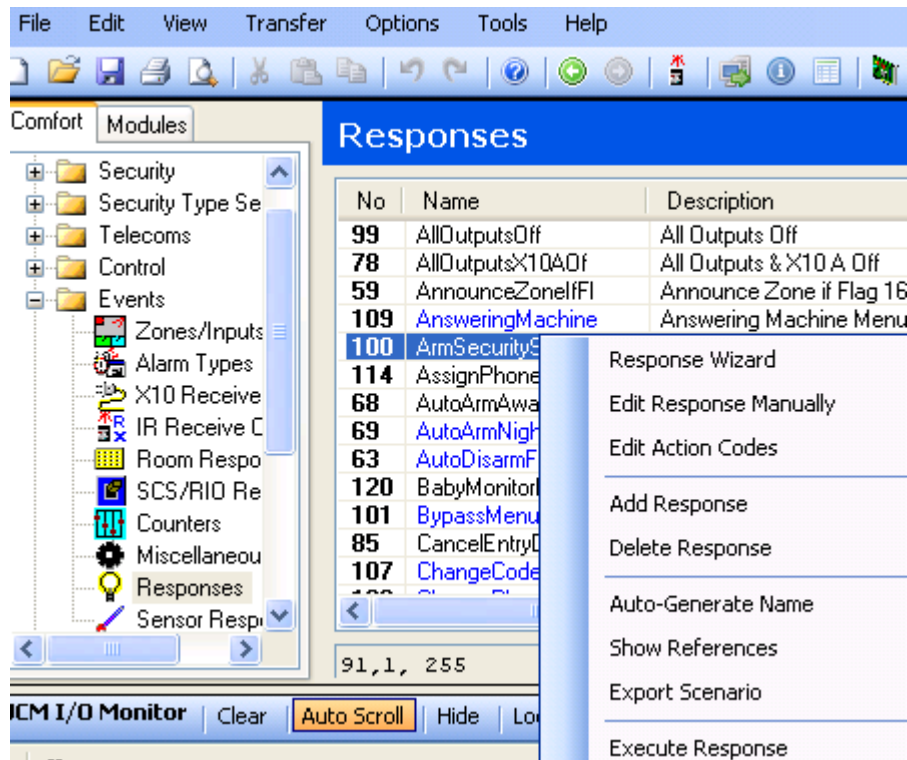
Sending Commands to Dupline - Response Wizard

Comfort Responses are programs that can be triggered by any Event in Comfort, e.g. Zones, Alarms, Time Programs, as well as combinations of events with logic e.g. If Time is 11 PM to 6 AM then turn on Lights 1 and 2 for 3 minutes when Motion is detected AND Security system is armed. This is a very important tool to configure a customised behaviour according to customers needs.

The Response Wizard will allow valid commands to be sent to UCM/Dupline

Go to Events > Responses, right click in the Responses Window

Comfort to Dupline Interface

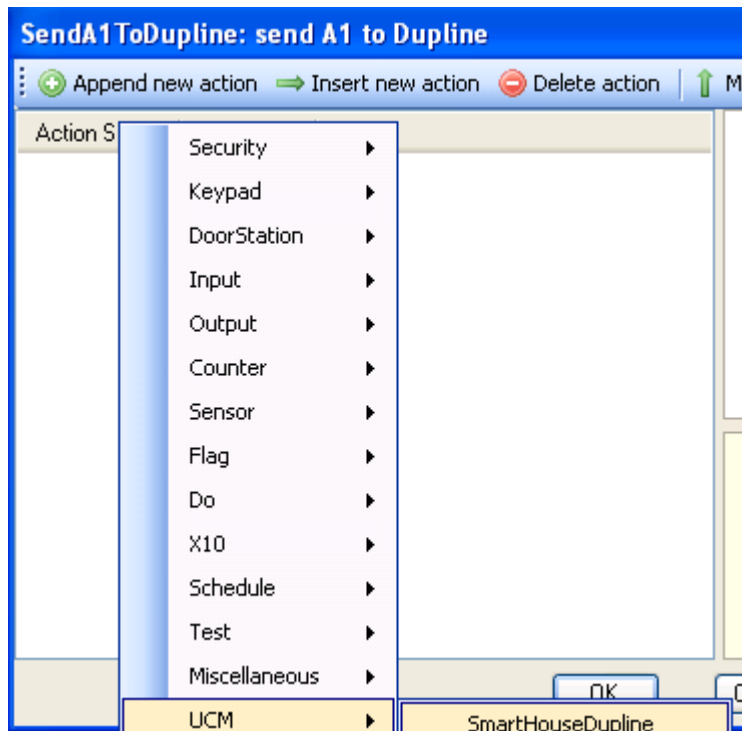


Select “Add Response” to create a new Response, or “Response Wizard” to edit the selected Response.

