

CRISTAL

CCSW-BN

User Manual

Version 2.1.0 - 2026-10-21



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1 Overview

1.1 General Description



CCSW-BN network wall switch

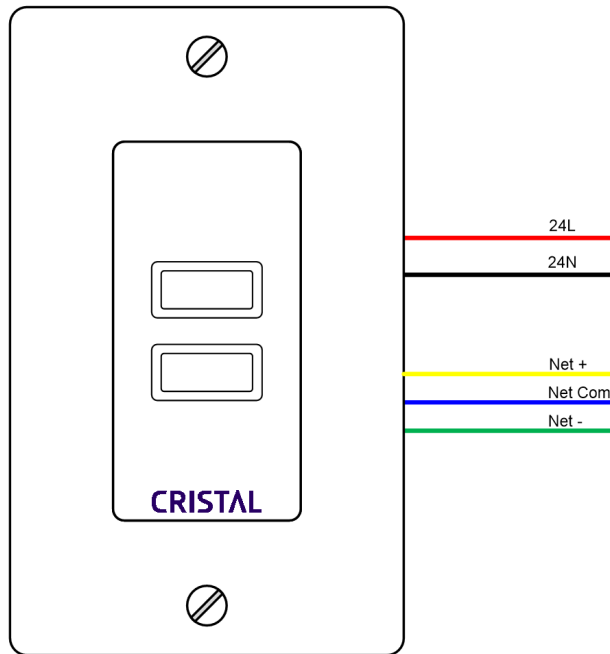
The CCSW-BN networked wall switch by Cristal Controls has been designed to transmit commands on a BACnet MS/TP network. It connects natively to a BACnet MS/TP network and is compatible with any BACnet device or controller, making it suitable for both small and large-scale projects.

The wall switch controls up to four logical dimmers and can share their levels with other switches and controllers on the network. When used with Cristal Controls dimming panels, its LEDs indicate the current dimming level.

1.2 Features

- Native BACnet MS/TP, compatible with any BACnet device or controller.
- Supports subscription with the BACnet Change of Value (COV) service.
- Designed to fit standard Decora-style light switch plate covers.
- Available in 2-button and 4-button versions.
- Switches can be configured in groups so several switches follow each other.
- LEDs indicate dimming levels when used with Cristal Controls dimming panels.
- LEDs can be controlled over BACnet to display on/off states or blink patterns.

2 Installation



CCSW-BN terminal connections

ELECTRICAL RISK

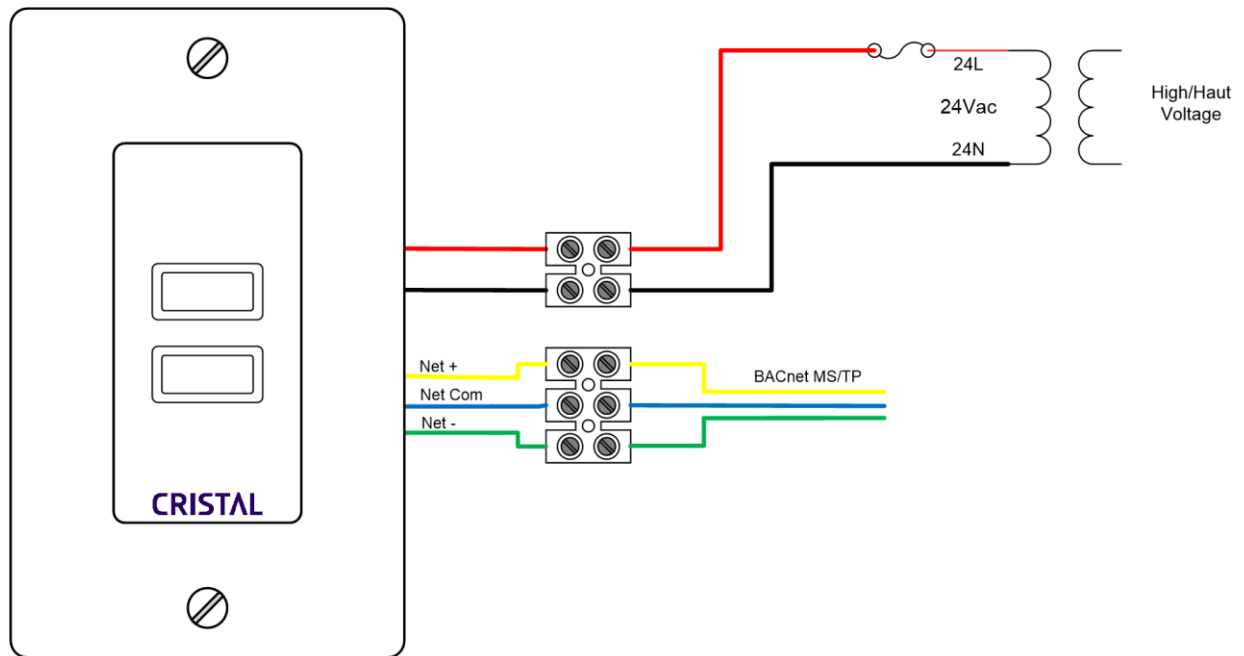
Turn off the power supply before the beginning of the installation. Otherwise, it can cause electrical shocks and damage the equipment.

2.1 Terminal identification

Signal	Description
24L	Positive (hot) power supply input terminal.
24N	Negative (neutral) power supply input terminal.
Net +	RS-485 communication, positive terminal.
Net Com	RS-485 communication, common.
Net -	RS-485 communication, negative terminal.

2.2 Connections

2.2.1 Wiring



CCSW-BN wiring diagram

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3 Software Algorithm

The wall switch allows control of lights and other controllers via the BACnet network.

3.1 Button

The functions of the physical buttons are configurable. When a button is pressed, the associated logical dimmer acts according to the configuration.

3.2 Dimmer

The wall switch integrates four (4) logical 0-100% dimmers. Any physical button of the wall switch can be associated with any dimmer.

3.3 LED Indicators

Each button has a backlight LED. By default the LED follows the local dimmer feedback, but it can also be controlled over the BACnet network.

For each LED, the wall switch provides an INDICATOR Binary Value object for simple on/off control and an INDICATOR PATTERN Multi-State Value object to select a behavior such as a blink or a pulse. When the network writes to either object, it takes control of that LED; the last write wins. Setting the INDICATOR PATTERN back to **Auto** releases the LED so it resumes following the local dimmer feedback.

While the wall switch is being identified, the network control of the LEDs is suspended so the identification can be seen clearly.

3.4 Notification

When the current dim level of a dimmer is modified from a button, the wall switch can send a notification to the lights or the controllers.

