



Technical Specifications

Power	5V-24V, 1A
Signal	908.42Mhz(US), 868.42Mhz(EU)
Range	Up to 100 feet line of sight between the wireless controller and the Z-Wave IR controller station (282920-200Z).
Serial Port	RS-485
Program button	To include/exclude the Z-wave device.

WARRANTY

Limited One (1) Year Warranty

This warranty does not cover or apply to:

(a) damage to the product due to misuse, mishandling, and abuse, (b) products not used in accordance with manufacturer's instructions or recommendations, (c) product not assembled or installed according to manufacturer's instructions, (d) normal wear and tear, (e) wearing of the cover do to improper installation of cover and goods (f) damage to the contents of the

shelter, (g) permits required due to zoning issues, (h) damage that has occurred during shipping, (i) acts of God. In addition consequential damage and incidental damages, such as damage to persons or property are not coverable under this warranty, and you should refer to your homeowner's insurance policy as with any other outside structure. Note: Some states do not allow the exclusion or limitation of certain damages, and in those cases these limitations do not apply.

Certification Notice

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference that may cause undesired operation.

Order Information:

HSC-45: Standard version

ST-485Z: Integrated version of intercom



Model:2829-485Z V1.0

Z-WAVE ETHERNET/RS-485 BRIDGE

Introduction

The Z-Wave Ethernet/RS-485 bridge (the "BRIDGE") is a multi function IO module of Z-Wave device (Figure 1). It can translate the Ethernet and RS-485 commands into Z-wave commands. In addition, it can be connected to relay board to control up to four channels. We can turn on or turn off all four ports at once by using any Z-wave primary controller. If we need to control the individual channel, a scene controller is required.



Figure 1 Outlook of the BRIDGE

The BRIDGE can accept input from other Z-wave compatible sensors and relay them to the RS-485/ Ethernet network.

The BRIDGE has additional built-in Ethernet port. It provides CGI interface so that it can be integrated to any products with browser.

The BRIDGE provides the following functions,

Z-wave to RS-485 bridge

When it receives the input change from other Z-wave device, bridge it to the RS-485.

Z-wave to IP bridge

When it receives the input change from other Z-wave device, bridge it to the IP.

Four channel network IO server.

When the status of any input changes, bridge to the IP port.

RS-485/IP to Z-wave bridge

Control the Z-wave devices from IP/RS-485.

Support learning mode which allow us to define the 485 command to send BASIC_SET.

Please note that all Z-Wave devices, light switches, dimmers, and shutter switches made from various vendors are compatible with your "Z-Wave AV Scenario Remote" (the "REMOTW", Model no.: 172820-100Z) as long as they carry the Z-Wave logo:



Installation

Press and release the program button of bridge will be the device into learning mode. If you are using REMOTE, please follow the below steps. Otherwise, please refer to the instruction sheet of your controller for the details.

Please open the configuration compartment then you can see the Remote setup keys (Figure 2).

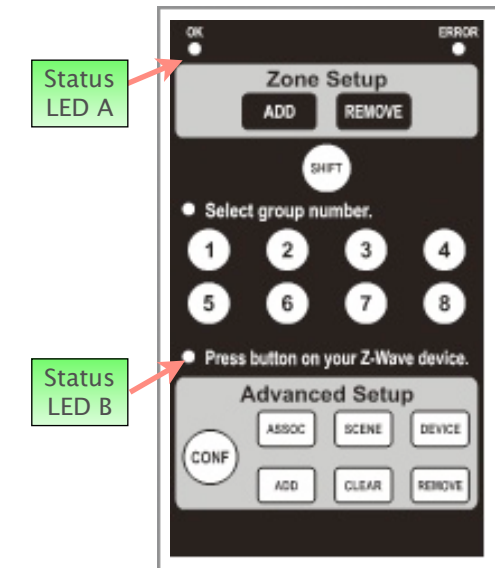


Figure 2 Setup Keys of the REMOTE

Inclusion		
Step	Setup Key	Setup LED Behavior
1	Press ADD	The OK LED turns on
2	Press DEVICE	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED B blinks slowly
3	Press and release the program button of the BRIDGE	<ul style="list-style-type: none"> • OK LED blinks once then turns off • LED B off Device inclusion completed

Exclusion		
Step	Setup Key	Setup LED Behavior
1	Press CLEAR	The OK LED turns on
2	Press DEVICE	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED B blinks slowly
3	Press and release the program button of the BRIDGE	<ul style="list-style-type: none"> • OK LED blinks once then turns off • LED B off Device Exclusion completed

Digital Output Mode

If the configuration #1 is 1, the bridge is in the output mode. Under this mode, the four output port become usable and the four input port must be disconnected to any wire.



