Crestron Fusion® Software Smart Building Integration
Integration

Enterprise Management Platform

Programming Guide

Contents

Crestron Fusion Software Smart Building Integration: Enterprise Management Platform

Introduction

This document details the inputs and outputs of each module required for Crestron Fusion support and their interactions with the Crestron Fusion Web Client. This guide assumes the programmer possesses a basic knowledge of SIMPL and SIMPL+® programming. Diagrams are included illustrating required connections between each module, symbol, and asset, as well as the required logic.

NOTE: The latest Crestron® database is required to use the Crestron Fusion modules and symbols.

Overview Diagram

The following diagram is an overview of the general interaction between the Crestron Fusion server, control systems, and devices.

Crestron Fusion Interactions
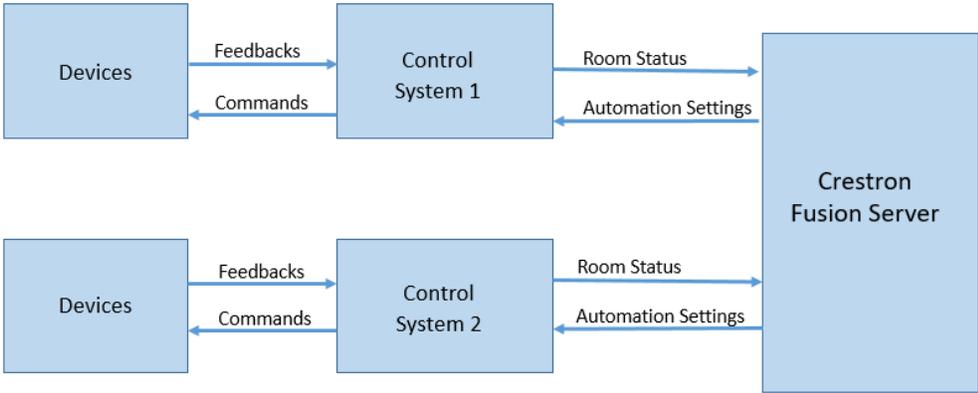
Crestron Fusion Symbol Descriptions

DemandResponse Symbol

The DemandResponse symbol is used when the programmer wants to trigger functions based on the status of a demand response event. A demand response event represents a period of time when a facility must reduce its overall power consumption in accordance with an agreement with its utility company.

The purpose of the DemandResponse symbol is to process the digital input. DREventActive indicates whether or not a demand response event is active. If the DREventActive signal goes high (DemandResponse active), the SetDREvent output is triggered. If the DREventActive signal goes low (DemandResponse inactive), the ClearDREvent signal is triggered.

When the DemandResponse symbol sends the SetDREvent signal to Crestron Fusion, the settings in the **Demand Response** tab under the **Automation** tab in the Crestron Fusion Web Client are triggered for the room(s) selected in the Room tree. When the DemandResponse symbol sends the ClearDREvent signal, the settings on the **Demand Response** tab are ignored and the system returns to normal.

Input Signals

SIGNAL NAME	DESCRIPTION
DREventActive	This signal is set to high while a demand response event is active and set to low when the demand response event is inactive.

Output Signals

SIGNAL NAME	DESCRIPTION
SetDREvent	This signal is triggered when a demand response event is active (DREventActive=high).
ClearDREvent	This signal is triggered when a demand response event is inactive (DREventActive=low).

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is DemandResponse and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

Energy Load Symbol

The Energy Load symbol is a generic symbol representing the energy load that consumes electrical power but is not the lighting or shade load.

Input Signals

SIGNAL NAME	DESCRIPTION
RTPValueNegative	The real time power value read from a GLS-MCU energy monitor is a signed value. This signal designates a positive or negative sign for the value sent by the energy monitor. A value of 0/Low indicates energy data is positive and 1/High indicates the energy data is negative.
RealTimePower	This signal sends real time power data to Crestron Fusion in units specified by the Units parameter. The valid data range is 0d to 65535d.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Energy Load and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.
Type	This parameter specifies the type of energy that drives the load. Valid values are Electric (default), Natural Gas, Steam, Hot Water, Chilled Water, or Fuel Oil.
Units	This parameter specifies the unit of energy described by the load. Valid values are W (default), W[x10], W[x100], kW, MW, BTU/hr, MBTU/hr, Therms/hr, Tons, and Gal/hr.
Category	The Category field is optional and is used to provide additional information regarding the asset.
SubCategory	The SubCategory field is optional and is used to provide additional information regarding this asset.

Energy Supply Symbol

The Energy Supply symbol represents a power supply that feeds one or more energy loads for a room or area.

Input Signals

SIGNAL NAME	DESCRIPTION
RTPValueNegative	The real time power value read from a GLS-MCU energy monitor is a signed value. This signal designates a positive or negative sign for the value sent by the energy monitor. A value of 0/Low indicates energy data is positive and 1/High indicates the energy data is negative.
RealTimePower	This signal sends real time power data to Crestron Fusion in units specified by the Units parameter. The valid data range is 0d to 65535d.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Energy Supply and cannot be changed.
InstanceID	This parameter is the unique ID for the asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.
Type	This parameter specifies the type of energy that drives this load. Valid values are Electric (default), Natural Gas, Steam, Hot Water, Chilled Water, and Fuel Oil.
Renewable	This parameter specifies whether or not this energy supply is driven by a renewable energy source. Valid values are Yes and No (default).
Units	This parameter specifies the unit of energy described by the load. Valid values are W (default), W[x10], W[x100], kW, MW, BTU/hr, MBTU/hr, Therms/hr, Tons, and Gal/hr.
Category	The Category field is optional and is used to provide additional information regarding the asset.
SubCategory	The SubCategory field is optional and is used to provide additional information regarding this asset.

HVAC Zone Symbol

The HVAC Zone symbol provides room environmental and status (occupied and unoccupied) feedback to Crestron Fusion.

Input Signals

SIGNAL NAME	DESCRIPTION
OccupiedModeActive	This signal provides feedback that the HVAC system is set to Occupied. The signal is high while the HVAC system is in Occupied mode and low when the HVAC system is in either Unoccupied or Standby mode.
UnoccupiedModeActive	This signal provides feedback to indicate that the HVAC system is set to Unoccupied mode. The signal is high while the HVAC system is in Unoccupied mode and low when the HVAC system is in either Occupied or Standby mode.
StandbyModeActive	This signal provides feedback to indicate that the HVAC system is set to Standby mode. The signal is high while the HVAC system is in Standby mode and low when the HVAC system is in either Occupied or Unoccupied mode.
RoomTemperature	This signal provides the current temperature of the room in degrees Fahrenheit (°F). The valid range is 0d to 65535d in 10th of degree increments.
CoolSetpoint	This signal provides feedback on the value of the current cool set point of the room in degrees Fahrenheit (°F). The valid range is 0d to 65535d in 10th of degree increments.
HeatSetpoint	This signal provides feedback on the value of the current heat set point of the room in degrees Fahrenheit (°F). The valid range is 0d to 65535d in 10th of degree increments.
Humidity	This signal provides feedback on the value of the current humidity in the room. The valid range is 0d to 65535d (RH).
CO2	This signal provides feedback on the value of the current CO2 level in the room. The valid range is 0d to 65535d (PPM).

Output Signals

SIGNAL NAME	DESCRIPTION
SetOccupiedMode	This signal is triggered to set the HVAC system to Occupied Mode.
SetUnoccupiedMode	This signal is triggered to set the HVAC system to Unoccupied Mode.
SetStandbyMode	This signal is triggered to set the HVAC system to Standby Mode.
SetCoolSetpoint	This signal is the analog value representing a new cool set point in degrees Fahrenheit (°F). When the HVAC system reaches this temperature, the cooling system is activated. The possible values are 650d to 850d in 10th of degree increments.
SetHeatSetpoint	This signal is the analog value representing a new heat set point in degrees Fahrenheit (°F). When the HVAC system reaches this temperature, the heating system is activated. The possible values are 550d to 750d in 10th of degree increments.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is HVAC Zone and cannot be changed.
TemperatureControl	This parameter specifies how the temperature in the room is controlled. The choices are: **Temperature Set Points**: The HVAC temperature is controlled by set points. **Room State Modes**: The HVAC temperature is controlled by room state (occupancy). **Both Set points and Modes**: The HVAC temperature is controlled by set points and the room state.
InstanceID	This parameter is the unique ID for the asset that is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

Lighting Load Symbol

The Lighting Load symbol represents an individual light that draws electricity in a room. This symbol is used for both switch loads and dimmable loads.

Input Signals

SIGNAL NAME	DESCRIPTION
LoadIsOn	This signal provides feedback to indicate that the load is on.
LoadLevel	This signal provides feedback to indicate the current load level. The valid range is 0d to 65535d.
RealTimePower	This signal provides feedback to indicate the amount of electrical power (in watts) consumed by the load. The valid range is 0d to 65535d (watts).

Output Signals

SIGNAL NAME	DESCRIPTION
LoadOn	This signal is triggered to turn the load on to full brightness.
LoadOff	This signal is triggered to turn the load off.
SetLoadLevel	This signal is the analog value that sets the load to a particular level. This signal cannot be used for switch loads.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what the symbol represents or controls in the program. The AssetType in this symbol is Lighting Load and cannot be changed.
Dimmable	This parameter indicates if the load is a dimmed load or a switch load. The valid values are Yes (default) and No. When No is selected, only the LoadOn and LoadOff digital outputs trigger with changes from Crestron Fusion. The SetLoadLevel analog output is no longer used.
InstanceID	This parameter is the unique ID for the asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.
Type	This parameter specifies the type of energy that drives the load. The type is Electric and cannot be changed.
Category	The Category field is optional and provides additional information regarding this asset. This field defaults to Other.
SubCategory	The SubCategory field is optional and is used to provide additional information regarding the asset. This field defaults to Other.
Wattage	This parameter indicates the electrical power consumed by the load in watts. The valid range is 0d (default) to 65535d (watts).
Voltage	This parameter indicates the voltage of the load. The valid range is 0d (default) to 65535d (in volts).
MeterType	This parameter indicates how this load is measured or metered. The choices are: **None [0d]**: None indicates the load is not metered. **Metered Amps [1d]**: RealTimePower indicates the current (in amps). **Metered Power [2d]**: RealTimePower indicates the consumed power (in watts). **Simulated [3d]**: RealTimePower is calculated based on the wattage and voltage of the load. This is the default.

Lighting Scenes Symbol

The Lighting Scenes symbol is used to set a lighting load to a specific level according to the selected scene. There are two sets of signals and parameters for this symbol, Lighting Scenes Slots and Lighting Scenes Names Slots.

The Lighting Scenes Slots signals and parameters are shown below.

Input Signals

SIGNAL NAME	DESCRIPTION
ScenesAllOff	This signal provides feedback to indicate that all scenes are off.

Output Signals

SIGNAL NAME	DESCRIPTION
SaveActiveScene	This signal is triggered to store the current load levels for the currently selected scene.
ResetActiveScene	This signal is triggered to revert the lighting loads back to the default levels for the currently selected scene.
AllOff	This signal is triggered to turn off all scenes.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Lighting Scenes and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

The Lighting Scenes Name Slots signals and parameters are shown below.

Input Signals

SIGNAL NAME	DESCRIPTION
DemandResponseRecall	This signal is triggered by Crestron Fusion to recall the DemandResponse scene.
Scene<x>	This signal is triggered by Crestron Fusion to recall the Scene<x>.

Output Signals

SIGNAL NAME	DESCRIPTION
DemandResponseActive	This signal provides feedback to Crestron Fusion to indicate that the DemandResponse scene was the last recalled scene.
Scene<x>Active	This signal provides feedback to Crestron Fusion to indicate that the Scene<x> is the last recalled scene.

Parameters

PARAMETER NAME	DESCRIPTION
DemandResponse	This parameter is the DemandResponse scene name. The default scene name is DemandResponse and is a reserved preset and should not be changed. If it is not used, leave the digital inputs and outputs from this scene unpopulated.
Scene<x>	This parameter is the name for the Scene<x>; the strings entered into this parameter are used to identify the lighting scenes in Crestron Fusion. It is recommended that the scene names for the same room be unique to avoid confusion.

Logging Symbol

The Logging symbol is used to transfer historical energy usage data to Crestron Fusion.

Input Signals

SIGNAL NAME	DESCRIPTION
LogData	This signal provides historical energy usage data sent to Crestron Fusion in XML format.

Output Signals

SIGNAL NAME	DESCRIPTION
LogFileReceived	This signal is triggered from Crestron Fusion to indicate that the most recent log file has been received.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what the symbol represents or controls in the program. The AssetType in this symbol is Energy Logging and cannot be changed.
HTTPRefreshRate	This parameter is included for future implementation. The default is 60d.
InstanceID	This parameter is the unique ID for the asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

Occupancy Sensor Symbol

The Occupancy Sensor symbol connects to a physical occupancy sensor in a room and sends occupied status to Crestron Fusion.