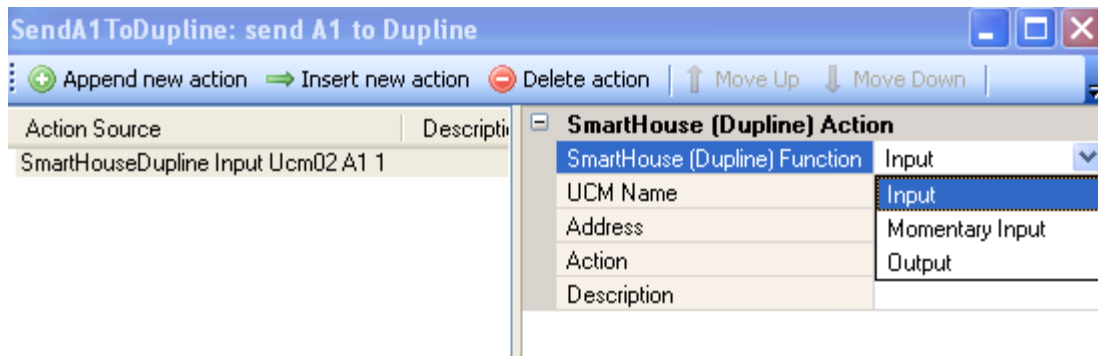
To Add a new Response, enter the Response Description in the pop-up window and press ENTER. The Name will be automatically generated as shown;

The screenshot shows the 'Add New Response' dialog box. It has a title bar 'Add New Response' and a section titled 'Response Properties'. This section contains three fields: 'Number' with the value '27', 'Description' with the value 'send A1 to Dupline', and 'Name' with the value 'SendA1ToDupline'. Below these fields is a large text area labeled 'Description' with the placeholder text 'This is a description of the response.' At the bottom of the dialog are two buttons: 'OK' and 'Cancel'.

Press OK. A new window will Open to append new action. Select UCM and SmartHouseDupline as shown below. Note that this is visible only if the UCM/Dupline has been added to the list of UCMs by scanning or manual addition.

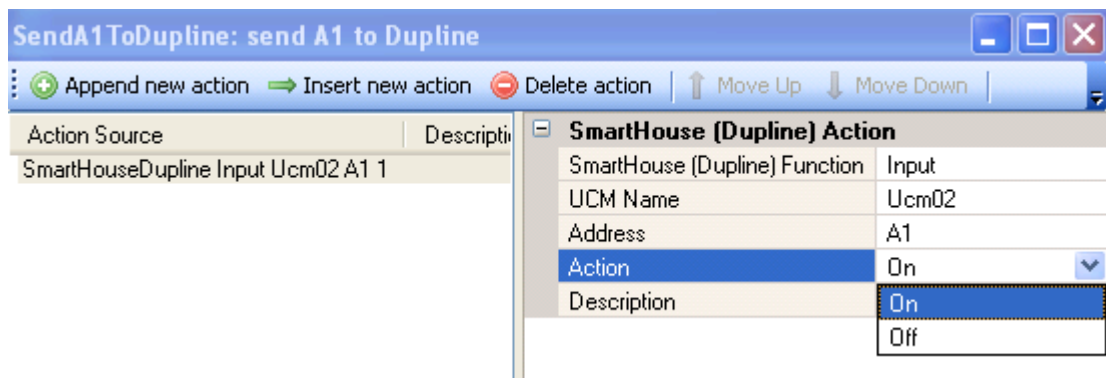


The right pane will show the selected action. Click on the Smarthouse (Dupline) Function to see a dropdown selection. The 3 options available are Input, Momentary Input, and Output.



Input

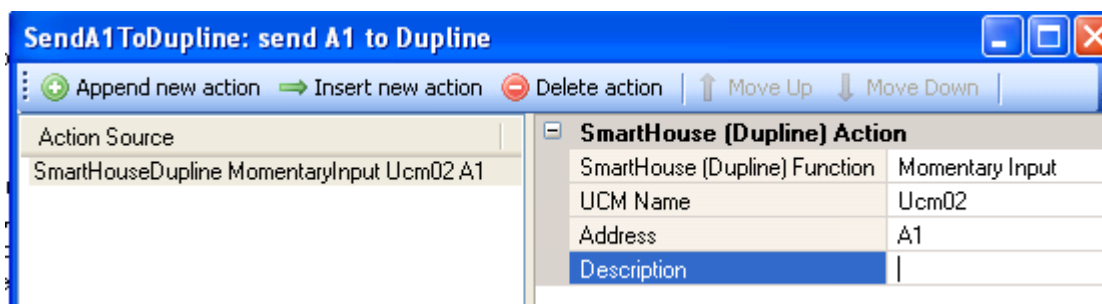
Select the Dupline Input address A1 to P8, and select On or Off. This will simulate a Dupline switch being pressed or released. The result of this depends on Dupline programming.