3.4.1 COV

The wall switch sends a BACnet COV notification, ConfirmedCOVNotification, message to the subscribed controller.

3.4.2 Write Property

When a change in the dimmer current value occurs, the wall switch can write the new value with the BACnet WriteProperty service to the configured object of the controller.

3.4.3 Write Group

The wall switch can send a BACnet WriteGroup message to the configured destination.

Each dimmer has a (1) associated Channel object and up to three (3) Control Groups. Only the first Control Group is used to send the notification with WriteGroup, but WriteGroup messages are received for all three (3) Control Groups.

When there are multiple wall switches in a zone, we might want them to follow each other, so that the dimmer value is the same on all wall switches of the zone. This way the LED indicator shows the correct value for all wall switches. For this, they must use the same Channel and Control Group numbers.

Presently this wall switch is the only product from Cristal Controls to support the BACnet WriteGroup service and the Channel object.

3.4.4 Polling

An external controller can read the current value of the dimmer with the BACnet services ReadProperty and ReadPropertyMultiple.

3.5 Settings

The wall switch settings are done using the **Config.bin** file available from the BACnet network. This BACnet file is changed with the BACnet Browser software.

4 BACnet MS/TP

The wall switch uses the BACnet MS/TP communication protocol on an RS-485 physical link. For advanced settings, you need BACnet Browser software on BACnet MS/TP.

4.1 BACnet Specifications

Parameter	Value
Data link layer	BACnet MS/TP (RS-485)
Protocol version	1
Protocol revision	13
Vendor name	Cristal Controles
Vendor identifier	263
Default device ID	30
Default device name	CCSW-BN
Max APDU length	480 octets
Segmentation	None
Baud rates	9600 to 230400 bps (default 38400)
MAC address	0 to 255 (default 127)
Max Master	0 to 127 (default 127)
Max Info Frames	1 to 255 (default 2)
COV subscriptions	Up to 8 per object

4.1.1 BACnet Services

List of available BACnet services.

BACnet Service	Initiate	Execute
I-Am	x	
Who-Is		x
Who-Has		x
ReadProperty		x
WriteProperty	x	x

BACnet Service	Initiate	Execute
DeviceCommunicationControl		x
ReinitializeDevice		x
AtomicReadFile		x
AtomicWriteFile		x
SubscribeCOV	x	x
ConfirmedCOVNotification	x	x
UnconfirmedCOVNotification	x	x
WriteGroup	x	x

4.1.1.1 COV (Change of Value)

COV subscription is supported for the Analog Input and Binary Input objects.

4.2 RS-485 Network

All RS-485 networks must have a terminating resistor installed. The wall switch has a built-in termination resistor. Therefore, if it is installed at the end of an RS-485 network, the Term. jumper must be activated. The Cristal Controls CC-BIAS can be used to terminate an RS-485 network.

(Call Cristal Controls to order a CC-BIAS).

For more RS-485 network information, refer to the Cristal Controls “Setting up a RS-485 Network” manual. Go to our web site or call customer service to get a PDF copy.

4.3 Objects

The following table lists the BACnet objects exposed by the wall switch, along with their instance, value range, and default value.

Object	Instance	Name	Min Value	Max Value	Default	Description
Device		CCSW-BN	0	4194302		
AI	1	DIMMER FB 1	0.0%	100.0%		Dimmer 1 Feedback
AI	2	DIMMER FB 2	0.0%	100.0%		Dimmer 2 Feedback
AI	3	DIMMER FB 3	0.0%	100.0%		Dimmer 3 Feedback
AI	4	DIMMER FB 4	0.0%	100.0%		Dimmer 4 Feedback
AO	1	DIMMER CMD 1	0.0%	100.0%		Dimmer 1 Command

Object	Instance	Name	Min Value	Max Value	Default	Description
AO	2	DIMMER CMD 2	0.0%	100.0%		Dimmer 2 Command
AO	3	DIMMER CMD 3	0.0%	100.0%		Dimmer 3 Command
AO	4	DIMMER CMD 4	0.0%	100.0%		Dimmer 4 Command
BI	1	BUTTON TOGGLE 1	0 = inactive	1 = active	0 = inactive	Toggle when button 1 is pressed
BI	2	BUTTON TOGGLE 2	0 = inactive	1 = active	0 = inactive	Toggle when button 2 is pressed
BI	3	BUTTON TOGGLE 3	0 = inactive	1 = active	0 = inactive	Toggle when button 3 is pressed
BI	4	BUTTON TOGGLE 4	0 = inactive	1 = active	0 = inactive	Toggle when button 4 is pressed
BI	101	BUTTON STATE 1	0 = inactive	1 = active	0 = inactive	Current button state
BI	102	BUTTON STATE 2	0 = inactive	1 = active	0 = inactive	Current button state
BI	103	BUTTON STATE 3	0 = inactive	1 = active	0 = inactive	Current button state
BI	104	BUTTON STATE 4	0 = inactive	1 = active	0 = inactive	Current button state
BV	1	OCCUPIED MODE 1	0 = inactive	1 = active	1 = active	Occupied mode for dimmer 1
BV	2	OCCUPIED MODE 2	0 = inactive	1 = active	1 = active	Occupied mode for dimmer 2
BV	3	OCCUPIED MODE 3	0 = inactive	1 = active	1 = active	Occupied mode for dimmer 3
BV	4	OCCUPIED MODE 4	0 = inactive	1 = active	1 = active	Occupied mode for dimmer 4
BV	1001	NETWORK BUTTON 1	0 = released	1 = pressed	0 = released	Network button state 1
BV	1002	NETWORK BUTTON 2	0 = released	1 = pressed	0 = released	Network button state 2
BV	1003	NETWORK BUTTON 3	0 = released	1 = pressed	0 = released	Network button state 3

