

CRESTRON INTEGRATION MODULE



INTRODUCTION

Ultamation's Hikvision Module allows a Crestron system to control various aspects of different Hikvision security products.

Ultamation have developed a close relationship with Hikvision's API development team in China which has given us privileged access to official documentation, support and participation in the development of an extended API to provide new functionality specifically for use in the home automation market.

The new API calls are only available for I-Series NVRs which require at least firmware version 4.1.64 build 190119 or Super I-Series NVRs which require at least firmware version 4.1.65 build 190819. Please ensure your NVR meets these requirements before trying the module.

The first release of the integration modules provides control over the NVR video outputs.

Different NVR models have different capabilities, so the module interrogates the NVR before applying any configuration to ensure that the requested options are valid.

For example, an 8-Channel NVR (such as the DS-7608NI-I2 / 8P) supports 8 cameras (obviously) and has both HDMI and VGA outputs. The module will report each of the available outputs, number of channels supported, available window layouts and switching intervals.

Your SIMPL program can then select the appropriate camera channels for each layout window and then trigger the selected configuration on the NVR. Where cameras are selected on windows across multiple "pages", the NVR will then automatically switch between pages at the given switching interval.

For example:

If you select the 2x2 layout ('4d' on the Layout_Size# input signal) and a 5s switch interval ('5d' on the Switch_Interval# input signal) and then select the following cameras on the "ScreenChannels" inputs.

1d => Screen Channel 1

3d => Screen Channel 6

5d => Screen Channel 10

2d => Screen Channel 16

This wouldn't be the most useful configuration(!), but would display a single camera image in the top left, then top right, then bottom left and finally bottom right corners at 5s intervals.

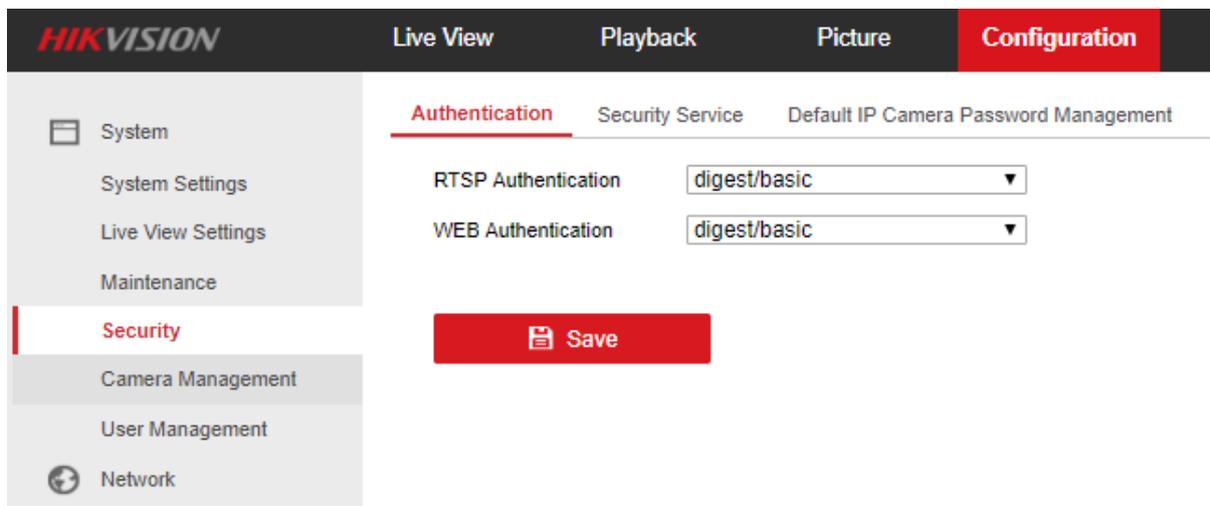
The Hikvision NVRs do not allow a camera channel to be repeated in a switching configuration, so the module will capture any duplicates and set the screen channel to "off" (od) – which will then show the "Hikvision" logo on the corresponding window.

The Hikvision suite also offers a module for PTZ control of hikvision cameras.