Momentary Input

Select the Dupline Input address A1 to P8. This will simulate a Dupline switch being

pressed and released. The result of this depends on Dupline programming.

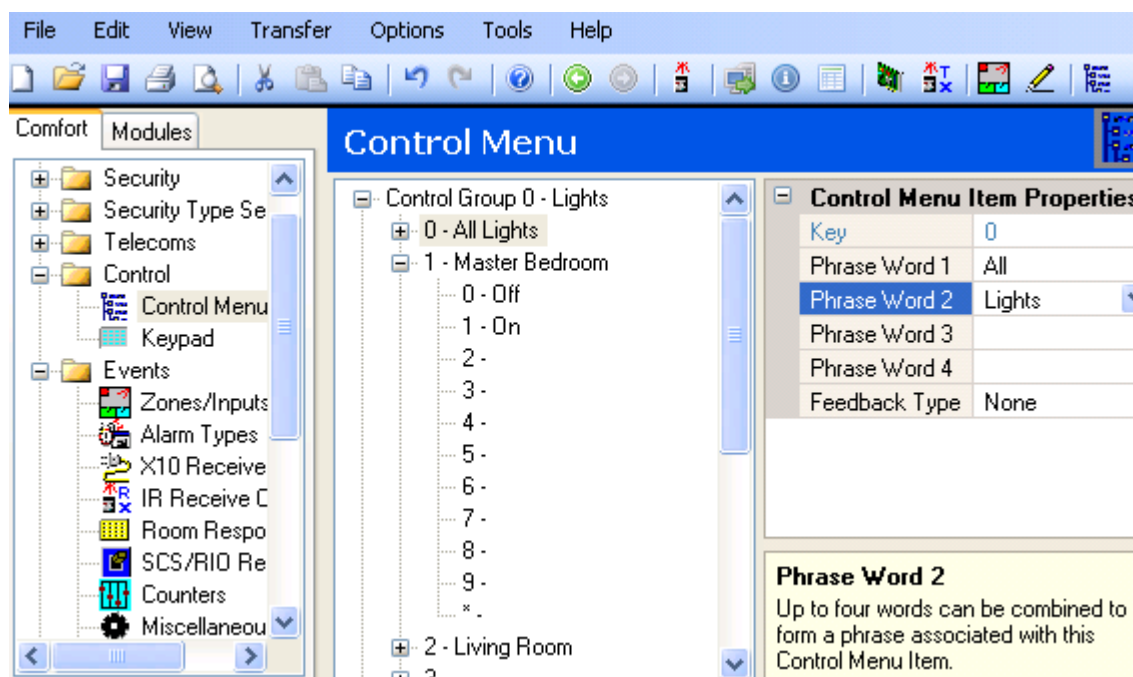


Output

Select the Dupline Output address A1 to P8, and select On or Off. This will force the Dupline Output to switch on or off .

