How to create a Synergy Programme

This guide will take you through how to create and deploy a synergy programme. Initially all aspects of the software are described as we create a working example.

Programming Software

The Synergy software has been design for ease of use using drag and drop configuration along with selection from pre-configured libraries for RS232 and IR devices. You can even name the buttons and print the labels from within the software.

To use an iKON Synergy controller it needs programming for the application. This is done using the free to use *Synergy Programming Tool* available for download at http://www.ikonavs.com/Configuration.html. The software only operates under Windows and is supported by all versions from XP to 10.

The computer to be used needs either a 9 pin serial port or the use of a USB to Serial converter. If using the latter the port needs to be assigned as Com 1 to 16.

NOTE: You can verify the com port number by going to Device Manger and finding the port under the Ports tab. If not in the range 1 to 16, it can be changed by opening the port, going to Port Settings and then click the advanced tab. In the lower corner of the advanced setting window the port number is selected. Set to an unused one in the range 1 to 16. Click OK to close the boxes and exit Device Manager.

Connecting the Synergy for Programming

Connect the serial port of the computer (or USB to serial converter) to the screw terminals labelled P-Link. Connect the DC power supply to the DC in. Don't connect to power until all connections are made.

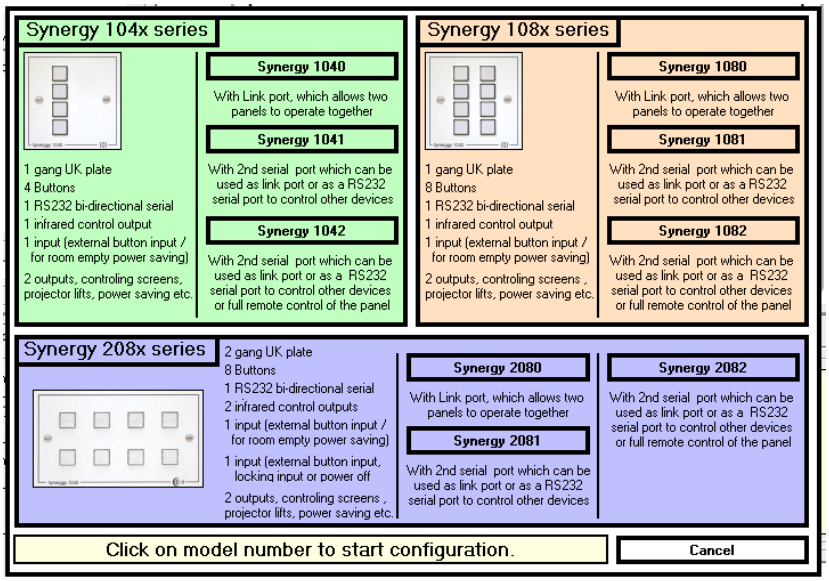
The serial connections are:-

P-Link	Computer Serial Port
A (Tx)	Pin 2
B (Rx)	Pin 3
G (Com)	Pin 5

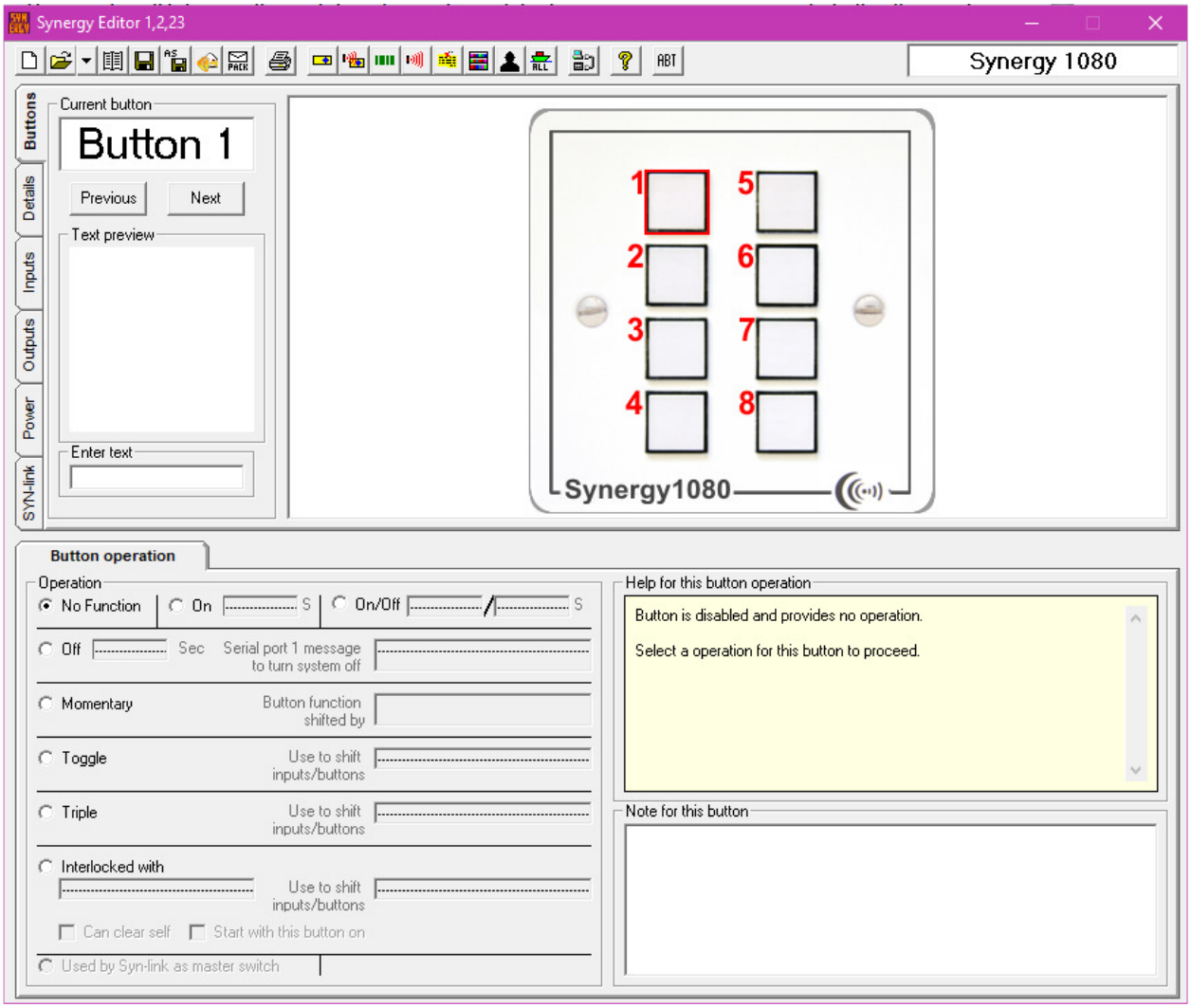
Creating Programmes

On first use after install you will be asked to complete optional user information, this is used to watermark programmes you create but is entirely optional. If you don't want to complete it now you can do so later from the  Tab on the main software screen.

On subsequent starts you will be offered the following screen:-



Simply select the model you wish to programme. For the purposes of this document we will select the basic 8 button controller Synergy 1080. This now takes us to another information screen to enter details about the programme we are about to create and then on to the main Synergy Editor screen.



Let's first take a look at the toolbar from left to right.

	Start a new configuration

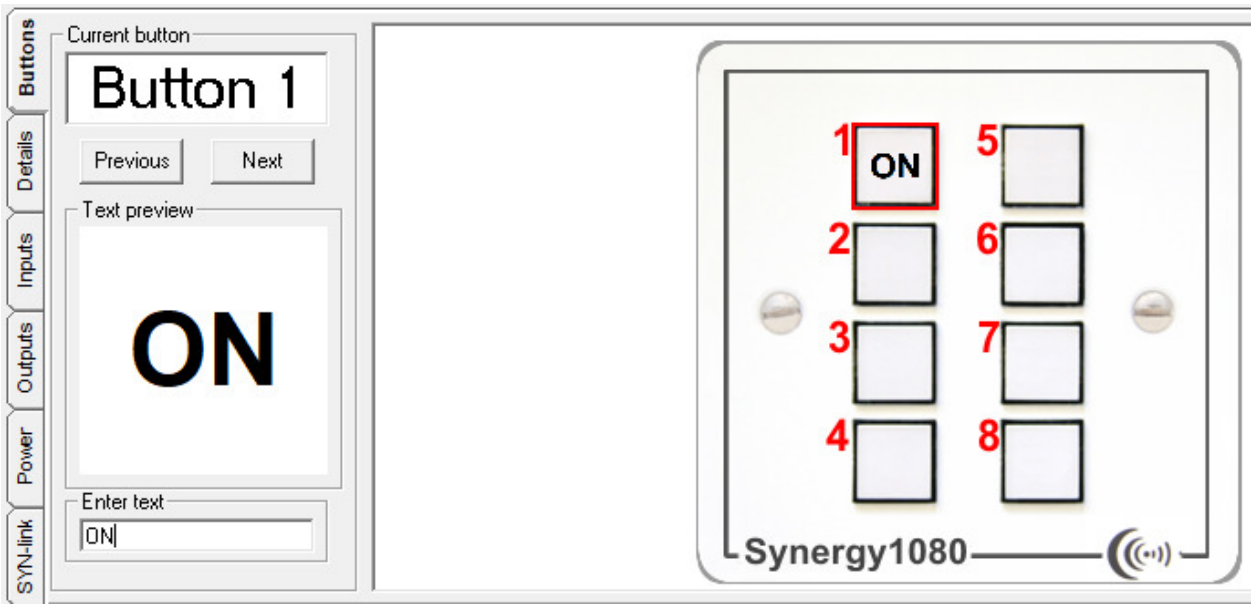
	Open an existing configuration with the last 8 on the down arrow
	Load library file – not currently supported
	Save and Save as
	No longer used
	Print the button labels
	Edit or create RS232 and IR display libraries
	Edit or create RS232 and IR libraries for other devices.
	No longer used
	Edit preferences
	Export all libraries for use on another system for Synergy programming.
	Download programme to controller
	Help – No longer available on the application. Refer to this document
	About the programme.

