Crestron SIMPL+ Module Help

MODULE NAME: Sony SRG-A40 A12 VISCA IP C2N-CAMIDJ v1.1

VERSION: 1.1

CATEGORY: Camera (19)

DEALER NAME: NC State DELTA

SYSTEM NAME: Sony SRG-A40 / SRG-A12 VISCA over IP Control

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GENERAL DESCRIPTION

This module provides comprehensive VISCA over IP control for Sony SRG-A40 and SRG-A12 PTZ cameras. It is designed to manage a wide array of camera functions, including power, pan, tilt, zoom, focus, presets, and detailed image/exposure settings (CCU).

A key feature of this module is its deep integration with the Crestron C2N-CAMIDJ joystick controller. This allows for intuitive, real-time physical control over camera movements, focus, iris, and speed settings, with mode and value feedback sent directly to the joystick's display. The module handles the VISCA over IP communication protocol, including sequence numbering, connection management, and response parsing, providing robust feedback for all camera states.

COMPATIBILITY

This module is specifically designed and tested for the following Sony PTZ cameras using the VISCA over IP protocol:

- Sony SRG-A40
- Sony SRG-A12

It may have partial compatibility with other Sony cameras that support the standard VISCA over IP command set, but all features are not guaranteed to work.

FEATURES

- Direct VISCA over IP control of compatible Sony cameras.
- Full Pan, Tilt, Zoom, and Focus (PTZF) control with variable speed settings.
- Extensive Camera Control Unit (CCU) adjustments including Exposure Mode, White Balance, Gain, Shutter, Iris, Backlight Compensation, WDR, and more.
- Preset management for storing, recalling, and clearing up to 256 presets.
- Integrated support for the C2N-CAMIDJ joystick, providing a tactile and responsive control experience.
- Mode-based joystick control for Pan/Tilt/Zoom Speed, Focus, and Iris.
- Feedback from the module drives the LEDs and the digital display on the C2N-CAMIDJ.
- Auto Framing and Tally light control.
- Automatic keep-alive polling to monitor connection status and re-initialize if communication is lost.
- Initialization sequence to query all camera statuses on startup.
- Debug output for monitoring commands and troubleshooting communication.

INPUTS

System & Power

Signal Name	Type	Description
Power_On_trig	DIGITAL	Momentary high pulse sends the "Power On" command.
Power_Off_trig	DIGITAL	Momentary high pulse sends the "Power Off" (Standby) command.
Query_All_Status_trig	DIGITAL	Momentary high pulse manually queries all supported camera statuses.
Set_Standby_Mode_Side_trig	DIGITAL	Momentary high pulse sets the camera's standby mode to 'Side' (lens points to the side).
Set_Standby_Mode_Neutral_trig	DIGITAL	Momentary high pulse sets the camera's standby mode to 'Neutral' (lens points forward).
Video_Mute_On_trig	DIGITAL	Momentary high pulse activates video mute (picture off).
Video_Mute_Off_trig	DIGITAL	Momentary high pulse deactivates video mute (picture on).

Image Toggles & Modes

Signal Name	Type	Description
Image_Flip_On_trig	DIGITAL	Momentary high pulse flips the image vertically.
Image_Flip_Off_trig	DIGITAL	Momentary high pulse turns off image flip.
Image_Stabilizer_On_trig	DIGITAL	Momentary high pulse enables the image stabilizer feature.
Image_Stabilizer_Off_trig	DIGITAL	Momentary high pulse disables the image stabilizer.
Flicker_Cancel_On_trig	DIGITAL	Momentary high pulse enables the anti-flicker feature.
Flicker_Cancel_Off_trig	DIGITAL	Momentary high pulse disables the anti-flicker feature.
Defog_On_trig	DIGITAL	Momentary high pulse enables the defog mode.
Defog_Off_trig	DIGITAL	Momentary high pulse disables the defog mode.
Picture_Effect_BW_trig	DIGITAL	Momentary high pulse sets the picture effect to Black & White.
Picture_Effect_Off_trig	DIGITAL	Momentary high pulse turns off all picture effects.
Tele_Convert_On_trig	DIGITAL	Momentary high pulse enables the tele-convert (digital zoom) mode.
Tele_Convert_Off_trig	DIGITAL	Momentary high pulse disables the tele-convert mode.
WDR_On_trig	DIGITAL	Momentary high pulse enables Wide Dynamic Range (WDR).
WDR_Off_trig	DIGITAL	Momentary high pulse disables Wide Dynamic Range (WDR).