Digital Input port must be disconnected to any wire

Figure 3 Digital Output Mode

Under the digital output mode, the BASIC is mapped to scene switch binary. It will turn on all ports when it receive (BASIC_SET,99) or (BASIC_SET,255) and turn off all ports when it receive (BASIC_SET,0).

The Bridge supports eight scenes as below.

Scene ID	Function
1	Output #1 off
2	Output #1 on
3	Output #2 off
4	Output #2 on
5	Output #3 off
6	Output #3 on
7	Output #4 off
8	Output #4 on

If you are using "REMOTE", please follow the below steps. Otherwise, please refer to the manual of your scene controller.

"REMOTE" Scene Setup

Adding Device to A Scene		
Step	Setup Key	Setup LED Behavior
1	Press ADD	The OK LED turns on
2	Press SCENE	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED A blinks slowly
3	Select a scene number from 1 to 16 (1-8 or SHIFT 1-8)	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED A off • LED B blinks slowly
4	Press the program button on the target device	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED B keep blinking slowly
5	Adjust the target device on/off or dim level with its program button, to the desired status	
6	Press SCENE	<ul style="list-style-type: none"> • OK LED blinks once then turns off • LED B off The current status of the device will be learned and saved to a scene successfully.

Remove Device from A Scene		
Step	Setup Key	Setup LED Behavior
1	Press REMOVE	The OK LED turns on
2	Press SCENE	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED A blinks slowly
3	Select a scene number from 1 to 16 (1-8 or SHIFT 1-8)	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED A off • LED B blinks slowly
4	Press the program button on the target device	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED B keep blinking slowly <p>Device removed from the scene successfully</p>

Deleting A Scene		
Step	Setup Key	Setup LED Behavior
1	Press CLEAR	The OK LED turns on
2	Press SCENE	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED A blinks slowly
3	Select a scene number from 1 to 16 (1-8 or SHIFT 1-8)	<ul style="list-style-type: none"> • OK LED blinks once and stays on • LED A off <p>Scene deleted from the scene successfully</p>

Note: If the ERROR LED turns on or blinks, meaning the setup process is failed. Please redo the process.

Digital Input Mode

If the configuration parameter #1 is 0, the device is in the input mode. This is the default mode. Under this mode, the output port should be disconnected and only the input port can be used.



Digital output port must be disconnected to any wire

Figure 4 Digital Input Mode

Under the input mode, if any of inputs changes, BRIDGE will keep track for the status change and send the status report when it is polled by the RS-485 or Ethernet.

RS-485 Learning Mode

The BRIDGE can be controlled by the RS-485 command to send the Z-Wave commands.

We need to define the Z-wave node ID and the value for each RS-485 commands. The format of each RS-485 command is

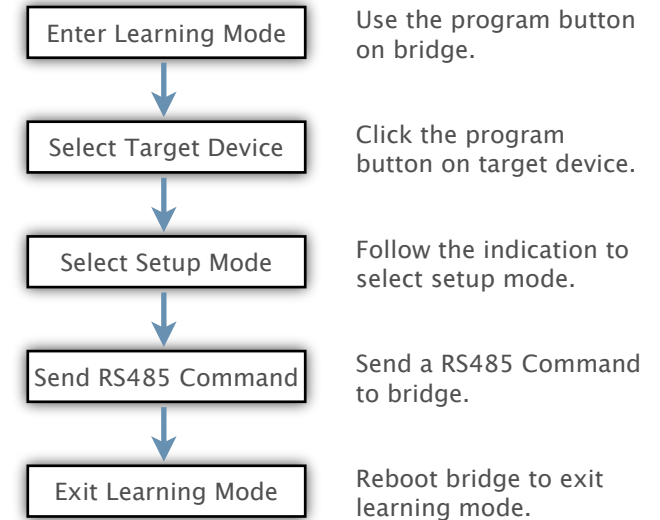
		len	cmd	RS-485 Command				
C0	ID	9	27	dev	port	val	CS	C1

In the learning mode, all ports will become output mode. It's recommended to unplug the terminal block if you are not sure your device is safe to this change.