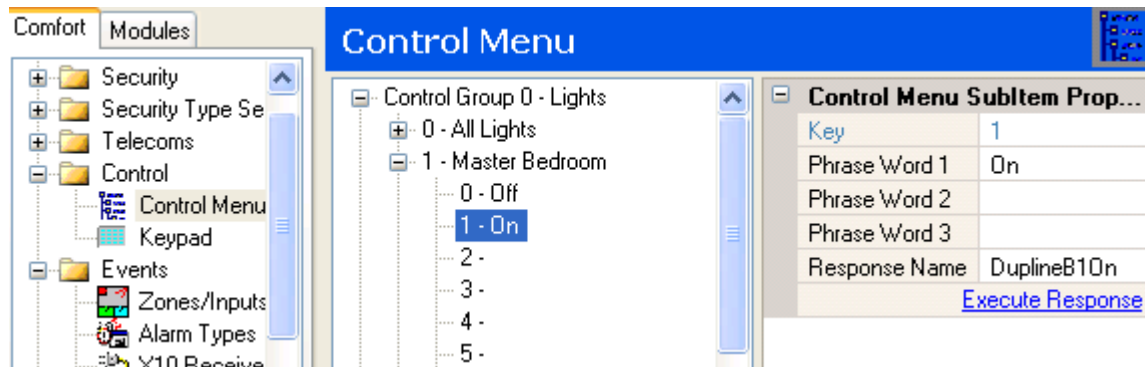
Control Menu

The Home Control Menu can be programmed to control Dupline addresses. The screenshot below shows an example of a Home Control Menu. Comfort Ultra has 6 Control Groups, which may be programmed as Lights, Aircons, Blinds etc. Each Control Group can have 10 Control Keys e.g. for All lights, Living Room Light, Bedroom light etc., and each Control Key can have 10 Actions or commands e.g. On, Off, Dim, Bright, Up, Down etc. Each Group, control key and Action Key can have words assigned for announcement.



In the above screenshot, Control Group 0 “Lights”, Control Key 1 is Master Bedroom and action keys are 0 for Off and 1 for On.

The Off key and On key activates Responses to control the relevant Dupline devices.



In the above example, The Master Bedroom On key activates the Response called DuplineB1On. This Response is programmed to turn on Dupline address B1 as described previously. Similarly Master Bedroom Off key activates the Response DuplineB1Off.

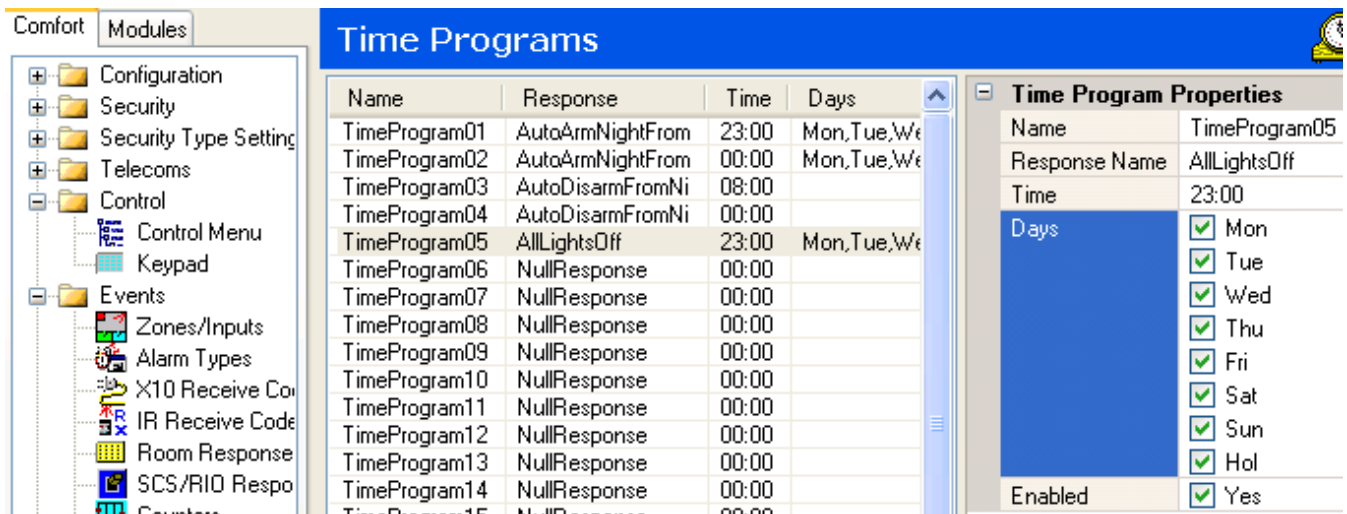
All Lights On and Off can be programmed to switch on and off all Dupline lights in the premises.

The Comfort iPhone App can also work on the programmed Home Control Menu to control and monitor the status of the programmed devices.

Time Programs

Comfort Time Programs can be scheduled to send commands to Dupline

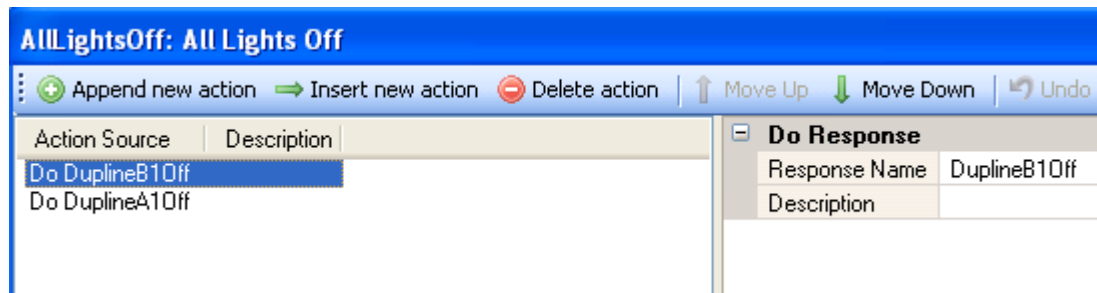
In Configurator, go to Schedule > Time programs.



