DoorBird v1.1
Module Application Guide

Description

This Module allows two-way control of DoorBird Video Door Stations D10x, D20x, BirdGuard B10x, and Holovision models 831, 731, 430 running firmware 000102 and above.

This Module uses a Module Instance License that can be obtained at www.controlworks.com. Each DoorBird in a system requires a separate module, and each module requires a separate license in order to function. See below for detailed instructions on ordering and activation.

The module also offers a complimentary trial period of 30 minutes if no license has been purchased.

Supported Processors

Any 2-series 3-series processor that supports Ethernet and Direct Sockets.

Compatibility			Processor Requirements	
3 COMPATIBLE	2 SERIES COMPATIBLE	Crestron Studio COMPATIBLE		REMOVABLE MEDIA NOT REQUIRED

Module Instance License

This Module requires a Module Instance License that can be obtained at www.controlworks.com. Each module in a program requires a separate license in order to function. Licenses are tied to the Crestron processor and DoorBird combination.

Steps for Purchasing a License.

Licenses are tied to the Crestron Processor and DoorBird combination. The steps below outline how to purchase a license and activate your module.

1. Ensure the DoorBird is on the LAN and can be reached by the Crestron processor.
2. Ensure the credentials for the SIP DoorBird account (these credentials do not exist by default) are in the module parameters. For details on how to create the SIP account, see the section below labeled DoorBird Username and Passwords.
3. Ensure the [reboot_finished] signal on the module is being latched high after boot. See the demo program for an example.
4. Open Text Console in toolbox, connect to the processor.
5. Ensure the processor has DNS servers by using the command [LISTDNS].
    a. If no DNS servers are present, add them by using [ADDDNS <DNS server>] or using the Ethernet Addressing dialog box.
    b. You can also test your DNS server by using the command [TESTDNS www.controlworks.com.
6. Load your program to the processor.
7. After the program has been loaded, in text console, use the command [UCMD:<program slot number> "GET ACTIVATION INFO"]. i.e UCMD:2 "GET ACTIVATION INFO" This will provide you with an activation key.
8. In a web browser, browse to www.controlworks.com and select the license to purchase. The website will prompt you for the activation key. Enter the activation key and click the proceed button.
9. The web store will have added your license to the shopping cart. Proceed through the checkout process.
10. After the checkout process has completed, in text console issue the command [UCMD:<program slot number> "RETRYAUTH"], or restart the program, and the module will attempt to contact the activation server for authentication. Once activated, the [module_authorized] will be high.

In most cases, once the module has been activated, it will not need to be reactivated. However, certain changes to the program structure or NVRAM contents may require reactivation, which should occur automatically as long as the processor has internet access.

If your processor is not connected to the internet, please email 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. You will need to provide the key noted in step 7.

Trial Period:
To aid testing your programming before deployment, we are offering a complimentary trial period of 30 minutes; during this time the module will be fully functional. This functionality only works for systems that have an active internet connection.

When the [reboot_finished] signal is held high, the module will attempt to activate. If the module has not been previously activated and doesn't find a license when checking the activation server, the trial period will be enabled for 30 minutes. After 30 minutes, the module will attempt reactivation. If a license has been purchased, the module will retain full functionality; if a license has not been purchased the module will be disabled. If you are developing in a lab or staging environment, simply restart your program to restart the trial period.

