

PRODUCT DATASHEET

Addressable System: M-Type Node Controller

Suitable for addressable window applications

Technical Specs

M-type Node Controller

Power supply: 220 Vac
 CPU: Cortex-A7, 800 MHz
 Consumption: 5 W
 RAM: 128 MB DDR2
 Storage: 128M Flash
 Serial comm: RS485 *2, RS232 *1
 Ethernet port: RJ45 *1, 10/100M
 Display: 7" TFT LCD
 Resolution: 800 x 480
 Inputs: 4 (24Vdc or dry contact)
 Outputs: 1x 24Vdc, 2x relay
 Max number of vents: 50
 RS485_1: 30 vents (or interfaces)
 RS485_2: 20 vents
 Max number of I/O modules: 5
 Max number of switches: 10
 Max number of sensors: 5
 Max number of zones: 9
 Recommended cable size:
 0.75mm² shielded twisted pair
 Max RS485 cable run: 1000 m
 Operating temp: 0 - 50 °C
 Operating RH: 5-90% (non-condensing)
 Ingress Protection: IP20



Description

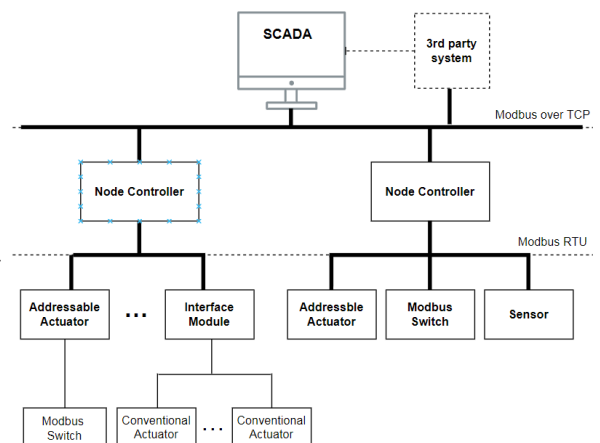
This addressable system is ideal for smoke and natural ventilation applications where the precise control of each individual window is required. It can seamlessly interface with conventional devices and third party system such as building automation and fire alarm systems. Utilizing the standard Modbus protocol it enables easy deployment of both local and global strategies.

Features

- Robust and stable performance.
- Low consumption.
- Flexible configuration options.
- Supporting Modbus RTU and Modbus over TCP.
- Two parallel RS485 bus in a single node controller, supporting 50 vents in total.
- Interface module available for connecting conventional motors.
- Supporting up to 9 local zones.
- Easy assignment of switch to zone.
- Switch configurable as window-subordinate to save bus resource.

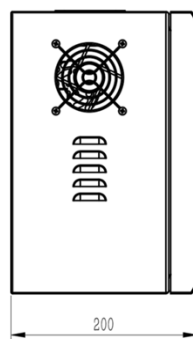
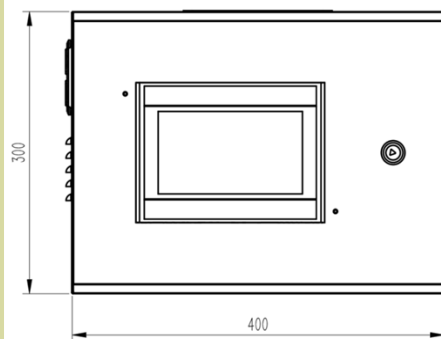
System Topology

The system is organized into three fundamental levels. At the field bus level, addressable actuators, interface modules and Modbus-compatible devices are connected. The middle level consists of node controllers that execute the local strategy and serve as gateways, relaying field data to the service level. At the service level, SCADA uses Modbus over TCP protocol to ensure intercommunication among node controllers, implement the global strategies and interface with third party systems.