Configuration

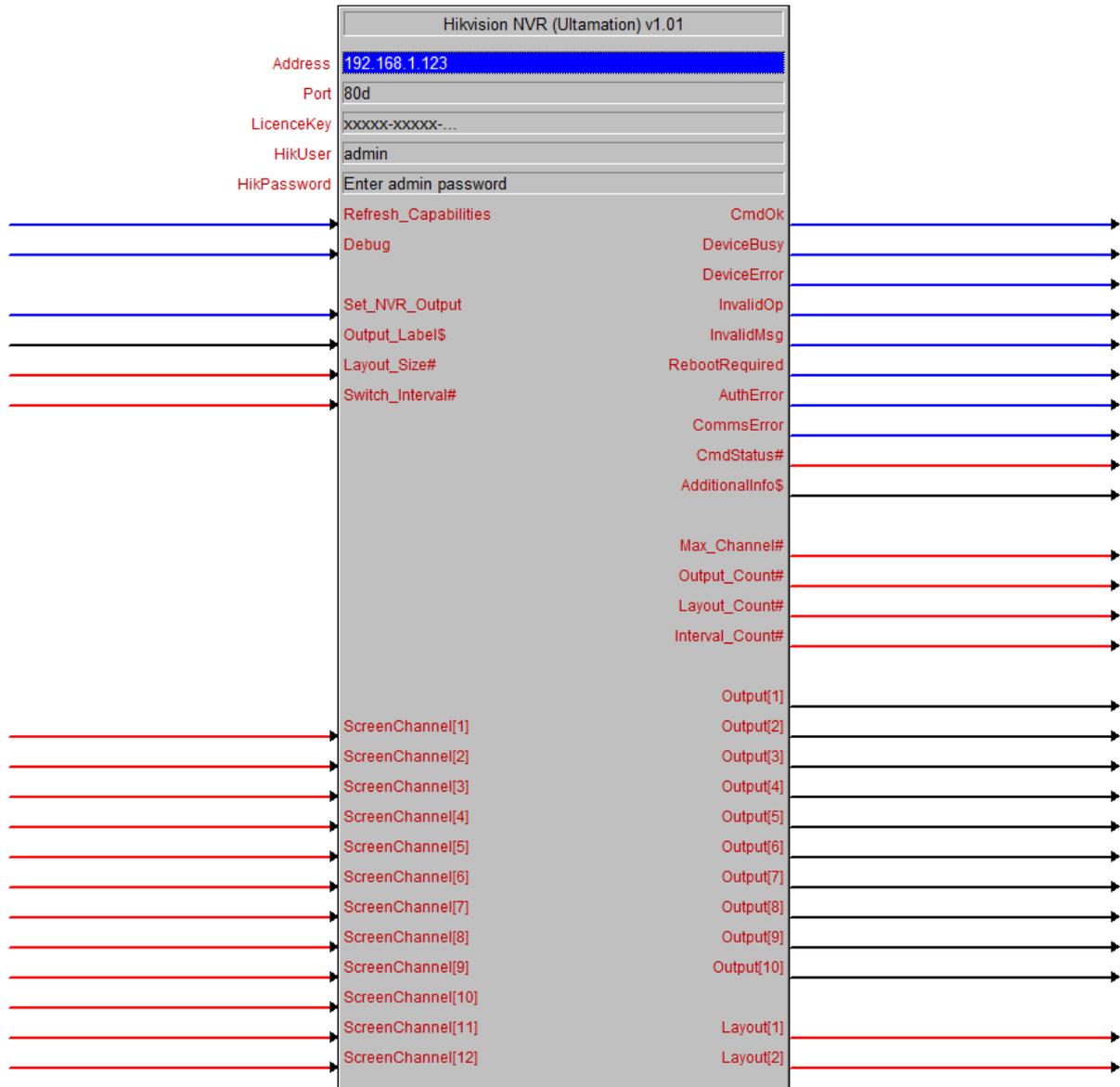
The connection requires Basic Authentication so this MUST be enabled on the NVR before the module will connect.

The setting is found (depending on the NVR model) under the web interface:



MODULE DETAILS

Hikvision NVR



Configure the signals/parameters of the bridge as follows:

Parameters

Address – Enter the IP address of the Hikvision NVR.