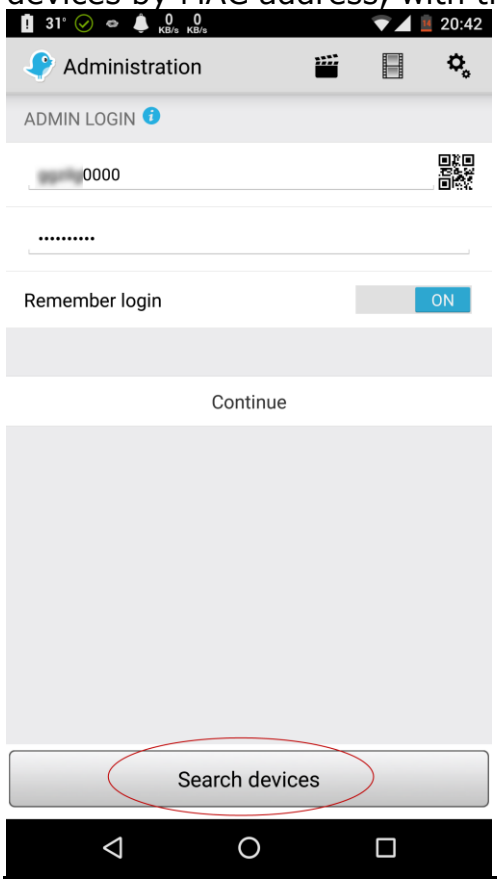
To prevent abuse of this service, the total number of trial activations for any processor may be limited in ControlWorks sole discretion.

Module Application

Locating devices on your LAN

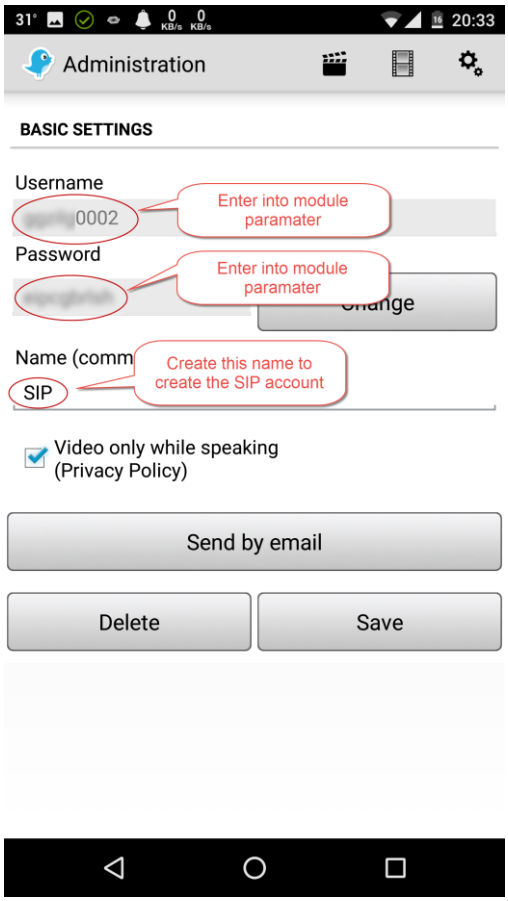
There are a number ways to find your DoorBird device on the LAN. Since the module requires registering a new account on the door station, we will focus on using the iOS/Android App which will be used later to create the necessary account.

Download the iOS/Android App from the App Store and install it on your mobile device. Using your mobile device when connected to the same network as the DoorBird, launch the app DoorBird App -> Settings(Gear Icon) -> Administration -> Search. The App will display a list of devices by MAC address, with their associated IP address.



DoorBird Username and Passwords

This Module uses an account that does not exist by default to control the DoorBird. To create the account, using the DoorBird app DoorBird App -> Settings -> Administration -> and enter the credentials for the administration account (found on the digital passport provided with the DoorBird.) Once in the Administration view, press "Add". In the "Name (comment)" field, enter "SIP" without the quotes, take note of the Username and Password, then press save. Enter the Username and Password for this SIP account into the Username and Password Parameters on the module.



SIP Calling

The DoorBird supports generic point to point SIP calls and works with Crestron touchpanels that support SIP in Peer to Peer Mode ("Rava"). Each SIP call terminates 180 seconds after it was initiated, unless the touchpanel hangs up or you send the hang up command to the DoorBird via the module before this timeout occurs. The DoorBird supports only one simultaneous SIP call.

Calling the DoorBird: The DoorBird by default does not allow untrusted inbound calls. You can enable inbound calls, however you must specify the SIP user(s) that will be calling the door station. ControlWorks recommends that the DoorBird call the touchpanel as documented below.