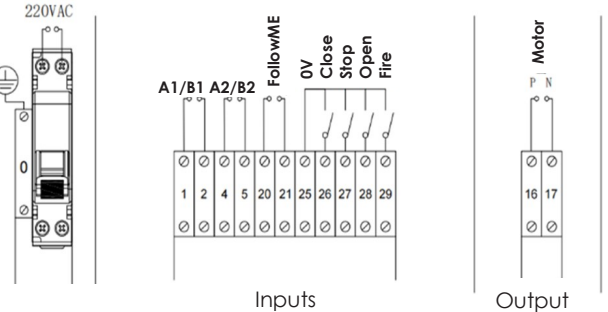


PRODUCT DATASHEET

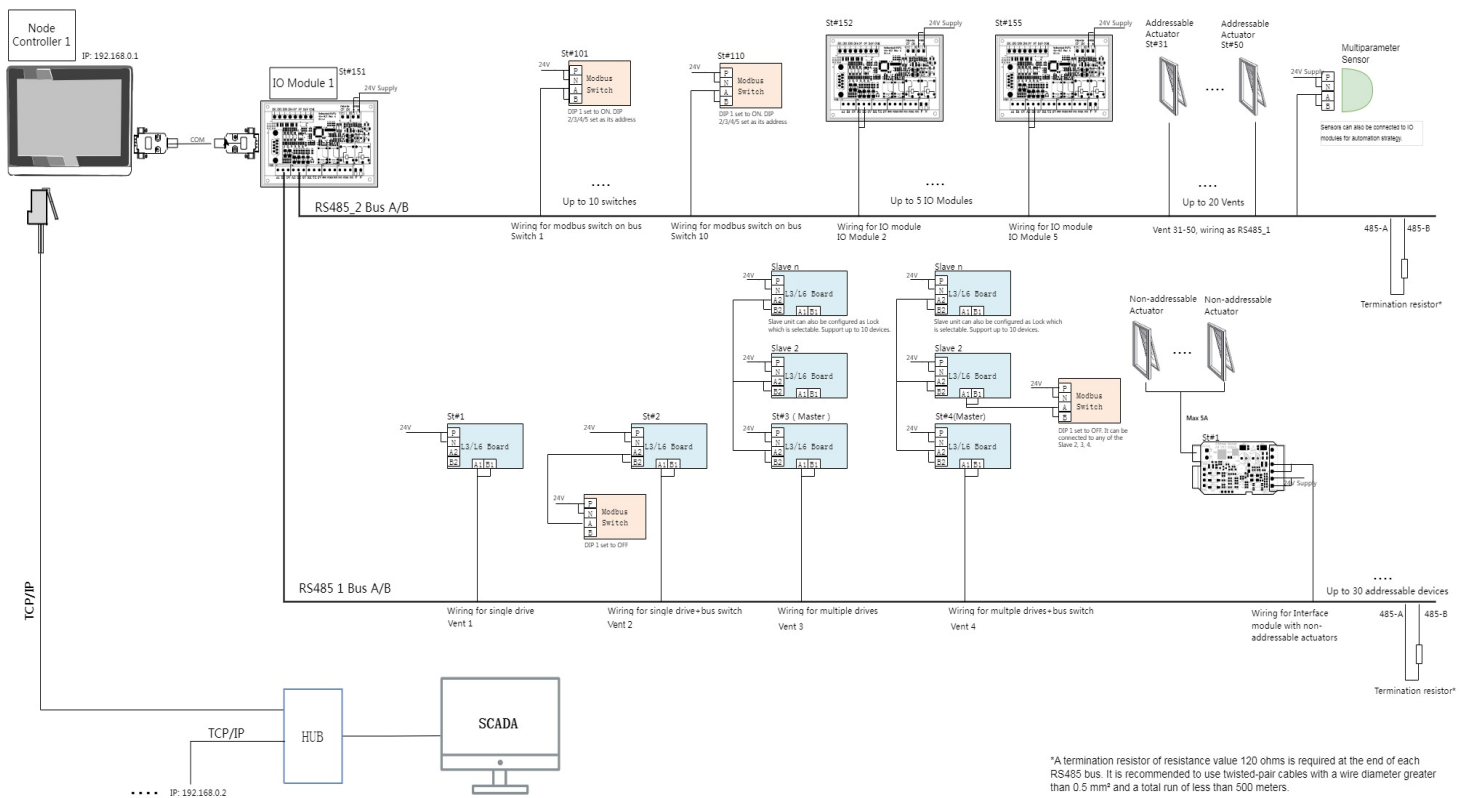
Dimensional Drawings



External Wiring (Default)



General System Structure and Wiring Diagram



A node controller is equipped with two RS485 buses, extended by an IO module (Station #151) which is built into the controller enclosure.

RS485_1 bus: Primarily intended for connecting addressable actuators (with L3/L6 PCB) or Modbus interface modules (for connecting non-addressable actuators). The maximum number of addressable devices on RS485_1 should not exceed 30.

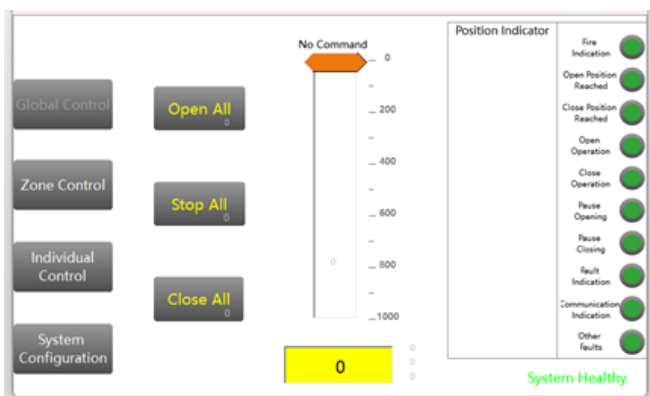
RS485_2 bus: Recommended for connecting IO modules, Bus switches, or sensors. Note: IO modules, Bus switches and 3rd party devices (e.g. sensors) can only be connected to RS485_2, they're not allowed to be on RS485_1!

