



# ControlWorks Weather Module Application Guide

## Description

This module allows a 2-series or 3-series Crestron processor with a connection to the internet to download and display robust weather forecasts and current weather conditions. The user is able to request weather forecasts and current conditions for many U.S. and international locations. Locations can be found using several formats; five-digit U.S. zip codes, International Civil Aviation Organization (ICAO) airport codes, U.S. city, state, or Canadian city, province.

Your processor must have Ethernet capability and be connected to the internet. The processor must also have DNS servers declared and other pertinent settings such as hostname and domain name configured properly.

## Internet Disclaimer

This module requires Internet access and it depends on a web-based service to provide content to ControlWorks Consulting. As such, ControlWorks Consulting is unable to guarantee full time availability of weather content. In the event of an outage, ControlWorks will work as quickly as possible to get the content back online.

ControlWorks Consulting, LLC accepts no responsibility for the accuracy or your usage of data returned by the module.

## Supported Processors

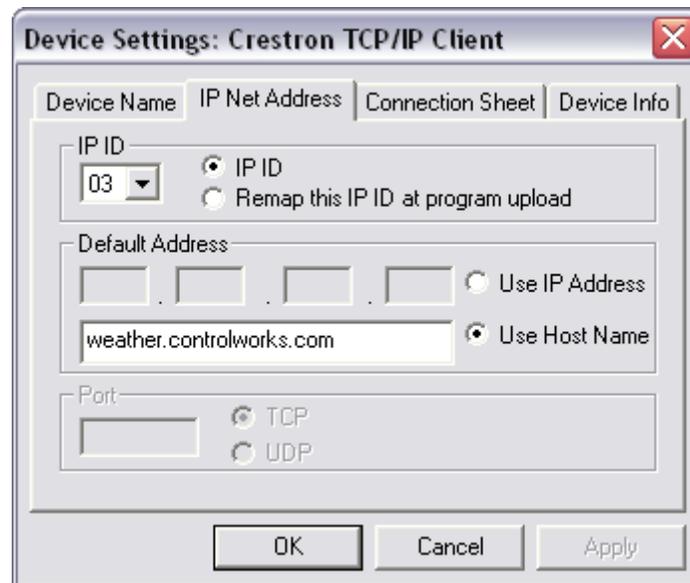
Any 2-series or 3-series processor with an Ethernet card is supported.

Compatibility			Processor Requirements	
				

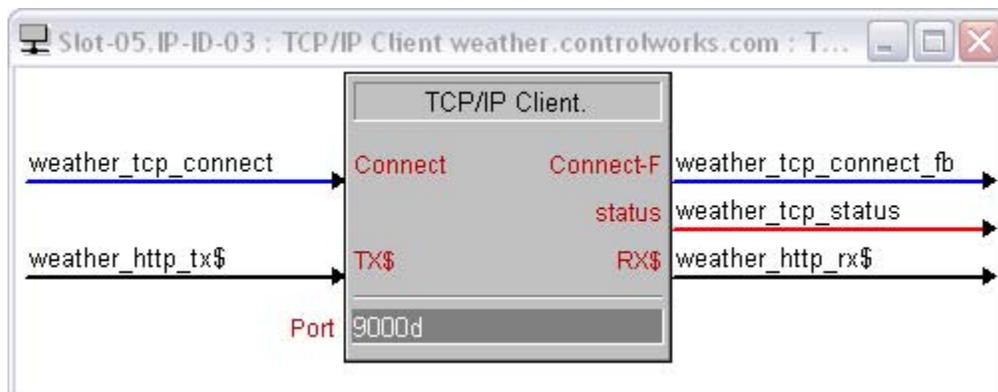
## Ethernet Configuration Information

The processor must have DNS servers and hostname declared in the DNS Management and Ethernet Addressing setup. To declare DNS servers from Toolbox, connect to your processor and select "DNS Management ..." from the "Functions" menu. Use the DNS server IP addresses provided by the Internet Service Provider of the project, or from open DNS servers available on the internet. Be sure to test the settings by using the "Test..." button and entering a domain name such as [www.controlworks.com](http://www.controlworks.com). Declare a Hostname by selecting "Ethernet Addressing..." from the "Functions" menu. Enter a Hostname in the "Host Name" field. The Hostname can be any combination of letters, numbers and select symbols, as long as the Hostname is unique on the network.