Getting Started

Labelling Buttons

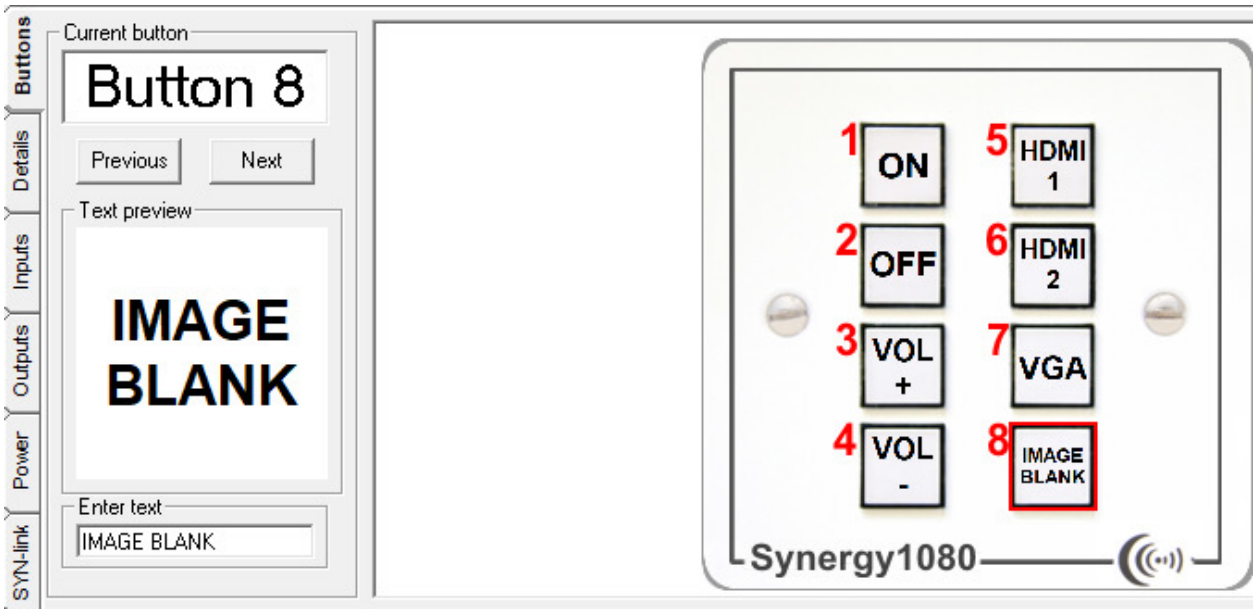
First you need to decide what button does what function and label them accordingly.

To do this select a button, it will highlight in red and the button number will appear in the 'Current button' box to the left. In the 'Enter text' box below enter the button name and it will appear on the button and in the text box above. It will automatically centre vertically and horizontally and use spaces to roll text onto a new line. These button labels are what are printed with the toolbar print button.



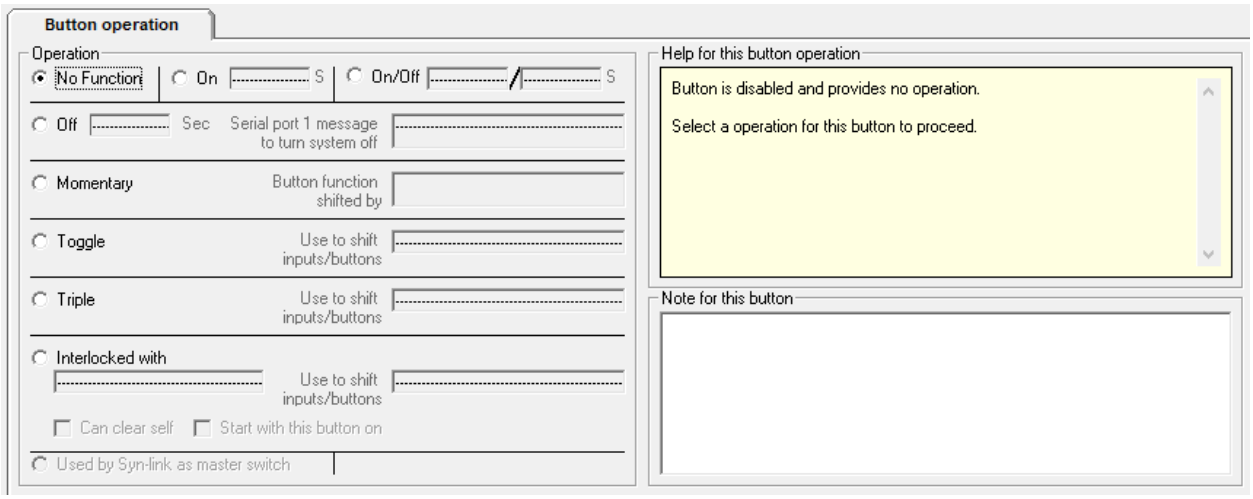
Do this for all the buttons you need to use first.

Now save the settings under the 'Save As' toolbar button.



Assigning Button Types

We now need to tell the system how each button behaves in the configuration, which buttons have special functions, which are linked together etc. This is done from the lower left of the same 'buttons' page.



To assign an operation you need to click on the button to highlight in red and then select the required function.

No Function	The button is not being used.
On	The button is assigned a special function as Display On – see below
On/Off	The button is assigned a special function as Display On or Off on alternative operation – see below
Off	The button is assigned a special function as Display Off and is only available if another button has nee set for On – see below
Momentary	Momentary action of pressing and releasing – see below
Toggle	Alternative action with a press on and press off action – see below
Triple	Version of above with three active states – see below
Interlocked with	Interlock up to 8 buttons with only one on at a time – see below.

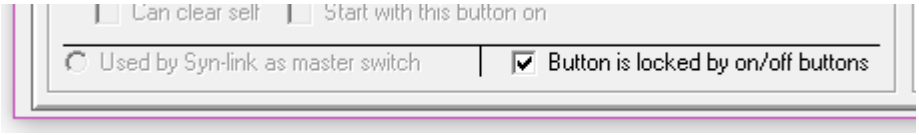
ON This is one of the special functions and defines the button as the main ON button for the, yet to be selected, display. When pressed it will issue the RS232 and/or IR command used to turn on the display and start its internal indicator slow flashing whilst the displays 'warm up' time takes place. Whilst this is occurring other buttons are locked out to prevent conflicting commands. Once the display is ready it becomes steady on.

To the right of the On radio button is a box with an ‘S’ to the right. Once On is selected this shows ‘0’ and is the time that the projector needs to accept commands after turning on. It is normally automatically selected when a display is selected but can be manually adjusted.

OFF For turning off the display. It is configured as a ‘press and hold’ for about 2-3 seconds before it operates to prevent accidental shutting down. When active the off command is issued to the display, any associated panel buttons are cancelled and the button slow flashes until the pre-set time for the display to cool expires and the indicator goes off. This is done to stop any attempt at restarting the display whist cooling down and ignoring commands. Again this has a box for the cooldown time.

ON/OFF Both on and off on the same button.

If a button is selected as the ON function when you set any other button the following box appears at the bottom of the Button operation section.



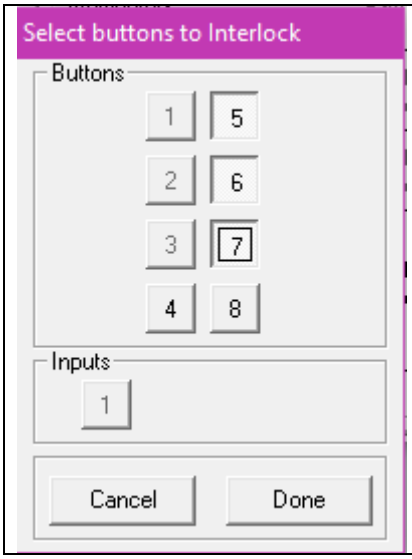
Done on a button by button basis it is used to disable the buttons operation if the ON button is off or if the display is in its warmup or cooldown process. If not ticked the buton is available all the time.