PRODUCT DATASHEET

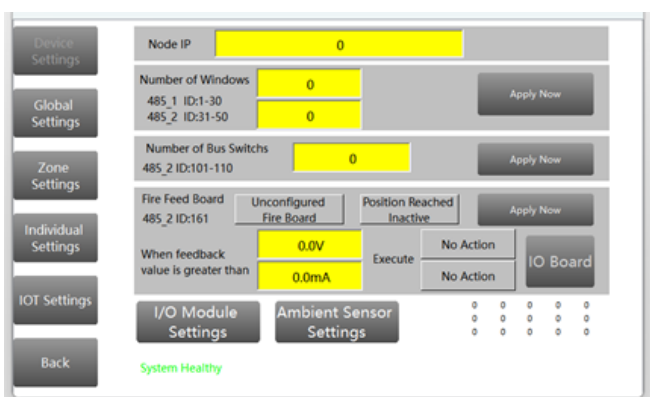
Node Controller Display Panel User Manual

System Configuration

Click "System Configuration" to access Settings page.



Device Settings



- 1, Set the Node IP address as required (e.g. 192.168.0.1).
- 2, Configure the number of windows installed in RS485_1 and RS485_2:
RS485_1 supports up to 30 windows, with IDs ranging from 1 to 30.
RS485_2 supports up to 20 windows, with IDs ranging from 31 to 50.
Click "Apply Now" to apply the settings immediately.
- 3, Input the actual number of bus switches installed. The max number of bus switches, which must be connected to RS485_2, is 10. The ID range is 101 to 110.
- 4, The fire feed board is disabled by default. To activate it, click "Configure Fire Board".
Choose "Position Reached Inactive/Active" mode.
Specify threshold value for voltage (V) or current (mA).
Define the desired actions to be triggered.
Click "Apply Now" to apply the settings.

5, Click "I/O Module Settings" to access the I/O Module configuration page.



Input the actual number of I/O modules connected to the node controller (supporting up to 5 modules on RS485_2 only, with IDs ranging from 151 to 155). Once completed, click "Apply Now" to apply the configuration.

The default window opening time is 120s and window closing time is 180. Change them as desired.

I/O module supports two modes: "Connect Window" or "Not Connect Window". Click the button to toggle between these modes.

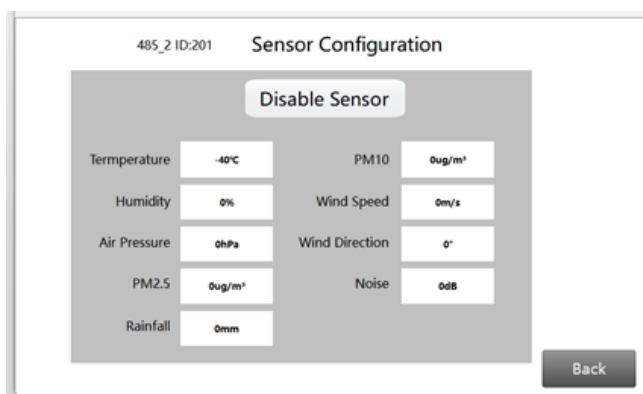
Each I/O module can be assigned to a specific zone. Click to toggle between "No Zone Assigned" or "Assigned Zone x".

There are 6 selectable input signal types: None, Open Reached, Close Reached, Open Command, Close Command, and Stop Command. Click the button to cycle through options.

There are 4 selectable output signal types: None, Fire Signal, Open Reached, and Close Reached. Click the button to cycle through options.

After completing all settings, click "Save & Exit" to finalize the configuration.

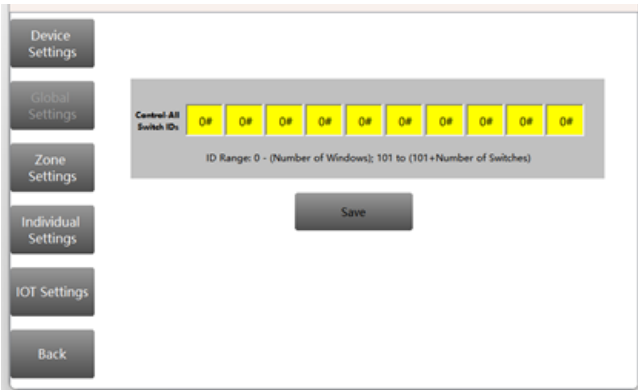
6, Click "Ambient Sensor Settings" button to open the configuration page. Enable/disable the sensor by



PRODUCT DATASHEET

toggling the “Enable/Disable Sensor” button. All 3rd party Modbus devices like sensors must be connected to RS485_2 bus which supports up to 5 sensors with IDs ranging from 201 to 205.