Insert a TCP/IP client into your program. Configure the client as shown below, making sure you use the host name `weather.controlworks.com` as the default address. The IP ID will vary depending on where it is inserted into the program, or the IP ID numbering scheme of the system.



Declare the TCP/IP client symbol as shown below, making sure the port is set to 9000d.



## Module Application

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This module is a service-based module. For the module to function, you must have an active service account with ControlWorks Consulting, LLC. To sign up for a service account, and for terms of service visit <http://admin.controlworks.com> . Once an account is set up for the project, the "client id" parameter field must be filled out with the client ID assigned at the time of creating the account.

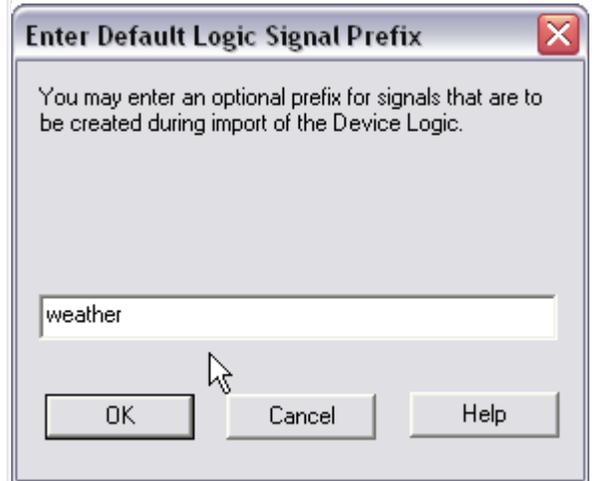
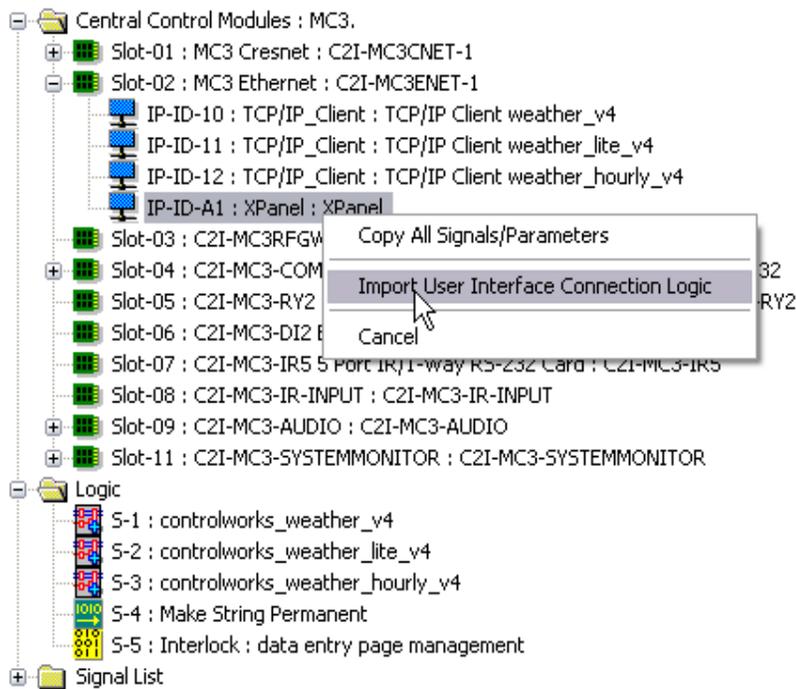
Formatting for weather requests should be in one of the following forms;