Port – Enter the port number of the Hikvision NVR Web API. This will be 80 by default.

LicenceKey – Enter the Licence Key that you will have received following purchase of the module. This licence key is associated with a specific Crestron processor’s serial number and will NOT validate on a different processor. The module will work for 1 hour after processor boot with a missing, or invalid a licence key. Please check the error log following a reboot to confirm the licence key validation was successful. If verification fails, you will see the following in the error log:

```
# Hikvision: Licence verification failed [xxxxx-xxxxx-...] for serial #00123456  
# Hikvision/Client: Falling back to trial mode
```

HikUser – Enter the user credentials for the Hikvision account with access to the Web API.

HikPassword – Enter the user password for the Hikvision account with access to the Web API.

Signals

Refresh_Capabilities – Capabilities are requested at program start, but this will fail if the NVR is offline or the processor cannot complete the request for some reason. Triggering this signal will re-request the capabilities. You can verify successful receipt of capabilities when the Max_Channel# signal is non-zero.

Debug – This signal should be left low and is for debugging purposes.

Set_NVR_Output – This signal will instruct the module to send the current output configuration to the NVR. Use the signals below to change the current output configuration before triggering this signal.

Output_Label\$ – This serial signal is used to specify which output you wish to control on the NVR. As each NVR model can offer a different list of outputs, which are specified by name. You must set this signal prior to triggering 'Set_NVR_Output' and you must use one of the values that is been reported on the 'Output' output signals. Once a valid output name has been established, this can just be driven with an SIO. E.g. sending "HDMI" will generally be ok!

Layout_Size# – This analogue value defines the window layout in the output configuration, to send to the NVR see "Set_NVR_Output". The number represents the number of camera channel windows are shown for each page, and must be one of the values that appears on the Layout outputs after a successful capabilities call.

For example, 1d represents "Full Screen", 4d would be a 2x2 grid, 8d would be 1 large main window, with 7 smaller windows around the right and bottom edges.

Switch_Interval# – This analogue value defines the time between automatic page flips in the output configuration, to send to the NVR see "Set_NVR_Output". This is only relevant if the ScreenChannel configuration defines cameras across MORE than one page. Any page that does not contain a single valid camera channel will be ignored.

For example, if you select Layout_Size# of 1d, and define ScreenChannels [1]=1d,[2]=2d and [8]=3d, and switch interval of 30s, then the NVR will display cameras 1, 2 and 3 at 30s intervals. The fact that ScreenChannels 3 to 7 were blank means that they will be ignored.

Using 0d here will fix the image to the first page only (i.e. no switching).

ScreenChannel[1-64] – The ScreenChannel defines the camera that will be displayed in a given window in the output configuration, to send to the NVR see "Set_NVR_Output". Where this window appears depends on the current Layout_Size#.

For example, For a layout of 1d (Full Screen) each Screen Channel is just the sequence of cameras to display. For a layout of 9d (3x3) each set of 9 Screen Channels represents a single page. A page can be partially complete (i.e. a 2x2 page may only show 3 cameras) but any page that is entirely empty (all ScreenChannel values = 0d) will not be displayed.

There are a maximum number of 64 Screen Channels, so it should be apparent that the maximum number of pages varies with layout size.

i.e.

Max pages for layout size = 1d would be 64.

Max pages for layout size = 4d would be (64/4=) 16

Note: A camera channel CANNOT appear more than once in the ScreenChannels list. This is a restriction of the Hikvision NVR. The module will ignore any channel that is used a second time, and warn you via the "AdditionalInfo\$" output.

Outputs

CmdOk, DeviceBusy, DeviceError, InvalidOp... - These outputs reflect the response from the Hikvision NVR and should be used for diagnostics purposes.

CmdStatus# - the numeric error from the Hikvision NVR associated with the digital outputs above. Ultimatum may request this value should support be required.

CommsError - the module cannot connect to the Hikvision NVR.

AdditionalInfo\$ - this serial output will provide useful info during integration, such as whether a value is valid, or invalid. We have used this value to drive the informational pop-up on the example program, though this would not normally be exposed to an end user.