Global Settings

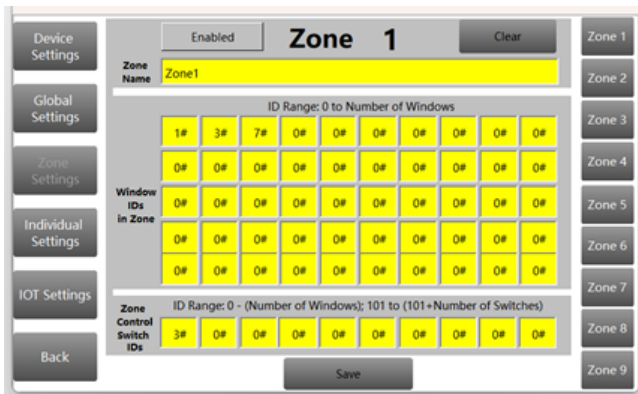


The screenshot shows the 'Global Settings' screen. On the left is a sidebar with buttons: Device Settings, Global Settings (selected), Zone Settings, Individual Settings, IOT Settings, and Back. The main area has a 'Control All Switch IDs' field with a grid of 10 yellow buttons, each labeled '0#'. Below this is a text field 'ID Range: 0 - (Number of Windows); 101 to (101+Number of Switches)' and a 'Save' button.

1, This section allows you to designate specific Modbus switches for global control. e.g. if the Modbus switch with address 101 is used to control all windows, input 101 in the Control-All Switch IDs field; if you want the Modbus switch subordinate to the window with address 10 to control all windows, input 10. Click “Save” to complete the setting.

Zone Settings

1, All zones (1-9) are disabled by default. Select the zone



The screenshot shows the 'Zone Settings' screen. On the left is the same sidebar as the Global Settings screen. The main area has a 'Zone 1' header with an 'Enabled' button and a 'Clear' button. Below is a 'Zone Name' field with 'Zone1' entered. Then is a 'Window IDs in Zone' grid with 10 yellow buttons, each labeled '0#'. Below this is a 'Zone Control Switch IDs' field with a grid of 10 yellow buttons, each labeled '0#'. At the bottom is a 'Save' button.

you want to configure, then click “Enable” to activate it.

2, Assign windows to the zone. Input the window IDs one by one. e.g. The above picture shows windows with address ID 1, 3, 4 and 7 are assigned to Zone 1.

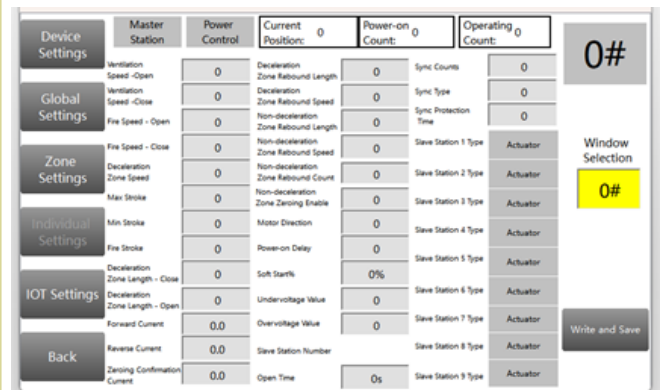
3, Specify the Modbus switches that will control this zone. The above example shows the switch subordinate to the window ID3 is now the control switch for the Zone 1.

4, Click “Save” to complete the setting.

Individual Settings

This section is to configure parameters for individual win-

dow actuators. Each actuator must be configured separately.



The screenshot shows the 'Individual Settings' screen. On the left is the same sidebar. The main area has a '0#' header. Below is a table with columns: Master Station, Power Control, Current Position, Power-on Count, Operating Count, and Actuator. The table has 10 rows, each corresponding to a different actuator. The 'Actuator' column has buttons labeled '0#'. At the bottom right is a 'Write and Save' button.

*Changing actuator parameter can lead to abnormal driving operation. Only qualified technicians are authorized to perform these settings.

1, Input the window address ID in the “Window Selection” field.

2, Change the specific parameters as required.

3, Click “Write and Save” to apply the settings.