Momentary Carries out its command when pressed and can also issue a second command when released. The internal indicator is only illuminated when being pressed. Typical Use - Volume Up.

Toggle On the first press the associated command is sent and the internal indicator remains on. On the next press it can send a second command and the internal indicator goes off. Typical use – image blank On & Off.

Triple Works similar to Toggle with a command sent on the first press and the indicator on. On a second press a second command is sent and the indicator starts flashing and on the third press a third command is sent and the indicator does off. Typical use – cycle between 3 inputs

Interlocked with Allows a group of buttons to be interlocked so that if any one is selected it sends its command and illuminates, if another is selected it cancels the first sends its own command and illuminates. To use you select the operation then double click in the box to open a setup screen.

	In this situation the three source select buttons have been created as a group for interlocking. You can also use the aux input as a button and include it in a group. The use of the Aux Input is covered later

With the interlock settings you also have available two addition options.

Can clear self creates toggle buttons within the group so each can turn itself on and off whilst cancelling any others in the group.

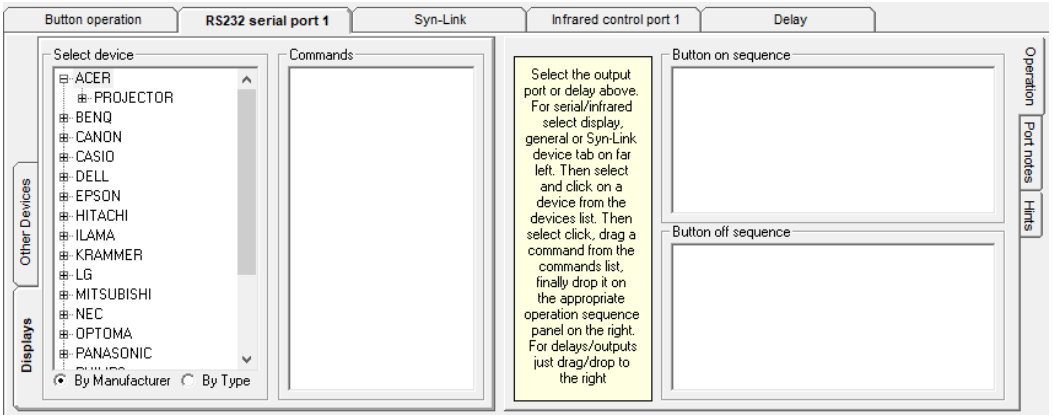
Start with this button on is just as it says; when the system starts or the 'On' period ends this button is 'pushed' by the software.

To the right of the Button operation screen is a simple help crib as to what the types of button do with a space below for those handy reminders of how you configured the buttons for next time.

Finally within the Button operation section are a number of optional boxed to the right of the function, these are classed as advanced features for experienced users of the Synergy panels and cover in another document.

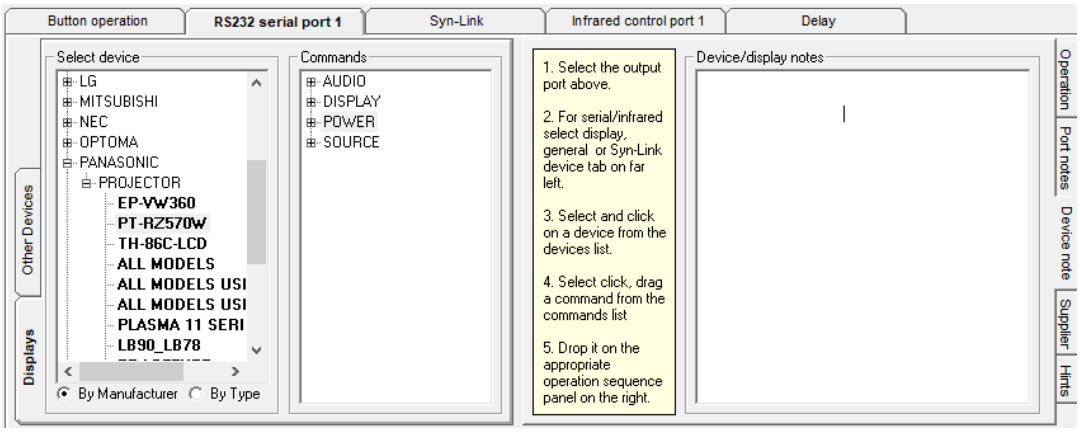
Assigning commands to buttons

Now we can move onto actually doing something with the buttons rather than just defining how they work. Select the ON button and with the horizontal tags across the centre of the app select RS232 serial port 1.

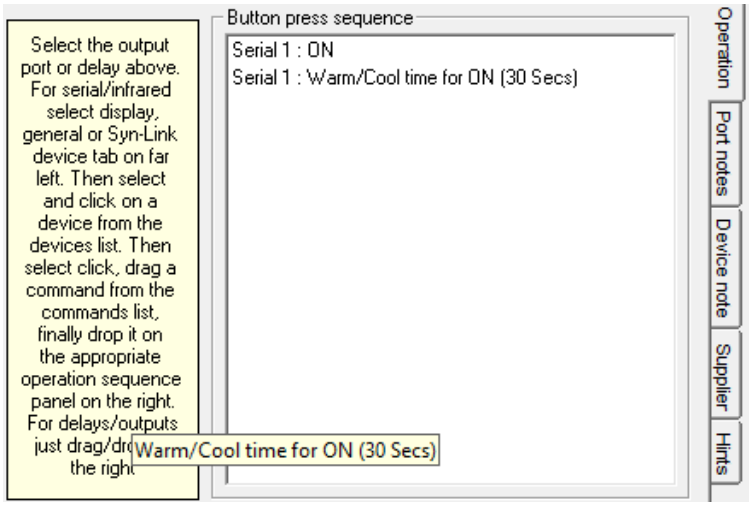


This is were you can select the disply youwant o use from the library. Editing an dcreating new entries fo rthe library are covered later. For now strole down to say

PANASONIC / PROJECTOR /PT-RZ570W as below

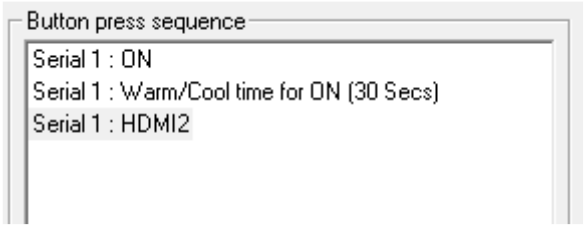


We can now click next to ‘power’ to see the options and then click on’ON’ and drag into the ‘Device/display notes box’ and drop. The box name will change to Button Press Sequence if it has not alreade done so. You will now see the serial command and warmup time added.



This button is now configured to send the ON command to the projector, start flashing the indicator for 30 seconds and then when it goes steady on allow other buttons to be pressed.

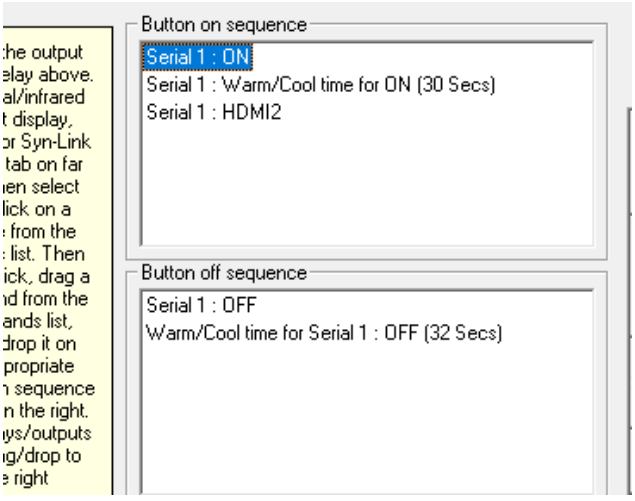
We can add additional functions here, for example select Source then click and drag HDMI2 onto the sequence. Now once the projector is ready it forces it to HDMI2.