In the above example, Time Program 5 is programmed at 11 PM Monday to Sunday and Holidays to send All Lights Off command.

All Lights Off can be programmed to switch off several Dupline devices. This can be done by calling other Responses which individually turn off Dupline devices as shown below.

Comfort to Dupline Interface



These are simple examples of how Comfort Responses can be triggered by Events to send commands to Dupline.

Dupline to Comfort

The UCM/Dupline polls and monitors for **Dupline Output** activity for addresses A1 to P8, and saves the value to **Comfort Counters**.

Comfort Ultra has 255 Internal Counters numbered from 0 to 254 which can be used as general purpose Registers or to hold the states of external devices like Dupline and C-Bus. Each Counter can hold a 1 byte value ie 0 to 255. Dupline output states are saved in the counter as 0 for OFF, 255 for ON.

When a Dupline Output command is received by UCM/Dupline, the state (ON or OFF) is kept in the mapped Counter register.

The Mapping between Dupline Output addresses and Counters is shown below

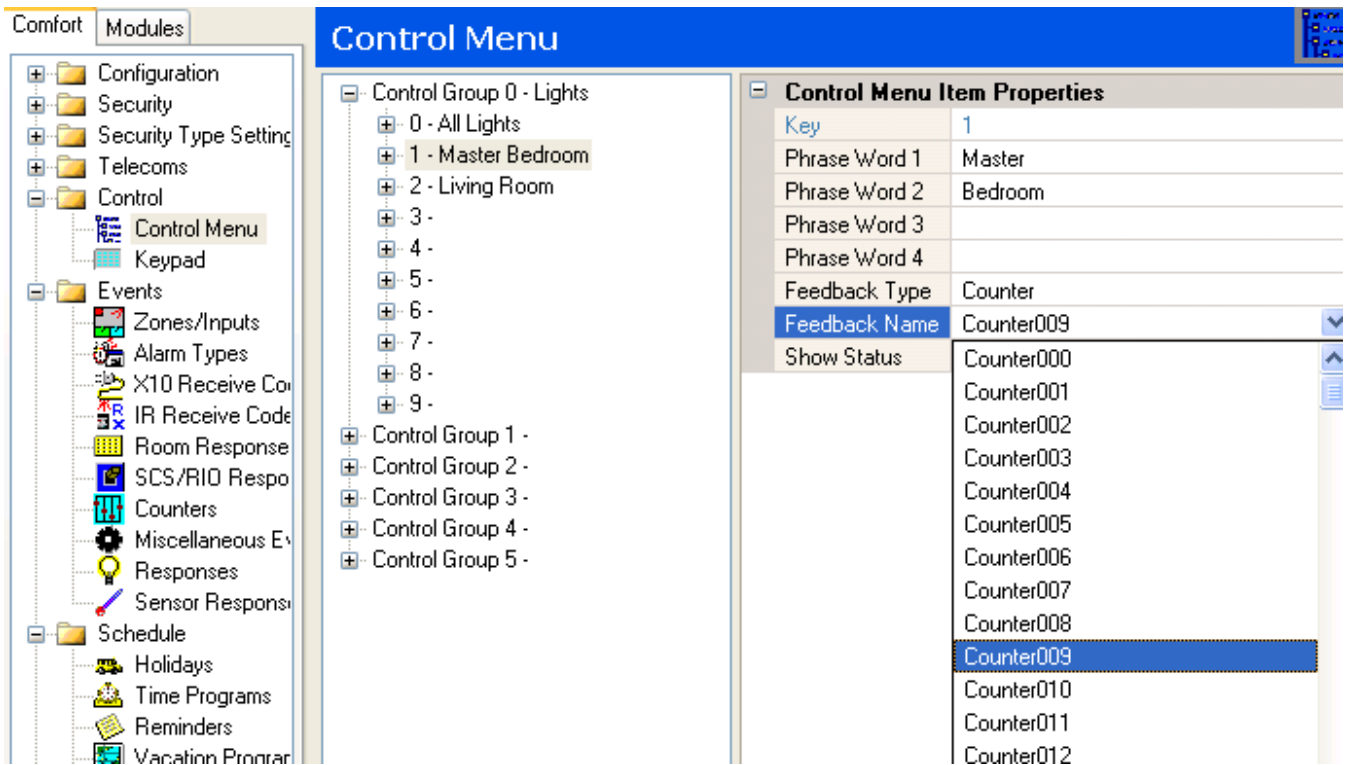
Dupl Addr	CTR	Dupl Addr	CTR	Dupl Addr	CTR	Dupl Addr	CTR	Dupl Addr	CTR	Dupl Addr	CTR	Dupl Addr	CTR	Dupl Addr	CTR
A1	0	C1	16	E1	32	G	48	I	64	K	80	M	96	O	112
A2	1	C2	17	E2	33	G	49	I	65	K	81	M	97	O	113
A3	2	C3	18	E3	34	G	50	I	66	K	82	M	98	O	114
A4	3	C4	19	E4	35	G	51	I	67	K	83	M	99	O	115
A5	4	C5	20	E5	36	G	52	I	68	K	84	M	100	O	116
A6	5	C6	21	E6	37	G	53	I	69	K	85	M	101	O	117
A7	6	C7	22	E7	38	G	54	I	70	K	86	M	102	O	118
A8	7	C8	23	E8	39	G	55	I	71	K	87	M	103	O	119
B1	8	D1	24	F1	40	H	56	J	72	L	88	N	104	P	120
B2	9	D2	25	F2	41	H	57	J	73	L	89	N	105	P	121
B3	10	D3	26	F3	42	H	58	J	74	L	90	N	106	P	122
B4	11	D4	27	F4	43	H	59	J	75	L	91	N	107	P	123
B5	12	D5	28	F5	44	H	60	J	76	L	92	N	108	P	124
B6	13	D6	29	F6	45	H	61	J	77	L	93	N	109	P	125
B7	14	D7	30	F7	46	H	62	J	78	L	94	N	110	P	126
B8	15	D8	31	F8	47	H	63	J	79	L	95	N	111	P	127