- 5 digit U.S. zip code
- 4 character ICAO code, such as LFPB. ICAO codes can be found at this third-party site. <http://www.airport-technology.com/icao-codes/>
- U.S. city, full state name. A space between the comma and the full state name can be entered, but is not required.
- U.S. city, 2 letter state abbreviation. A space between the comma and the 2 letter state name abbreviation can be entered, but is not required.
- Canadian city, full province name. A space between the comma and the full province name can be entered, but is not required.
- Canadian city, 2 letter province abbreviation. A space between the comma and the 2 letter province name abbreviation can be entered, but is not required.

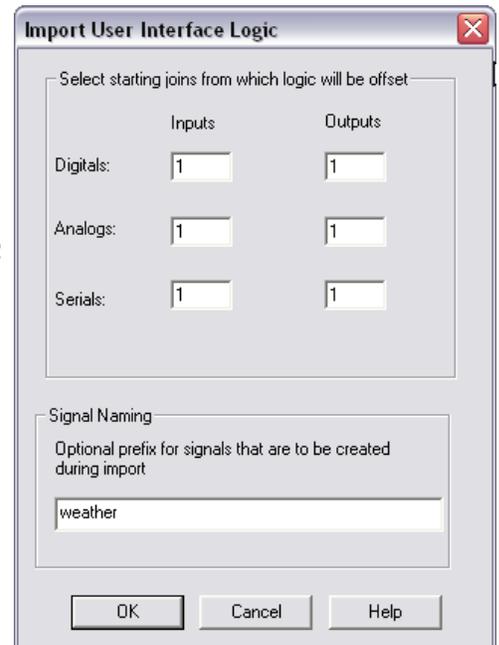
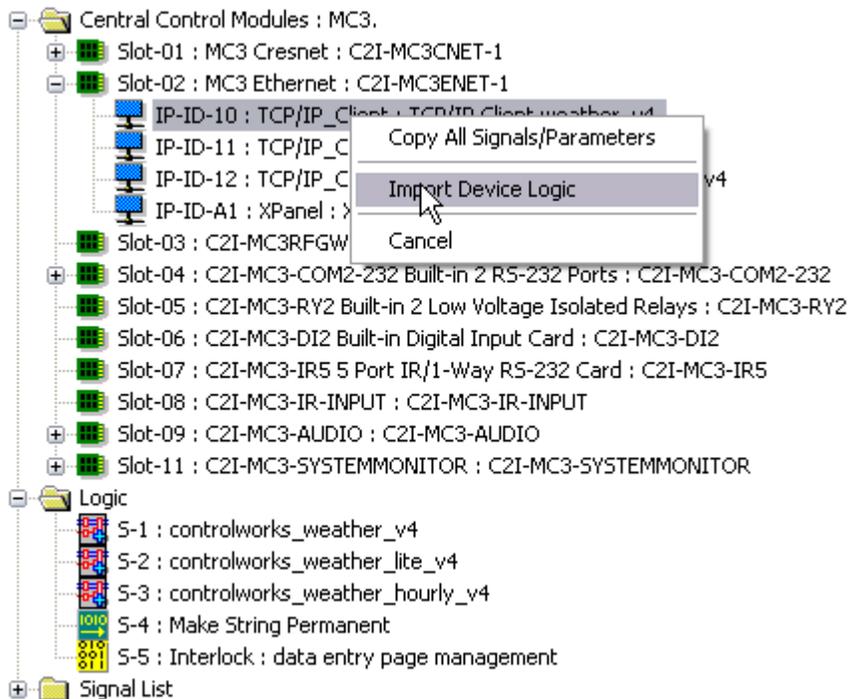
Forecasts based on an ICAO code are usually not as detailed as other requests.