Object	Instance	Name	Min Value	Max Value	Default	Description
BV	1004	NETWORK BUTTON 4	0 = released	1 = pressed	0 = released	Network button state 4
BV	1101	NETWORK OCCUPANCY 1	0 = inactive	1 = active	0 = inactive	Network occupied mode for dimmer 1
BV	1102	NETWORK OCCUPANCY 2	0 = inactive	1 = active	0 = inactive	Network occupied mode for dimmer 2
BV	1103	NETWORK OCCUPANCY 3	0 = inactive	1 = active	0 = inactive	Network occupied mode for dimmer 3
BV	1104	NETWORK OCCUPANCY 4	0 = inactive	1 = active	0 = inactive	Network occupied mode for dimmer 4
BV	2001	INDICATOR 1	0 = inactive	1 = active	0 = inactive	LED indicator 1
BV	2002	INDICATOR 2	0 = inactive	1 = active	0 = inactive	LED indicator 2
BV	2003	INDICATOR 3	0 = inactive	1 = active	0 = inactive	LED indicator 3
BV	2004	INDICATOR 4	0 = inactive	1 = active	0 = inactive	LED indicator 4
MSV	2001	INDICATOR PATTERN 1	1	9	1 = Auto	LED indicator pattern 1
MSV	2002	INDICATOR PATTERN 2	1	9	1 = Auto	LED indicator pattern 2
MSV	2003	INDICATOR PATTERN 3	1	9	1 = Auto	LED indicator pattern 3
MSV	2004	INDICATOR PATTERN 4	1	9	1 = Auto	LED indicator pattern 4
CH	1	CHANNEL 1				Channel for dimmer 1
CH	2	CHANNEL 2				Channel for dimmer 2
CH	3	CHANNEL 3				Channel for dimmer 3
CH	4	CHANNEL 4				Channel for dimmer 4
FILE	0	Config.bin	-	-	-	Configuration file

Object	Instance	Name	Min Value	Max Value	Default	Description
FILE	1	ConfigNetwork.bin	-	-	-	Network configuration file
FILE	2	Flash.bin	-	-	-	Flash memory

4.3.1 Binary Input - Button Toggle

The BUTTON TOGGLE Binary Input objects flip their state (active to inactive, or inactive to active) each time the corresponding physical button is pressed. These objects are read-only. Updates stop when the button is disabled through the Command_Allowed property.

4.3.2 Binary Input - Button State

The BUTTON STATE Binary Input objects reflect the live state of each physical button: active while the button is pressed and inactive while it is released. These objects are read-only. Updates stop when the button is disabled through the Command_Allowed property.

4.3.3 Binary Value - LED Indicator

The INDICATOR Binary Value objects provide a simple on/off command for each button LED. Writing active turns the LED on and writing inactive turns it off. The INDICATOR and INDICATOR PATTERN objects control the same LED independently; the most recent write wins. To release the LED back to the local dimmer feedback, set the corresponding INDICATOR PATTERN to Auto.

4.3.4 Multi-State Value - LED Indicator Pattern

The INDICATOR PATTERN Multi-State Value objects set how each button LED behaves. The accepted values are as follows.

Value	Pattern	Description
1	Auto	The LED follows the local dimmer feedback (default).
2	Manual	The LED holds its current level and ignores the dimmer feedback.
3	Off	The LED is turned off.
4	On	The LED is turned on.
5	Single Pulse	The LED briefly toggles once, then returns to Manual.
6	Double Pulse	The LED briefly toggles twice, then returns to Manual.

Value	Pattern	Description
7	Slow Blink	The LED indefinitely blinks slowly.
8	Fast Blink	The LED indefinitely blinks quickly.
9	Wink	The LED indefinitely stays on and briefly winks off at regular intervals.

4.4 Properties

4.4.1 Device

Property Identifier	Property ID	Property Datatype	Conformance Code
MSTP_MAC_Address	512	Unsigned	W
MSTP_Baudrate	513	Unsigned	W
Identify_BlinkLED	702	Unsigned	W
Identify_Timeout	703	Unsigned	W
System_Info_Reset_Reason	900	Unsigned	R
System_Info_Temperature	901	REAL	R
System_Info_Voltage	902	REAL	R
System_Info_Uptime	903	Unsigned	R

4.4.1.1 MSTP_MAC_Address

The MS/TP MAC address. The accepted values are between 0 and 255. The default value is 127.

4.4.1.2 MSTP_Baudrate

The MS/TP baud rate. The default value is 2 (38400 bps). The accepted values are as follows.

Value	Description
0	9600
1	19200
2	38400
3	57600

Value	Description
-------	-------------

4	76800
---	-------

5	115200
---	--------

6	230400
---	--------

4.4.1.3 Identify_BlinkLED

Used to start and stop the identification. During the identification the LEDs flash for the configured time. The accepted values are as follows.

Value	Description
-------	-------------

0	Stop identification
---	---------------------

1	Start identification
---	----------------------

4.4.1.4 Identify_Timeout

The time in seconds during which the identification will be active. The accepted values are between 0 and 1073741823.

4.4.1.5 System_Info_Reset_Reason

The reason for the last reboot.

4.4.1.6 System_Info_Temperature

Allows obtaining the current temperature in degrees Celsius. This temperature value is not calibrated and is provided for informational purposes only.

4.4.1.7 System_Info_Voltage

Allows obtaining the internal supply voltage. This value is normally close to 3.3 volts.

4.4.1.8 System_Info_Uptime

The elapsed time in seconds since the last reboot.

4.4.2 Binary Input

Property Identifier	Property ID	Property Datatype	Conformance Code
Command_Allowed	532	Enumerated	W

4.4.2.1 Command_Allowed

Allows temporarily disabling a button. After a reboot the button is enabled. The accepted values are as follows.

Value	Description
-------	-------------

0	The button is disabled
---	------------------------

Value	Description
3	The button is enabled

4.5 Services

4.5.1 ReinitializeDevice

The wall switch supports the BACnet ReinitializeDevice service. A Coldstart request issued with the factory-default password restores the Outputs configuration (button, dimmer, channel, COV, and occupancy settings) to its factory defaults. Contact Cristal Controls to obtain the password.

5 Configuration

The wall switch can be configured using Cristal Controls “BACnet Browser” application software. This software allows reading and writing the wall switch setting over the BACnet network. The settings can also be saved and read from a file. Here are the different wall switch settings and their uses. This application software is free and is available from the Cristal Controls website.