Input Signals

SIGNAL NAME	DESCRIPTION
OccSensorEnabled	This signal provides feedback to indicate whether or not the occupancy sensor is enabled. The signal is high as long as the occupancy sensor is enabled; otherwise, it is low.
RoomOccupied	This signal provides feedback to indicate if the room is occupied. The signal is high as long as the room is occupied; otherwise, it is low.
RoomUnoccupied	This signal provides feedback to indicate if the room is unoccupied or no longer detecting motion. The signal is high as long as the room is unoccupied; otherwise, it is low.
OccSensorTimeout	This signal indicates the current occupancy sensor timeout value in seconds. The valid range is 0d to 65535d (seconds).

Output Signals

SIGNAL NAME	DESCRIPTION
EnableOccSensor	This signal is triggered to enable the occupancy sensor in the room. This only works for an occupancy sensor and can be programmatically enabled.
DisableOccSensor	This signal is triggered to disable the occupancy sensor in the room. This only works for an occupancy sensor and can be programmatically disabled.
SetOccSensorTimeout	This signal is a timeout value and indicates how long an occupancy sensor retains occupied status after the room is no longer occupied. The valid range is 0d to 65535d (seconds).

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Occupancy Sensor and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

Photocell Symbol

The Photocell symbol connects to a physical photocell in the room and measures natural light entering the room.

Input Signals

SIGNAL NAME	DESCRIPTION
LightSensorEnabled	This signal provides feedback to indicate if the light sensor is enabled. The signal is high as long as the sensor is enabled; otherwise, it is low.
ClosedLoopSensor	This signal provides feedback to indicate whether the sensor is a closed loop sensor. A closed loop sensor looks down on a surface to measure the light from a fixed point. An open loop sensor faces outward and measures the natural light coming into the room.
LightLevel	This signal provides feedback to indicate the light level measured by the photocell. The valid range is 0d to 65535d.

Output Signals

SIGNAL NAME	DESCRIPTION
EnableLightSensor	This signal is triggered to enable the light sensor.
DisableLightSensor	This signal is triggered to disable the light sensor.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what the symbol represents or controls in the program. The AssetType is fixed and cannot be changed. The AssetType in this symbol is Photocell and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

Remote Occupancy Sensor Symbol

The Remote Occupancy Sensor symbol provides a way to set occupancy information for a room and either does not have a physical occupancy sensor or has two control systems controlling the room where the occupancy status must be fed from one to the other.

Input Signals

SIGNAL NAME	DESCRIPTION
RoomOccupied	This signal provides feedback to indicate the room is occupied or detecting motion. The signal is high as long as the room is occupied; otherwise, it is low. When the feedback is specified, Crestron Fusion tracks the occupancy state sent to the program by the SetRoomOccupied signal.
RoomUnoccupied	This signal provides feedback to indicate the room is unoccupied or no longer detecting motion. The signal is high as long as the room is unoccupied; otherwise, it is low. When the feedback is specified, Crestron Fusion tracks the occupancy state sent to the program by the SetRoomUnoccupied signal.

Output Signals

SIGNAL NAME	DESCRIPTION
SetRoomOccupied	This signal is triggered from Crestron Fusion to set the occupancy status for a room. Since this room has no means to determine occupancy status, there is no feedback. If latched feedback is needed, the output is pulsed when the room becomes occupied and additional logic needs to be added in the programming.
SetRoomUnoccupied	This signal is triggered from Crestron Fusion to set the occupancy status for a room. The output is pulsed when the room becomes unoccupied or motion is no longer detected. Additional logic needs to be added in the programming if the latched state of the signal is needed.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Remote Occupancy Sensor and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The Instance ID cannot be changed.

Remote RealtimePower Symbol

The Remote RealTimePower symbol is used when multiple control systems are used to control or monitor a room. For example, when one control system is installed to handle the load directly, another control system can be used to monitor the energy consumption of the load. In a situation like this, the remote RealTimePower symbol is used to relay the energy data to Crestron Fusion.

The InstanceID of the load is referenced as a parameter on the RealTimePower symbol so that Crestron Fusion can associate the power reading with the correct asset. In cases where the load energy is monitored from the same control system and connects to the load, the remote RealTimePower symbol is not necessary.

The Remote RealtimePower Slot signals and parameters are shown below.

Output Signals

SIGNAL NAME	DESCRIPTION
EnableDataSend	This signal is triggered to enable the symbol to send data. When the symbol is enabled, all connected devices send energy feedback to Crestron Fusion.
DisableDataSend	This signal is triggered to disable the symbol to send data. When the symbol is disabled no energy data is sent to Crestron Fusion for connected devices.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Energy Meter and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

The Asset RealtimePower Slot signals and parameters are shown below.

Input Signals

SIGNAL NAME	DESCRIPTION
Asset<x>	This signal provides feedback and indicates the real time power of the specified asset. The valid range is 0d to 65535d (in watts).

Parameters

PARAMETER NAME	DESCRIPTION
Asset<x>	This parameter must be filled with the InstanceID of the particular asset.

Shade Load Symbol

The Shade Load symbol represents an individual shade control in a room. This symbol can be used for multiple types of shades.

Input Signals

SIGNAL NAME	DESCRIPTION
ShadeIsMoving	This signal provides feedback to indicate if the shade is moving. The signal is high as long as the shade is moving. When the shade is not moving, the signal is low.
ShadePosition	This signal provides feedback to indicate the current position of the shade. The valid range is 0d to 65535d.
RealTimePower	This signal provides feedback to indicate the amount of electrical power (in amps or watts) consumed by the load. The valid range is 0d to 65535d (in watts).

Output Signals

SIGNAL NAME	DESCRIPTION
OpenShade	This signal is triggered to open the shade to the full-open position.
CloseShade	This signal is triggered to close the shade to the full-closed position.
StopShade	This signal is triggered to stop the shade at its current position.
GotoShadePosition	This signal is an analog value which sets the fixed position of the shade. The valid range is 0d to 65535d.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter is the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Shade Load and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program.
Type	This parameter specifies the type of energy that drives this load, in this case Electric.
Category	This parameter is the Category field (optional field) providing additional information regarding the asset. The default is Other.

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PARAMETER NAME	DESCRIPTION
SubCategory	This parameter is the SubCategory field (optional field) providing additional information regarding the asset. The default is Other.
SupportsShadePosition	This parameter specifies if the shade supports positions between open and closed; if not, only the OpenShade, CloseShade, and StopShade signals can be triggered. The valid values are Yes (default) and No.
MeterType	This parameter indicates how this load is metered. The choices are: **None [0d]**: None indicates the load is not metered. **Metered Amps [1d]**: The RealTimePower indicates the amps of the load. **Metered Power [2d]**: The RealTimePower indicates the power (in watts) of the load. **Simulated [3d]**: This is the default. The RealTimePower is calculated based on the wattage and voltage of the load.

Shade Presets Symbol

The Shade Presets symbol represents shade controls in a room. This symbol can be used for multiple types of shades.

The Shade Presets Slot signals and parameters are shown below.

Input Signals

SIGNAL NAME	DESCRIPTION
ShadesAllOpen	This signal provides feedback to indicate that the All Open preset in the Crestron Fusion Monitoring Web Client is selected. The signal is high as long as this is the active preset. If any other preset is selected, the signal is low.
ShadesAllClosed	This signal provides feedback to indicate that the All Closed preset is selected. The signal is high as long as this is the active preset. If any other preset is selected, the signal is low.

Output Signals

SIGNAL NAME	DESCRIPTION
SaveShadePreset	This signal is triggered to store the current shade positions with the active preset.
ResetShadePreset	This signal is triggered to set the shade positions back to a default value for the active preset.
OpenAllShades	This signal is triggered to activate this preset.
CloseAllShades	This signal is triggered to activate this preset.

Parameters

PARAMETER NAME	DESCRIPTION
AssetName	This parameter provides the name of the asset as it appears in Crestron Fusion.
AssetType	This parameter specifies what this symbol represents or controls in the program. The AssetType in this symbol is Shade Presets and cannot be changed.
InstanceID	This parameter is the unique ID for this asset and is automatically generated when the asset is added to the program. The InstanceID cannot be changed.

The Shade Presets Names Slot signals and parameters are shown below.

Input Signals

SIGNAL NAME	DESCRIPTION
Preset<x>	This signal is triggered by Crestron Fusion to recall preset <x>.

Output Signals

SIGNAL NAME	DESCRIPTION
Preset<x>Active	This signal provides the feedback to Crestron Fusion to indicate that scene <x> is the last recalled scene.

Parameters

PARAMETER NAME	DESCRIPTION
Preset<x>	This parameter is the name for Preset <x>; the strings entered into these parameters are used to identify the presets in Crestron Fusion. It is recommended that preset names for presets in the same room be unique to avoid confusion.

SIMPL+/# Modules

There are several SIMPL+ modules that are needed for complete Crestron Fusion implementation as follows:

NOTE: When establishing FilePath$ input signals, make sure that the serial send, which feeds the FilePath$ input on a module, is the same. This ensures that the same signal connects to all FilePath$ inputs instead of individual serial sends.

Current SIMPL+ Modules

- Fusion EM® File Manager (one per program) used in conjunction with the Energy Monitoring modules

- Fusion EM GLS-EM-MCU Energy Monitoring (1 per GLS-EM-MCU device) used in conjunction with the File Manager module

- Fusion EM Generic Energy Monitoring (1 per 100 loads) used in conjunction with the File Manager module

- Fusion EM Parameter Formatting

- Fusion EM Time Sync (1 per program and 1 per processor)

- Fusion EM Lighting Control Interface (1 per 10 zones and 10 presets)

- Fusion EM Load module

New SIMPL+ Modules

- Fusion EM GUID Updater Helper

- Fusion EM GUID Updater Symbol Processor

New SIMPL# Modules

- Fusion EM Automation (one per program)
- Fusion EM Room Control

Deprecated SIMPL+ Modules

- Fusion EM XML Parser (one per program) (replaced by Fusion EM Automation SIMPL# module)
- Fusion EM Master Scheduler (one per program) (replaced by Fusion EM Automation SIMPL# module)
- Fusion EM Dynamic Lighting Preset (1 per scene)
- Fusion EM Room Control (1 per room)

A general overview of the modules is provided in this section.

Current SIMPL+ Modules

There are three different modules that are used to provide Crestron Fusion with energy data.

Fusion EM File Manager Module

The Fusion EM File Manager is the central file management module. Its purpose is to check the file system at set intervals, find the energy usage log files (*.log), and copy those files to either the Crestron Fusion server or removable media, such as a USB or CompactFlash® device. Upon successful transfer of the energy usage log files to Crestron Fusion, the module deletes the local log files in order to preserve file system space. One Fusion EM File Manager module is required per program and is used in conjunction with the Crestron Fusion Energy Monitoring modules.

Input Signals

SIGNAL NAME	DESCRIPTION
Fusion_Online_fb	This signal tells the module that Crestron Fusion is online. When this signal is received, the module begins sending log data to Crestron Fusion. This signal should be driven by the Not symbol of the Ethernet Offline Manager associated with the Crestron Fusion symbol that contains a Crestron Fusion Logging device.
Console_rx$	This signal is the response from the Console symbol and must be connected to the receiving side of the Console symbol ("rx$").
File_Path$	This signal provides the log file storage location at run time. NOTE: This signal overrides the file location provided by the FileStorageLocation$ and FileStoragePath$ parameters.
Fusion_rx$	This signal must be connected to the LogFileReceived signal on the Fusion EM Logging Device symbol. This signal tells the module whether or not the log file was received successfully.
Total_Load_Count_fb[x]	This signal is the total number of loads in each of the Crestron Fusion Energy Monitoring modules (expandable up to 10 inputs). It must be connected to the Total_Load_Count_fb output on the Energy Monitoring modules.

Output Signals

SIGNAL NAME	DESCRIPTION
Free_Space_Ok_fb	This signal goes high and remains high for as long as the maximum usage limit has not been reached. This limit is dictated by MaxSizedAllotedInKB and CheckAllFileSizes parameters. This signal is used to direct the logging modules to pause logging when there is not enough space to write the *.log files. When this signal goes low, no log files are written.
Log_Transfer_Started_Pulse	This signal pulses at the start of a *.log file transfer to Crestron Fusion.
Log_Transfer_Finished_Pulse	This signal pulses at the completion of a *.log file transfer to Crestron Fusion.
Console_tx$	This signal is a command to the Console symbol. This signal must be connected to the sending side of the Console symbol ("tx$").
Current_File_Full_Path$	The output indicates which file is being uploaded to Crestron Fusion. This signal is used mainly for debugging purposes.
Fusion_tx $	This signal is used to transmit the log file data to Crestron Fusion. This signal must be connected to the LogData signal on the Fusion EM Logging Device slot.