Forecast data provided from the source is updated only several times per day, therefore requests to refresh the data should only be made in a similar timeframe. Current condition data provided from the source is updated approximately every hour and a half, therefore requests to refresh the data should only be made in a similar timeframe.

This module is built utilizing virtual connection logic that will allow you to right-click and drag the module symbol to a TCP/IP client symbol, select "Import Device Logic" to auto-connect the two symbols. You will be prompted to add an optional signal prefix to the auto-connected signals. SIMPL will add an underscore character at the end of the prefix you enter automatically, so a space or underscore does not need to be entered in this dialog. Due to Crestron's implementation of this feature, the programmer will still need to manually enter the port number (9000d) on the TCP/IP client symbol.



Also utilized is connection logic enabling you to right-click and drag the weather module symbol to a touchpanel to have all of the two symbols auto-connected. Right-click and drag the weather module symbol to a touchpanel and select "Import User Interface Logic" from the drop-down list. You will be prompted for starting join offsets and a signal prefix. Using values of 100 for all of the offsets will connect the joins to match the demo touchpanel files included in the distribution package. You may change this offset to suit the needs of your project.



This module contains an MSP symbol with a permanent string size of 100d declared.

The SIMPL module file, "controlworks\_weather\_v4.umc" and the SIMPL+ file, "controlworks\_weather\_parser\_v4" are encrypted.

The module will restrict consecutive requests for the same location to once per hour. The current conditions from the data source are not updated more often than once per hour. A message will be displayed to the user when a request is made for the same location within that time period. This does not restrict requests to a different location.

# Signal and Parameter Descriptions

Bracketed signals such as “[signal\_name]” are optional signals

## **DIGITAL INPUTS**

weather_tcp_connect_fb.....	Route to the Connect-F output of the TCP/IP client.
[kp_enter] .....	Pulse to retrieve the weather forecast for the location entered via alpha or numeric keyboard
[clear_message] .....	Pulse to clear the message_fb and message\$ signals.
[kp_0]-[kp_9] .....	Used to enter a U.S. zip code for the current location.
[kp_a]-[kp_z], [kp_space],[kp_comma] .....	Used to enter a City, State, or ICAO code for the current location.
[kp_clear] .....	Pulse to clear the current keypad entry.
[kp_backspace] .....	Pulse to clear the last entered character in the keypad entry.
[preset_1]-[preset_8] .....	Pulse to recall location presets. If set in parameters as such, press and hold to store the current location as a preset. When a preset is successfully stored a message stating as such will be displayed.
[recall_last_location] .....	Pulse to recall the last selected location.
[clear_preset_toggle] .....	Pulse to toggle the clear preset mode. Once preset clear mode is on, the subsequent press of a preset button will clear the preset information associated with that button. After clearing a preset, a message will be displayed stating that the preset has been cleared and preset clear mode is switched off.
[units_select_auto] .....	Pulse to have the module return current temperature and barometric pressure values in the units used for that location.
[units_select_fahrenheit] .....	Pulse to have the module return current temperature and barometric pressure values in Fahrenheit for the current conditions view.
[units_select_celsius] .....	Pulse to have the module return current temperature and barometric pressure values in Celsius for the current conditions view.
[units_select_toggle] .....	Pulse to have the module cycle through the three units select modes.

## **ANALOG INPUTS**

Weather_tcp_status .....	Routed from the status output of the TCP/IP client.
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## **SERIAL INPUTS**

weather_http_rx\$ .....	Route to the TCP/IP client rx\$ output.
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## **DIGITAL OUTPUTS**