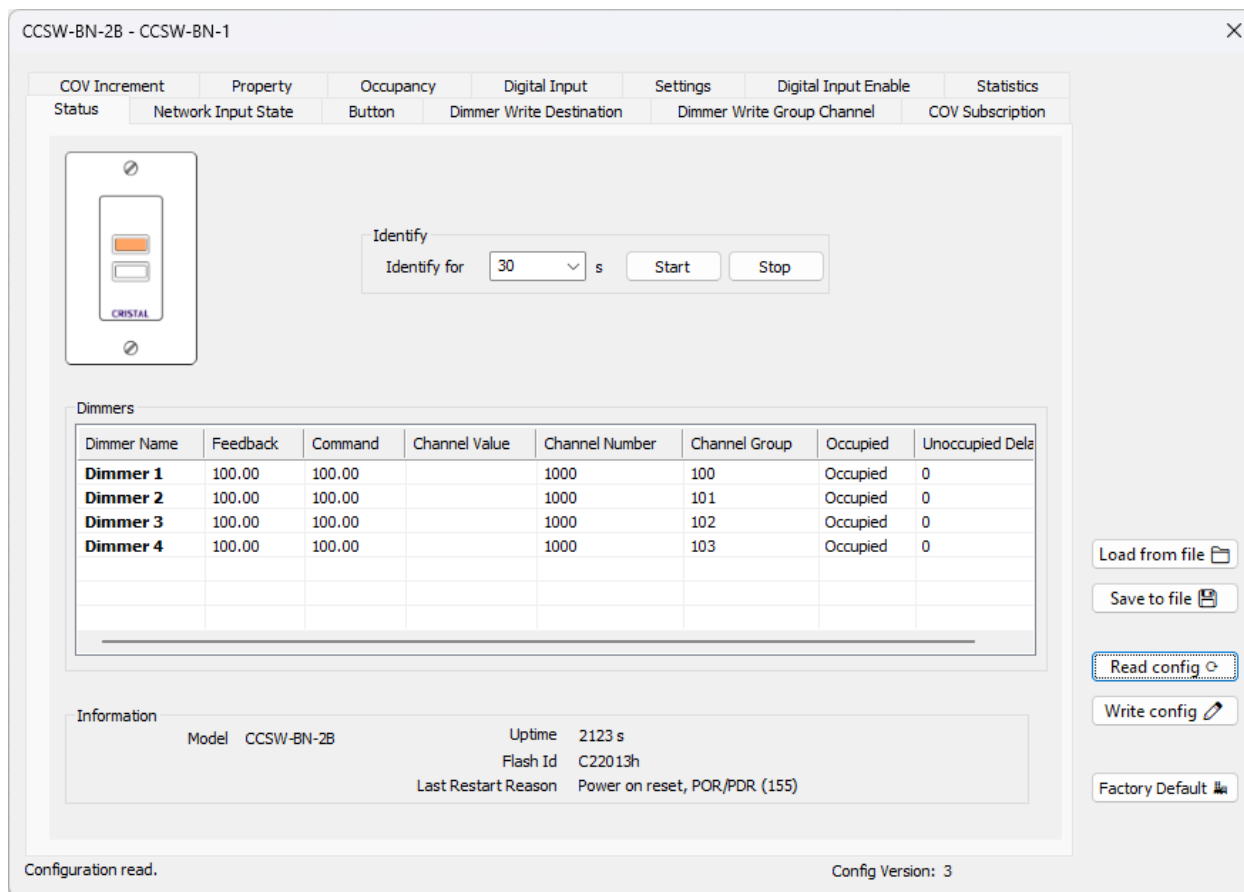
The wall switch can also be used without this software if only basic functionality is needed.

5.1 Configuration buttons

Button	Details
Load from file	Loads a binary configuration file from the computer into the BACnet Browser.
Save to file	Saves the configuration from the BACnet Browser to a binary file on the computer.
Read config	Reads the configuration from the wall switch to the computer.
Write config	Writes the configuration from the computer to the wall switch.
Factory Default	Restores the wall switch configuration to its factory defaults.

The configuration version is shown at the bottom of the window.

5.2 Status



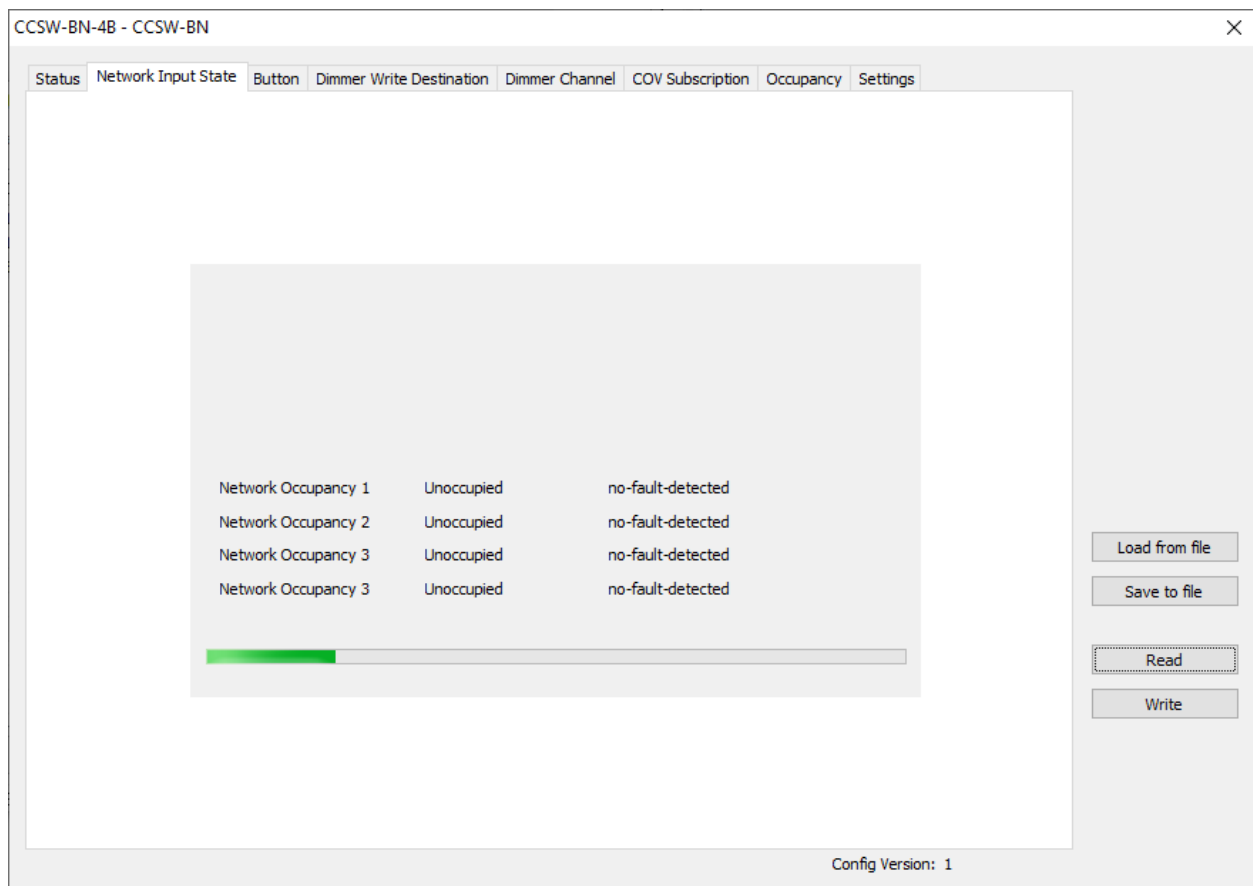
BACnet Browser Status window

This window provides access to the status of the wall switch.