Parameters

PARAMETER NAME	DESCRIPTION
MaxSizeAllotedInKB	This parameter is used in two different ways based on what the CheckAllFileSizes parameter is set to. • If CheckAllFileSizes is set to No, then this parameter indicates the amount of free space that the module leaves on a USB or CompactFlash. For example, if CheckAllFileSizes is set to 1024d and there is a 256 Mb USB flash drive, files continue to be written until there is less than 1024 Kb of free space on the USB flash drive. • If CheckAllFileSizes is set to Yes, then this parameter is the maximum size of the log files allowed to occupy on the USB or CompactFlash. For example, if CheckAllFileSizes is set to 1024d and there is a 256 Mb USB flash drive, files continue to be written until there are more than 1024 Kb of log files on the USB flash drive.
CheckAllFileSizes	This parameter is used in conjunction with MaxSizeAllocatedInKB. • When this parameter is set to Yes, the module runs through and adds up the size of each *.log file in the specified storage path and checks to ensure the size of the log files is less than the size that is specified in the parameter. • When the parameter is set to No, the module checks to ensure the free space is on the storage location is greater than the size that is specified. If it is, the module allows the energy monitoring modules to continue creating *.log files.
FileStorageLocation$	This parameter specifies where the files should be read from. The choices are: Removable Media (USB): This sets the module to read files from Removable Media. CompactFlash: This sets the module to read files from CompactFlash. NOTE: This location should match the location that is set for all of the energy monitoring modules.

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PARAMETER NAME	DESCRIPTION
FileStoragePath$	This parameter specifies the subfolder where the log files are read. It is recommended to store the *.log files in a subfolder when possible so other files do not interfere during processing. It is also recommended in cases where a large number of log files build up, which can cause issues with File Manager in Crestron Toolbox™ software. An example subfolder path is EMLogs\\. Note the double backslash. NOTE: This location should match the location that is set for all of the energy monitoring modules.

Fusion EM GLS-EM-MCU Energy Monitoring Module

This module takes the Data_Energy_Usage output generated by the GLS-EM-MCU device and records it in a Crestron Fusion format that can be sent to the Fusion EM File Manager. One Energy Monitoring module is required per Crestron Fusion device and is used in conjunction with the File Manager module.

The GLS-EM-MCU Energy Monitoring module reviews how many logs the GLS-EM-MCU device has in its file system, and if it has more than one stored log, the module queries the device at preset intervals to send the log over and save it on its own file system. In the event that there is not enough space on the file system to store the file, the module stops querying the device for the file until there is enough room to store another log file.

The data files are saved in the form MMDDYYYY.HHMM-D<instanceID>.log. For example, a file saved on 10/4/2011 at 2:30PM by a module with InstanceID 2 is given the file name 10042011.1430-D2.log.

Input Signals

SIGNAL NAME	DESCRIPTION
Free_Space_Ok_fb	This signal is used to tell the File Manager module that there is enough space on the file system to write more data logs. This signal must be connected to the Free_Space_Ok_fb signal on the File Manager module.
Num_Rec_Files_On_GLS_EM_MCU_fb	This signal indicates the number of data records that are currently stored on the GLS-EM-MCU device. This signal must be connected to the Num_Rec signal on the GLS-EM-MCU device's Logging Data slot.
File_Path$	This signal is used to provide the log file storage location at run time. NOTE: Using this signal overrides the file location provided by the FileStorageLocation$ and FileStoragePath$ parameters.
Data_Energy_Usage_rx$	This is an Input signal for the serial energy usage data for the GLS-EM-MCU. This signal must be connected to the Data_Energy_Usage signal on the GLS-EM-MCU device symbol (Logging Data slot).
EnergyParameters[x]	This signal accepts the formatted Energy Parameter provided by the Fusion EM Parameter Formatting module. NOTE: This signal is expandable to 84 inputs to provide monitoring of 84 loads.

Output Signals

SIGNAL NAME	DESCRIPTION
Get_Next_Record_Pulse	This signal requests that the GLS-EM-MCU sends the next energy record in its file system via the serial join. This must be connected to the Get_Next signal on the GLS-EM-MCU device symbol's Logging Data slot.
Total_Load_Count_fb	This signal indicates the total number of loads that are being monitored by the module. This signal is used by the File Manager module to estimate the file size and determine if an additional log file can be written. This signal must be connected to the Total_Load_Count_fb signal on the File Manger module.

Parameters

PARAMETER NAME	DESCRIPTION
InstanceID	This parameter is a unique identifier tagged onto the Energy Log data file and is saved on the file system. Make sure that no other Energy Monitoring instances of the Energy Monitoring module have the same ID.
FileStorageLocation$	This parameter specifies where the files should be read from. The choices are: **Removable Media (USB)**: This sets the module to read files from Removable Media. **CompactFlash**: This sets the module to read files from CompactFlash. **NOTE**: This location should match the location that is set for all of the Energy Monitoring modules.
FileStoragePath$	This parameter specifies the subfolder where the log files are read. It is recommended to store the log files in a subfolder when possible so that other files do not interfere with the processing. It is also recommended in cases where a large number of log files build up, which can cause issues with File Manager in Crestron Toolbox. An example subfolder path would be EMLogs\\. Note the double backslash. **NOTE**: This location should match the location that is set for all of the Energy Monitoring modules.
Phase_ABC_Total_GUID$	This parameter takes in the GUID of the Fusion EM Energy Supply device that has the Active_Pwr_Total_ABC signal from the GLS-EM-MCU device symbol (Master Real Time Data slot) to which it is connected.
Phase_A_GUID$	This parameter takes in the GUID of the Fusion EM Energy Supply device that has the Active_Pwr_Ph_A signal from the GLS-EM-MCU device symbol (Master Real Time Data slot) to which it is connected.
Phase_B_GUID$	This parameter takes in the GUID of the Fusion EM Energy Supply device that has the Active_Pwr_Ph_B signal from the GLS-EM-MCU device symbol (Master Real Time Data slot) to which it is connected.
Phase_C_GUID$	This parameter takes in the GUID of the Fusion EM Energy Supply device that has the Active_Pwr_Ph_C signal from the GLS-EM-MCU device symbol (Master Real Time Data slot) to which it is connected.

Fusion EM Generic Energy Monitoring Module

The Fusion EM Generic Energy Monitoring module records estimated energy usage data and saves that data in a format that Crestron Fusion accepts. One instance of the Fusion EM Generic Energy Monitoring module supports monitoring of up to 100 loads.

One noticeable difference between the generic module and the GLS-EM-MCU module is that the generic module has analog inputs that accept a current, a level, or a power input. This means that Current Transformer reading can be connected to the input, a light level, or a real time power reading to the analog input of the generic module. However, the light level estimation of energy usage has less accuracy when compared to the Current Transformer reading. The module determines the type of input it is receiving is by interpreting the EnergyParameters[x] input from the Fusion EM Parameter Formatting module.

Input Signals

SIGNAL NAME	DESCRIPTION
Free_Space_Ok_fb	This signal is used to tell the File Manager module that there is enough space on the file system to write more data logs. This signal must be connected to the Free_Space_Ok_fb signal on the File Manager module.
File_Path$	This signal is used to provide the log file storage location at run time. NOTE: Using this signal overrides the file location provided by the FileStorageLocation$ and FileStoragePath$ parameters.
EnergyParameters[x]	This signal accepts the formatted Energy parameter provided by the Fusion EM Parameter Formatting module. NOTE: This signal is expandable to 100 inputs to provide monitoring of 100 loads.
ReadingIn[x]	This input signal indicates power, current draw, or light level. The value of this signal is accumulated in the module and then stored on the control system in a format readable by Crestron Fusion. This signal must not be expanded to more than the number of inputs used because the module is using this signal list to determine the number of loads being monitored. Expanding to more than the total number of loads may cause Crestron Fusion to reject log files. NOTE: It is important that the input matches the data type (power, current, or light level) indicated on the Fusion EM Parameter Formatting module. NOTE: The current input is expected to be current multiplied by 10. NOTE: This signal is expandable to 100 inputs to provide monitoring of 100 loads.

Output Signals

SIGNAL NAME	DESCRIPTION
TotalLoadCount	This signal indicates the total number of loads that are being monitored by the module. This signal is used by the File Manager module to estimate the file size and determine if additional log files can be written. This signal needs to be connected to the Total_Load_Count_fb signal on the File Manager module.

Parameters

PARAMETER NAME	DESCRIPTION
MonitorInterval	This parameter indicates how often the historical data is written. The shorter the interval the more accurate the historical data. This parameter can be set to 5, 10, or, 15 minutes. NOTE: This parameter should be set to a longer time interval if there are multiple instances of the Energy Monitoring module in a program. If the intervals are too short, then it is possible to create a backlog of log files on the processor and increase the potential for historical data loss.
InstanceID	This parameter is the unique identifier tagged onto the Energy Log data file and is saved on the file system. Make sure that no other instances of the Energy Monitoring module have the same ID.

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PARAMETER NAME	DESCRIPTION
FileStorageLocation$	This parameter specifies where the files are saved. The choices are:
	Removable Media (USB): This sets the module to write files to Removable Media.
	CompactFlash: This sets the module to write files to CompactFlash.
	NOTE: The location should match the location that is set for all of the Energy Monitoring modules.
FileStoragePath$	This parameter specifies the subfolder where the log files are written. It is recommended to store the log files in a subfolder when possible, so that other files do not interfere with the processing. It is also recommended in cases where a large number of log files build up, which can cause issues with File Manager in Crestron Toolbox. An example subfolder path would be EMLogs\\. Note the double backslash.
	NOTE: This location should match the location that is set for all of the Energy Monitoring modules.

Fusion EM Parameter Formatting Module

This module is designed to format data into the appropriate format for the Fusion EM Generic Energy Monitoring module and the Fusion EM GLS-EM-MCU Energy Monitoring module.

NOTE: If the data entered in the parameters of this module is incorrect, undesirable behavior, such as loss of data or incorrectly logged data, may result.

Output Signals

SIGNAL NAME	DESCRIPTION
Energy_Parameters_txt$	This formatted output must be connected to the EnergyParameters[x] input on the Fusion EM Generic Energy Monitoring module or the Fusion EM GLS-EM-MCU Energy Monitoring module.
	NOTE: This signal must be connected to the same index as the associated ReadingIn input. For example, if this signal is connected to EnergyParameters[3], then the monitored value should be connected to ReadingIn[3].

Parameters

PARAMETER NAME	DESCRIPTION
Instance-GUID_ID	This parameter is a 36 character long hexadecimal string ID associated with the load being monitored. The hexadecimal string can be found on the InstanceID parameter field of each Fusion EM Load Device symbol.
Load_Name	This is a name given to the load that distinguishes it from the other loads being monitored.
	NOTE: The name entered in this field cannot contain any spaces.
Voltage	This is the value in volts for the energy load that is being monitored for example, 120 V.
Max_Wattage	This is the maximum wattage of the load being monitored and is only used when energy data is estimated using the current load level. For example, if monitoring a bank of 10 lights and each light has two 50 W bulbs installed, the value is 1000.

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PARAMETER NAME	DESCRIPTION
Load_Type	This parameter must be set according to the type of load being monitored. The choices are: **Load Power**: This is energy fed directly from a third-party device or other method where the energy is being monitored (in watts). **Load Level**: This is energy estimated based on the percent of its total possible wattage. **Load Current**: This is energy monitored using an external current sensor which is provided to the control system via an I/O. Amp * 10 is the unit expected for input into the Energy Monitoring module when this load type is used.

Fusion EM Time Sync Module

The Fusion EM Time Sync module allows the program to sync its time with the Crestron Fusion server based on the InstanceID parameter and when the Sync Time signal is triggered. When the Sync_Time_b input signal is triggered, the module calculates a random delay using the InstanceID and the current control system time.

NOTE: The InstanceID must be a unique number in each program to ensure that the Crestron Fusion server is not flooded with time sync requests from the control systems.

Input Signals

SIGNAL NAME	DESCRIPTION
Sync_Time_b	This signal starts a time synchronization process between the Crestron Fusion server and the connected control system. When this signal is triggered, the logic waits a random amount of time before sending out a LocalTimeRequest$ to Crestron Fusion. The amount of time it waits is calculated by using the InstanceID and the current processor time. NOTE: This signal does not adjust the time zone. If the Crestron Fusion server is in a different time zone, this only is used to set GMT. The control system adjusts its time as needed.`
Local_Date_Time_Query_rx$	This signal is the local time sync response from Crestron Fusion. This signal must be connected to the LocalDateTimeQueryResponse$ output signal on the Fusion EM Room Data Device extender.