IOT Settings

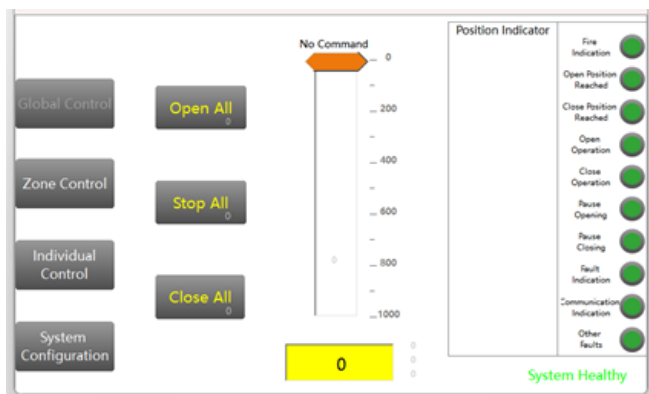
This feature is only available with WiFi-enabled node controllers, allowing remote access and assistance over the internet. Contact us for more information.

PRODUCT DATASHEET

System Operations

Global Control

Click "Global Control" to access the control options for open, stop and close all windows connected to the node controller.



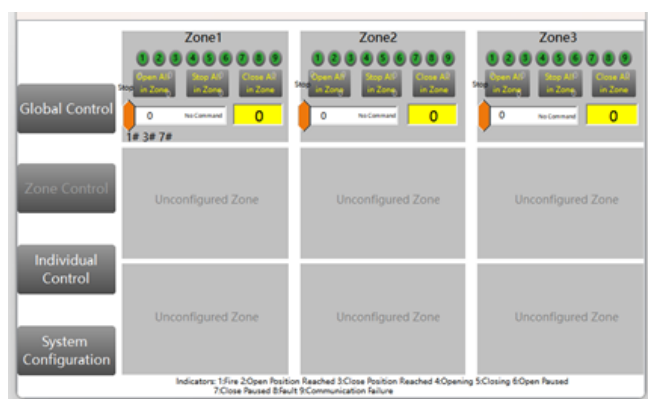
You can adjust the windows open/close position by sliding or entering a value directly.

The "Position Indicator" displays the position of every window in the node. Click on it to show all.

The side bar displays the control status.

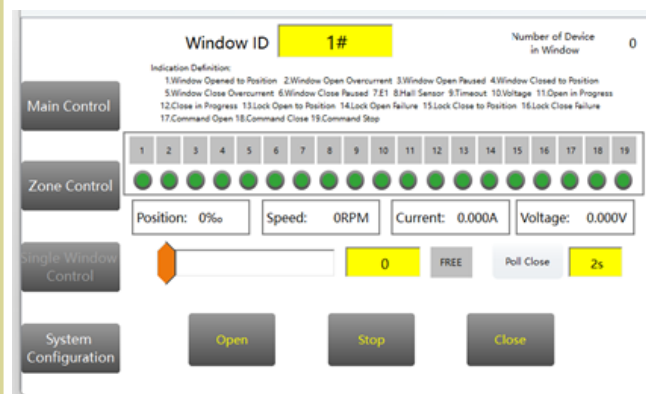
Zone Control

Zone Control section allows you to control the specific zone by opening, stopping or closing all windows within it. The operation status is displayed with numbered indicators for easy reference.



Individual Control

This section allows for the individual control of a specific window actuator. It supports status polling, enabling sequential checks of each window based on a pre-defined time interval. This helps monitor the operational state of each window efficiently.



PRODUCT DATASHEET

Addressable System: Addressable Actuators

Suitable for addressable window applications

Technical Specs

Addressable Actuators

Power supply: 24Vdc +/-25%

Control variant: 3A/6A

Serial comm: RS485

Protocol: Modbus RTU

Max number on Bus: 50

Address range: 1-50

Refer to the specific models for more technical details.

The default communication parameters are "8 data bits, 1 stop bit, even parity and 38.4K baud rate". These parameters can be modified by writing a new value to Address 209 as per below table. The station number can also be updated by writing to Address 204, followed by writing 1111 to Address 201 to save the change. Restart the device for the changes to take effect.

Setting Comm Parameters

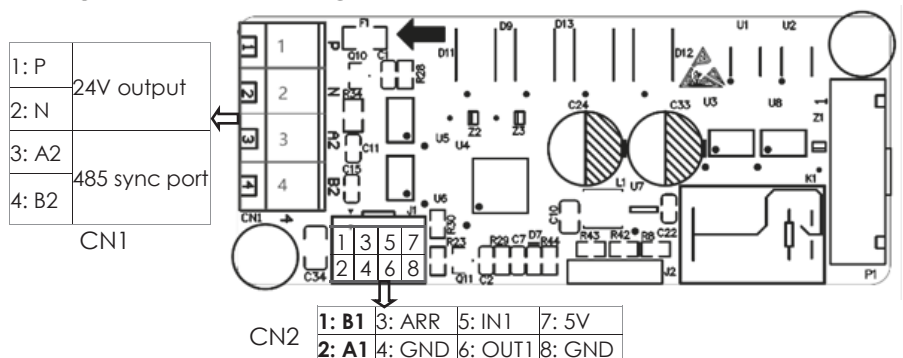
Add.	Bit	Description
209	Bit0: Baud rate	1: 4800
		2: 9600
		3: 14400
		4: 19200
		5: 28800
		6: 38400
		7: 57600
		8: 115200
209	Bit1: Stop bit	0: 1
		1: 2
209	Bit2: Checksum	0: None
		1: Even parity
209		2: Odd parity
204	Word	New station#
201	Word	Write 1111 to 201 to save station# change

Description

All AutoFacade electrical window actuators can be upgraded into addressable Modbus devices by using our advanced control and communication board, ensuring seamless integration in the window control system.