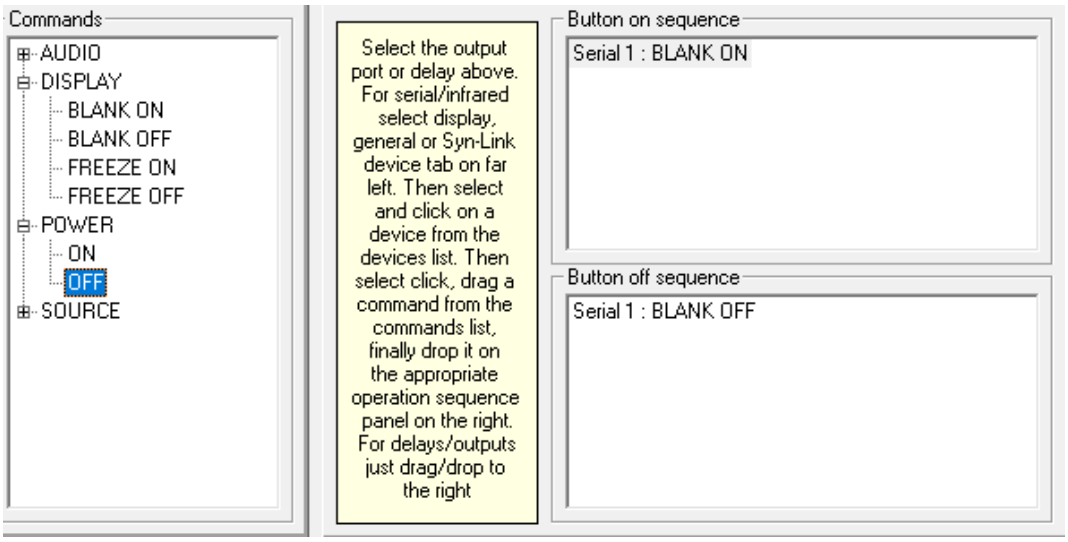
Note that the maximum number of commands you can add to a single buttos On or Off sequence is 8 entries. The above example represent 3.

The OFF button is treated the same way, click on the OFF button to highlight. The projector choice and options are retained so click on Power / OFF and drag to the now empty Button Press Sequence box.

If you are using a combined ON/OFF button the process is the same but you will be presented with a split area with an upper Button on sequence and the lower Button off sequence. Just drag an drop accordingly.

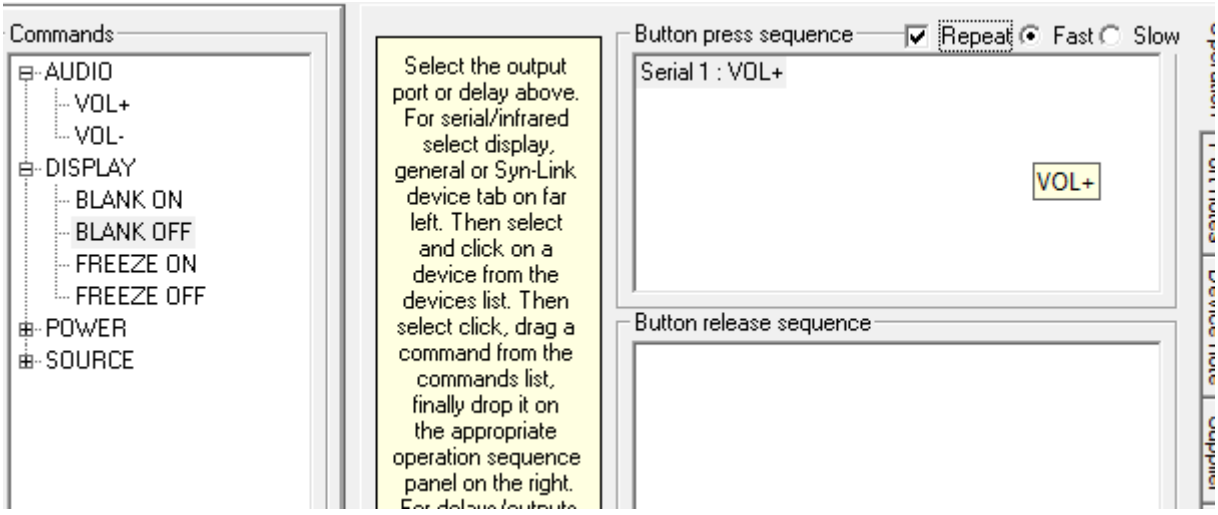


If using a button set for toggle, it the same as for the combined ON/OFF in this case Blank on and Blank off.



Use of the interlock command is similar but usually you only use the on sequence.

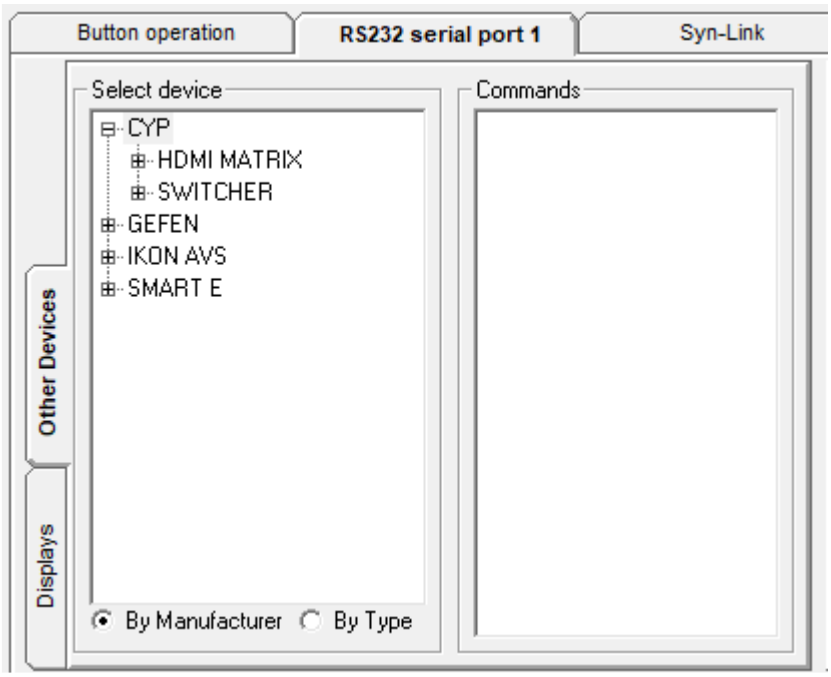
When it comes to momentary commands, as these are often used for an action that increments or decrements such as a volume, in addition to the usual option for press and release command it's possible to set the press command to automatically repeat to, for example, continually send the VOL up command until the button is released.



Save your programme again.

Adding other RS232 commands

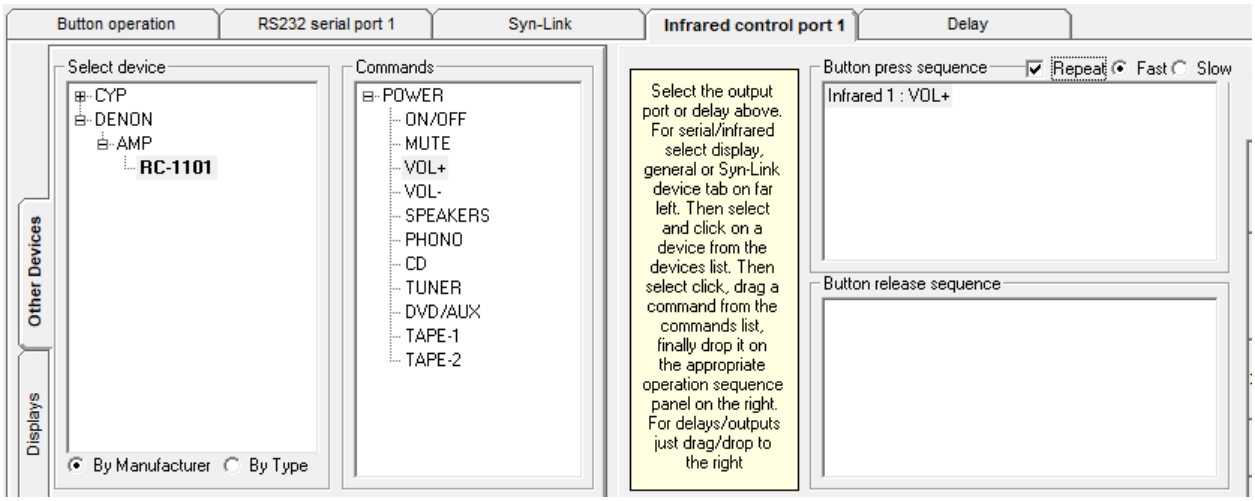
Not all uses of the synergy panel are for display control, you may be controlling an audio amplifier, matrix switch or similar.
The procedure here follows the same as the above but instead of selecting the Displays tab on the left you would select the Other Devices tab to show the alternative RS232 Devices library entries.



As before just select the device, then the function and drag & drop onto the 'Button On' screen for the button.

Adding IR commands

This operates the same way as RS232 devices but you select the Infrared control port 1 horizontal tab to access the Displays and Other Devices library.