If the Output is Off, the value 0 is saved in the corresponding counter. If the Output is On, the value 255 is saved in the corresponding counter.

This allows Comfort to Monitor the status of the Dupline Outputs and to trigger Responses based on each Counter.

Monitoring Dupline Status

The state of Counters can be heard on the Home Control Menu. In the above example, each Control Key can be assigned to a specific Counter. E.g. Master Bedroom controls Dupline address B2, which is mapped to Counter 9. Hence assigning Feedback Type as Counter and Counter as 9 means the feedback status is obtained from counter 9.



This means that when Dupline Output B2 is On the Home Control menu for Master Bedroom will announce its status as “On” and when Output B2 is Off the master Bedroom will announce its status as “Off”.

🔊 Sending commands to Dupline addresses will also update the mapped Counters

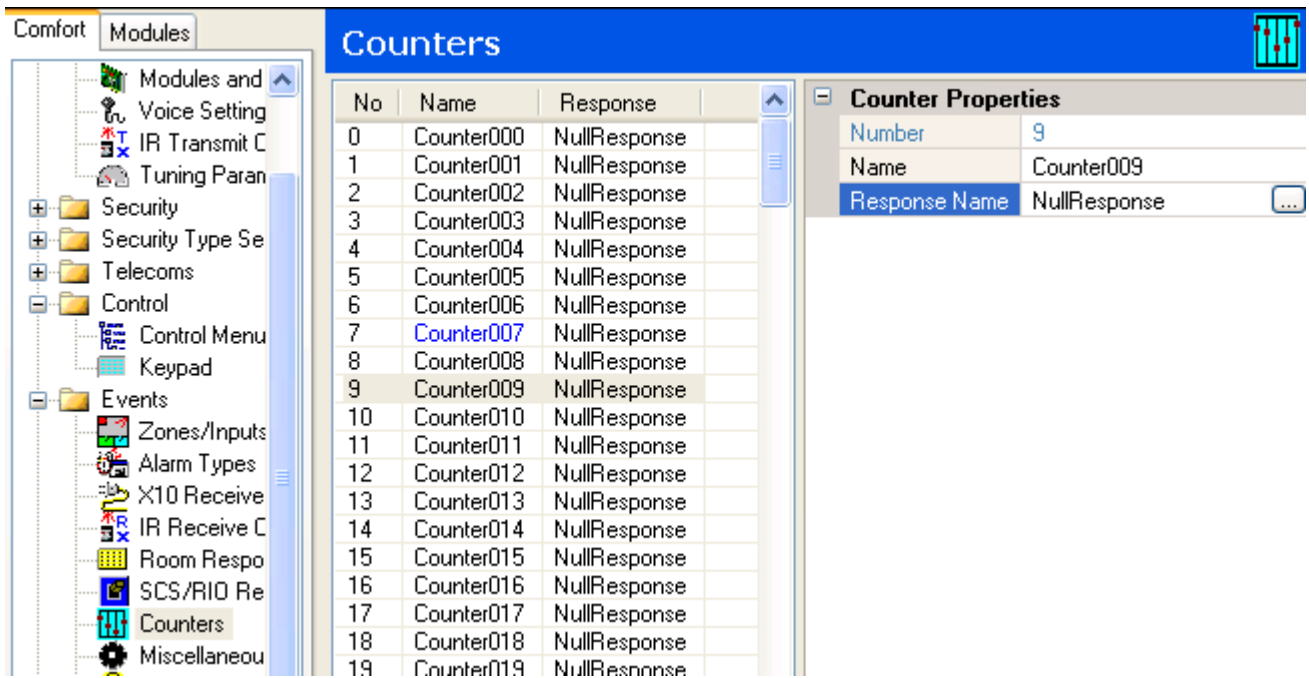
Feedback Types on the Home Control menu can be configured as Inputs, Outputs, Counters, Sensors, or Flags.