Capability Info

Max_Channel# - This value provides the maximum number of camera channels supported by the NVR. You should not use values in excess of this number as a ScreenChannel value.

Output_Count# - The number of valid outputs for the NVR. The specific values are then detailed in the Output serial outputs. In the example program, we use this value to drive a dynamic list of outputs.

Layout_Count# - The number of valid layouts for the NVR. The specific values are then detailed in the Layout analog outputs. In the example program, we use this value to drive a dynamic list of layouts.

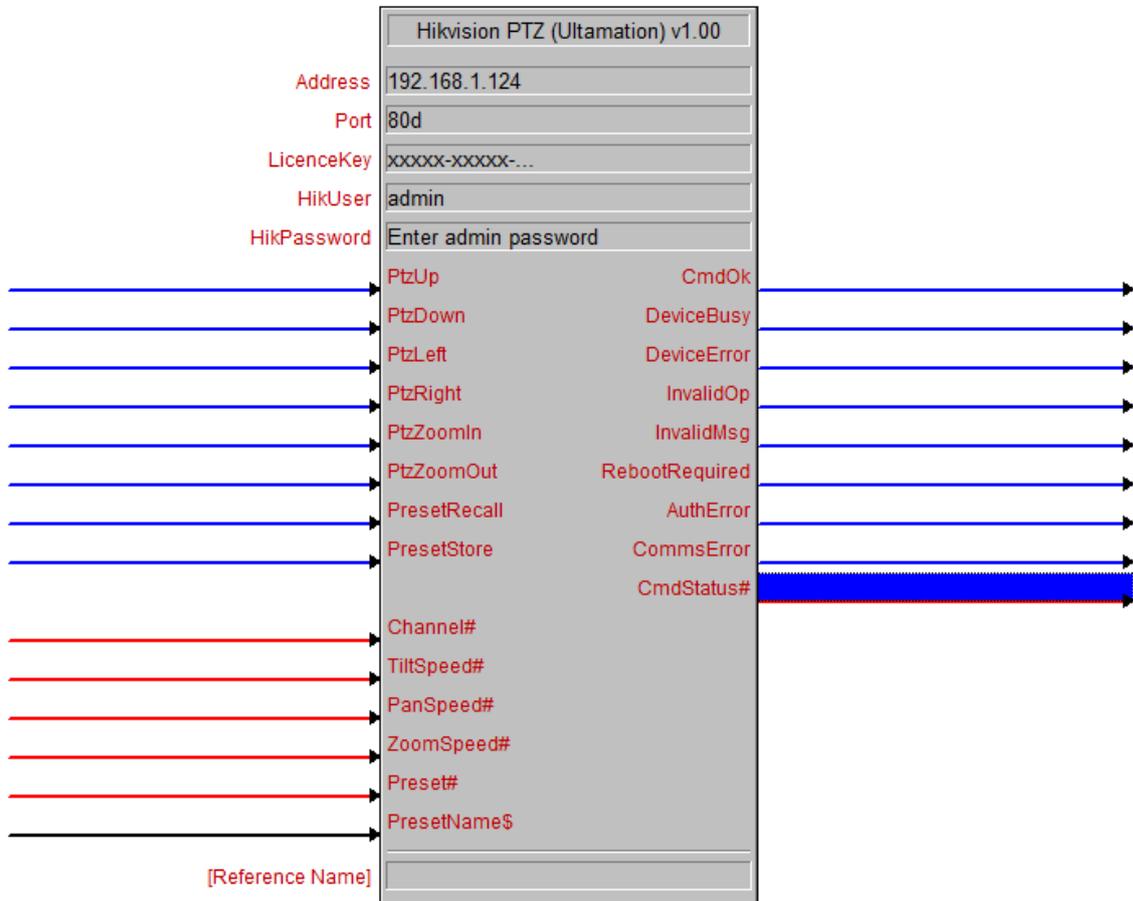
Interval_Count# - The number of valid switching interval values for the NVR. The specific values are then detailed in the Interval analog outputs. In the example program, we use this value to drive a dynamic list of switching intervals.