The (dev,port) is used to define an external UI entity. We can use the setup flow in the following section to define the actions which will be executed when a RS-485 command is received.

The definition of the val field is different for different mode. Please refer to the sections below for their definition.

Standard Setup Flow



By default, the BRIDGE will in the switch mode. We can switch to other modes by the following methods.

Switch2 mode

Send Multi-instance command to control the second channel of a device.

IR mode

Send a simple AV command from the REMOTE to the bridge

Sensor mode and Curtain mode

Press the program button to cycle between switch, sensor and curtain mode.

Capture mode

Capture the current status of all devices associated to a certain (dev,port) pair.

Local port mode

Report the current status of the digital input ports .

Local button mode

Define the command which will be sent when one of the input port is triggered.

Scene mode

Send a scene activation set command from REMOTE to BRIDGE.

Please refer to the latter section for the details of each mode.

Switch Mode

This mode will define a command to send BASIC command to a Z-Wave device.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only
3	Press the program button on the target device	<ul style="list-style-type: none">• LED 1 stays on• LED 2 turns on
4	Send a corresponding RS-485 command	<ul style="list-style-type: none">• LED 1~4 blinking 3 times• LED 1 stays on
5	Reboot BRIDGE	

Switch2 Mode

This mode will define a command to send BASIC command to the second channel of a Z-Wave device.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only

3	Press the program button on the target device	<ul style="list-style-type: none">• LED 1 stays on• LED 2 turns on
4	Press and hold the program button of bridge.	<ul style="list-style-type: none">• LED blink once
5	Send a corresponding RS-485 command	<ul style="list-style-type: none">• LED 1~4 blinking 3 times• LED 1 stays on
6	Reboot BRIDGE	

Sensor Mode

This mode will enable the BRIDGE to capture the status of a sensor. These sensor status will be sent to the RS-485 device periodically.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only
3	Press the program button on the target device	<ul style="list-style-type: none">• LED 1 stays on• LED 2 turns on
4	Press the program button on bridge again	<ul style="list-style-type: none">• LED blink once
5	Send a corresponding RS-485 command	<ul style="list-style-type: none">• LED 1~4 blinking 3 times• LED 1 stays on
6	Reboot BRIDGE	

Curtain Mode

This mode will define a command to send SWITCH_MULTILEVEL command to Z-wave devices. It can be used to send

Set position

SWITCH_MULTILEVEL_SET when val is between 0 and 99

Open,close

SWITCH_MULTILEVEL_START_LEVEL_CHANGE

- Direction is up when val is 128
- Direction is down when val is 129

Stop

SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE when the val is 130

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only
3	Press the program button on bridge 2 times	<ul style="list-style-type: none">• All LED turn off
4	Send a corresponding RS-485 command	<ul style="list-style-type: none">• LED 1~4 blinking 3 times• LED 1 stays on
5	Reboot BRIDGE	

IR Mode

In this mode, we will define a command to send SIMPLE_AV_SET command to Z-wave devices. We can use it send control any IR-capable AV devices, such as TV, stereo, or air conditioner.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only
3	Press the program button on HSK-200Z	<ul style="list-style-type: none"> • LED 1 stays on • LED 2 turns on
4	Send an AV command from HSK-100Z(*1)	<ul style="list-style-type: none"> • LED 1 stays on • LED 2 turns off • LED 3 turns on
5	Send a corresponding RS-485 command	<ul style="list-style-type: none"> • LED 1~4 blinking 3 times • LED 1 stays on
6	Reboot BRIDGE	

*1 If the dev is 0x35-0x38, the step 4 is optional.

Delete Mode

In this mode, we can clear the commands from the bridge.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on

2	Release program button	LED 1 stays on only
3	Press and Hold program button for more than 4 seconds	LED 1~3 turns on
4	Send a corresponding RS-485 command	<ul style="list-style-type: none"> • LED 1~4 blinking 3 times • LED 1 stays on
5	Reboot BRIDGE	

Capture mode

In this mode, we can capture the current status for all devices that are associated with a RS-485 command. In this way, we can define a scene. After this procedure, when the RS-485 command is received by the BRIDGE, it will ignore the val field and then use the value captured in the capture mode instead.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only
3	Press the program button	LED1 is off and LED2 is on
4	Send a corresponding RS-485 command	LED1-LED3 will start blinking until all states are captured.
5	Reboot BRIDGE	

Local button mode

Under this mode, we can define a command which is triggered by the local digital input port. We can connect any on/off button to the digital input port so that we can turn on/off devices according to the status of the digital input port.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only
3	Press the program button	LED1 is off and LED2 is on
4	Press the program of the device.	<ul style="list-style-type: none"> • LED blinking • LED1 is on and others are off.
5	Reboot BRIDGE	

Local input mode

Under this mode, the status of the local port will be reported to the Ethernet/RS485 by using the (dev,port) captured.