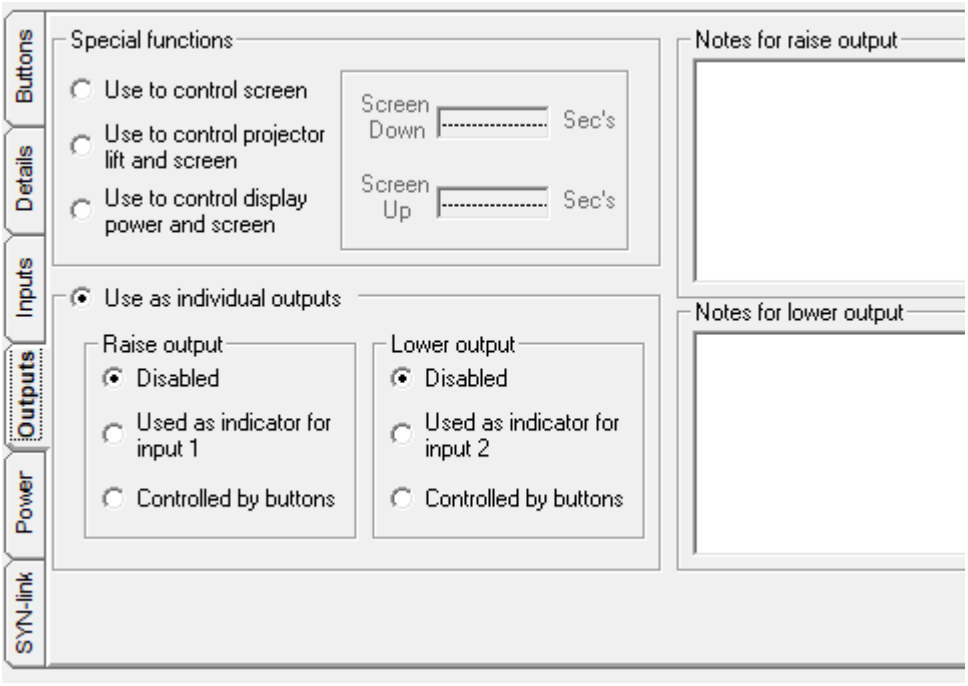


You can add both RS232 and IR commands to a button sequence.

So far we have just looked at the setting of attributes and operating sequence for the buttons. Before moving on to creating libraries we will have a quick look at the aux inputs and outputs.

Outputs

Setting of the outputs is carried out from the left hand Outputs tab.



The two outputs, labelled Raise and Lower are Open Collector outputs. The load relay, indicator etc, is placed between the output and the adjacent +V which is 12V. For more information on the ports refer to the document Synergy Port Connections available from our website.

Special functions

These options are only available if you are using the On and Off button operations The primary use of the raise and lower outputs is for the control of a screen but it can also be used to control the projectors power and a projector lift. In all three cases a diagram appear in the bottom left of the app window showing the required wiring of relays for the selected function.

Use to control screen
When selected the operation of the screen is automatically tied in with the projector. Lowering when the projector is turn on and raising when turned off. All you need to do is enter the times required to lower and raise the screen. Hint, if the screen is using its internal limit switches, just set to a bit longer than it takes. Always set the Raise time longer.

Use to control projector lift and screen
Again automatically tied to the projector and both the projector lift and screen must have their own internal limit switches set.
When the projector is turned on the lift and screen both lower and when in lift is in position the projector ON command is sent.
When you turn off the projector the screen will raise but the lift waits for the lamp to cool down before retracting the lift.
The Screen Down time should be set to time the lift takes to lower and the Screen Up time the time for the lift to raise.

Use to control display power and screen
When the projector is turned on power is applied to it and the screen lowered. After the time set under Screen Down which should be long enough for the projector to initialise after power on, the ON command will be sent to the projector.
When you turn off the projector it waits for the cooldown time, to expire and then removes power and raises the screen.

Use as Individual outputs

For situations where you want to use the outputs for a different purpose or manually control the screen.

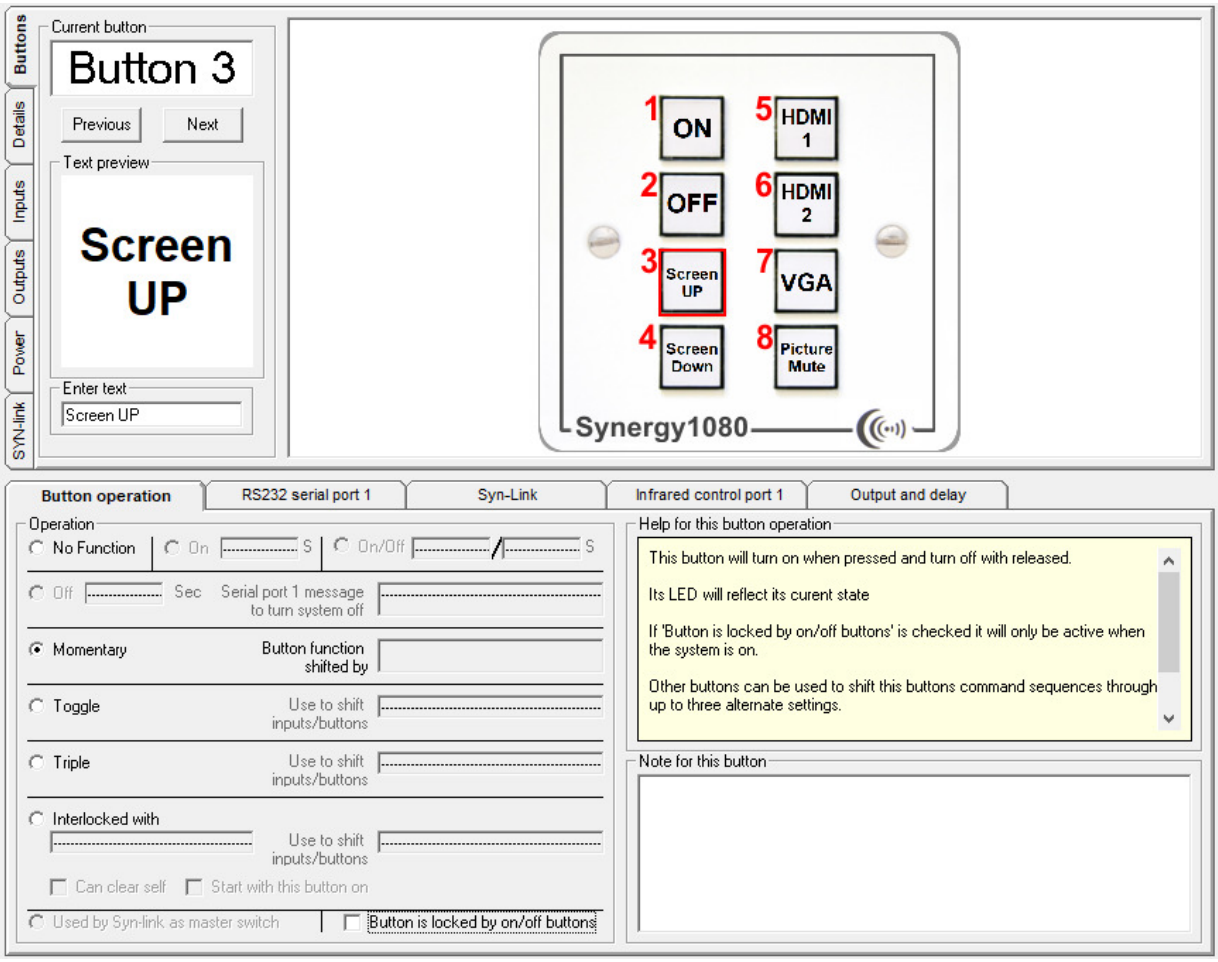
Disabled
Just as it says, the output is disabled.

Use as indicator for input 1
The aux input, detailed later, can be used as a switch input and with this option the output is used for an indicator to show the state of the switch. Only the Raise output can be used this way on a 10** series Synergy panel, as it only has 1 aux input. Both are available on a 20** series.

Controlled by buttons
Operation of the raise or lower output can be assigned to a button.

As an example of this let's change the VOL+ and VOL- to Screen Up and Screen down.

Return to the opening screen and change the button names, then select each button in turn and remove the tick from 'Button is locked' at the bottom centre. This will allow the screen to be operated independently of the projector.