Exposure & Color

Signal Name	Type	Description
Exposure_Mode_Auto_trig	DIGITAL	Sets the camera to full Auto Exposure mode.
Exposure_Mode_Manual_trig	DIGITAL	Sets the camera to Manual Exposure mode.
Exposure_Mode_Shutter_Priority_trig	DIGITAL	Sets the camera to Shutter Priority AE mode.
Exposure_Mode_Iris_Priority_trig	DIGITAL	Sets the camera to Iris Priority AE mode.

High_Sensitivity_On_trig	DIGITAL	Enables the high sensitivity mode for low-light conditions.
High_Sensitivity_Off_trig	DIGITAL	Disables the high sensitivity mode.
Backlight_Comp_On_trig	DIGITAL	Enables backlight compensation.
Backlight_Comp_Off_trig	DIGITAL	Disables backlight compensation.
Exposure_Comp_On_trig	DIGITAL	Enables exposure compensation control.
Exposure_Comp_Off_trig	DIGITAL	Disables exposure compensation control.
WB_Mode_Auto_trig	DIGITAL	Sets White Balance to Auto.
WB_Mode_Indoor_trig	DIGITAL	Sets White Balance to the Indoor preset.
WB_Mode_Outdoor_trig	DIGITAL	Sets White Balance to the Outdoor preset.
WB_Mode_One_Push_trig	DIGITAL	Sets White Balance to One-Push mode.
WB_Mode_Manual_trig	DIGITAL	Sets White Balance to Manual mode.
Trigger_One_Push_WB_Calibrate_trig	DIGITAL	Momentary high pulse triggers a one-push white balance calibration.

Pan & Tilt

Signal Name	Type	Description
Pan_Left_trig	DIGITAL	Press and hold to pan left. Speed is set by Pan_Speed_ain.
Pan_Right_trig	DIGITAL	Press and hold to pan right. Speed is set by Pan_Speed_ain.
Tilt_Up_trig	DIGITAL	Press and hold to tilt up. Speed is set by Tilt_Speed_ain.
Tilt_Down_trig	DIGITAL	Press and hold to tilt down. Speed is set by Tilt_Speed_ain.
Go_Home_trig	DIGITAL	Momentary high pulse sends the camera to its home position.
Pan_Tilt_Reset_trig	DIGITAL	Momentary high pulse resets the pan/tilt mechanism.
Set_Absolute_Position_trig	DIGITAL	Momentary high pulse moves the camera to the position specified by Absolute_Pan_Position_ain and Absolute_Tilt_Position_ain.
Pan_Speed_ain	ANALOG	Sets the pan speed (1-24) for manual pan operations. A value of 0 uses a default.

Tilt_Speed_ain	ANALOG	Sets the tilt speed (1-23) for manual tilt operations. A value of 0 uses a default.
Absolute_Pan_Position_ain	ANALOG	Sets the target absolute pan position for use with Set_Absolute_Position_trig.
Absolute_Tilt_Position_ain	ANALOG	Sets the target absolute tilt position for use with Set_Absolute_Position_trig.

Zoom & Focus

Signal Name	Type	Description
Zoom_In_trig	DIGITAL	Press and hold to zoom in. Speed is set by Zoom_Speed_ain.
Zoom_Out_trig	DIGITAL	Press and hold to zoom out. Speed is set by Zoom_Speed_ain.
Set_Zoom_Position_trig	DIGITAL	Momentary high pulse moves the lens to the zoom position specified by Set_Zoom_Position_ain.
Auto_Focus_On_trig	DIGITAL	Enables Auto Focus mode.
Auto_Focus_Off_trig	DIGITAL	Disables Auto Focus (sets to Manual Focus).
Auto_Focus_Toggle_trig	DIGITAL	Toggles the Auto Focus mode.
Trigger_One_Push_Focus_trig	DIGITAL	Momentary high pulse triggers a one-push auto focus cycle.
Focus_Far_trig	DIGITAL	Press and hold to adjust focus toward infinity. Speed is set by Focus_Speed_ain.
Focus_Near_trig	DIGITAL	Press and hold to adjust focus toward the camera. Speed is set by Focus_Speed_ain.
Zoom_Speed_ain	ANALOG	Sets the zoom speed (1-7) for manual zoom operations. A value of 0 uses a default.
Focus_Speed_ain	ANALOG	Sets the focus speed (1-7) for manual focus operations. A value of 0 uses a default.
Set_Zoom_Position_ain	ANALOG	Sets the target absolute zoom position for use with Set_Zoom_Position_trig.
Set_Focus_Position_ain	ANALOG	Sets the target absolute focus position.