Item	Explanation
<i>Buttons</i>	Graphic of the wall switch. A button turns orange when the corresponding physical button is pressed.
<i>Identify</i>	Allows the LED to blink to identify the wall switch.
<i>Dimmer 1</i>	States of the dimmer 1.
<i>Dimmer 2</i>	States of the dimmer 2.
<i>Dimmer 3</i>	States of the dimmer 3.
<i>Dimmer 4</i>	States of the dimmer 4.

Item	Explanation
<i>Dimmer X</i>	States in percentage of the dimmer X.
-	
<i>Feedback</i>	
<i>Dimmer X</i>	Current command as a percentage of the dimmer X.
-	
<i>Command</i>	
<i>Dimmer X</i>	Present Value of the Channel object associated with the dimmer X.
- <i>Channel Value</i>	
<i>Dimmer X</i>	Channel number of the Channel object associated with the dimmer X.
- <i>Channel Number</i>	
<i>Dimmer X</i>	Control Groups of the Channel object associated with the dimmer X.
- <i>Channel Group</i>	
<i>Dimmer X</i>	Indicates whether the dimmer is in occupied or unoccupied mode.
-	
<i>Occupied</i>	
<i>Dimmer X</i>	Delay in seconds before the Occupied Mode takes into account the
-	changes to the input. Example, this value may adjust the time of a motion
<i>Unoccupied Delay</i>	sensor. It must then be set to minimum as sensor delay is added to this
	delay.
<i>Information</i>	Displays some general information about the wall switch.
<i>n</i>	

5.3 Network Input State



BACnet Browser Network Input State window

This window displays the current states of the network inputs as read by the wall switch. This information is useful when the wall switch reads the BACnet objects from other controllers by itself.

5.4 Button

CCSW-BN-4B - CCSW-BN

Status Network Input State **Button** Dimmer Write Destination Dimmer Channel COV Subscription Occupancy Settings

Button
Button 1

Command Last Level / Up

Value %

Configuration
Press Delay 1000 ms
Press Step Time 500 ms

Destination Local
Enable ☒
Dimmer Dimmer 1

Load from file
Save to file
Read
Write

Config Version: 1

BACnet Browser Button configuration window

This window is to set the actions of the physical buttons.

5.4.1 Button

Select the button being configured.

5.4.2 Configuration

How to set the selected button.

Item	Explanation
<i>Command</i>	Command for the button. See table below.
<i>Value</i>	Percentage or numeric value.
<i>Press Delay</i>	Debounce of the input.
<i>Press Step Time</i>	Time between the resend of the long press command.

5.4.2.1 Command List for buttons

Command	Button function
<i>Undefined</i>	No command / inactive
<i>Direct Value</i>	Pressed = "Value" %
<i>Max Level / Up</i>	Pressed = Max LevelLong Press = Up (repeated)
<i>Last Level / Up</i>	Pressed = Last LevelLong Press = Up (repeated)
<i>Off / Down</i>	Pressed = OffLong Press = Down (repeated)
<i>Recall Max Level</i>	Pressed = Recall Max Level
<i>Recall Min Level</i>	Pressed = Recall Min Level
<i>Off</i>	Pressed = Off

5.4.3 Destination Local

Item	Explanation
<i>Enable</i>	Indicates if the button affects a dimmer.
<i>Dimmer</i>	Indicates the dimmer affected by the button.

5.5 Dimmer Write Destination

CCSW-BN-2B - CCSW-BN-1

COV Increment Property Occupancy Digital Input Settings Digital Input Enable Statistics
Status Network Input State Button Dimmer Write Destination Dimmer Write Group Channel COV Subscription

Dimmer
Dimmer 1

Increment 1.00

Write Property

Enable ☐

Device ID

Object Type

Object Instance

Property Identifier

Priority 8

Write CCLP Group Input

Enable ☐

CAN Address 2

Input Number 1

CAN Gateway 1

Write Group

Enable ☐

Type BACnet Address

Address Network

Address MAC

Device ID

Priority 8

Load from file

Save to file

Read config

Write config

Factory Default

Configuration read. Config Version: 3

BACnet Browser Dimmer Write Destination window

This window allows configuring the writes of the dimmers.

5.5.1 Dimmer

Choice of dimmer to configure.

5.5.2 Increment

The increment of the current value of the dimmer between each write.

5.5.3 Write Property

Configures the destination object for Write Property.

Item	Explanation
<i>Enable</i>	Enable Write Property for the selected dimmer.
<i>Device ID</i>	The Device ID of the destination device.

Item	Explanation
<i>Object Type</i>	Object type to write. Choose between the predefined object type or enter the object type number directly.
<i>Object Instance</i>	Instance number of the object.
<i>Property Identifier</i>	Property identifier to write. Choose between the predefined property identifier or enter the property identifier number directly.
<i>Priority</i>	Priority used by the write.

5.5.4 Write Group

Configures the Write Group destination.

Item	Explanation
<i>Enable</i>	Enable Write Group for the selected dimmer.
<i>Type</i>	The destination type.
<i>Address Network</i>	The network number.
<i>Address MAC</i>	The destination MAC address.
<i>Device ID</i>	The destination device ID.
<i>Priority</i>	Priority used by the write.

5.5.5 Write CCLP Group Input

Configures the CCLP Group Input destination to be sent to Cristal Controls CCLP lighting relay panels.

Item	Explanation
<i>Enable</i>	Enable CCLP Group Input write for the selected dimmer.
<i>CAN Address</i>	The CAN address of the destination CCLS.
<i>Input Number</i>	The Group Input number to write.
<i>CAN Gateway</i>	The CAN gateway number used to reach the destination.

5.6 Dimmer Write Group Channel

CCSW-BN-2B - CCSW-BN-1

COV Increment Property Occupancy Digital Input Settings Digital Input Enable Statistics

Status Network Input State Button Dimmer Write Destination Dimmer Write Group Channel COV Subscription

Dimmer Channel

Dimmer 1

Control Group

1 100 Write Group

2

3

Channel

1000

Read Write

Load from file

Save to file

Read config

Write config

Factory Default

Configuration read. Config Version: 3

BACnet Browser Dimmer Write Group Channel window

Configures the Channel objects.

5.6.1 Dimmer Channel

Choice of dimmer to configure.

5.6.2 Control Group

Configures the control groups numbers.

Item Explanation

- 1 Control Group 1. Also used with Write Group.
- 2 Control Group 2.
- 3 Control Group 3.

5.6.3 Channel

Configures the channel number.