Triggering Comfort Responses by Dupline

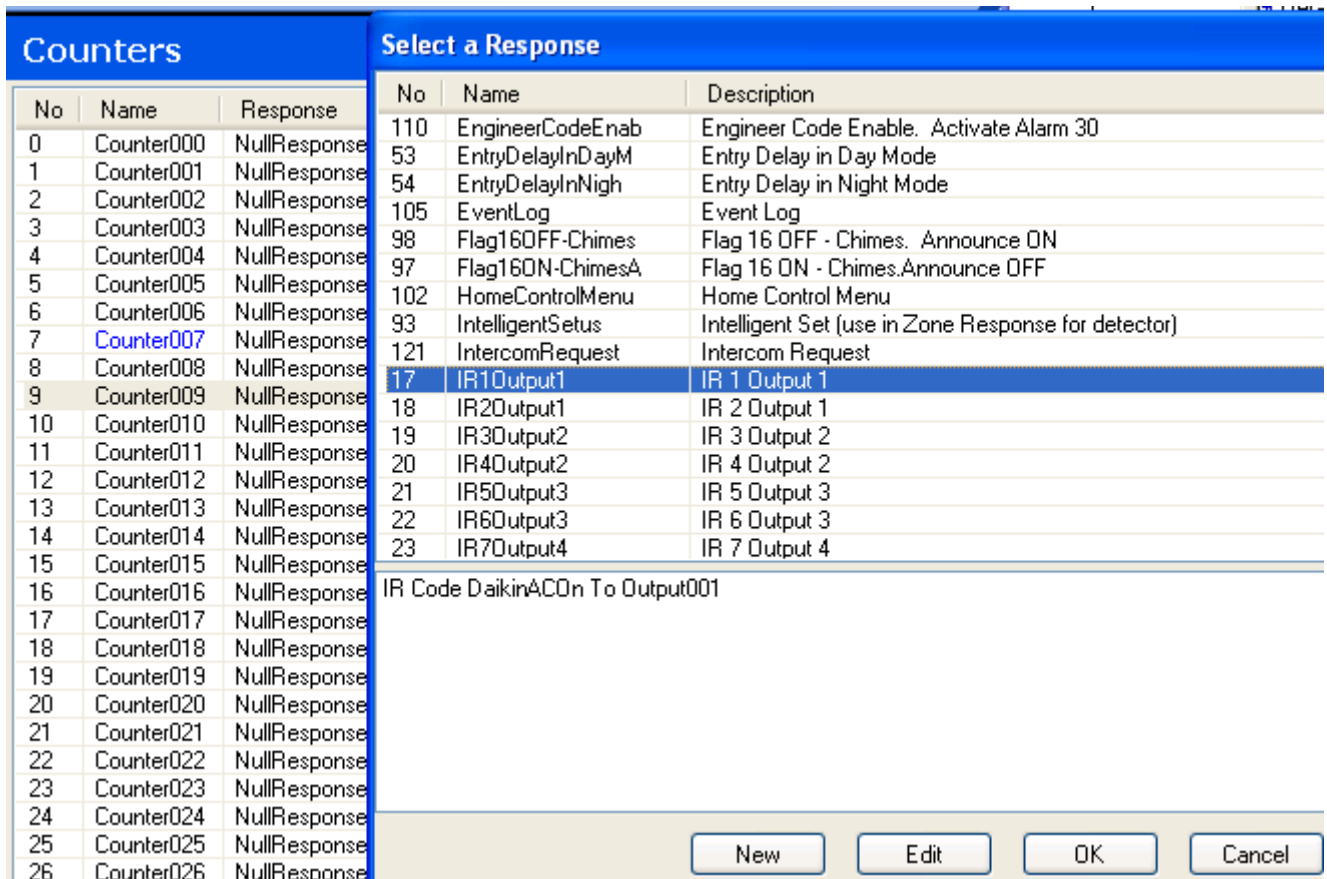
Each Comfort Counter will also trigger a Counter Response when Dupline sends a command which is mapped to a counter.