Manual Value Controls & Direct Set Triggers

Signal Name	Type	Description
Iris_Up_trig / Down_trig	DIGITAL	Momentary pulse to increment/decrement the iris level.
Gain_Up_trig / Down_trig	DIGITAL	Momentary pulse to increment/decrement the gain level.
Shutter_Up_trig / Down_trig	DIGITAL	Momentary pulse to increment/decrement the shutter speed.
Exposure_Comp_Up_trig / Down_trig / Reset_trig	DIGITAL	Momentary pulse to adjust or reset exposure compensation.
Set_Iris_Level_trig	DIGITAL	Sets the iris to the value from Set_Iris_Level_ain.
Set_Gain_Level_trig	DIGITAL	Sets the gain to the value from Set_Gain_Level_ain.
Set_Shutter_Level_trig	DIGITAL	Sets the shutter to the value from Set_Shutter_Level_ain.
Set_Red_Gain_Level_trig	DIGITAL	Sets the manual Red Gain to the value from Set_Red_Gain_Level_ain.
Set_Blue_Gain_Level_trig	DIGITAL	Sets the manual Blue Gain to the value from Set_Blue_Gain_Level_ain.
Set_Aperture_Level_trig	DIGITAL	Sets the aperture/detail level from Set_Aperture_Level_ain.
Set_Exposure_Comp_Level_trig	DIGITAL	Sets the exposure compensation level from Set_Exposure_Comp_Level_ain.
Set_AE_Speed_trig	DIGITAL	Sets the auto exposure response speed from Set_AE_Speed_ain.
Set_WB_Offset_trig	DIGITAL	Sets the white balance offset from Set_WB_Offset_ain.
Set_Iris_Level_ain	ANALOG	Analog value for direct iris level setting.
Set_Gain_Level_ain	ANALOG	Analog value for direct gain level setting.
Set_Shutter_Level_ain	ANALOG	Analog value for direct shutter level setting.

Set_Red_Gain_Level_ain	ANALOG	Analog value for direct Red Gain setting.
Set_Blue_Gain_Level_ain	ANALOG	Analog value for direct Blue Gain setting.
Set_Aperture_Level_ain	ANALOG	Analog value for direct aperture/detail setting.
Set_Exposure_Comp_Level_ain	ANALOG	Analog value for direct exposure compensation setting.
Set_AE_Speed_ain	ANALOG	Analog value for direct AE speed setting.
Set_WB_Offset_ain	ANALOG	Analog value for direct white balance offset setting.
Noise_Reduction_Level	ANALOG	Sets the noise reduction level (0-5).

Presets

Signal Name	Type	Description
Store_Preset_trig	DIGITAL	Toggles "Store Mode". When active, the next Recall_Preset_#_trig will store a preset to that number instead of recalling.
Recall_Preset_trig	DIGITAL	Recalls or stores a preset based on the number from Preset_Number_ain and the state of Store_Preset_Active_fb.
Clear_Preset_trig	DIGITAL	Clears the preset specified by Preset_Number_ain.
Recall_Preset_1_trig to Recall_Preset_8_trig	DIGITAL	Momentary high pulse recalls or stores the corresponding preset number (1-8).
Preset_Number_ain	ANALOG	Sets the preset number (0-255) to be used by Recall_Preset_trig and Clear_Preset_trig.