Output Signals

SIGNAL NAME	DESCRIPTION
Local_Date_Time_Query_tx$	This signal is the local time sync request from the control system to Crestron Fusion. This signal must be connected to the LocalDateTimeQuery$ input signal on the Fusion EM Room Data Device extender.

Parameters

PARAMETER NAME	DESCRIPTION
InstanceID	The Instance ID is used to create a random offset so that numerous LocalTimeRequest$s do not reach the Crestron Fusion server at the same time, degrading performance. If there are a multiple systems using this module, then this ID should be unique across the programs.

Fusion EM Lighting Control Interface Module

This module saves and recalls lighting presets for up to 10 zones of lights. There should be one instance of this module per lighting location to control.

Input Signals

SIGNAL NAME	DESCRIPTION
Lighting_Preset[x]_b	If this input is triggered for less than the **Preset_Save_Hold_Time** parameter, the lighting preset is recalled. If this input is pressed and held for longer than **Preset_Save_Hold_Time**, the preset is saved. This input is useful when the user is allowed to save the preset levels once the system is programmed.
Lighting_Recall_Preset[x]_b	If this input is triggered, the lighting preset is recalled. This input is used when saving the lighting preset is not required.
Lighting_Save_Preset[x]_b	If this input is triggered, the lighting preset is saved. This input provides a convenient way to save the preset.
Lighting_Level[x]_init	If this signal is set, the corresponding Lighting_Level[x]_fb is also set.
Demand_Response_Mode_On_fb	This input is used for enabling the demand response mode. As long as this signal is high, the Lighting_Level[x]_fb outputs are not allowed to go above the corresponding Demand_Response_Level[x]_Max_Percent value defined in the parameter. This signal does nothing when it is low.

Output Signals

SIGNAL NAME	DESCRIPTION
Lighting_Recall_Preset_Busy_fb	This signal goes high to indicate the module is busy recalling the lighting preset.
Lighting_Recall_Preset[x]_fb	This set of outputs is an interlocked output signal group that shows the last recalled preset. For example, if Lighting_Recall_Preset[3]_b is the last preset recalled, then Lighting_Recall_Preset[3]_fb stays high until another preset has been recalled.
Lighting_Save_Preset_Busy_fb	This signal goes high to indicate when the module is busy saving the lighting preset.
Lighting_Save_Preset_Complete_Pulse	This signal is pulsed when the module has completed saving the preset.
Lighting_Level[x]_fb	This signal must be connected to the Fusion EM Lighting Load device symbol's LoadLevel input. It is used to provide Crestron Fusion with the lighting load control slider feedback.
Demand_Response_Mode_Enabled_fb	This signal mirrors the Demand_Response_Mode_On_fb input and stays high for as long as the input is high. It indicates that demand response is enabled for the Fusion EM Lighting Control Interface module.

Parameters

PARAMETER NAME	DESCRIPTION
File_Location	This parameter specifies the location where the files are written and from which they are read.
File_Name	This parameter defines the file name used to store the lighting preset settings. It must be unique for each instance of Fusion EM Lighting Control Interface module.
Preset_Save_Hold_Time	This parameter defines the length of time the Lighting_Preset[x]_b input needs to be held before a preset is saved.
Demand_Response_Level[x]_Max_Percent	This parameter sets the maximum lighting level for the corresponding zone when the system enters a demand response.

Fusion EM Load Module

This module is designed to make it easier to perform estimated energy usage logging based on a given load level as well as to provide load status feedback to Crestron Fusion.

Input Signals

SIGNAL NAME	DESCRIPTION
Load_Full_Range_fb	This signal is the current lighting load level.

Output Signals

SIGNAL NAME	DESCRIPTION
Load_On_fb	This signal indicates that the Load_Full_Range_fb input value is larger than 0.
Load_Off_fb	This signal indicates that the Load_Full_Range_fb input value is equal to 0.
Load_Level_fb	This signal must be connected to the Fusion EM Lighting Load device symbol's LoadLevel input. This signal is used to provide Crestron Fusion with the lighting load control slider feedback.
Real_Time_Power_fb	This signal must be connected to the Fusion EM Lighting Load device symbol's RealTimePower input. It provides estimated real time energy usage to Crestron Fusion so the real time power graph is properly updated.
Energy_Monitoring_Module_fb	This signal must be connected to the Fusion EM Generic Energy Monitoring module's ReadingIn input. **NOTE**: This signal must be connected in the same index as the associated EnergyParameters input is connected. For example, if this signal is connected to ReadingIn, then the matching EnergyParameters from the Fusion EM Parameter Formatting module needs to be connected to EnergyParameters.

Parameters

PARAMETER NAME	DESCRIPTION
Load_Total_Watts	This is the maximum monitored load measured (in watts). This value is only used when energy data is estimated using the current load level. For example, if monitoring a bank of 10 lights and each light has two 50 W bulbs installed, this value should be 1000.

New SIMPL+ Modules

Fusion EM GUID Updater Helper

The Fusion EM GUID Updater Helper module allows the use of the Fusion EM Room symbol while still maintaining the cookie cutter code. The Fusion EM GUID Updater Helper module also allows for easier Crestron Fusion programming any time that the GUID devices are required throughout the program. The Fusion EM GUID Updater Helper module is used in conjunction with the Fusion EM XML Parser module, Fusion EM Master Scheduler module, Fusion EM GLS-EM-MCU Energy Monitoring module, Fusion EM Generic Energy Monitoring module, as well as the new Fusion EM Automation Helper SIMPL# module.

GUIDs are used to identify the specific Fusion EM Room symbols and Crestron Fusion devices that are associated with the symbol. When programming for Crestron Fusion, the GUIDs are required to identify the different Fusion EM Room symbols and devices for automation and energy data.

The Fusion EM GUID Updater Helper module modifies the RVI file at runtime. The RVI file is read and all GUIDs (Instance IDs) are prefixed with the TSID of the processor (and the program slot number if a 3-Series® processor is used). If a processor has to be changed, there is a serial input that allows the prefix to be overridden by the previous prefix.

NOTE: If all that is needed is the ability to have cookie cutter code, the Fusion EM GUID Updater Helper module needs to be connected to a console symbol; the remaining inputs and outputs can be commented out using Ctrl+L.

NOTE: The Fusion EM GUID Updater Helper module supports a maximum of 60 Fusion EM Room symbols. If more than 60 Fusion EM Room symbols are needed, the program should be broken up into multiple processors for a 2-Series processor or multiple program slots for a 3-Series processor.

Input Signals

SIGNAL NAME	DESCRIPTION
Update_GUIDs_b	This signal is used to tell the module to start the GUID update process. NOTE: This does not need to be pulsed; it is done automatically at startup. It is provided when case debugging needs to be done so that the process can be watched using a debugger.
Master_Override_GUID_Prefix$	This signal is used to allow the prefix to be overridden, a processor has been replaced, or if another prefix model is being used. NOTE: The max length of a prefix is 8 characters.
Console_rx$	This signal needs to be connected to the Console_rx$ signal of a console symbol.
Override_Symbol_Room_Name$[x]	This signal can be used to override the room name that is specified in the Fusion EM Room symbols. NOTE: The max length of a prefix is 50 characters. NOTE: The overridden room names need to be populated into the module at program startup.
Override_Symbol_GUID_Prefix$[x]	This signal can be used instead of the Master_Override_GUID_Prefix$ to override the prefix for a signal Fusion EM Room symbol. This can be helpful if multiple programs are being consolidated into a single program. NOTE: The max length of a prefix is 8 characters.

Output Signals

SIGNAL NAME	DESCRIPTION
Update_GUIDs_Busy_fb	This signal shows that the module is currently running and processing the RVI file. This need to be connected to the GUID_Update_Busy_Held input of the Fusion EM XML Parser, Fusion EM Master Scheduler, Fusion EM Generic Energy Monitoring, Fusion EM GLS-EM-MCU Energy Monitoring, and Fusion EM Automation Helper modules.
Update_GUID_Status_txt$	This signal displays the current status of the GUID updater. This signal can be used for debugging or to provide the current status of the module to an advanced page of a touch panel.
Master_GUID_Prefix_txt$	This signal provides feedback on the prefix to apply to all the GUIDs.
RVI_File_Name_txt$	This signal provides feedback on the name of the RVI file detected by the module.
RVI_File_Full_Path_txt$	This signal provides feedback on the complete path to the RVI file detected by the module.
Console_tx$	This signal needs to be connected to the Console_tx$ signal of a console symbol.

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Output Signals (Continued)

SIGNAL NAME	DESCRIPTION
Console_Status_txt$	This signal provides feedback on the current status of the console connection.
Symbol_GUID_Count_fb[x]	This signal provides feedback on how many GUIDs were detected on the corresponding Crestron Fusion Room symbol.
Symbol_GUID_Count_txt$[x]	This signal provides feedback on how many GUIDs were detected on the corresponding Crestron Fusion Room symbol.
Symbol_Room_Name_txt$[x]	This signal provides feedback on the room name for the corresponding Crestron Fusion Room symbol.
Symbol_GUID_txt$[x]	This signal provides feedback on the GUID for the corresponding Crestron Fusion Room symbol, also known as the Room GUID.
Symbol_IPID_txt$[x]	This signal provides feedback on the IPID for the corresponding Crestron Fusion Room symbol.
Symbol_Slot_GUIDs_tx$[x]	This signal should be connected to the Fusion EM GUID Updater Symbol Processor. **NOTE**: The symbol number is determined by the order of IPID. For example, if the symbol is IPID 60, 61, 62, or 63, the IPID GUID information is provided by the symbol output as follows IPID60 by Symbol1 output, IPID 61 by Symbol2 output, IPID 62 by Symbol3 output, and IPID 63 by Symbol4 output.

Parameters

PARAMETER NAME	DESCRIPTION
ProcessorMode	This parameter is used to set the startup delay of the module. If using a DMPS or MPS series processor, select MPS/DMPS Processors; otherwise, select Standard Processors.
PrefixGUIDs	This parameter is used to set the module prefix of all the GUIDs in the system. By default, this is set to Yes. If for some reason the GUIDs do not need to be prefixed, No should be selected.
ThreeSeriesAppendSlotNumber	This parameter is used to set the module to include the program slot number in the prefix of the GUIDs. By default, this is set to Yes. If for some reason the program slot number should not be used in the prefix of the GUIDs, No should be selected.
FileStorageLocation$	This specifies the temporary space that is used during the processing of the RVI file. **NVRAM Disk**: This sets the module to use NVRAM for the temporary storage. **Removable Media (USB)**: This sets the module to use Removable Media for the temporary storage. **Removable Media 2 (USB)**: This sets the module to use the second Removable Media for the temporary storage. **CompactFlash**: This sets the module to use CompactFlash for the temporary storage. **Multimedia Card**: This sets the module to use the Multimedia Card for the temporary storage.

Fusion EM GUID Updater Symbol Processor

The Fusion EM GUID Updater Symbol Processor module is a supporting module for the Fusion EM GUID Updater Helper module. Both modules are used in conjunction with the Fusion EM XML Parser module, Fusion EM Master Scheduler module, Fusion EM GLS-EM-MCU Energy Monitoring module, Fusion EM Generic Energy Monitoring module, and the new Fusion EM Automation Helper SIMPL# module.

When adding support for 60 rooms, breaking the symbol GUIDs out to its own module makes it more efficient and provides the ability to reduce the number of outputs on the Fusion EM GUID Updater Helper module.

Input Signals

SIGNAL NAME	DESCRIPTION
Symbol_Slot_GUIDs_Data$	This signal should be connected from the corresponding Symbol_Slot_GUIDs_tx$[x] output of the Fusion EM GUID Updater Helper module.

Output Signals

SIGNAL NAME	DESCRIPTION
Symbol_Slot_GUIDs_txt$[x]	This signal provides feedback of the GUID for the corresponding Fusion EM Room symbol and corresponding slot number. **NOTE**: The slot number can be determined by reviewing the Crestron Fusion Room symbol and the devices listed. Slot 1, Slot 2, and Slot 3 are fixed. Slot 4 through Slot 252 allows custom Crestron Fusion devices to be defined.

Parameters

SIGNAL NAME	DESCRIPTION
DebugMode	This setting is used to output additional print statements to console for debugging.

New SIMPL# Modules

The new SIMPL# modules, Fusion EM Automation and Fusion EM Room Control, replace the old SIMPL+ Fusion EM XML Parser, Fusion EM Master Scheduler, and Fusion EM Room Control modules. For the best performance and reliability of the Fusion EM Automation, the new modules should be used in place of the old modules.

Fusion EM Automation Module

The Fusion EM Automation module processes all automation rules and TimeClock events that are set up in Crestron Fusion. The module is responsible for sending automation commands to the appropriate Room Control modules.