DoorBird calling a touchpanel: In a typical application, the programmer should program the DoorBird to call the touchpanel that wants to initiate a SIP call. This is done by sending the touchpanels SIP URI to the [number_to_dial] input, then by pulsing [dial] to initiate the call. The touchpanels SIP URI can be found on the TSW VOIP Reserved Joins device extender or in the Rava setup screen (local extension).

To see all the settings for SIP on the DoorBird, you can browse to http://<device-Address>/bha-api/sip.html using your SIP Credentials.

Note:
Testing has revealed that the DTMF PIN cannot be used with Crestron Touchpanels DTMF to open the door relay contact. Please use the [open_door] digital input on the module to activate the door relay contact.

ControlWorks has been unable to establish a SIP call with the Crestron App on Android, and does not currently support using the module to call a device running the Crestron App on Android.

Subscription to Door Open, Doorbell Press, and Motion Sensor events

The DoorBird provides unsolicited feedback for Door Open, Doorbell Press, and Motion Sensors. Two parameters (Crestron Processor IP Address, and Notification Port Number) on the module provide the connection information so the DoorBird can contact the Crestron processor for an event. By default, ControlWorks uses port 9783 however this can be changed as it is a parameter on the module. If two or more DoorBird's modules are in use on a processor (including in different program slots), each module instance must be assigned a unique port number.

A digital input is provided on the module to subscribe to an event, or unsubscribe from an event. These inputs can be pulsed or latched after [module_authorized] is high. Once an event is subscribed to, the subscription will remain in effect until that event has been unsubscribed.

Each event is accompanied by a relaxation period. This is the time interval in seconds in which subsequent events will not retrigger. By default the relaxation time is 10 seconds, and the range is 10s-10000s. In a typical scenario, this value should not need to be adjusted.

H.264 and MJPG streams

Since each project is different, and every touchpanel works differently, please take some time and review the following information to help consider how best to implement your project with regards to steaming the DoorBird Camera.

Crestron has provided a best practices online help article (Answer ID 5195) for streaming video to touchpanels. https://support.crestron.com/app/answers/detail/a_id/5195/kw/streaming.

H.264: The DoorBird provides an H.264 stream, as well as a MJPEG stream to view the live camera. The **H.264 stream only allows one concurrent stream at any given time**. Care should be taken to ensure that only one device is receiving the H.264 stream. The stream is a 1280x720, 720p HD Variable bit rate at 10FPS stream. These settings cannot be changed.

Note: At the time this document was written, ControlWorks was unable to view the H.264 stream on a TSW-1050, TSW-1052, and TSW-750, however TSW-X60, and TS-1542 touchpanels have been successfully tested.

MJPEG: The MJPEG stream is a 640x480 steam with an average of 8FPS. The MJPG stream only allows two concurrent connections. Care should be taken to ensure that **a maximum of two devices are receiving the MJPG stream**. These settings cannot be changed.

ControlWorks recommends using the live image snapshot URL (with a dynamic graphics object) to show the user who is at the door at the time of an event and only using the H.264 or MJPG stream when needed at a specific panel, as illustrated in the demo program included with the module.

Steps for importing the module into Crestron Studio

- Ensure you have the latest demo program and modules.
- From the start page, choose File -> Import.
- Select the three modules included in the distribution package and select open:
  - Base64 Encode Engine v1.usp
  - DoorBird_Engine_V1.1_(ControlWorks).usp
  - DoorBird_V1.1_(ControlWorks).umc
- Next the File Import Assistant will show you the modules to be imported. Select the Import location and Import Action appropriate for your system and select next.
- Once the files are imported, the import results will be displayed. Each of the files have an open checkbox that should be unchecked. Since the DoorBird modules are password protected none can be opened.
- Select File -> Import.
- In the Select Files to Import dialog box, select DoorBird_V1.1_(ControlWorks).ct_Device that is included with the module.
- Next the File Import Assistant will show you the device to be imported. Select the Import location and Import Action appropriate for your system and select next.
- After the device has been added to a system, ensure you do not remove the device or any of the modules from Studio, or you may not be able to reopen your project.