5.7 COV Subscription

CCSW-BN-4B - CCSW-BN

Status Network Input State Button Dimmer Write Destination Dimmer Channel **COV Subscription** COV Increment Occupancy Settings

COV Subscription

Input

Network Occupancy 1

Configuration

Mode: Disable

Device Id: 0

Object Type: Analog Input

Object Instance: 0

Life Time: 900 s

Load from file

Save to file

Read

Write

Config Version: 1

BACnet Browser COV Subscription window

This window is used to define the readings of the network.

Item	Explanation
<i>Input</i>	A choice between Network Occupancy 1, Network Occupancy 2, Network Occupancy 3 and Network Occupancy 4.
<i>Mode</i>	A choice between Disable, Subscribe COV, Subscribe Unconfirmed COV, Polling / COV without a subscription. This is the BACnet service for network updates.
<i>Device Id</i>	Instance number of the BACnet device source.

Item	Explanation
<i>Object Type</i>	A choice between Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Multi-state Input, Multi-state Output, Multi-state Value.
<i>Object Instance</i>	Instance number of the BACnet object.
<i>Life Time</i>	Time in seconds between COV subscriptions.
<i>Interval</i>	Time in seconds between polling.

5.8 COV Increment

CCSW-BN-4B - CCSW-BN

Status | Network Input State | Button | Dimmer Write Destination | Dimmer Channel | COV Subscription | **COV Increment** | Occupancy | Settings

Dimmer Feedback 1: %
 Dimmer Feedback 2: %
 Dimmer Feedback 3: %
 Dimmer Feedback 4: %

Config Version: 1

BACnet Browser COV Increment window

This window is to set the COV Increment of objects that can be subscribed by another BACnet device. These settings are the differences used to make new transmissions on status changes. These adjustments have an impact on network bandwidth. For example, if a dimmer is oscillating frequently by 1%, set its COV Increment to 5% to get only significant changes and avoid continuous transmissions.

5.9 Property

CCSW-BN-2B - CCSW-BN-1

Status	Network Input State	Button	Dimmer Write Destination	Dimmer Write Group Channel	COV Subscription
COV Increment	Property	Occupancy	Digital Input	Settings	Digital Input Enable
					Statistics

Property

☒ Power On Level %

Minimum Level %

Maximum Level %

Fade Time secs

Load from file

Save to file

Read config

Write config

Factory Default

Configuration read. Config Version: 3

BACnet Browser Property window

This window is to set the dimmer level limits and behavior.

Item	Explanation
<i>Power On Level</i>	Dimmer level applied at power on. When disabled, the dimmer keeps its last level.
<i>Minimum Level</i>	The minimum level the dimmer can reach.
<i>Maximum Level</i>	The maximum level the dimmer can reach.
<i>Fade Time</i>	Time taken by the dimmer to fade from one level to another.

5.10 Occupancy

CCSW-BN-4B - CCSW-BN

Status Network Input State Button Dimmer Write Destination Dimmer Channel COV Subscription **Occupancy** Settings

Configuration

Dimmer
Dimmer 1

Occupancy
Occupied

Command
Last Level / Up

Value
%

Load from file

Save to file

Read

Write

Config Version: 1

BACnet Browser Occupancy window

This window is to set the actions of the occupied mode.

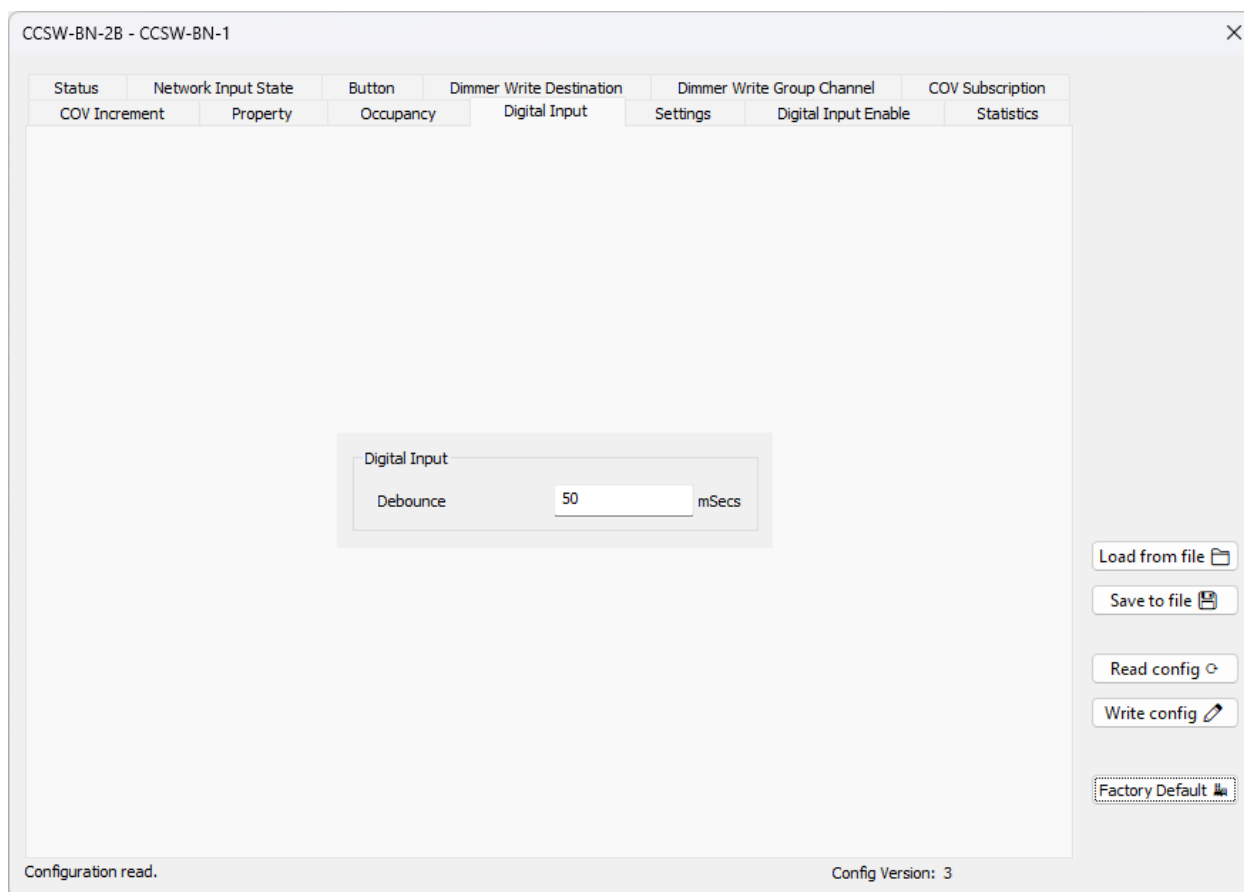
5.10.1 Dimmer Channel

Choice of dimmer to configure.