Input Signals

SIGNAL NAME	DESCRIPTION
GUID_Update_Busy_Held	This signal is used to tell the module that GUID initialization has been completed and the module can finish its initialization. This signal needs to be connected to the Update_GUIDs_Busy_fb signal on the Fusion EM GUID Updater Helper module.
Enable_Held	This signal enables the Fusion EM Automation. Setting this to low disables both the TimeClock events and the meeting scheduling automation. **NOTE**: Automation rules are still pulled down by the module from Crestron Fusion, however; the automation settings will not run.
Demand_Response_Enabled_Held	On the rising edge of this signal, this signal sends the system into demand response state. On the falling edge of this signal, it returns the system into normal operation mode.
Room_Online_Held[x]	This signal is used to tell the module if a room is online with Crestron Fusion. This ensures that requests are only being made when the module can communicate with Crestron Fusion.

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Input Signals (Continued)

SIGNAL NAME	DESCRIPTION
Room_Occupied_Held[x]	This signal informs the module that the room is occupied on the rising edge of the signal. The module performs associated Room Occupancy/Vacancy action (if any). A GLS-SIM or Digital I/O can be used to detect the occupancy state of a room.
Sunrise_Hour_fb Sunrise_Min_fb Sunset_Hour_fb Sunset_Min_fb	These signals provide the time of sunrise and sunset based on the calculation from the Astronomical Clock symbol. NOTE: These inputs are used only if using the Fusion EM 9.X Automation rules.
FilePath$	This signal provides the data file storage location at run time. NOTE: Using this signal overrides the file location provided by FileStorageLocation$ and FileStoragePath$ parameters. NOTE: If using this input, the value sent in should be delayed 2 seconds after the startup of the system.
Room_Automation_Response$[x]	This signal needs to be connected to the RoomAutomationResponse$ signal on the Fusion EM Room Data Device extender of the Fusion EM Room Device symbol. The module receives the Room Automation XML data from this input.
Room_Time_Clock_Response$[x]	This signal needs to be connected to the RoomTimeclockResponse$ signal on the Fusion EM Room Data Device extender of the Fusion EM Room Device symbol. The module receives the TimeClock XML data from this input. NOTE: This is connected only when using Crestron Fusion 10.X TimeClock events; it is not required if using Fusion EM 9.X.
Schedule_Response$[x]	This signal needs to be connected to the ScheduleResponse$ signal on the RoomView® Scheduling Data Device extender of the Fusion EM Room Device symbol. The module receives the Meeting Schedule XML data from this input.
Action_Response$[x]	This signal needs to be connected to the ActionResponse$ signal on the Room Data Device extender of the Fusion EM Room Device symbol. The module receives the meeting truncation response and action trigger confirmation from this input.
Room_GUID$[x]	This signal needs to be connected to the corresponding Symbol_GUID_txt$[x] signal on the Fusion EM GUID Updater Helper module.
Room_Automation_Query$[x]	This signal needs to be connected to the RoomAutomationQuery$ signal on the Fusion EM Room Data Device extender of the Fusion EM Room Device symbol. The module sends Fusion EM Room Automation XML queries from this serial output.
Room_Time_Clock_Query$[x]	This signal needs to be connected to the RoomTimeclockQuery$ signal on the Fusion EM Room Data Device extender of the Fusion EM Room Device symbol. The module sends Fusion EM Room TimeClock XML queries from this serial output. NOTE: This is connected only when using Crestron Fusion 10.X TimeClock events, it is not required if using Fusion EM 9.X.
Schedule_Query$[x]	This signal needs to be connected to the ScheduleQuery$ signal on the RoomView Scheduling Data Device extender of the Fusion EM Room Device symbol. The module sends Crestron Fusion meeting schedule XML queries from this serial output.

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SIGNAL NAME	DESCRIPTION
Action_Query$[x]	This signal needs to be connected to the ActionQuery$ signal on the Room Data Device extender of the Fusion EM Room Device symbol. The module uses this output to send the meeting truncation and action query's from this output.
Room_Command$[x]	This signal needs to be connected to the Room_Command$ input on the Fusion EM Room Control module. The module uses this set of serial joins to send room level commands to the Fusion EM Room Control module.

Parameters

PARAMETER NAME	DESCRIPTION
DebugMode	This parameter turns on and off print statements from the module for debugging purposes.
TimeClockVersion	This parameter is used to set the version of Crestron Fusion that is being used, so the module can request TimeClock events in the proper format.
TimeFormat	This parameter is used to set the time format for meeting information that is displayed through the Fusion EM Room Control module. Use either 12-hour formatting or 24-hour formatting.
FileStoragePath$	This parameter specifies the subfolder where the Fusion EM Automation files are written. It is recommended to store the files in a subfolder when possible so that other files do not interfere with the processing. It is also recommended in cases where a large number of log files build up, which can cause issues with File Manager in Crestron Toolbox. An example subfolder path would be EMConfig\\. Note the double backslash.
FileStorageLocation$	This parameter specifies where the files are to be saved. The choices are: **Removable Media (USB)**: This sets the module to read files from Removable Media device. **Removable Media 2 (USB)**: This sets the module to read files from the second Removable Media device. **CompactFlash**: This sets the module to read files from CompactFlash. **Multimedia Card**: This sets the module to read files from Multimedia card.

Fusion EM Room Control Module

The Fusion EM Room Control module interprets the Automation and TimeClock events that are sent over from the Fusion EM Automation module. This module also provides the outputs to connect around the system and trigger the actions from the Automation rules and TimeClock events. All outputs of the Fusion EM Room Control module can be jammed so that they can be used with the same signal names that come from the Crestron Fusion devices.

Input Signals

SIGNAL NAME	DESCRIPTION
Room_Command$	This signal needs to be connected to the Room_Command$[x] output from the Fusion EM Automation module. This is the XML data coming from the Fusion EM Automation module which contains the rules to be triggered.

Output Signals

SIGNAL NAME	DESCRIPTION
Current_Event_Name_txt$	This signal does not need to be connected but provides the name of the last event that was triggered. In the case of Automation based rules, the name reflects which rule was triggered, for example Meeting Started, Meeting Prep, etc. In the case of TimeClock rules, the name that was entered in the Crestron Fusion interface is displayed. NOTE: The TimeClock rule names are currently only supported for Fusion EM 9.X; support for TimeClock rule names using Crestron Fusion 10.X are to be added to a future release of Crestron Fusion.
Current_Event_Name_txt$	This signal does not need to be connected but provides the Instance ID of the last event that was triggered. In the case of Automation based rules, the Instance ID is empty. In the case of TimeClock rules, the Instance ID is populated. NOTE: The Instance ID fields are only supported for Crestron Fusion 10.X and higher.
System_Power_On_Pulse	This signal does not need to be connected but is triggered if an Automation rule or TimeClock event includes the System Power On action and Crestron Fusion is currently offline. If this is connected, it should be connected to the same signals that come from the Fusion EM Room symbol SystemPowerOn output. NOTE: If any customization has been done to this action in Crestron Fusion, that customization is not to be triggered from this output.
System_Power_Off_Pulse	This signal does not need to be connected but is triggered if an Automation rule or TimeClock event includes the System Power Off action and Crestron Fusion is currently offline. If this is connected, it should be connected to the same signals that come from the Fusion EM Room Symbol SystemPowerOff output. NOTE: If any customization has been done to this action in Crestron Fusion, that customization is not to be triggered from this output.
Display_Power_On_Pulse	This signal does not need to be connected but is triggered if an Automation rule or TimeClock event includes the Display Power On action and Crestron Fusion is currently offline. If this is connected, it should be connected to the same signals that come from the Fusion EM Room Symbol DisplayPowerOn output. NOTE: If any customization has been done to this action in Crestron Fusion, that customization is not triggered from this output.
Display_Power_Off_Pulse	This signal does not need to be connected but is triggered if an Automation rule or TimeClock event includes the Display Power Off action and Crestron Fusion is currently offline. If this is connected, it should be connected to the same signals that come from the Fusion EM Room Symbol DisplayPowerOff output. NOTE: If any customization has been done to this action in Crestron Fusion, that customization is not triggered from this output.
Temperature_Scale_Fahrenhei_fb	This signal does not need to be connected but provides feedback about what format temperature is being processed in.
HVAC_Mode_Occupied_fb	This signal is pulsed when the current TimeClock event or Automation rule sets the HVAC to an occupied mode. It should be tied into the TSTAT controls and the signal that sets the TSTAT to occupied.
HVAC_Mode_Unoccupied_fb	This signal is pulsed when the current TimeClock event or Automation rule sets the HVAC to an unoccupied mode. It should be tied into the TSTAT controls and the signal that sets the TSTAT to unoccupied.

(Continued on following page)

Output Signals (Continued)

SIGNAL NAME	DESCRIPTION
HVAC_Mode_Standby_fb	This signal is pulsed when the current TimeClock event or Automation rule sets the HVAC to a standby mode. It should be tied into the TSTAT controls and the signal that sets the TSTAT to standby.
HVAC_Mode_Other_fb	This signal is pulsed when the current TimeClock event or Automation rule sets the HVAC to a mode that is not included in the standard modes. It should be tied into the TSTAT controls and the signal that sets the TSTAT to that other mode.
HVAC_Cool_Offset_init	This signal outputs the value of the offset that was specified in Crestron Fusion. This should be tied together with the HVAC_Cool_Setpoint_init with an Analog Sum symbol and be brought to the devices Cool Set point input.
HVAC_Cool_Setpoint_init	This signal outputs the value of the set point that was specified in Crestron Fusion. This should be tied together with the HVAC_Cool_offset_init with an Analog Sum symbol and be brought to the devices Cool Set point input.
HVAC_Heat_Offset_init	This signal outputs the value of the offset that was specified in Crestron Fusion. This should be tied together with the HVAC_Heat_Setpoint_init with an Analog Sum symbol and be brought to the devices Heat Set point input.
HVAC_Heat_Setpoint_init	This signal outputs the value of the set point that was specified in Crestron Fusion. This should be tied together with the HVAC_Heat_offset_init with an Analog Sum symbol and be brought to the devices Heat Set point input.
Demand_Response_Cap_Lights_fb	This signal is held when the Automation rule or TimeClock event has put the system into a demand response mode. This signal can be used to drive logic in the program that puts the system into demand response mode. This should also be connected to the Demand_Response_Mode_On_fb input on the Fusion EM Lighting Control Interface module.
Demand_Response_Lights_Preset_Pulse	This signal is pulsed when the Automation rule or TimeClock event has been setup to trigger the DemandResponse lighting scene. This signal should be jammed together with the DemandResponse scene preset signal on the Fusion EM Lighting Scene Names extender of the Fusion EM Lighting Scenes device.
Lights_All_Off_Scene_Pulse	This signal is pulsed when the Automation rule or TimeClock event has been setup to trigger the all off lighting scene. This signal should be jammed together with the AllOff scene preset signal on the Fusion EM Lighting Scenes device.
Lights_Scene[x]_Pulse	This signal is pulsed when the Automation rule or TimeClock event has been setup to trigger the corresponding lighting scene. This signal should be jammed together with the Scene[x] scene preset signal on the Fusion EM Lighting Scene Names extender of the Fusion EM Lighting Scenes device. NOTE: On the Fusion EM Lighting Scene Names device, the first output is reserved and is used for the DemandResponse preset. Starting with the second output, the outputs are custom scenes and should correspond with the Lights_Scene[x]_Pulse output.
Shades_Position_init	This signal is used when a specific shade position has been specified in an Automation rule or a TimeClock event. This signal only updates if the Shades_Support_Position parameter is set to Yes. This signal should be brought directly to the shade controller and can be jammed together with another signal that sets the position of the shades.
Shades_Full_Open_Scene_Pulse	This signal is pulsed when the Automation rule or TimeClock event has been setup to trigger the full open shades scene. This signal should be jammed together with the OpenAllShades scene preset signal on the Fusion EM Shade Presets device.