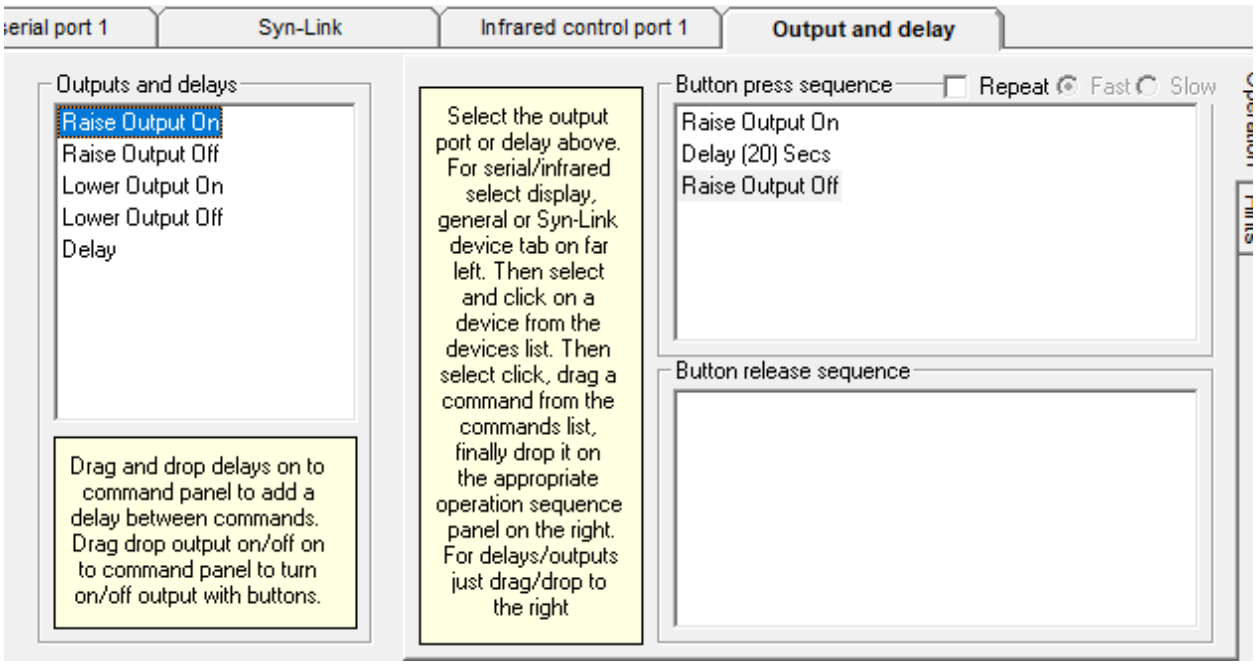


Select the Screen Up button and click on the centre row tab 'Output & Delay'.

The Button press sequence may still be set the VOL+, click on it and delete either by pressing the delete key on your keyboard or right clicking and selecting delete. If the 'Repeat' is enabled clear it.

To the left of the Button press sequence is a box ‘Outputs and delays’, drag and drop Raise Output On into the button sequence as below.

Now add a timer and set for the screen raise time followed by the Raise output Off.

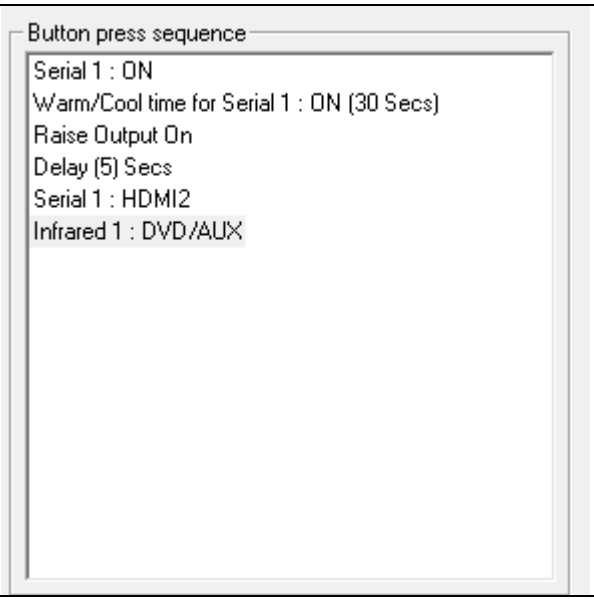


The lower command is complete in the same way using the Lower Output commands.

You now have a manually controlled screen independent of the projectors status.

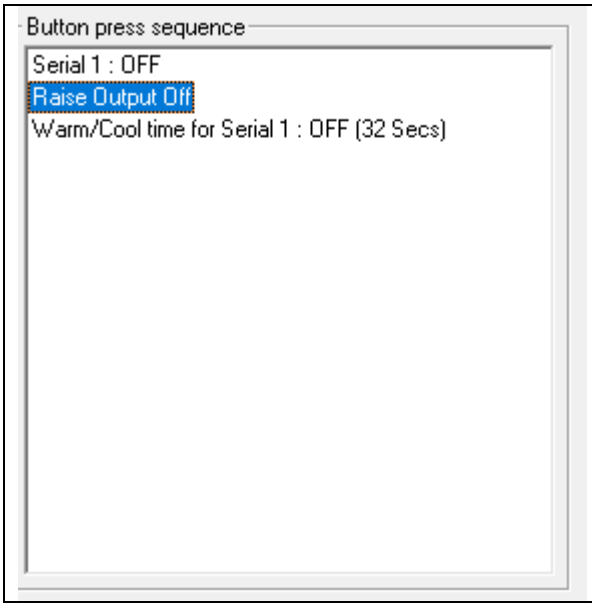
Of course you don’t have to control the screen with these outputs; you could use it to turn on maybe an amplifier when the projector is turned on. In a similar way you may need to add a time to within a button sequence to allow an operation to complete before issuing a further command.

In the example below this is what has been done with the ON command.



1. When the button for Projector ON is activated the ON command is sent to the projector and the warm up time starts.
2. After the end of the warm up time the Raise output, which is used to power the amplifier via a relay, is turned on.
3. Five seconds are allowed for the amplifier to initialise and accept IR commands.
4. The projector is set via RS232 to the HDMI 2 input.
5. The amplifier is set, via IR to the DVD input.

Similarly for the off command:

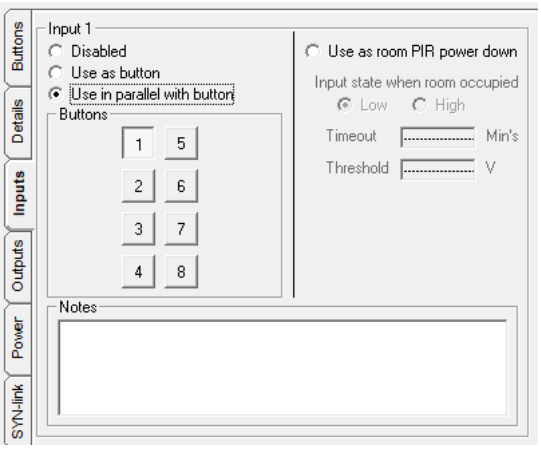


1. When the button for Projector OFF is activated the OFF command is sent to the projector.
2. The Raise output is turned off immediately to shut down the amplifier.
3. The cool down time starts.

Note, you can move commands up or down in the sequence by right clicking on the command and selecting Move up or Move down.

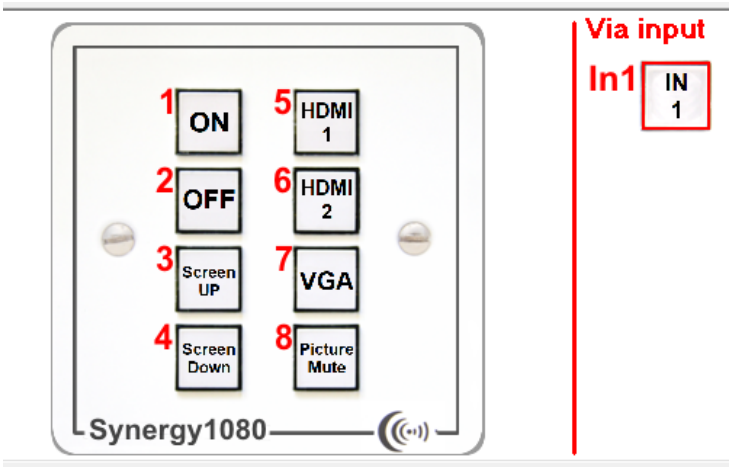
Inputs

Use of the inputs is carried out from the left hand Inputs tab. With a 10** series panel only 1 input is available whilst with the 20** panels two inputs are available.



Disabled. Not used

Use as a button. Create an additional 'virtual' button that can be configured as any other button for control. This appears on the main buttons screen and can be labelled.



Use in parallel with button. Can be used as an external contact trigger to activate a command sequence assigned to an existing button. For example, selecting a camera input to the display on an alarm activation.

Use as room PIR power down. For systems were there is a tendency not to turn off the projector as everyone leaves the room. You can set a time with no movement for triggering as well as the input state and a threshold for sensitivity normally only used if digital trigger is used rather than a relay.

Syn-Link

The final tab on the centre set is Syn-Link. This is used to access certain iKON products that are manufactured to allow control via the programming port without any additional programming.
At present only the AU4 audio interface is available for this and its use is covered in the AU4 operating manual.

Upper Left side tabs.

We have covered the use of most of these but the final three are:

Details. Details of the programmed as per the opening screens.

Power. You can configure the system to power down the display and reset the panel if no buttons are pressed for the set time.

SYN-Link All Synergy panels have the ability to link two panels together for dual control.

Each can operate independently to control, its own display but when the link is enabled you have a choice of three operating modes.

Master / Slave One panel will become the master when linked and operate both displays.

Equals Operate either panel to change functions on both.

Alternate Each take control in turn. If panel 1 turns on, the other follows but only panel 1 can control both until turned off. If panel 2 now turns on it has control of both until turned off.