Configuration and Wiring



A1/B1 on CN2 connector is the networking port. Follow the wiring instruction as per General System Structure and Wiring Diagram in controller datasheet.

Communication Protocol Definition

Function Code	Address	Bit	Description	Type	Remarks
06 or 16	401	Bit0	Open	Read/Write	Write 1 to open
		Bit1	Close	Read/Write	Write 1 to close
		Bit2	Stop	Read/Write	Write 1 to stop
		Bit3	Fire	Read/Write	Write 1 to set Fire active
		Bit4	Force Zero	Read/Write	Write 1 to force zero on full close
		Bit5	Save target pos	Read/Write	Write 1 to save change by 402
03	402	word	Change target 0.1%	Read/Write	Change target position, 1000=full
	502	Bit0	Fw pos reached	Read	-
		Bit1	Fw overcurrent	Read	-
		Bit2	Fw pause	Read	-
		Bit3	Rv pos reached	Read	-
		Bit4	Rv overcurrent	Read	-
		Bit5	Rv pause	Read	-
		Bit6	Fault overcurrent	Read	-
		Bit9	Voltage abnormal	Read	-
		Bit12	Lock Fw pos reached	Read	-
		Bit13	Lock Fw fault	Read	-
		Bit14	Lock Rv pos reached	Read	-
		Bit15	Lock Rv exception	Read	-
	503	word	Pos feedback 0.1%	Read	Based on opening time
	504	word	Speed feed rpm	Read	-
	505	word	Current feed mA	Read	-

PRODUCT DATASHEET

Addressable System: I/O Module

Suitable for addressable window applications

Technical Specs

I/O Module

Power supply: 24Vdc +/-25%

Input: 4x Universal (configurable)

FollowME input: 24V+/-

Output: 2 relay outputs

P/N O/P: Max. 4A@24V

Serial comm: RS485

Protocol: Modbus RTU

Max number on Bus: 5

Address range: 151-155

Operating temp: 0 - 50 °C

Operating RH: 5-90% (non-condensing)

Attention: The unit does not have built-in lightning protection or isolation mechanism. If the RS485 network cable runs over long distances or passes through outdoor areas prone to lightning strikes, additional lightning protection devices must be installed. If the devices on the RS485 network do not share a common ground, isolation devices must be added.

Comm Protocol Definition

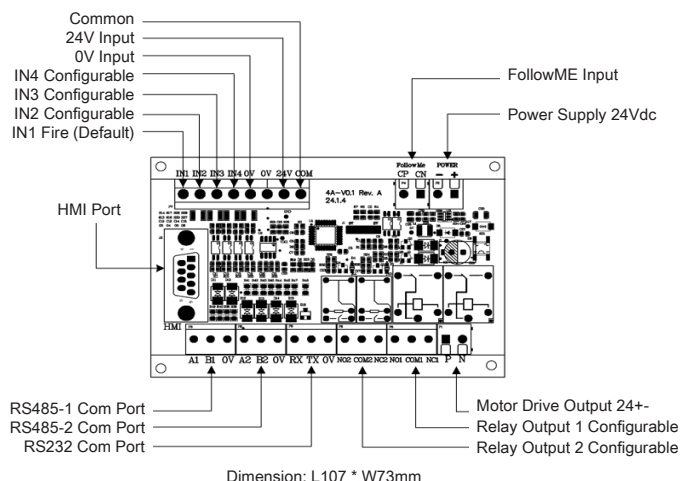
Fn Code	Add.	Bit	Description	Type
03	2	Bit0	Input 1	Read
		Bit1	Input 2	Read
		Bit2	Input 3	Read
		Bit3	Input 4	Read
		Bit4	Direction CW	Read
		Bit5	Direction CCW	Read
	4	Bit0	O/P +24V	Read
		Bit1	O/P -24V	Read
		Bit2	O/P 1	Read
06,16	204	Word	Station#	R/W
	209	Word	Comm paras	R/W
	406	Bit0	DO 1	R/W
		Bit1	DO 2	R/W
	407	word	0:No, 1:+24v, 2:-24v	R/W

Description

This module is a key component of the node controller, serving as a bridge between the control panel and field devices. Additionally it can function as an independent device within the bus. The module features 4 universal inputs and 2 relay outputs. The inputs can be configured in the panel as either 24dc signal (polarity insensitive) or dry contacts. Each input and output has a unique address displacement in the system. Furthermore, this module can interface with conventional actuators using P/N port, adding to its versatility.