(Continued on following page)

SIGNAL NAME	DESCRIPTION
Shades_Full_Close_Scene_ Pulse	This signal is pulsed when the Automation rule or TimeClock event has been setup to trigger the full close shades scene. This signal should be jammed together with the CloseAllShades scene preset signal on the Fusion EM Shade Presets device.
Shades_Scene[x]_Pulse	This signal is pulsed when the Automation rule or TimeClock event has been setup to trigger the corresponding shade scene. This signal should be jammed together with the Preset[x] signal on the Fusion EM Shade Preset Names extender of the Fusion EM Shade Presets device.
Meeting_In_Progress_fb	This signal is held when there is a meeting in progress on the calendar of the room. This signal can be used for feedback on a touch panel or to unlock the room when a meeting is in progress, etc.
Meeting_Not_In_Progress_fb	This signal is held when there is no meeting in progress on the calendar of the room. This signal can be used for feedback on a touch panel or to lock the room when there is no meeting is in progress, etc.
Current_Meeting_Subject_txt$	This signal provides the subject of the meeting that is currently in progress on the room's calendar. This signal can be used for feedback on a touch panel or other applications where the information may be needed.
Current_Meeting_Organizer_ txt$	This signal provides the organizer of the meeting that is currently in progress on the room's calendar. This signal can be used for feedback on a touch panel or other applications where the information may be needed.
Current_Meeting_Start_Time_ txt$	This signal provides the start time of the meeting that is currently in progress on the room's calendar. This signal can be used for feedback on a touch panel or other applications where the information may be needed. NOTE: This is displayed in either a 12-hour or 24-hour format depending on the TimeFormat parameter setting on the Fusion EM Automation module.
Current_Meeting_End_Time_ txt$	This signal provides the end time of the meeting that is currently in progress on the room's calendar. This signal can be used for feedback on a touch panel or other applications where the information may be needed. NOTE: This is displayed in either a 12-hour or 24-hour format depending on the TimeFormat parameter setting on the Fusion EM Automation module.
Current_Meeting_Formatted_ Time_txt$	This signal provides the start and end time of the meeting that is currently in progress on the room's calendar. The format is HH:MM AM/PM – HH:MM AM/PM. This signal can be used for feedback on a touch panel or other applications where the information may be needed. NOTE: This is displayed in either a 12-hour or 24-hour format depending on the TimeFormat parameter setting on the Fusion EM Automation module.
Current_Meeting_RV_Meeting_ ID_txt$	This signal provides the meeting ID from Crestron Fusion of the meeting that is currently in progress on the room's calendar. This signal can be used for feedback on a touch panel or other applications where the information may be needed. This signal can also be tied to the Fusion EM Device Usage module so that usage information can be tracked with meeting information.

Parameters

PARAMETER NAME	DESCRIPTION
Shades_Support_Position	This parameter enables the use of the Shades_Position_init output and allows the module to send direct shade positions.

Depreciated SIMPL+ Modules

The following modules are the SIMPL+ modules that have been deprecated and replaced by the new SIMPL# module. These modules should no longer be used and are only maintained for backwards compatibility.

Fusion EM XML Parser Module

Fusion EM XML Parser module is responsible for receiving automation and meeting XML strings from Crestron Fusion, and parsing them and storing the settings on the control system. There should be only one instance of this module per program.

NOTE: Crestron Fusion automation is based on room occupancy and schedule information stored in the control system.

NOTE: The Fusion EM XML Parser files must be stored in the same location as the Fusion EM Master Scheduler files, as determined by the entries in the filepath$ inputs for each module.

Input Signals

SIGNAL NAME	DESCRIPTION
RoomOnline[x]	This signal tells the module that the Crestron Fusion room is online. The module queries the Crestron Fusion server for automation changes in the room when this signal is triggered (rising-edge).
ActionCommand	This serial signal tells the module which room to send a custom command to and which command to send. It should be connected to the Fusion EM Master Scheduler module's Action_Command_tx$ output.
FilePath$	This signal is used to provide the data file storage location at run time. NOTE: Using this signal overrides the file location provided by FileStorageLocation$ and FileStoragePath$ parameters.
RoomAutomationResponse$[x]	This signal must be connected to the RoomAutomationResponse$ signal on the Room Data Device extender of the room. The module receives the Room Automation XML data from this input.
ScheduleResponse$[x]	This signal must be connected to the ScheduleResponse$ signal on the RoomView Scheduling Data Device extender of the room. The module receives the Meeting Schedule XML data from this input.
RoomsGUID$[x]	This signal takes in the GUID of the Crestron Fusion rooms. The GUIDs can be found on the Fusion EM Room Device symbol as a parameter named InstanceID.

Output Signals

SIGNAL NAME	DESCRIPTION
RoomAutomationQuery$[x]	This signal must be connected to the RoomAutomationQuery$ signal on the Fusion EM Room Data Device extender of the Fusion EM Room Device symbol. The module sends Fusion EM Room Automation XML queries from this serial output.
ScheduleQuery$[x]	This signal must be connected to the ScheduleQuery$ signal on the RoomView Scheduling Data Device extender of the Fusion EM Room Device symbol. The module sends Crestron Fusion meeting schedule XML queries from this serial output.

Parameters

PARAMETER NAME	DESCRIPTION
FileStorageLocation$	This parameter specifies where the files are to be saved. The choices are: **Removable Media (USB)**: This sets the module to write files to removable media. **CompactFlash**: This sets the module to write files to CompactFlash. **NOTE:** This location should match the location that is set for the Fusion EM Master Scheduler module.
FileStoragePath$	This parameter specifies the target storage subfolder for the Fusion EM Automation files. It is recommended to store the files in a subfolder so other files do not interfere during processing. It is also recommended in cases where a large number of log files build up, which can cause issues with File Manager in Crestron Toolbox. An example subfolder path would be EMConfig\\. Note the double backslash. **NOTE:** This location should match the location that is set for the Fusion EM Master Scheduler module.

NOTE: Each RoomID parameter field on the XML Parser module must contain the InstanceID of any room symbol whose schedule and automation data is to be processed by that XML Parser module.

Fusion EM Master Scheduler Module

The Fusion EM Master Scheduler module reads the automation and meeting data interpreted by the Fusion EM XML Parser module and is responsible for sending the automation commands on to the appropriate Room Control modules. This module is also responsible for triggering TimeClock events and required meeting actions.

When a setting is changed in Crestron Fusion, the module pulls down a complete set of new event information. The retrieved events run without any input from Crestron Fusion, even if it is offline, with the exception of automation rules, which run only after the Enable signal is set to high.

NOTE: TimeClock events do not cross the day boundary when using astronomical time base (sunrise and sunset) offsets, and TimeClock events do not fire when the room is occupied.

Input Signals

SIGNAL NAME	DESCRIPTION
Enable	This signal enables the Crestron Fusion automation. If this signal is set to low, both the TimeClock events and the meeting scheduling automation is disabled. **NOTE:** Automation rules are pulled down from Crestron Fusion by the module whenever there is a setting change. However, the automation settings do not run until the Enable signal is set to high.
Demand_Response_Enabled	This signal's rising edge sends the system into the demand response state. The falling edge of this signal returns the system to normal operation mode.
Room_Occupied_fb[x]	This signal's rising edge informs the module that the room is occupied. The module then performs any associated Room Occupancy/Vacancy action. A GLS-SIM or Digital I/O can be used to detect the occupancy state of a room.

(Continued on following page)

SIGNAL NAME	DESCRIPTION
Sunrise_Hour_fb Sunrise_Min_fb Sunset_Hour_fb Sunset_Min_fb	These signals provide the time of sunrise and sunset based on the calculation from the Astronomical Clock symbol. **NOTE:** This signal is only needed when rules are based on sunrise or sunset.
FilePath$	This signal is used to provide the data file storage location at run time. **NOTE:** Using this signal overrides the file location provided by FileStorageLocation$ and FileStoragePath$ parameters.
ActionResponse$[x]	This signal must be connected to the ActionResponse$ signal on the Room Data Device extender of the Fusion EM Room Device symbol. The module receives the meeting truncation response from this input.

Output Signals

SIGNAL NAME	DESCRIPTION
Action_Command_tx$	This signal tells the Fusion EM XML Parser which action to perform. It must be connected to the Action_Command_rx$ signal on the Fusion EM XML Parser module.
RoomCommand$[x]	This signal must be connected to the Room_Command$ input on the Room Control module. The module uses this set of serial joins to send room level commands to the Room Control module.
ActionQuery$[x]	This signal needs to be connected to the ActionQuery$ signal on the Room Data Device extender of the Fusion EM Room Device symbol. The module uses this output to send the meeting truncation response.

Parameters

PARAMETER NAME	DESCRIPTION
FileStorageLocation$	This parameter specifies where the Master Scheduler files are saved. **Removable Media (USB)**: This sets the module to write files to removable media. **CompactFlash**: This sets the module to write files to CompactFlash. **NOTE:** This location should match the location that is set for the Fusion EM XML Parser module.
FileStoragePath$	This parameter specifies the target subfolder where the Crestron Fusion automation files are stored. It is recommended to store the files in a subfolder so other files do not interfere during processing. It is also recommended in cases where a large number of log files build up, which can cause issues with File Manager in Crestron Toolbox. An example subfolder path would be EMConfig\\. Note the double backslash. **NOTE:** This location should match the location that is set for the Fusion EM XML Parser module.

Fusion EM Dynamic Lighting Preset Module

The Fusion EM Dynamic Lighting Preset module stores and saves lighting scene values and also allows recalling, saving, and resetting of the scene values. One Fusion EM Dynamic Lighting Preset module is required per scene.

The Fusion EM Dynamic Lighting Preset module saves scenes to files on the file system. Upon startup, the module first searches the system for its data files. If it cannot find them, it loads the default values specified in the parameters.

Input Signals

SIGNAL NAME	DESCRIPTION
Recall	This signal recalls the scene with the fade time specified by the Fade_Time parameter.
Fast_Recall	This signal recalls the scene with a half second fade time.
Fade_Off	This signal recalls the off scene with the fade time specified by the Off_Time parameter.
Fast_Off	This signal recalls the off scene with a half second fade time.
XSave	This signal saves the current levels to be the new scene target levels.
Revert	This signal reverts the scene target levels to the defaults specified on the parameters.
Update_FB	This signal forces an update on the feedbacks.
Demand_Response	This signal caps all loads defined in the DemandResponse scene to the demand response setting levels. The load levels do not change when demand response is cancelled (falling edge of this signal). Enter DemandResponse.
Preset_Busy	This signal Indicates to the module that the associated preset used to trigger the scene is busy.
Command$	<N/A>
Path$	This signal indicates the location where all the data files for this module are saved.

Output Signals

SIGNAL NAME	DESCRIPTION
Any_On_FB	This signal indicates that any of the loads in the scene are on. Excluded loads are not considered.
All_On_FB	This signal indicates that all loads in the scene are on. Excluded loads are not considered.
At_Scene_FB	This signal indicates that all the included loads are at the scene target level.
Raise_Loads	<N/A>
Lower_Loads	<N/A>
Busy_FB	This signal indicates that the module is busy.
Recalling_Scene	This signal indicates that the module is working on recalling a scene.
Turning_Off_Scene	This signal indicates that the module is working on recalling the off scene.
Recall_Ok	This signal indicates that the scene is recalled successfully.
Save_Ok	This signal indicates that the scene is saved successfully.
Save_Error	This signal indicates that there was an error saving the scene.
Revert_Ok	This signal indicates that the scene has been reverted to use the default target levels successfully.
Revert_Error	This signal indicates that there was an error in the attempt to revert the scene to use the default target levels.
Fire_Ramp	This signal triggers the ramp and must be connected to the Double-Precision Analog Variable Preset* symbol's Scene1 input.
Load_In_Scene[x]	This signal indicates which loads are in the scene and can be used in conjunction with buffers to implement scene raise and lower.

(Continued on following page)

Output Signals (Continued)

SIGNAL NAME	DESCRIPTION
Reponse$	<N/A>
ResponseID	<N/A>
UpperWordFadeTime	This signal is the upper word of the fade time. This signal must be connected to time-HiWord signal of the Double-Precision Analog Variable Preset symbol.
LowerWordFadeTime	This signal is the lower word of the fade time. This signal must be connected to time-LoWord signal of the Double-Precision Analog Variable Preset symbol.
Target_Levels[x]	This signal is the target levels of the scene. This must be connected to the level# signals on the Double-Precision Analog Variable Preset symbol.
Current_Levels[x]	This signal is the current level of the loads that are defined in the scene. When save is triggered, the module saves the values from these signals as the new scene value.

* The Double Precision Analog Variable Preset symbol is used only when a device cannot store its own internal presets.

Parameters

PARAMETER NAME	DESCRIPTION
Scene_ID	This parameter is the instance ID of the scene. This ID must be unique per the scene module.
DR_Scene_ID	This parameter is the DemandResponse Scene ID that is the Scene ID of the DemandResponse scene. This parameter must be entered so that other scenes know which scene data file to read in order to extract DemandResponse settings.
IsDRScene	This parameter indicates that the scene is a DemandResponse scene.
Fade_Time	This parameter indicates that fade time is used when recalling scenes (Off_Time for off scene).
Off_Time	This parameter indicates that fade time is used when recalling the off scene.
Load_Property[x]	The load property that contains the default target levels of the loads in the scene. This parameter receives data in the following format: <Load ID>, <Default value>. The Load ID is the unique identifier for each load in the program. The Default value can be one of the following: **On**: The load defaults to on. **Off**: The load defaults to off. **Xd**: The load is by default excluded from the scene and is a dimmable load. **Xn**: The load is by default excluded from the scene and is a non-dimmable load. **<analog value>**: The default target level of the load.