Menu Navigation & Tally

Signal Name	Type	Description
Menu_On_trig / Off_trig / Toggle_trig	DIGITAL	Controls the On-Screen Display (OSD) menu.
Menu_Up_trig / Down_trig / Left_trig / Right_trig	DIGITAL	Navigates the OSD menu.
Menu_Enter_trig	DIGITAL	Selects the highlighted item in the OSD menu.
Tally_On_trig	DIGITAL	Turns the camera's front tally light ON and starts a keep-

		alive to maintain the state.
Tally_Off_trig	DIGITAL	Turns the camera's front tally light OFF and stops the keep-alive.

Auto Framing

Signal Name	Type	Description
Start_Auto_Framing_trig	DIGITAL	Momentary high pulse starts the camera's auto framing feature.
Stop_Auto_Framing_trig	DIGITAL	Momentary high pulse stops the camera's auto framing feature.
Query_Auto_Framing_trig	DIGITAL	Momentary high pulse requests the current auto framing status.

C2N-CAMIDJ Interface

Signal Name	Type	Description
C2N_CAMIDJ_Focus_Button_trig	DIGITAL	Sets joystick mode to Focus. Toggles camera between Auto and Manual focus.
C2N_CAMIDJ_Zoom_Button_trig	DIGITAL	Sets joystick mode to Zoom Speed adjustment.
C2N_CAMIDJ_Pan_Button_trig	DIGITAL	Sets joystick mode to Pan Speed adjustment.
C2N_CAMIDJ_Tilt_Button_trig	DIGITAL	Sets joystick mode to Tilt Speed adjustment.
C2N_CAMIDJ_Iris_Auto_Button_trig	DIGITAL	Sets camera to Auto Iris and enters a blank display mode on the joystick.
C2N_CAMIDJ_Iris_Manual_Button_trig	DIGITAL	Sets camera to Manual Iris and sets joystick mode to Iris adjustment.
C2N_CAMIDJ_Speed_Fast_trig	DIGITAL	Selects the "Fast" speed profile for the active mode (Pan, Tilt, or Zoom).
C2N_CAMIDJ_Speed_Slow_trig	DIGITAL	Selects the "Slow" speed profile for the active mode (Pan, Tilt, or Zoom).
C2N_CAMIDJ_Wheel_Clockwise_trig	DIGITAL	Triggered when the joystick wheel is turned clockwise. Adjusts focus far or iris down.
C2N_CAMIDJ_Wheel_Counter_Clockwise_trig	DIGITAL	Triggered when the joystick wheel is turned

		counter-clockwise. Adjusts focus near or iris up.
C2N_CAMIDJ_Wheel_Stopped_trig	DIGITAL	Triggered when the joystick wheel stops turning.
C2N_CAMIDJ_Pan_ain	ANALOG	Connect to the Pan analog output of a C2N-CAMIDJ symbol. Controls camera panning.
C2N_CAMIDJ_Tilt_ain	ANALOG	Connect to the Tilt analog output of a C2N-CAMIDJ symbol. Controls camera tilting.
C2N_CAMIDJ_Zoom_ain	ANALOG	Connect to the Zoom analog output of a C2N-CAMIDJ symbol. Controls camera zooming.
C2N_CAMIDJ_Speed_Adjust_ain	ANALOG	Connect to the Speed Adjust analog output of a C2N-CAMIDJ symbol. Used for setting speed values.

Serial Communication

Signal Name	Type	Description
From_Camera_rx$	BUFFER	Connect to the TCP/IP Client's RX$. Receives all data from the camera. Max buffer size: 1024.

OUTPUTS

System & Power Feedback

Signal Name	Type	Description
Is_On_fb	DIGITAL	HIGH when the camera is confirmed to be ON.
Is_Off_fb	DIGITAL	HIGH when the camera is confirmed to be OFF (in Standby).
Video_Is_Muted_fb	DIGITAL	HIGH when video mute is active.

Image & Mode Feedback

Signal Name	Type	Description
Is_Image_Flip_On_fb	DIGITAL	HIGH when image flip is active.
Is_Image_Stabilizer_On_fb	DIGITAL	HIGH when image stabilizer is active.