weather_tcp_connect .....	Route to the Connect input on the TCP/IP client.
[message_fb].....	Latched high as long as the module needs to display a message to the user. This should be used to drive a subpage that will contain an indirect text field containing the message\$ signal.
[kp_enter_fb] .....	Latched high as long as the module is actively retrieving the weather data.
[warning_fb] .....	Latched high as long as the forecast for the current location contains a weather warning such as a severe thunderstorm warning.
[preset_1_fb]-[preset_8_fb] .....	Latched high when the preset is currently selected. Oscillates when the module is storing the current location as a preset.
[clear_preset_mode_on].....	Latched high when the module is in clear preset mode. The press of a preset button while clear preset mode is on, will clear the contents of the information associated with that button.
[units_select_auto_fb].....	Latched high when the module is returning current temperature and barometric pressure values in the units used for that location.
[units_select_fahrenheit_fb].....	Latched high when the module is returning temperature and barometric pressure values in Fahrenheit for the current conditions view.
[units_select_celsius_fb] .....	Latched high when the module is returning temperature and barometric pressure values in Celsius for the current conditions view.

## **ANALOG OUTPUTS**

[current_icon_multimode].....	Used to drive a multimode button containing all of the graphics for the current conditions icon.
[moon_phase_multimode] .....	Used to drive a multimode button containing the graphics for the current moon phase icon.
[forecast_icon_multimode[1-13]].....	Used to drive a multimode button containing all of the graphics for the day 1 through day 13 forecast icon.
[forecast_day_pop%[1-13]] .....	Analog percent value for the day 1 through day 13 forecasted probability of precipitation. These outputs will display "0%" if there is no chance of precipitation or if there is no data available for this location. If you encounter a location that displays a forecast of some form of precipitation and 0% pop, then the data model for this location does not supply the data.

## **SERIAL OUTPUTS**

weather_http_tx\$. .....	Route to the TCP/IP client tx\$ input.
message\$. .....	Text to display a message to the user. Usually a status message
[weather_kp\$]. .....	Output string of keypad.
[city\$]. .....	City name of the current location.
[state\$]. .....	State name of the current location.
[latitude\$]. .....	Latitude of current location in minutes and degrees.
[longitude\$]. .....	Longitude of current location in minutes and degrees.
[wx_zone\$]. .....	National Weather Service zone code for current US location.
[icao\$]. .....	International Civil Aviation Organization airport code for current location.
[location\$]. .....	Formatted location in City, State format for current US location.
[current_timestamp\$]. .....	Timestamp provided by the reporting agency for the current conditions for the current location.
[current_warning1\$- current_warning4\$]. .....	Warning message, if one is active for the current location, split into up to four lines. Length is governed by the 'notes length' parameter.
[current_sky\$]. .....	Current sky conditions for the current location. An example would be "Partly Cloudy".
[current_temperature\$]. .....	Current temperature in degrees for the current location.
[current_humidity\$]. .....	Current humidity in percent for the current location.
[current_wind\$]. .....	Formatted current wind information. Formatted as direction, speed and gust speed in MPH.
[current_pressure\$]. .....	Current barometric pressure for the current location.
[current_dew_point\$]. .....	Current dew point in degrees for the current location.
[current_heat_index\$]. .....	Current heat index in degrees for the current location.
[current_wind_chill\$]. .....	Current wind chill in degrees for the current location.
[current_remarks\$]. .....	Any special remarks for the current location.
[current_visibility\$]. .....	Current visibility in miles for the current location.
[civil_twilight_am\$]. .....	Time of civil twilight for the current location.
[sunrise\$]. .....	Time of sunrise for the current location.
[sunset\$]. .....	Time of sunset for the current location.
[civil_twilight_pm\$]. .....	Time of civil twilight for the current location.
[moon_phase\$]. .....	Current moon phase for the current location. An example would be "Waxing Gibbous Moon".
[forecast_issue_time\$]. .....	Timestamp provided by the reporting agency for when the current forecast was issued for the current location.
[forecast_expire_time\$]. .....	Timestamp provided by the reporting agency for when the current forecast will expire for the current location.
[forecast_day_title\$[1-13]]. .....	Title for the day 1 through day 13 forecast for the current location. Examples would be "Monday" or "Thursday Night".
[forecast_sky\$[1-13]]. .....	Forecasted sky conditions for day 1 through day 13 for the current location. An example would be "Partly Cloudy".
[forecast_day_high\$[1-13]]. .....	Text string displaying the day 1 through day 13 forecasted high temperature in degrees Fahrenheit for the current location.
[forecast_day_low\$[1-13]]. .....	Text string displaying the day 1 through day 13 forecasted high temperature in degrees Fahrenheit for the current location.