Step	Setup Key	Setup LED Behavior
1	Press and Hold program button for more than 4 seconds	LED 1~4 turn on
2	Release program button	LED 1 stays on only
3	Press the program button	LED 1 is off and LED2 is on

4	Press the program button	<ul style="list-style-type: none"> • LED1–LED3 will turn on.
5	Send a corresponding RS-485 command	<ul style="list-style-type: none"> • LED 1~4 blinking 3 times • LED 1 stays on
6	Reboot BRIDGE	

Capture the RS-485 command

Now, we need to send the RS-485 command from the RS-485 controller. Please refer to the RS-485 controller's manual for the instruction to send the RS-485 command.

After we receive the RS-485 command successfully, all LEDs will blink for a couple of times to indicate the learning is successful. Then the IO1 LED will stay on to indicate that the device is ready for the next binding.

The bridge support up to 64 bindings.

Leave learning mode

Unplug the power and put it back. The device will return to the normal mode.

Actions for each mode

After we learn the actions for the RS-485 commands, the bridge will do the captured action when it receives the same RS-485 commands in the future. The following table describes the commands sent in each mode.

The val is the val field of the command 0x27.

Switch	When we received the RS-485 command, the (BASIC_SET,val) will be sent to the captured Z-wave devices.
Switch2	When we received the RS-485 command, the (BASIC_SET,val) will be sent to the second channel of the captured Z-wave devices.

Sensor	We will record the BASIC_SET signal from the captured Z-wave devices and put it in the status buffer which can be polled by RS-485 or Ethernet latter.
Curtain	When we receive the RS-485 command, the BASIC command will be sent according to the following table.
IR	When we receive the 485 command, the captured SIMPLE_AV_CONTROL_SET command will be sent to the captured Z-wave device. If the dev is 0x35-0x38, we will send key 6,7,8 and 9.
Scene	When we receive the RS-485 command, the captured SCENE_ACTIVATION_SET command will be sent to the captured Z-wave devices.

Ethernet Support

The BRIDGE provides CGI interface for the following functions.

- Include/Exclude devices.
- Send BASIC GET/SET command
- Send Configuration command
- Send Association command
- Get routing table

Please look at the bridge CGI reference manual, which is available at [2829-485z-CGI-reference.PDF](#).

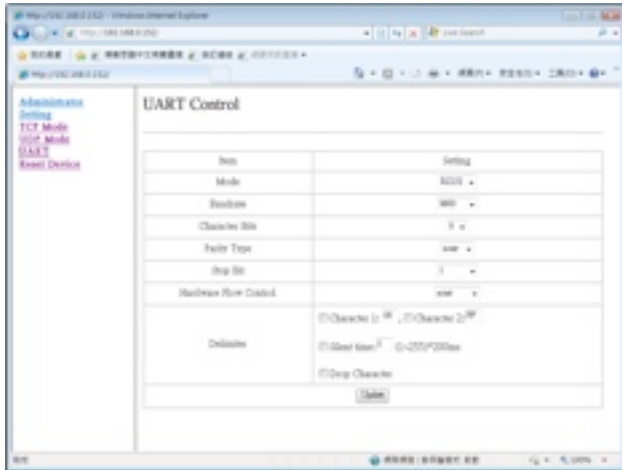
Configuration

The bridge has the following configuration.

Parameter	Description
1	Device Mode: 0: input mode 1: output mode Default : 0
2	The polling interval. The unit is 10ms. The valid range is 10-255.
3	The serial port mode. 0: 232/IP mode at 9600 8N1 2: 232/IP mode at 115200 8N1 80: 485 mode at 9600 8N1 82: 485 mode at 115200 8N1

(5) UART

The UART Control provides R-S-232, RS-422 and RS485 modes, and set the baud rate. The default value is RS-232 and 115200 baud rate.



(7) User Interface

You can use this friendly web UI to control all your home systems, e.g. lighting, thermostat, door access, window shades, security monitoring, A/V equipment, etc.



(6) Reset Device



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