Knowledge Base

Please be sure to visit our Knowledge Base for additional information that can assist in developing your solutions. http://controlworks.com/ResourceLibrary/KnowledgeBase.aspx

Module Application

It's important to note that the feature set of the DoorBird requires some different thinking when building your program. Below are some quick pointers to help during the development of your project:

- The DoorBird only accepts calls from one trusted source (Source -> DoorBird). This means that if you have multiple panels that need to engage in a SIP call, the best practice is to have the DoorBird call the desired touchpanel.
- Since the DoorBird allows a small number of concurrent video streams (MJEPG allows 2 streams, while H.264 allows 1 stream), you should not have every panel request a stream when the door trigger notification occurs. Instead, use the live_image_url$ to show the user who is at the door. The live_image_url$ contains a dynamic graphic image of the camera at the time you request it. Once in a call, show the camera on the desired touchpanel using a video window.
- The DoorBird only supports 1 concurrent SIP call. This includes calls with the DoorBird iOs and Android apps. If the module is unable to place a call because a call is already in progress, the [sip_call_failed] output on the module will be pulsed.

Signal and Parameter Descriptions

Bracketed signals such as "[signal_name]" are optional signals

DIGITAL INPUTS

[reboot_finished] ..... Latch this signal high after your reboot is complete. Module will attempt to activate when this input goes high.

[open_door] ..... Pulse to send the command to the DoorBird to energize the door open relay. The relay is momentary, and the duration in which the signal is high has no bearing on how long the relay is energized.

[light_on] ..... Pulse to turn the IR camera light on. The duration in which the signal is high has no bearing on how long the light is on. The light will automatically time out, and cannot be manually turned off.

[dial] ..... Pulse to have the DoorBird dial the SIP number on [number_to_dial].

[end_call] ..... Pulse to have the DoorBird terminate any SIP call in progress.

[reset_sip_settings] ..... Pulse to reset all the SIP settings on the DoorBird. This will clear out any SIP values, and hang up any ongoing call.

[query_sip_settings] ..... Pulse to query all SIP settings. After module activation, this will be done automatically.

[enable_sip] ..... Pulse or hold high to enable the SIP functions on the DoorBird. Can be triggered by a 1 on the input.

[disable_sip] ..... Pusle or hold high to disable the SIP functions on the DoorBird. Can be triggered by a 1 on the input.

[enable_dtmf] ..... Pulse or hold high to enable DTMF control of the door station. When in a call and DTMF is enabled. Will not work with DTMF from touchpanels. Use the [open_door] input to rigger the door open relay.

[disable_dtmf] ..... Pulse or hold high to disable DTMF control of the door station. Can be triggered by a 1 on the input.

[prioritize_ios/android_app] ..... Pulse or hold high to enable priority mode for the DoorBird iOS/Android App. If enabled, all SIP-calls get terminated, when the App wants to use the audio interface of the DoorBird. Can be triggered by a 1 on the input.

[prioritize_other_apps] ..... Pulse or hold high to give SIP priority to other apps such as Crestron. Can be triggered by a 1 on the input.

[disable_motionsensor_autocall] ..... Pulse or hold high to disable the motion sensor auto call feature. The feature can be re-enabled by sending a SIP address to the [autocall_motionsensor_url$] Can be triggered by a 1 on the input.

[disable_doorbell_autocall] ..... Pulse or hold high to disable the doorbell press auto call feature. The feature can be re-enabled by sending a SIP address to the [autocall_doorbell_url$] Can be triggered by a 1 on the input.

[subscribe_to_motionsensor_events] ..... Pulse or hold high to subscribe to motion sensor events. Can be triggered by a 1 on the input.

[unsubscribe_to_motionsensor_events] ..... Pulse to unsubscribe to motion sensor events. Can be triggered by a 1 on the input.

[subscribe_to_door_open_events] ..... Pulse or hold high to subscribe to door open events. Can be triggered by a 1 on the input.