[forecast_day_pop\${1-13}]. .....	Text string displaying the day 1 through day 13 forecasted probability of precipitation for the current location. This output will display "***" if data is unavailable for this location, or if there is no chance of precipitation.
[forecast_notes1a\$-13f\$.....	Individual text output for each day for the current location. Each day is broken up into parts a-f to accommodate the limitations of text fields on Crestron touchpanels. Field length is determined by the "notes length" parameter.
[preset_1_text\$] – [preset_8_text\$]. .....	Text labels for preset 1-8 buttons. If using default presets, the text will be what is entered in the preset1 – preset8 parameter fields. If using dynamic presets, the text will be the location\$ value for the location being saved.

## **PARAMETERS**

client id.....	Enter the unique client id number given when registering this module to a particular job site. This module will not function if the client id entered here does not match the number assigned to the job site. You can register the module at <a href="http://admin.controlworks.com">admin.controlworks.com</a>
preset_1_default – preset_8_default. ....	Default values for presets 1 through 8. These values are used if the preset mode is set to "use default [1d]". Values must be entered as one of the following; a five digit U.S. zip code, a four character ICAO airport code, or, for U.S. or Canadian locations, a string with the city name followed by a comma then the state or province name or two-letter abbreviation.
preset_1_mode – preset_8_mode. ....	Set to "use default [1d]" if using the default presets. Set to "use dynamic [0d] if using dynamic, user-settable presets. Preset modes are independent of each other and can be used in any combination of default or dynamic.
notes length.....	Enter the maximum length in characters for text output fields.
default units. ....	Sets the default units to be displayed. 1d – auto will automatically select the native units of measure for the location being queried. 2d – Fahrenheit will, when possible, display temperatures in Fahrenheit and pressure in inches. 3d – Celsius will, when possible, display temperatures in Celsius and pressure in millibars.

## Support

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This module is supported by ControlWorks Consulting, LLC. Should you need support for this module please email [support@controlworks.com](mailto:support@controlworks.com) or call us at 440-449-1100. ControlWorks normal office hours are 9 AM to 5 PM Eastern, Monday through Friday, excluding holidays.

Before calling for support, please ensure that you have loaded and tested operation using the included demonstration program and touchpanel(s) to ensure that you understand the correct operation of the module. It may be difficult for ControlWorks to provide support until the demonstration program is loaded.

Updates, when available, are automatically distributed via Email notification to the address entered when the module was purchased. In addition, updates may be obtained using your username and password at <http://www.thecontrolworks.com/customerlogin.aspx>.

## Distribution Package Contents

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The distribution package for this module should include:

controlworks_weather_v4_demo.smw .....	Sample SIMPL windows program for a PRO2
controlworks_weather_v4.umc .....	User module to insert in program
controlworks_weather_parser_v4.usp .....	SIMPL+ module used by .UMC file
Base64 Encode Engine v1.usp .....	SIMPL+ module used by .UMC file
Two String Comparison v1.usp .....	SIMPL+ module used by .UMC file
cworks_weather_tpmc17_v4.vtp .....	Sample touchpanel file
cworks_weather_TPS-4L_v4.vtp .....	Sample touchpanel file
cworks_weather_TPS-12_v4.vtp .....	Sample touchpanel file
cworks_weather_TPS-15_v4.vtp .....	Sample touchpanel file
cworks_weather_TPS-3000_v4.vtp .....	Sample touchpanel file
cworks_weather_XPANEL_v4.vtp .....	Sample touchpanel file
controlworks_weather_hourly_v4.umc .....	User module to insert in program
controlworks_weather_hourly_parser_v4.usp .....	SIMPL+ module used by .UMC file
controlworks_weather_lite_v4.umc .....	User module to insert in program
controlworks_weather_parser_lite_v4.usp .....	SIMPL+ module used by .UMC file