Is_Flicker_Cancel_On_fb	DIGITAL	HIGH when flicker cancellation is active.
Is_Defog_On_fb	DIGITAL	HIGH when defog mode is active.
Is_Picture_Effect_BW_On_fb	DIGITAL	HIGH when the Black & White picture effect is active.
Is_Tele_Convert_On_fb	DIGITAL	HIGH when tele-convert mode is active.
WDR_Is_On_fb	DIGITAL	HIGH when Wide Dynamic Range is active.

Exposure & Color Feedback

Signal Name	Type	Description
Is_AE_Mode_Auto_fb	DIGITAL	HIGH when Auto Exposure mode is active.
Is_AE_Mode_Manual_fb	DIGITAL	HIGH when Manual Exposure mode is active.
Is_AE_Mode_Shutter_Priority_fb	DIGITAL	HIGH when Shutter Priority AE mode is active.
Is_AE_Mode_Iris_Priority_fb	DIGITAL	HIGH when Iris Priority AE mode is active.
Is_High_Sensitivity_On_fb	DIGITAL	HIGH when high sensitivity mode is active.
Backlight_Is_On_fb	DIGITAL	HIGH when backlight compensation is active.
Is_Exposure_Comp_On_fb	DIGITAL	HIGH when exposure compensation is active.
Is_WB_Mode_Auto_fb	DIGITAL	HIGH when Auto White Balance mode is active.
Is_WB_Mode_Indoor_fb	DIGITAL	HIGH when Indoor White Balance mode is active.
Is_WB_Mode_Outdoor_fb	DIGITAL	HIGH when Outdoor White Balance mode is active.
Is_WB_Mode_One_Push_fb	DIGITAL	HIGH when One-Push White Balance mode is active.
Is_WB_Mode_Manual_fb	DIGITAL	HIGH when Manual White Balance mode is active.

PTZF & Value Feedback

Signal Name	Type	Description
Is_Auto_Focus_On_fb	DIGITAL	HIGH when Auto Focus is active.
Pan_Position_fb	ANALOG	Reflects the current absolute pan position of the camera.
Tilt_Position_fb	ANALOG	Reflects the current absolute tilt position of the camera.
Zoom_Position_fb	ANALOG	Reflects the current absolute zoom position of the camera.
Focus_Position_fb	ANALOG	Reflects the current absolute focus position of the camera.
Noise_Reduction_Level_fb	ANALOG	Reflects the current noise reduction level (0-5).
Iris_Level_fb	ANALOG	Reflects the current iris level.
Gain_Level_fb	ANALOG	Reflects the current gain level.
Shutter_Level_fb	ANALOG	Reflects the current shutter speed level.
Red_Gain_fb	ANALOG	Reflects the current manual Red Gain level.
Blue_Gain_fb	ANALOG	Reflects the current manual Blue Gain level.
Aperture_Level_fb	ANALOG	Reflects the current aperture/detail level.
Exposure_Comp_Level_fb	ANALOG	Reflects the current exposure compensation level.
AE_Speed_fb	ANALOG	Reflects the current AE response speed.
WB_Offset_fb	ANALOG	Reflects the current white balance offset.

Preset & Tally Feedback

Signal Name	Type	Description
Store_Preset_Active	DIGITAL	HIGH when "Store Mode" is active.
Preset_1_Active_fb to Preset_8_Active_fb	DIGITAL	HIGH when the corresponding preset is the last one recalled.
Is_Tally_On_fb	DIGITAL	HIGH when the tally light is confirmed to be on.