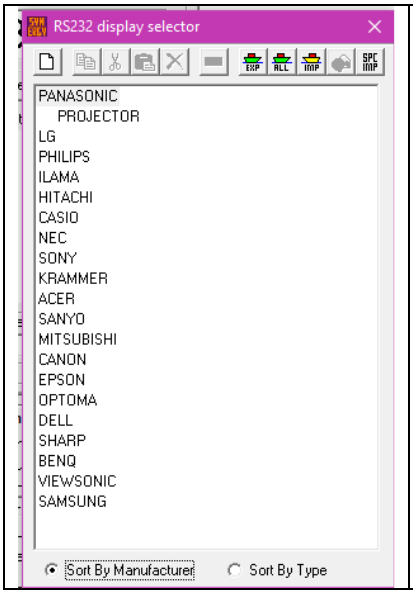
In all three linked mode you can make the link a permanent link that is always there or, as you may have two rooms linked by a movable partition, make the link only when switched. This switch can be one of the push buttons on either panel or a separate switch / sensor via one of the inputs.

It is possible to link 3 panels this way and a separate application note is available onhow to do this.

Creating RS232 Libraries

Whilst there are two RS232 libraries they are both the same in format and creation. It's just split to keep displays and other devices separate for ease of finding.

Click on the  button to open the menu.

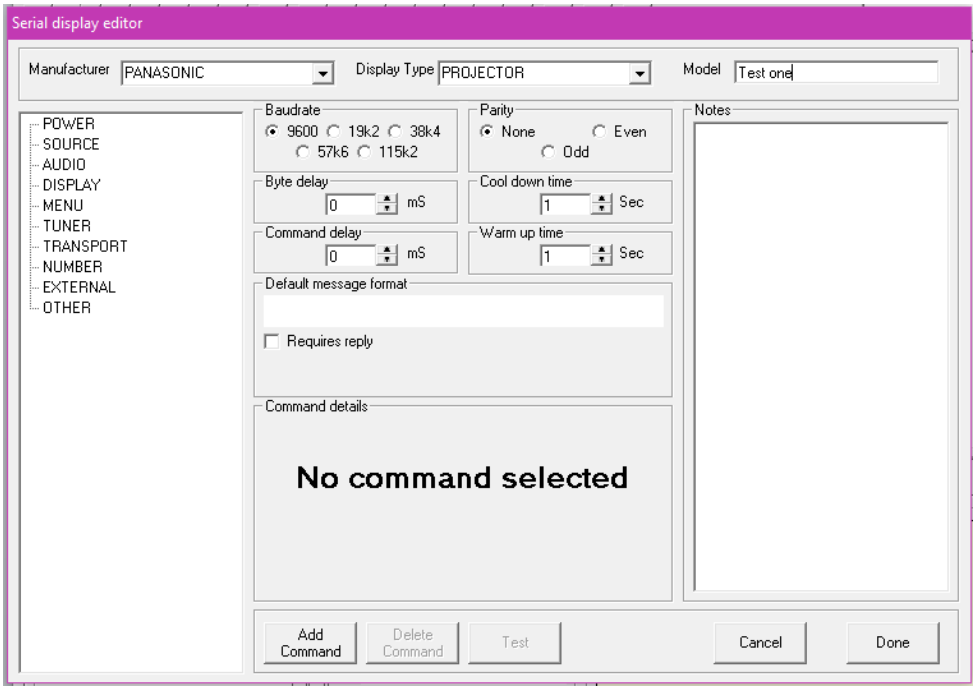


The top tool bar offers the usual new, open, etc options as well as the ability to import and export libraries. There is also a tool to import and convert existing libraries created for our SPC controllers into the Synergy format.

To open an existing library just select from the drop down table and double click to open.

To create a new library click on the top left, create new library symbol

This first setup page allows you to enter information about the device you are controlling.



Select or enter the Manufacturer, Display Type and model number along the top.
Now select the Baud Rate to use along with any Parity settings. We next come to information about the Projector and the data format.

Byte Delay Depending upon how the RS232 data is processed within the display, a small delay between the individual bytes of a message string may be needed to allow the display to process commands. This can often be determined for detailed information from the display manufacture but is

usually 2-3mS. Some displays notably Sony, Phillips and some iiyama will only operate with a 0mS delay.

Command delay Similar top Byte delay but the default setting of 0mS appears Ok with most modern devices.

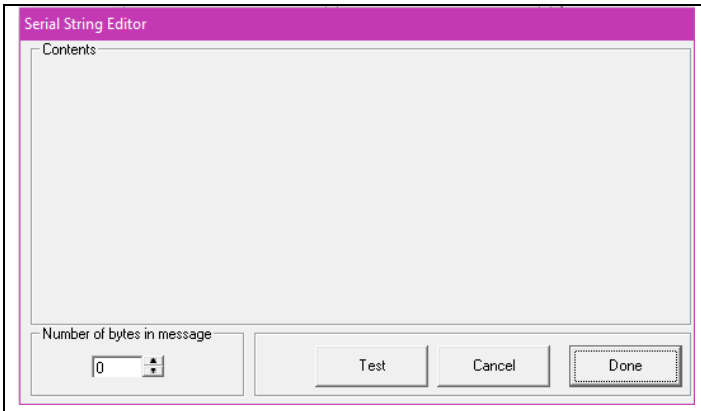
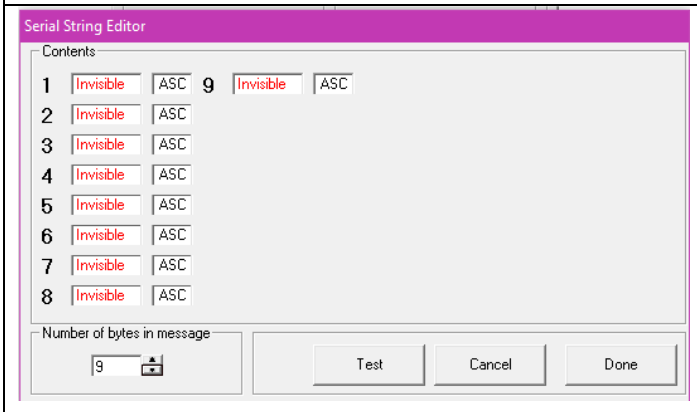
Cool Down Time This is the time it takes for the display to cool down and accept a new power on command. It can often be taken from the manufacturers data but as a good rule of thumb allow 30-40 seconds for a laser projector, 90 seconds for a normal lamp projector and 5-10 seconds for a flat screen display. Not really needed for the latter but as this is also the time the OFF button flashes, it's a good idea as it allows the user to confirm it's turning off.

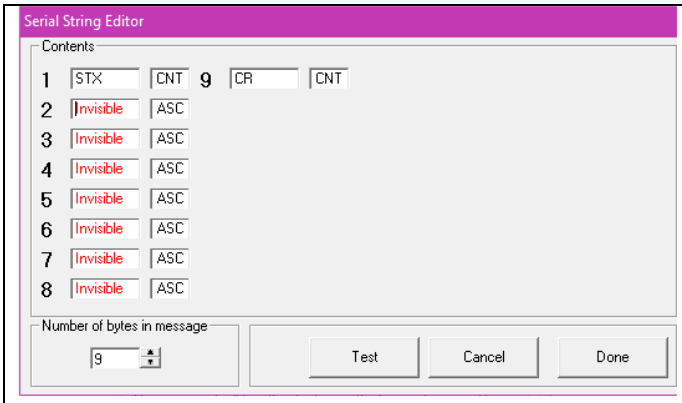
Warm Up Time Same as above but the time it takes for the display to warm up and accept additional RS232 commands. Typically 30 seconds for a laser projector, 50 seconds for a normal lamp projector and 5-10 seconds for a flat screen display. This is also the time the ON button flashes and keeps the other buttons locked out.

Adding RS232 commands

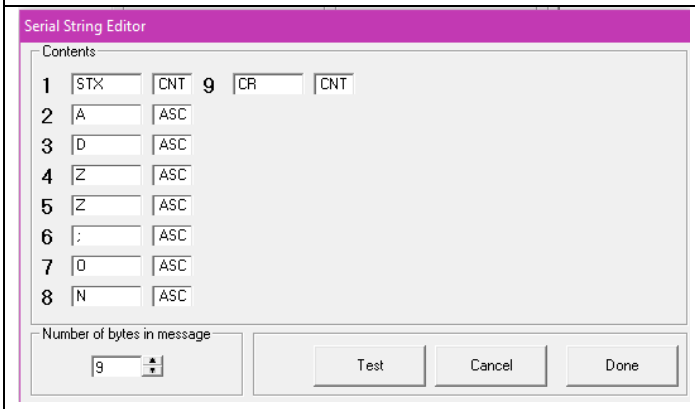
Click on the 'Add Command' button towards the bottom centre of the app window and it will open a command list. Click on the type of command – Power / Source / Audio etc. and if the command you want is listed just click on it to select then click done. If the command is not listed just enter the name and click done.