[unsubscribe_to_door_open_events] .....Pulse or hold high to unsubscribe to door open events. Can be triggered by a 1 on the input.

[subscribe_to_doorbell_button_presses] .....Pulse or hold high to subscribe to doorbell button presses. Can be triggered by a 1 on the input.

[unsubscribe_to_doorbell_button_presses].....Pulse or hold high to unsubscribe to doorbell button presses. Can be triggered by a 1 on the input.

[query_notifications] .....Pulse to update the status feedback of all subscriptions.

[get_info].....pulse to query the version number and build number.

ANALOG INPUTS

[historical_image_1-20].....Initialize to update the dynamic graphic [historical_image_url$] with the initialized value. Range is 1d-20d.

[microphone_volume].....Initialize after [module_authorized] is high. Range is 0d-100d. This input should be used with an Analog Initialize. Do not ramp the input.

[speaker_volume] .....Initialize after [module_authorized] is high. Range is 0d-100d. This input should be used with an Analog Initialize. Do not ramp the input.

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SERIAL INPUTS

[number_to_dial].....Initialize the input to a SIP number to call. The string should be in the format of SIP:<extension_number>@<ip_address or hostname>. Once the string is initialized, pulsing [dial] will send the command to the DoorBird to dial the specified SIP number.

[autocall_motionsensor_url$] .....Initialize this input to a SIP number. The string should be in the format of SIP:<extension_number>@<ip_address or hostname>. Once the string is initialized, the DoorBird will auto call the number anytime the motion sensor detects motion. To disable this feature, place a 1 or pulse [disable_motionsensor_autocall]. When disabled the string will be "none".

[autocall_doorbell_url$].....Initialize this input to a SIP number. The string should be in the format of SIP:<extension_number>@<ip_address or hostname>. Once the string is initialized, the DoorBird will auto call the number anytime the doorbell button is pushed. To disable this feature, place a 1 or pulse [disable_doorbell_autocall]. When disabled the string will be "none"

DIGITAL OUTPUTS

[module_authorized_fb]..... Latched high after the module is authorized. The module will not function if this output is low.

[sip_call_failed] ..... Pulsed high if the Door Station returns "503 Service Unavailable" when a call is attempted. Also a user event notice is logged in the error log when this occurs.

[sip_enabled_fb]..... Latched high if SIP is enabled.

[sip_disabled_fb] ..... Latched high if SIP is disabled.

[dtmf_enabled_fb] ..... Latched high if DTMF is enabled.

[dtmf_disabled_fb]..... Latched high if DTMF is disabled.

[prioritize_app_fb] ..... Latched high if the iOS/Android app is prioritized for SIP.

[prioritize_other_apps_fb]..... Latched high if other applications are prioritized for SIP.

[autocall_motionsensor_disabled_fb]..... Latched high if the autocall motion sensor is disabled.

[autocall_doorbell_disabled_fb] ..... Latched high if the autocall doorbell button press is disabled.

[event_motionsensor_subscribed_fb] ..... Latched high if subscribed to motion sensor events.

[event_dooropen_subscribed_fb] ..... Latched high if subscribed to door open events.

[event_doorbell_subscribed_fb] ..... Latched high if subscribed to doorbell button events.

[motionsensor_event_pulse] ..... Pulsed high when the DoorBird detects motion.

[doorbell_press_event_pulse]..... Pulsed high when the DoorBird detects a doorbell press.

[dooropen_event_pulse] ..... Pulsed high when the DoorBird detects a door open event.

ANALOG OUTPUTS

[microphone_volume_fb] ..... Indicates the current microphone volume. Range is 1-100d.

[speaker_volume_fb]..... Indicates the current speaker volume. Range is 1-100d

[last_error_code] ..... Indicates the most recent SIP registration status code. 200 if everything is ok, 401 authentication failure, 402 if SIP function is not licensed (previous versions of firmware) 503 if there is was call currently in progress.

[notification_socket_status_fb] ..... Indicates the notification socket status. 1=Waiting for connection, 2=Connected.