5.10.2 Occupancy

Item	Explanation
<i>Occupied</i>	Set the actions for the occupied mode.
<i>Unoccupied</i>	Set the actions for the unoccupied mode.

5.11 Digital Input



BACnet Browser Digital Input window

This window is to set the digital input parameters.

Item	Explanation
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<i>Debounce</i>	Debounce time in milliseconds applied to the buttons.
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5.12 Settings

CCSW-BN-4B - CCSW-BN

Status Network Input State Button Dimmer Write Destination Dimmer Channel COV Subscription Occupancy Settings

Dimmer
Dimmer 1

Flick Warning
Warning Value 10 %
Warning Time 300

☐ Allow Timeout
Timeout Time 3600 Secs

BACnet Output Priority 8 Secs

Load from file
Save to file
Read
Write

Config Version: 1

BACnet Browser Settings window

This window is for the wall switch settings.

5.12.1 Dimmer

Choice of dimmer to configure.

5.12.2 Flick Warning

Item	Explanation
<i>Warning Value</i>	Dimmer percentage at which the warning is shown before reaching the unoccupied mode (the dimmer value before OFF).
<i>Warning Time</i>	Output remaining warning time before it reaches unoccupied mode.

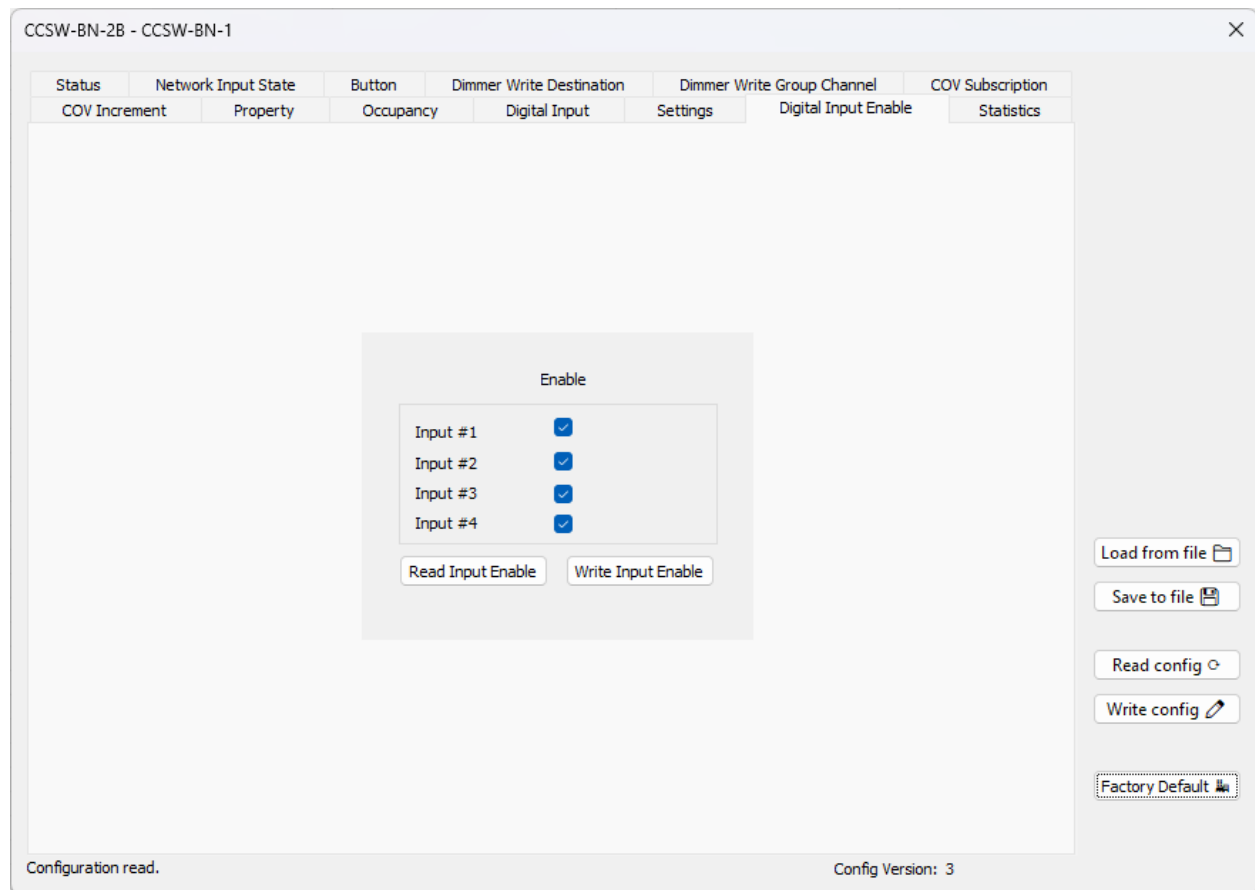
5.12.3 Timeout

Item	Explanation
<i>Allow Timeout</i>	Allows buttons to suspend the unoccupied mode.
<i>Timeout Time</i>	Override period in seconds for the unoccupied mode.

5.12.4 BACnet Output Priority

BACnet priority internally used by the wall switch.