In the command details box the name of the command will be shown with a empty white box just below, double click on this to start entering the strings required.

	A new window opens with no contents. Use the bottom left nudge buttons to select the number of bytes you need in the command. You can add or remove more later.
	For the projector we are using nine commands are required. By default these are created as ASCII entries but if you click and hold over the ASC box you can select from ASCII, HEX, Decimal, Binary, Control, Variable and Checksum. Checksum is not available on entry 1.

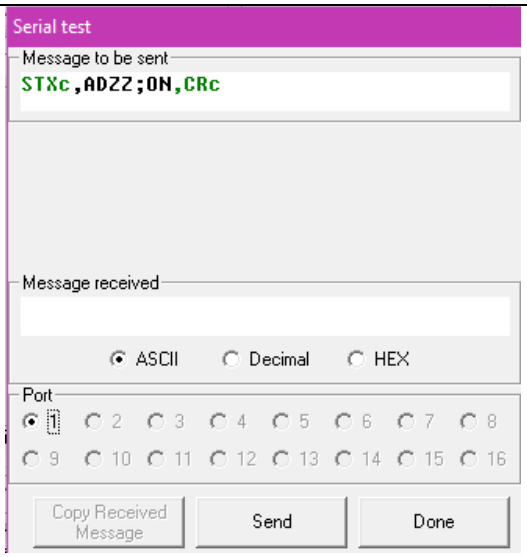


The control string stars with STX and ends with CR (carriage return). These have been set as control characters but could just as easily been set for the hex value of 02 and 0D.
The other entries are all ASCII and to enter a value just type into the box.



The Panasonic command sequence has now been added.

Three options,
Cancel to cancel the entry and start again.
Done to save the command sequence
Test which allows you to connect the computers serial port to the projector and test the string works.



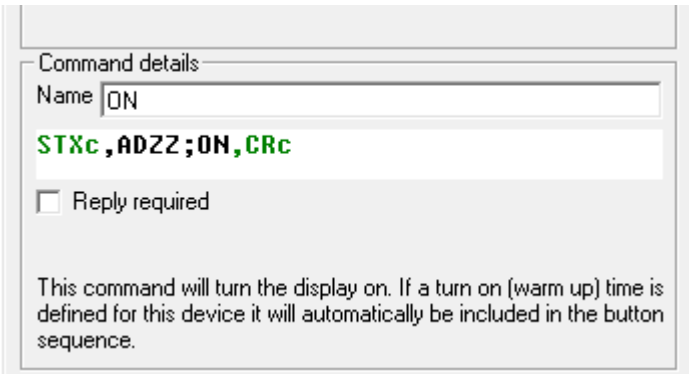
The message you are going to send is shown at the top. Toward the bottom you need to select the serial port you are using.

When ready click on Send.

If all is well the projector should turn on and you will receive a reply string. You can change the format of this between ASCII, Decimal and Hex but as we are using some control characters Hex is recommended.

There is an option to copy this received string if you want to configure the controller us use this as detailed later.

Click done to go back to the string editor to alter if necessary and when correct click done again to go back to the main screen.



The string is now shown in the command details window. You can right click to copy this string and paste into another entry which is useful if the strings are similar. In this case the STX ADZZ; is common to all commands.

Reply Required
Not very common now but some projectors, particularly some early Sony models, need a continuous sending of the on command until the projector sends the correct response when the sending should stop. Clicking this entry will open another window where you can create the required reply string or past in the one captured earlier.

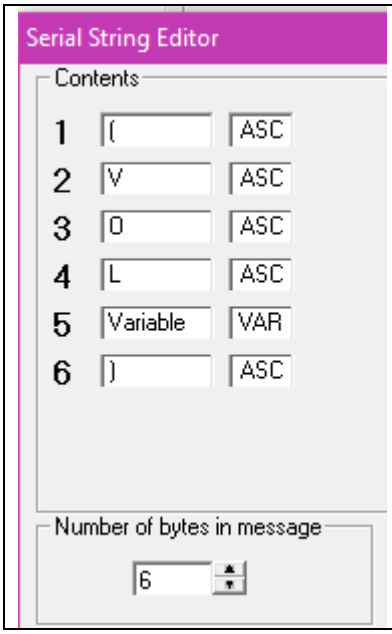
Note. If you are not using replies from the projector don't connect the 'rec' on the synergy RS232 port as it is undefined and any stray string can trigger a panel shutdown. Use Tx and Com only.

At this stage it's a good idea to save the configuration then reopens to continue.

The rest of the required commands can now be entered and if you save again it will ask if you want to override the previous saved version.

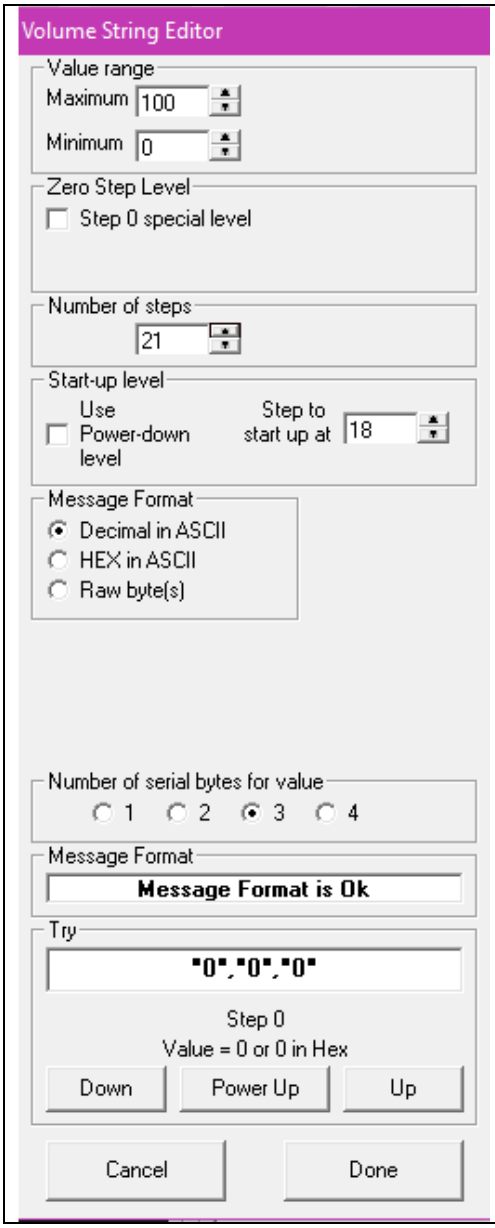
Variable and Checksum options
Most command type, ASCII, Hex, Control etc. are very simple and straightforward. These are two exceptions.

Variable Often used for volume when a variable level needs to be sent rather than the preferred Vol+ and Vol-.



The string to the left is for a Casio projector with byte 5 set for variable.

Whilst shown as 6 bytes it is actually 8 bytes as the variable takes 3 bytes as shown below.



The range of values for volume, in the case 100 with 0 = mute and 100 = max.

Number of steps for 0 to 100, effectively sets the amount of change per press of Vol+ or Vol-.

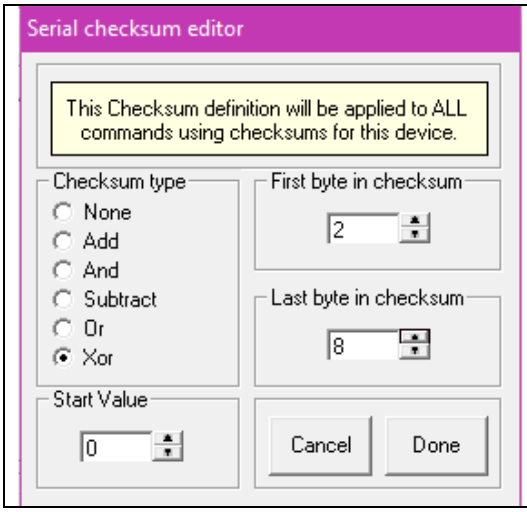
Restart at a set level, 18% or retain the last power down setting.

Formal depends upon the manufactures requirements.

Number of bytes to contain the message. As we are using 100 in ASCII, that's 3.

Facility to test what values will be sent. If in test mode a similar set of control s is made available.

Checksum Many RS232 devices require a checksum to verify that all the data has been received correctly. It can take a number of formats and whilst it is normally at the end of all the strings, some manufactures follow it with CR or LF.



From the manufactures date you need to select the correct checksum type, XOR is common.

Now decide where the checking starts,, normally after any control characters co in this case byte 2.

Also where it ends, it will be before the checksum itself so in this case byte 8.

Creating IR Libraries

Whilst there are two IR libraries they are both the same in format and creation. It's just split to keep displays and other devices separate for ease of finding.

To create entries you need the use of an iKON Capture Pod which is currently unavailable whilst a new model is in development.

We do offer a free IR capture service where you can send the IR handset to us, specify which commands you need and we will capture the codes, email the library file for you to import and send the handset back.