SERIAL OUTPUTS

[mjpg_stream_url$] ..... String URL for a MJPEG stream.

[live_image_url$]..... String URL for a current image snapshot of the camera. Use with a dynamic graphic object.

[rtsp_url$] ..... String URL for a RTSP stream. **DoorBird only supports one concurrent stream.**

[historical_image_url$]..... String URL for a historical image. Initializing [historical_image_1-20] will update the URL.

[autocall_doorbell_url_fb$] ..... String indicating the current auto call number for doorbell events.

[autocall_motitionsensor_url_fb$]..... String indicating the current auto call number for motion sensor events.

[last_error_fb$] ..... reports the last error text as provided by the door station.

[event_motionsensor_url_fb$]..... Reports the motion sensor auto call URL the doorstation is sending notifications to Crestron. Used for debugging only.

[event_dooropen_url_fb$]..... Reports the door open auto call url the doorstation is sending notifications to Crestron. Used for debugging only.

[event_doorbell_url_fb$]..... Reports the doorbell auto call url the doorstation is sending notifications to Crestron. Used for debugging only.

[build_number_fb$] ..... String indicating the build number of the DoorBird

[version_number_fb$] ..... Indicates the current firmware version number

PARAMETERS

IP Address or Hostname..... Enter the DoorBird's IP address or hostname.

HTTP Port Number..... Enter the HTTP Port number of the DoorBird. The Port is defaulted to 80d.

Username ..... Enter the SIP account username.

Password ..... Enter the SIP account password.

Crestron Processor IP address or Hostname..... Enter the Crestron Processor's IP address or Hostname. This is used for the DoorBird to send events to the processor.

Notification Port Number ..... Enter a port number the DoorBird should send notifications on. ControlWorks uses 9783 as a default, but can be any port number. If you are using two or more DoorBird modules in your program, the port numbers must be unique to each module. The value must be between 1 and 65535.

Notification Relaxation time ..... Enter the relaxation time (in decimal seconds) between multiple events. Range is 10d-10000d. Notifications that occur during the "relaxation" time will not be generated.

Support

This module is supported by ControlWorks Consulting, LLC. Should you need support for this module please email 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 https://www.controlworks.com/Customers/Login.aspx.

Distribution Package Contents

The distribution package for this module should include:

DoorBird_V1.1_(ControlWorks).umc .....Crestron User Module
DoorBird_Engine_v1.1_(ControlWorks).usp .....SIMPL+ file used within the processor module
DoorBird_Engine_v1.1_(ControlWorks).ush .....SIMPL+ header file
DoorBird_V1.1_(ControlWorks).vtp .....Demo touchpanel for TSW-1052
DoorBird_V1.1_(ControlWorks).smw .....Demo program for PRO3 processor

Revision History

V1.1 caleb@controlworks.com 2017.04.25
-Added temporary activation period.

V1.0 caleb@controlworks.com 2017.01.17
-Initial release

Development Environment

This module version was developed 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.

Manufacturer Hardware	**Software Version**
D202	102
Crestron Hardware	**Firmware Version**
Crestron AV3 Processor	1.501.0013
TSW-750	v1.501.0013 (Mar 15 2016), #0085A880
TSW-1050	v1.501.0013 (Mar 15 2016), #009BCC10
TSW-1052	v1.002.0013 (March 03 2016), #00C4C03D
TSW-760	v1.000.0023 (Fri Oct 14 22:16:01 EDT 2016), #00E64996
Software	**Software Version**
SIMPL Windows	4.04.03
Vision Tools Pro-e	6.0.07
Smart Graphics Controls	2.09.06.01
Crestron Database	58.00.002.00
Device Database	77.02.001.00

ControlWorks Consulting, LLC Module Instance License Agreement

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 Instance License refers to a module license that is granted to a specific combination of a Crestron Processor and a single controlled device (for example, based on the respective serial numbers); a separate Module Instance License must be purchased for each such combination. *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. Any modifications to the Module shall immediately terminate any licenses purchased with respect thereto. You may, however, 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.

License Grant
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