## Revision History

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V1 [gary@controlworks.com](mailto:gary@controlworks.com) 2007.08.09

Initial release

V2 [gary@controlworks.com](mailto:gary@controlworks.com) 2007.11.05

- Added more server and connection error messages
- Now handle variable preset logic in the SIMPL+ module
- Added ability to clear a preset
- Added preset action messages
- Fixed issue with storing an ICAO code as a preset
- Optimized memory usage

V3 [gary@controlworks.com](mailto:gary@controlworks.com) 2008.09.15

- Added improved handling of locations not found in the database
- Improved initial parsing of data file for speed
- Improved presentation of data to outputs

V4 -- [gary@controlworks.com](mailto:gary@controlworks.com) 2011.04.12

- Release for Series 3 processor compatibility and testing

## Development Environment

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This version of the module was developed and tested on the following hardware and software. Different versions of hardware or software may or may not operate properly. If you have questions, please contact us.

Hardware	Firmware Version
Crestron MC3 Processor	1.000.0027
Crestron PRO2 Processor	4.001.1012
Software	Software Version
Crestron SIMPL Windows	3.01.24.00
Crestron Vision Tools Pro-e	4.2.14.02
Crestron Database	25.00.002.00
Device Database	33.00.005.00

# ControlWorks Consulting, LLC Module License Agreement

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## Definitions:

*ControlWorks*, *We*, and *Us* refer to ControlWorks Consulting, LLC, with headquarters located at 701 Beta Drive, Suite 22 Mayfield Village, Ohio 44143-2330. *You* and *Dealer* refer to the entity purchasing the module. *Client* and *End User* refer to the person or entity for whom the Crestron hardware is being installed and/or will utilize the installed system. *System* refers to all components described herein as well as other components, services, or utilities required to achieve the functionality described herein. *Module* refers to files required to implement the functionality provided by the module and may include source files with extensions such as UMC, USP, SMW and VTP. *Demo Program* refers to a group of files used to demonstrate the capabilities of the Module, for example a SIMPL Windows program and VisionTools Touchpanel file(s) illustrating the use of the Module but not including the Module. *Software* refers to the Module and the Demo Program.

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## Provision of Support

We provide limited levels of technical support only for the most recent version of the Module as determined by Us. We do not provide support for previous version of the module, modifications to the module not made by Us, to persons who have not purchased the module from Us. In addition, we may decline to provide support if the Demo Program has not been utilized. We may withdraw a module from sale and discontinue providing support at any time and for any reason, including, for example, if the equipment for which the Module is written is discontinued or substantially modified. The remainder of your rights and obligations pursuant to this license will not be affected should ControlWorks discontinue support for a module.

## Modification of Software

You may not decrypt (if encrypted), reverse engineer, modify, translate, disassemble, or de-compile the Module in whole or part. You may modify the Demo Program. In no event will ControlWorks Consulting, LLC be liable for direct, indirect, incidental or consequential damages resulting from You modifying the Software in any manner.

## Indemnification/Hold Harmless

ControlWorks, in its sole and absolute discretion may refuse to provide support for the application of the Module in such a manner that We feel has the potential for property damage, or physical injury to any person. Dealer shall indemnify and hold harmless ControlWorks Consulting LLC, its employees, agents, and owners from any and all liability, including direct, indirect, and consequential damages, including but not limited to personal injury, property damage, or lost profits which may result from the operation of a program containing a ControlWorks Consulting, LLC Module or any component thereof.

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