For example, Dupline Output B2 is mapped to Counter 9. In order to allow this to send a command to control an airconditioner by IR commands, we can make use of the Counter Response. Go to Events > Counters and select Counter 9.

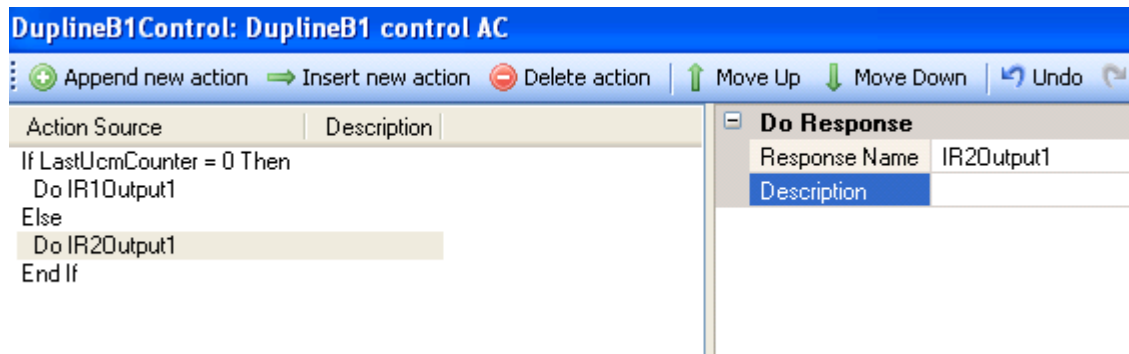
Comfort to Dupline Interface



Each Counter can be assigned a Response which is triggered when the Counter is changed by Dupline. On the right pane, you can assign the Response by clicking on the ... Button to the right of Response Name. The example below shows how to assign as Response to send an IR code to Output 1.



This means that when any change in the Dupline B2 Output is seen by Comfort, it will trigger the IR command. In practice you would like to control the Aircan to turn on or off depending on the Dupline On or Off command. This can be done by creating the Response as shown as the Counter Response



If Last UCM Counter = 0 means if the Value of the Counter that triggered the Response is 0. Hence the above Response will do IR1Output1 when the Dupline B1 command is OFF and do IR2Output1 when the Dupline B1 command is On.

Technical Note: Action Code 197 (Send RS232) Format for Dupline

The Response Wizard for Dupline is only visible when a UCM/Dupline is present.

Select from the following

- 1 Select Address A1 (00) to P8 (127) or ALL (255)
- 2 Select Function, Input = 1, Momentary Input = 2, Force Output = 3 (other Functions in future)
- 3 Select Action OFF = 0, ON = 1

For Momentary Input, the action is fixed at ON=1. (UCM/Dupline will disregard this byte)

The action created is in the form

197, UCM/Dupline ID, Header =1 (fixed), Dupline address 0 to 127, Function (1-3) , action (0,1)

E.g.

197, 18, 1, 8, 2, 1 means send UCM ID2, B1, Momentary Input, (ON)

197, 19, 1, 16, 3, 0 means send UCM ID3, C1, Off

Firmware Version History

Note: Always check for the latest version of the firmware at <http://www.cytech.biz/firmware.html>

- UCM 6.022 - Initial Release

Document History

Version 1.0.1 - 21 June 2012 Initial Release

Important Note

The printed manual may not always be the most current version. Please check and download the latest version from <http://www.cytech.biz/manuals.html>

This manual is in A4 format. To print this manual as an A5 Booklet, on HP PCL printers select Page Scaling = Fit to Printable Area. Select Properties Finishing Tab, Document Options = Print on Both Sides, Booklet Layout = Left Side Binding. Other printers may have different settings to achieve the same result.

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Tech SupportEmail: support@cytech.biz
User Group/Tech Support: <http://www.comfortforums.com>



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