Fusion EM Room Control Module

The Fusion EM Room Control module is responsible for performing the TimeClock event and meeting automation functionality. The Fusion EM Room Control module performs the following actions:

- Recalls scene levels
- Changes shade positions
- Changes HVAC mode`
- Changes HVAC setpoint and offset

Most of the control over the HVAC system is defined by the current mode of the HVAC system. While there are specific setpoint signals present on the module, their purpose is to drive the setpoint values when the Crestron Fusion action is set to Manual.

This means that the Occupied, Unoccupied, and Standby modes must be connected to additional custom logic in order to drive the setpoint values used for each mode.

Input Signals

SIGNAL NAME	DESCRIPTION
Room_Command$	The module receives room commands from this serial string and must be connected to the corresponding RoomCommand$[x] signal on the Fusion EM Master Scheduler module.

Output Signals

SIGNAL NAME	DESCRIPTION
Temp_Scale_Fahrenheit_fb	This signal indicates the HVAC setpoint units. **High**: Fahrenheit **Low**: Celsius
HVAC_Mode_Occupied_fb	This signal indicates that the HVAC is in Occupied mode and may be used to trigger preset setpoint values. This signal must be connected to the OccupiedModeActive signal on the Fusion EM HVAC Zone Device symbol. **NOTE:** This is a latched signal.
HVAC_Mode_Unoccupied_fb	This signal indicates that the HVAC is in Unoccupied mode and may be used to trigger preset setpoint values. This signal must be connected to the UnoccupiedModeActive signal on the Fusion EM HVAC Zone Device symbol. **NOTE:** This is a latched signal.
HVAC_Mode_Standby_fb	This signal indicates that the HVAC is in Standby mode and may be used to trigger preset setpoint values. This signal must be connected to the StandbyModeActive signal on the Fusion` EM HVAC Zone Device symbol. **NOTE:** This is a latched signal.
HVAC_Mode_Other_fb	This signal indicates that the HVAC action is set to Manually Adjust Setpoints on the Crestron Fusion User Interface (UI) and that the setpoints specified on the Crestron Fusion UI are used. **NOTE:** This is a latched signal.
Shades_Full_Open_Pulse	This signal tells the shade to open fully. Connect this to the shade module's full open signal.
Shades_Full_Close_Pulse	This signal tells the shade to close fully. Connect this to the shade module's full close signal.
Demand_Response_Cap_Lights_fb	This signal is used to tell the scene modules to cap the light level at the DemandResponse settings specified by the DemandResponse scene. This may mean that the user either may not be able to raise the light level above the DemandResponse level or that they may not be able to change the lighting scene at all. **On the rising edge**: The lights enter DemandResponse mode. **On the falling edge**: The lights exit DemandResponse mode.
Lights_Recall_Demand_Response_Scene_Pulse	This signal pulses when the DemandResponse preset should be called.

(Continued on following page)

SIGNAL NAME	DESCRIPTION
Lights_All_Off_Scene_Pulse	This signal pulses when all lights in a room should be turned off. This signal must be connected to the logic that drives the Lights All Off function in the room.
Lights_Recall_Scene_Pulse[x]	This signal pulses when a specific lighting scene should be recalled. This signal must be connected to the logic that drives the lighting scene logic for the room.
Shades_Recall_Preset_Pulse[x]	This signal pulses when a specific shade preset should be recalled. This signal must be connected to the logic that drives the shade preset logic for the room.
Shade_Position_Init	This signal tells the shades to go to the position specified. This must be connected to the shade position signal (if available).
HVAC_Heat_Offset_Init	This is the heat offset applied to the HVAC heat setpoint during a demand response event. This value is zero when there is no offset. This offset value compounds the Demand Response offset when it is enabled. This signal can be combined with an Analog Sum symbol to create the actual heat setpoint.
HVAC_Heat_Setpoint_Init	This signal tells the HVAC system to warm the room to the selected setpoint temperature. **NOTE:** This value is only set when the HVAC action is set to Manually Adjust Setpoints on the Crestron Fusion UI.
HVAC_Cool_Offset_init	This is the cooling offset applied to the HVAC cool setpoint during a demand response event. This value is zero when there is no offset. This offset value compounds the DemandResponse offset when it is enabled. This signal can be combined with an Analog Sum symbol to create the actual cool setpoint.
HVAC_Cool_Setpoint_init	This signal tells the HVAC system to cool the room to the selected setpoint temperature. **NOTE:** This value is only set when the HVAC action is set to Manually Adjust Setpoints on the Crestron Fusion UI.

Parameters

| PARAMETER NAME	DESCRIPTION
Shades_Support_Position	This parameter is used to tell the module whether or not the shades in the room support a position command. Set this to Yes if the shades in the room support position commands.

Fusion EM Automation Symbol and Module Connection

Refer to the Fusion EM Automation Symbol and Module Connection diagram on the next page as a guide to the required signal connections between each of the Fusion EM Room Automation and Meeting Scheduling logic modules and symbols.

The blocks shown in light green are Crestron Fusion device symbols, the light blue blocks are logic modules, and the dark green blocks are logic symbols.

The interlock in the Scene Save/Revert Glue Logic box is used to determine which scene was the last recalled. This is mainly to provide feedback to Crestron Fusion as well as provide a way to determine which scene is active.

NOTE: Currently Crestron Fusion cannot handle more than one scene feedback high at a time.

*Fusion EM Automation Symbol and Module Connection Diagram*
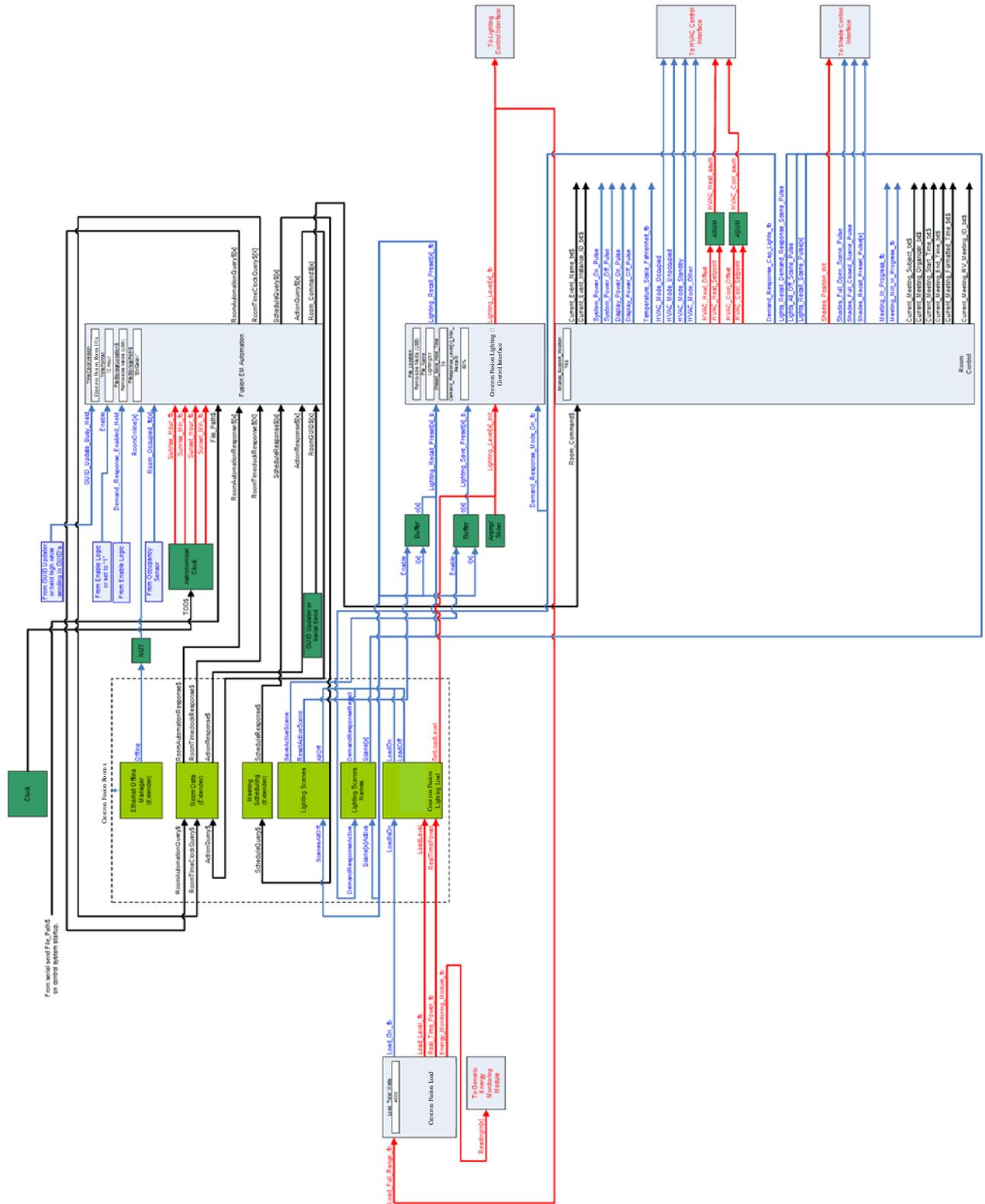
Adding Crestron Fusion Logging

In order to use Crestron Fusion logging support, the user must add a Fusion EM Logging Device to the Crestron Fusion room. Only one instance of this device is needed per program in order to facilitate sending the energy data to the Crestron Fusion server.

Refer to the Logging Module and Logging Device Signal Connections diagram on the next page for guidance on the necessary signal connections between the logging module and the Fusion EM Logging Device symbol.

The blocks shown in light green are Crestron Fusion device symbols, the light blue blocks are logic modules, and the dark green blocks are logic symbols.

Logging Module and Logging Device Signal Connections Diagram
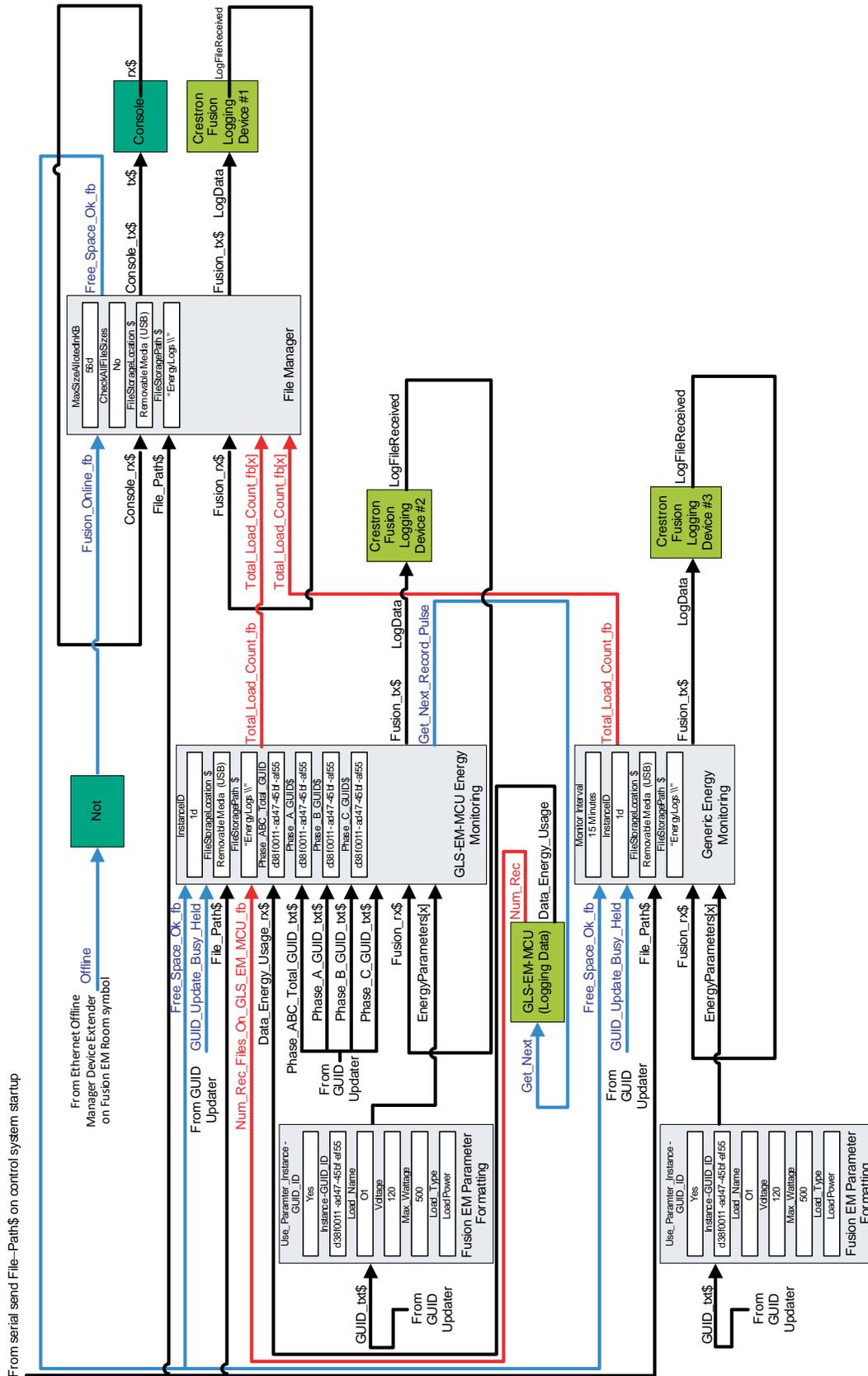
Adding Raise and Lower Lighting Scene Capability using the Dynamic Lighting Preset Module

If Raise and Lower Lighting Scene capability is desired, the logic shown in the following diagram can be used as a guide.