C2N-CAMIDJ Interface Feedback

Signal Name	Type	Description
C2N_CAMIDJ_Focus_Button_Is_Active_fb	DIGITAL	Drives the 'FOCUS' button LED. HIGH when in manual focus mode.
C2N_CAMIDJ_Zoom_Button_Is_Active_fb	DIGITAL	Drives the 'ZOOM' button LED. HIGH when in zoom speed adjust mode.
C2N_CAMIDJ_Pan_Button_Is_Active_fb	DIGITAL	Drives the 'PAN' button LED. HIGH when in pan speed adjust mode.
C2N_CAMIDJ_Tilt_Button_Is_Active_fb	DIGITAL	Drives the 'TILT' button LED. HIGH when in tilt speed adjust mode.
C2N_CAMIDJ_Iris_Auto_Button_Is_Active_fb	DIGITAL	Drives the 'IRIS AUTO' button LED. HIGH when in auto iris mode.
C2N_CAMIDJ_Iris_Manual_Button_Is_Active_fb	DIGITAL	Drives the 'IRIS MAN' button LED. HIGH when in manual iris mode.
C2N_CAMIDJ_Speed_Fast_Is_Active_fb	DIGITAL	Drives the 'FAST' button LED. HIGH when the fast speed profile is selected.
C2N_CAMIDJ_Speed_Slow_Is_Active_fb	DIGITAL	Drives the 'SLOW' button LED. HIGH when the slow speed profile is selected.
C2N_CAMIDJ_Display_aout	ANALOG	Connect to the Display analog input of a C2N-CAMIDJ symbol. Shows the current value for the active mode.
C2N_CAMIDJ_Display_Mode_aout	ANALOG	Connect to the Display Mode analog input of a C2N-CAMIDJ symbol. Sets the display mode (e.g., "FC" for focus, scaled value, etc.).

Information & Debug

Signal Name	Type	Description
Model_Name_fb$	STRING	Reports the model name of the camera.
Debug_fb$	STRING	Provides status messages, raw command data, and error information for troubleshooting.
To_Camera_tx$	STRING	Connect to the TCP/IP Client's TX$. Transmits formatted VISCA over IP commands to the camera.

OPERATIONS

Initialization & Connection

On program start, the module waits for a successful TCP/IP connection to the camera. Once connected, it automatically performs a VISCA sequence number reset and then queries the camera for all supported statuses. This populates all feedback signals with the camera's actual state. The module includes a keep-alive poll; if it fails to get a response after two attempts, it assumes the connection is lost and will re-attempt the full initialization on the next successful connection.

C2N-CAMIDJ Joystick Control

The module is designed for seamless control with a C2N-CAMIDJ joystick.

- **Mode Selection:** Pressing the Focus, Zoom, Pan, or Tilt buttons on the joystick changes the function of the joystick and the adjustment wheel. The active mode is shown on the joystick's LEDs, driven by the module's feedback.
- **PTZ Movement:** Moving the joystick sends continuous pan, tilt, and zoom commands to the camera. The speed of movement is determined by the active speed profile (Fast/Slow) and the corresponding speed values (g_nPanSpeed_Fast, etc.).
- **Wheel Control:** The wheel's function changes with the mode. In Focus mode, it adjusts focus far/near. In Iris mode, it ramps the iris up/down. In Pan/Tilt/Zoom Speed modes, turning the wheel while it's pressed down adjusts the speed value for the selected profile, with the new value shown on the joystick's display.
- **Mode Timeout:** To prevent being stuck in an adjustment mode, the joystick mode will automatically revert to a default state after 30 seconds of inactivity. Any joystick or wheel movement resets this timer.

Preset Operation

- **Recalling:** Pulse a Recall_Preset_#_trig input to recall the corresponding preset. The associated feedback LED will light.
- **Storing:** Pulse the Store_Preset_trig to enter "Store Mode" (Store_Preset_Active goes high). The next Recall_Preset_#_trig pulse will then *store* the current camera position and settings to that preset number. Store mode is automatically cancelled after one use.

Tally Light

The module uses a keep-alive mechanism for the tally light. When Tally_On_trig is pulsed, the module sends the "Tally On" command and then re-sends it every 10 seconds to ensure the tally remains active. Pulsing Tally_Off_trig stops this keep-alive and sends the "Tally Off" command.

TROUBLESHOOTING & NOTES

- **Communication:** This is a VISCA over IP module. Ensure the TCP/IP Client symbol in your SIMPL program is configured with the correct IP address for the Sony camera. The standard VISCA port is 52381.
- **Debug_fb$ Output:** This string output is the most critical tool for troubleshooting. It displays formatted commands being sent (TX), raw responses from the camera (RX), status updates, and error messages like timeouts. Monitor this output in SIMPL Debugger to verify communication.
- **Joystick Initialization:** The module initializes joystick speed values on first run. These are non-volatile and can be adjusted in real-time using the joystick's wheel.
- **Auto Framing Override:** Any manual PTZ movement (from triggers or the joystick) will automatically disable the Auto Framing feature.
- **Preset Recall Override:** Recalling a preset will automatically disable the Auto Framing feature.