5.13 Digital Input Enable



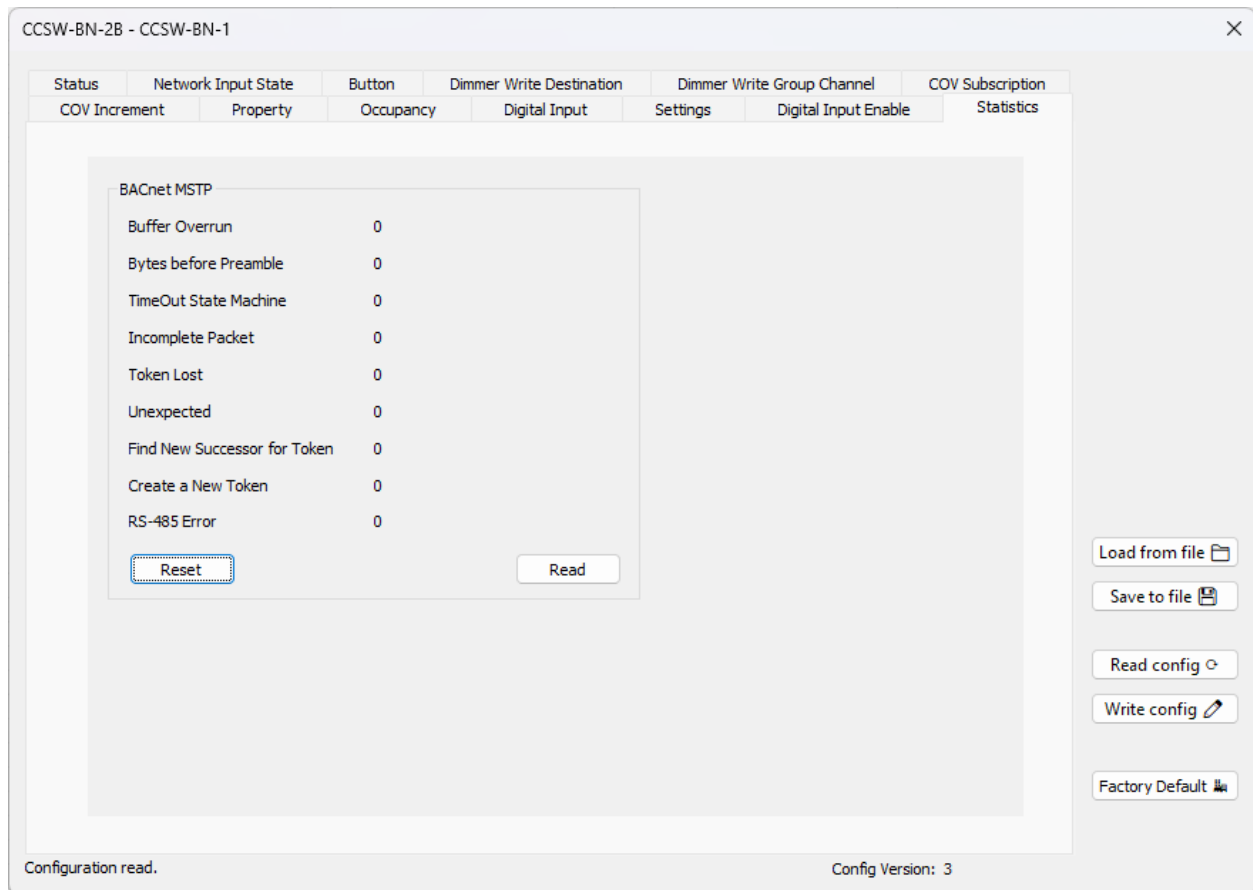
BACnet Browser Digital Input Enable window

This window enables or disables each physical button input.

Item	Explanation
<i>Input #1</i>	Enable or disable the input of button 1.
<i>Input #2</i>	Enable or disable the input of button 2.

Item	Explanation
<i>Input #3</i>	Enable or disable the input of button 3.
<i>Input #4</i>	Enable or disable the input of button 4.

5.14 Statistics



BACnet Browser Statistics window

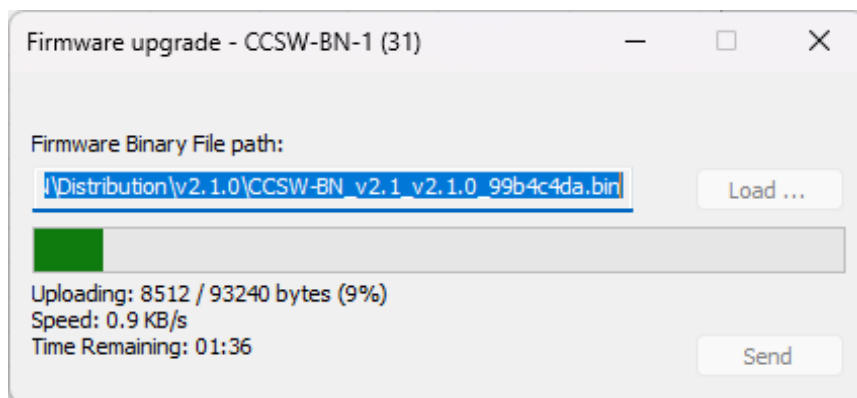
This window displays the BACnet MS/TP communication diagnostic counters. Use the *Read* button to refresh the values and the *Reset* button to clear them.

5.14.1 BACnet MSTP

Item	Explanation
<i>Buffer Overrun</i>	Number of times the receive buffer overflowed.
<i>Bytes before Preamble</i>	Number of bytes received before a valid preamble.
<i>TimeOut State Machine</i>	Number of timeouts in the MS/TP state machine.

Item	Explanation
<i>Incomplete Packet</i>	Number of incomplete packets received.
<i>Token Lost</i>	Number of times the token was lost.
<i>Unexpected</i>	Number of unexpected frames received.
<i>Find New Successor for Token</i>	Number of times a new successor was searched for the token.
<i>Create a New Token</i>	Number of times a new token was created.
<i>RS-485 Error</i>	Number of RS-485 communication errors.

5.15 Firmware Upgrade



BACnet Browser Firmware upgrade window

The wall switch firmware can be updated over the BACnet network using the BACnet Browser. In the device list, select the wall switch, then open the **Device > Firmware Upgrade** menu. You can also right-click the wall switch in the device list and choose **Firmware Upgrade** from the context menu.

Warning

Contact Cristal Controls before upgrading, as some firmware versions may not be compatible and could result in the BACnet MS/TP and other configuration being lost.

Step

- 1 Select the wall switch in the device list and open **Device > Firmware Upgrade** (or right-click the wall switch and choose **Firmware Upgrade**).
- 2 Click **Load ...** and select the firmware binary file provided by Cristal Controls.
- 3 Click **Send** to start the transfer. The progress bar shows the upload progress.

CRISTAL

Step Action

- 4 Wait for the *Firmware upgrade completed* message. The wall switch reboots automatically.

Do not power off the wall switch or close the window during the transfer. Once the upgrade is complete, read the configuration back to confirm the device is operating normally.

6 Hardware Specifications

- Supply Voltage: 24 Vac (50–60 Hz) or 24 Vdc $\pm 10\%$
- Supply Current: 30 mA (24 Vac), 15 mA (24 Vdc)
- Operating temperature: 10 °C to 45 °C (50 °F to 113 °F)
- Storage temperature: -30 °C to 80 °C (-22 °F to 176 °F)
- Communication: RS-485 / BACnet MS/TP

6.1 Communication

- BACnet MS/TP: Isolated RS-485, 1/4 Loads
- Wiring: Twisted pair

6.2 Physical

- Buttons: 2 or 4 (model dependent)
- Dimensions: 10.9 cm $\times$ 4.8 cm $\times$ 4.1 cm (4.3 in $\times$ 1.9 in $\times$ 1.6 in)
- Construction: High-impact injection-molded plastic
- Color: White (default) or Black
- Mounting: Single-gang electrical box
- Plate compatibility: Standard Decora-style switch plate covers

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