Raise and Lower Lighting Scene Capability with the Fusion EM Dynamic Lighting Preset Diagram
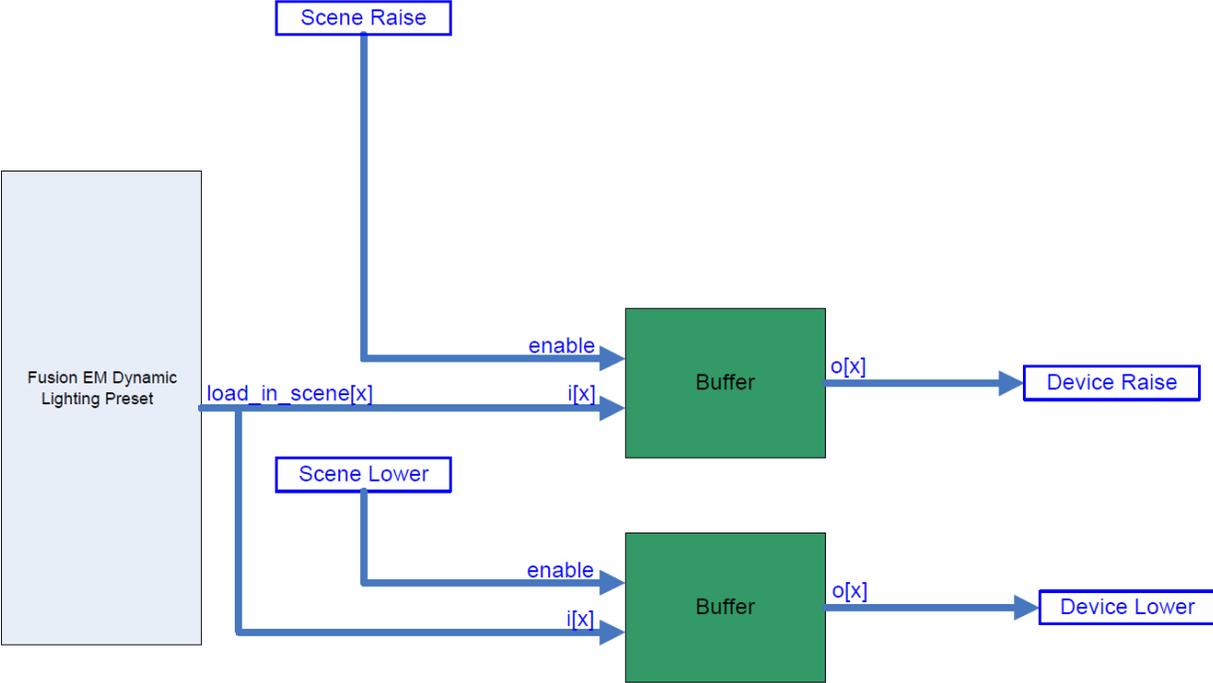
Adding Motion and Photocell Sensor Logic

If a Crestron Fusion motion sensor support is desired, the user must add an occupancy sensor device to the Crestron Fusion room where the motion sensor is located, either by program or by being connected to a room scheduling panel with support for a wired occupancy sensor.

NOTE: If the room already has an occupancy sensor outside of the program, use the Remote Occupancy Sensor symbol.

In the event that photocell support is desired, a Crestron Fusion photocell device must be added and used in conjunction with any of the Open and Closed Loop Dimming Photocell Control modules in the Crestron database.

Refer to the Photocell Logic Diagram and the Occupancy Sensor Logic Diagram below for information on how to connect the module signals needed for Crestron Fusion sensor support.

NOTE: If the photocell modules are used to control the lighting load and raise and lower control is needed, use the raise and lower signal on the photocell module. If outside logic is needed, disable the photocell control before the raise and lower commands are triggered.

Photocell Logic Diagram
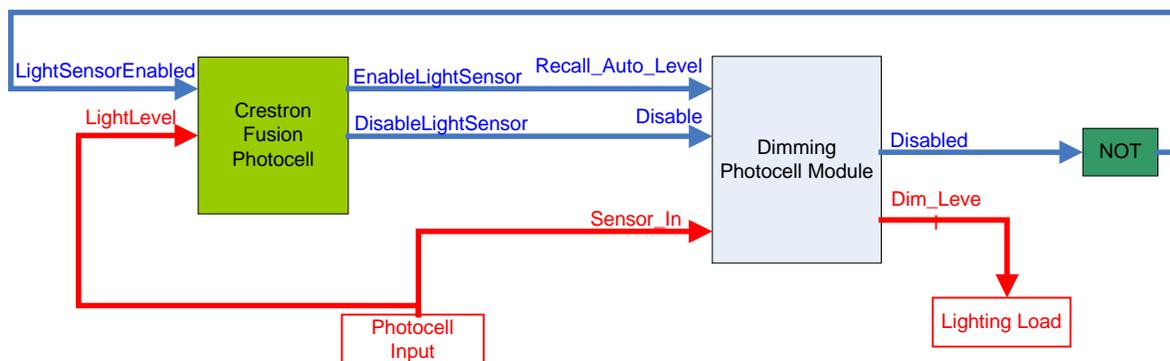
Occupancy Sensor Logic Diagram
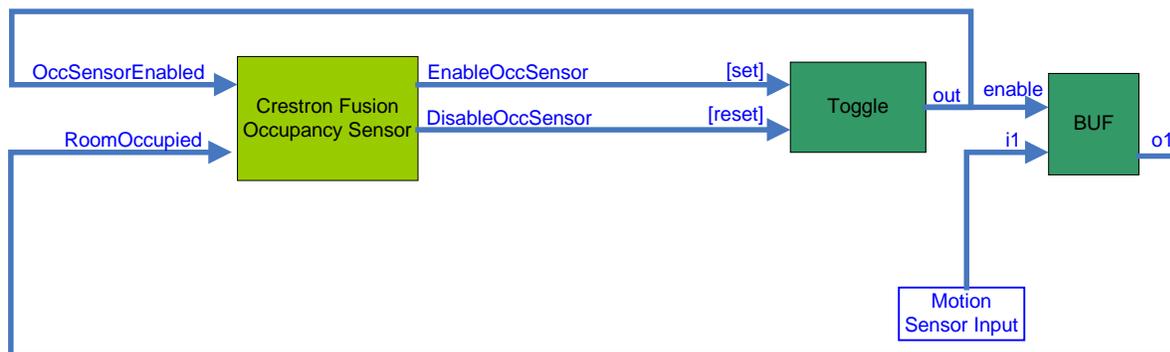
Adding Time Synchronization with the Crestron Fusion Server

In order to add time synchronization with the Crestron Fusion server so that the control system always has the right time for the room, the logic shown in the Local Time Sync Logic diagram must be added.

Time synchronization with the Crestron Fusion server ensures that the control system has the right time for the program's local time zone. A request to Crestron Fusion returns an XML string that allows the control system to correct its own time, if necessary. This should be done once a day by selecting a time to enter on the When logic symbol to trigger the SyncTime digital input on the TimeSync module. The When logic symbol allows the user to enter a time of day and provides a digital pulse when it is that time of day.

To avoid bogging down the server with time requests, the TimeSync module delays sending out a request by a random period of time. Once the Crestron Fusion server returns a time value, the control system sets its own time to match the time provided by the server.

Extended Clock Driver is needed in order to ensure accurate energy logging as well as a TimeClock event firing across DST changes. If the time zone of the program is not supported by the control system, refer to the notes below.

NOTE: Ensure that the room time zone is configured properly. Consult the Crestron Fusion Setup Web Client online help for details on how to set up the location of a room.

NOTE: For DST zones that the control system does not support, the DST must be set to 0d and the time sync must be set to an appropriate time. Keep in mind that having a DST mode that the control system does not support may result in some events firing incorrectly if there are events in the early morning. Logging data is also shifted by an hour until the time is corrected, and up to one hour of logging data may be lost depending on when the time synchronization occurs.

Local Time Sync Logic Diagram
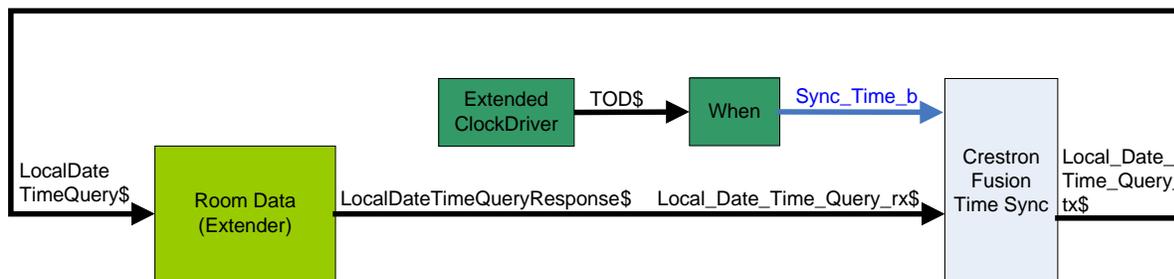
Room Automation Action Rules

The Room Automation Action Rules in Crestron Fusion are executed based on the Lighting and HVAC States tables in this section. These tables contain all of the possible states that can be readily applied to any Crestron Fusion automation configuration.

Lighting States Table

The Lighting States table shows how automation rules trigger lighting events. The table is laid out as follows:

- The top row of the diagram indicates the current state.

- The leftmost column indicates the event that occurred within the room.

- The text in the boxes indicates the new state of the lighting control after the event occurs.

- The boxes that are crossed out indicate no state change.

- The color indicates which action can be performed. The colors used to call out the type of possible actions are as follows: Gray: No Action, Orange: Occupancy Action, and Green: Vacancy Action.

Lighting States Table

	NO MEETING + VACANT	NO MEETING + OCCUPIED	MEETING + VACANT	MEETING + OCCUPIED
MOTION DETECTED	No Meeting + Occupied	✕	Meeting + Occupied	✕
MOTION TIMEDOUT	✕	No Meeting + Vacant	✕	Meeting + Vacant
MEETING START	Meeting + Vacant	Meeting + Occupied	✕	✕
MEETING END	✕	✕	No Meeting + Vacant	No Meeting + Occupied

HVAC States Table

The HVAC States table shows HVAC controls. The table is laid out as follows:

- The top row of the diagram indicates the current state.

- The leftmost column indicates the event that occurred within the room.

- The text in the boxes indicates the new state of the lighting control after the event occurs.

- The boxes that are crossed out indicate no state change.

- The color indicates which action can be performed. The colors used to call out the type of possible actions are as follows: Gray: No Action, Orange: Occupancy Action, Green: Vacancy Action, and Blue: Prep.

Notice the additional states with Prep. Prep is a term used to describe the time before the meeting starts but within the pre-meeting HVAC action time window. For example, if there is a meeting set to start at 2:00PM and the pre-meeting HVAC action is set to 15 minutes prior to the meeting, then from 1:45PM to 2:00PM is the pre-meeting HVAC action time window.

HVAC States Table

	NO MEETING + VACANT	NO MEETING + OCCUPIED	MEETING + VACANT	MEETING + OCCUPIED	PREP + VACANT	PREP + OCCUPIED
MOTION DETECTED	No Meeting + Occupied	✕	Meeting + Occupied	✕	Prep + Occupied	✕
MOTION TIMEDOUT	✕	No Meeting + Vacant	✕	Meeting + Vacant	✕	Prep + Vacant
MEETING START	Meeting + Vacant	Meeting + Occupied	✕	✕	Meeting + Vacant	Meeting + Occupied
MEETING END	✕	✕	No Meeting + Vacant	No Meeting + Occupied	✕	✕
MEETING PENDING	Prep + Vacant	Prep + Occupied	✕	✕	✕	✕
PENDING MEETING CANCELLED	✕	✕	✕	✕	No Meeting + Vacant	No Meeting + Occupied