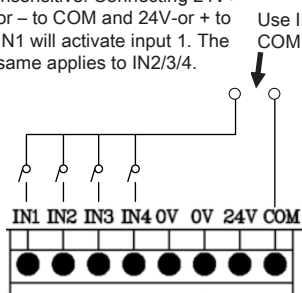


Configuration and Wiring



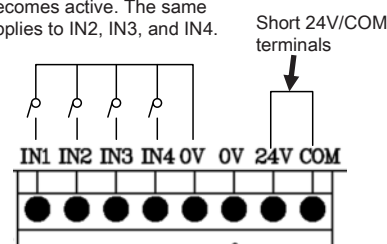
Configuring Inputs as 24Vdc signal

The inputs are polarities insensitive. Connecting 24V+ or - to COM and 24V- or + to IN1 will activate input 1. The same applies to IN2/3/4.



Configuring Inputs as dry contact signal

By default, the input is active when closed. e.g. If 0V and IN1 are shorted, input 1 becomes active. The same applies to IN2, IN3, and IN4.



PRODUCT DATASHEET

Addressable System: Modbus Interface Module

Suitable for addressable window applications

Technical Specs

Modbus Interface Module

Power supply: 24Vdc +/-25%

(Polarity insensitive)

Input: 3x dry contact (NO)

FollowME Input*: 24V +/- 6V

P/N O/P: 3A or 5A@24V optional

Serial comm: RS485

Protocol: Modbus RTU

Max number on Bus: 30+20

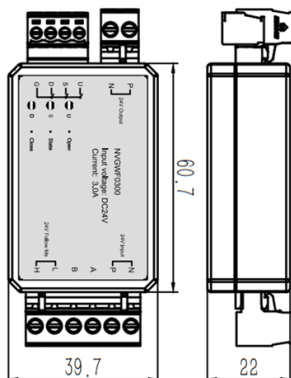
Address range: 1-50 (same as window)

Operating temp: 0 - 50 °C

Operating RH: 5-90% (non-condensing)

Ingress Protection: IP20

*By default (v5102), FollowME signal takes highest priority over bus commands while button operations holds the lowest priority. Optional versions are available for special applications such as using 24V power supply as FollowME input (v6102) or using inputs as "Position reached" feedback (v7102). Please consult supplier for details.

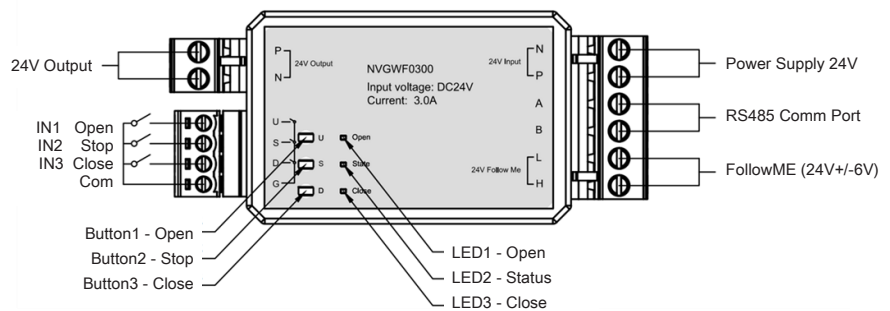


Description

This module is a standard Modbus device designed for addressable systems to integrate with conventional actuators (non-addressable) to enhance system compatibility. Its slim design allows for easy installation within window profiles. Built-in buttons and LED indicators facilitate field control and monitoring.



Configuration and Wiring



LED Definition: LED1 On - Open; LED2 On - Close; LED3 - Status indicated as below

Flash once	Forward position reached	Flash 6 times	Reverse pause
Flash twice	Forward overcurrent	Flash 7 times	Drive overcurrent
Flash 3 times	Forward pause	Flash 8 times	Hall error
Flash 4 times	Reverse position reached	Flash 9 times	Synchronization timeout
Flash 5 times	Reverse overcurrent	Flash 10 times	Voltage abnormal