Output, Layout, Interval - An enumeration of the valid values for each of the Output_Label\$, Layout_Size\$ and Switch_Interval# inputs. Supplying a value to any of these inputs that is not present in the output enumerations will be ignored. The

“AdditionalInfo\$” output will also confirm if the selection was successful or not - this is for human readability only.

Hikvision PTZ Module

This module allows for control of Hikvision PTZ cameras.



Configure the signals/parameters of the bridge as follows:

Parameters

Address – Enter the IP address of the Hikvision Camera.

Port – Enter the port number of the Hikvision Camera Web API. This will be 80 by default.

LicenceKey – Enter the Licence Key that you will have received following purchase of the module. This licence key is associated with a specific Crestron processor’s serial number and will NOT validate on a different processor. The module will work for 1 hour after processor boot with a missing, or invalid a licence key. Please check the error log following a reboot to confirm the licence key validation was successful. If verification fails, you will see the following in the error log:

```
# Hikvision: Licence verification failed [xxxxx-xxxxx-...] for serial #00123456
# Hikvision/Client: Falling back to trial mode
```

HikUser – Enter the user credentials for the Hikvision account with access to the camera’s Web API.

HikPassword – Enter the user password for the Hikvision account with access to the camera's Web API.

Signals

Inputs

PTZ(Up/Down/Left/Right) – This signal will start moving the camera, in the corresponding direction, on the leading edge of the signal and will stop moving the camera on the trailing edge.

PTZZoom(In/Out) – This will start zooming the camera, in or out, on the leading edge of the signal and will stop zooming the camera on the trailing edge.

PresetRecall – Recall the preset which has been set in the signal "Preset#".

PresetStore –

TiltSpeed# – This signal sets the speed of tilting for the signal PTZ(Up/Down). Values can range from 0 – 100.

PanSpeed# – This signal sets the speed of panning for the signal PTZ(Left/Right). Values can range from 0 – 100.

ZoomSpeed# – This signal sets the speed of zooming for the signal PTZZoom(In/Out). Values can range from 0 – 100.

Preset# – This signal sets the preset number in the module config for signals "PresetRecall" or "PresetStore".

PresetName\$ – The signal sets the preset name in the module config for "PresetStore".

Outputs

CmdOk, DeviceBusy, DeviceError, InvalidMsg – These outputs reflect the response from the Hikvision NVR and should be used for diagnostics purposes.

RebootRequired – Hikvision is reporting that the device needs to be rebooted.

AuthError – There is a problem with the username or password.

CommsError – The module cannot connect to the Hikvision NVR.

CmdStatus# – The numeric error from the Hikvision NVR associated with the digital outputs above. Ultamation may request this value should support be required.

HELPER MODULE

Hikvision Channel Helper

This module is not really part of the Hikvision module suite at all, but is simply included to assist with the example program.

We would normally expect a program to drive the Hikvision NVR module from pre-defined output "presets", but should you wish to provide an interface to the end user to set up their own layouts, the Channel Helper module provides a way to populate the 1-64 ScreenChannel inputs on the NVR module from a layout/page representation.

To explain the challenge:

The top left camera for Page 2 in a 2x2 layout is ScreenChannel[5] whereas the top left camera for Page 2 in a 3x3 layout is Screen Channel[10] (and ScreenChannel[5] would be the centre window of Page 1).

The Helper module provides this "mapping". While we don't support this module as part of the Hikvision module suite, the example program demonstrates how it works.

Licence

This module (including software, images and any and all other associated assets distributed as part of the purchased download package) is licenced PER Processor.

A licence key is generated at the point of purchase and is linked at that time to specific information that MUST be provided at the time of purchase. A purchase should not be completed without correct information as refunds cannot be issued for errors or changes made to details following purchase.

The licence key for each processor will be delivered via email along with links to download the module. There is no physical delivery.

The module is provided without any warranty with respect to Hikvision platform. We will endeavour, through best efforts, to maintain the module's functionality and any bug fixes will be provided free-of-charge. Additional functionality may be released as a variation of this module and this will be a separate, purchasable, product.