Communication Protocol Definition

Function Code	Address	Bit	Description	Type	Remarks
06 or 16	401	Bit0	Open	Read/Write	Write 1 to open
		Bit1	Close	Read/Write	Write 1 to close
		Bit2	Stop	Read/Write	Write 1 to stop
03	502	Bit0	Fw pos reached	Read	-
		Bit1	Fw overcurrent	Read	-
		Bit2	Fw pause	Read	-
		Bit3	Rv pos reached	Read	-
		Bit4	Rv overcurrent	Read	-
		Bit5	Rv pause	Read	-
		Bit6	Fault overcurrent	Read	-
		Bit9	Voltage abnormal	Read	-
		Bit10	Opening	Read	-
		Bit11	Closing	Read	-
	503	word	Pos feedback 0.1%	Read	Based on opening time
	505	word	Current feed mA	Read	-
	508	word	Voltage feed mV	Read	-
	6	16 bits	Voltage in mV	Read	Unsigned data
06 or 16	7	16 bits	Current in mA	Read	Unsigned data
	307	16 bits	Open time in 0.1S	Read	Stop counting on max parameter
	308	16 bits	Close time in 0.1S	Read	Stop counting on max parameter
	217	16 bits	Max open time S	Read/Write	Parameter setting
	218	16 bits	Max close time S	Read/Write	Parameter setting

The default comm parameters are 8 data bits, 1 stop bit, even parity and 38.4K baud rate. These parameters can be modified by writing to Address 209. The station number can also be updated by writing the new value to Address 204, followed by writing 1111 to Address 201 to save the change. Restart the device for the changes to take effect.

PRODUCT DATASHEET

Addressable System: Modbus Switch

Suitable for addressable window applications

Technical Specs

Modbus Switch

Power supply: 24Vdc +/-25%

(Polarity insensitive)

Serial comm: RS485

Protocol: Modbus RTU

Max number on Bus: 10

Unique address range: 101-110

Operating temp: 0 - 50 °C

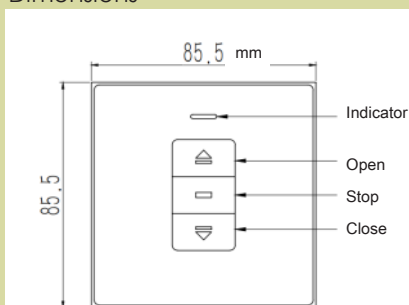
Operating RH: 5-90% (non-condensing)

Ingress Protection: IP20

Comm Protocol Definition

Fn Code	Add.	Bit	Description	Type
03	2	Bit0	Open state	Read
		Bit1	Close state	Read
		Bit2	Stop state	Read
		Bit3	DIP 1 state	Read
		Bit4	DIP 2 state	Read
		Bit5	DIP 3 state	Read
		Bit6	DIP 4 state	Read
		Bit7	DIP 5 state	Read
06 or 16	4	Bit0	LED red	Read
		Bit1	LED green	Read
06 or 16	204	Word	Station#	R/W
	209	Word	Comm paras	R/W

Dimensions

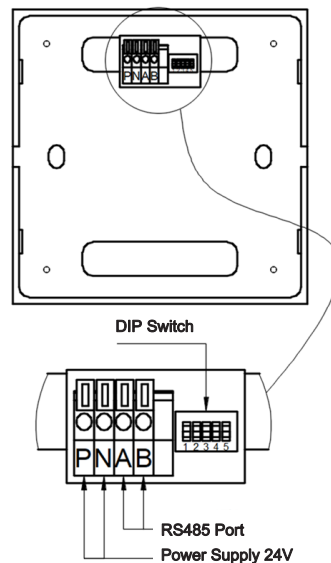


Description

This Modbus switch is designed for dual purpose functionality. It can operate as a standalone conventional switch to control the local window it is subordinate to. More importantly it functions as a Modbus device which can be assigned to any window zones in addressable system, enabling easy control.



Configuration and Wiring



DIP Settings*							
DIP	1	2	3	4	5	Binary	Address
	○	This invalidates other DIPs, it defaults to window address					
	●	●	○	○	○	0001	101
	●	○	●	○	○	0010	102
	●	●	●	○	○	0011	103
	●	○	○	●	○	0100	104
	●	●	○	●	○	0101	105
	●	○	●	●	○	0110	106
	●	●	●	●	○	0111	107
	●	○	○	○	●	1000	108
	●	●	○	○	●	1001	109
	●	○	●	○	●	1010	110

*When DIP 1 is set to Off, DIP 2/3/4/5 are invalid. The switch then uses window actuator's address as its address (master mode). When no zone is assigned to the switch, it directly control the connected window; when a zone is assigned, it controls the assigned zone plus the connected window regardless of whether it is in this zone. When DIP is set to On, DIP 2/3/4/5 become valid, and the switch is assigned its own address as per above table (slave mode). In this scenario, if no zone is assigned to it, it does not control anything. If the state of DIP 1 is changed, the switch must be powered off and restarted for the change to take effect. Changes to DIP 2/3/4/5 take effect immediately without requiring a power reset.

LED Indicator Status

Off	No command received
Red on for 3S, then off	Opening command in progress
Green on for 3S, then off	Closing command in progress
Yellow on for 3S, then off	Stop command in progress
Yellow flashing every 1s for 8 times	Communication error