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Touch-Plate®

www.touchplate.com

Lighting Controls

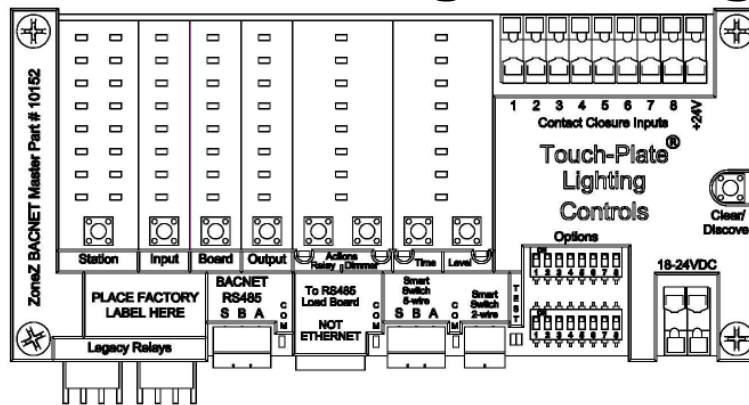


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BACnet Master Programming Guide



This document covers how to program and wire products to the BACnet Master. It assumes that a BACnet Systems Integrator / Technician is performing the programming.

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Preparation

Unpack the BACnet Master and inspect the contents for damaged or missing products. If there is damage or any missing products, please contact Touch-Plate immediately for repair or replacement products. If there are any problems that arise, contact Touch-Plate at (260)426-1565 immediately for assistance.

Precautions

The hardware is designed to be in environments that have a temperature range of 0-60°C (non-condensing atmosphere). Installing in an environment outside of these parameters will shorten the life span of the hardware.

Compatible Hardware

This product was designed to be compatible with the following items.

Panel Products:

- WCR-D30L Relays
- Legacy Relays (3000PL & 4000PL)
- Touch-Plate® Relay Firing Cards (Model RFC-108)
- Legacy Relay Firing Cards (Model RFC-012 or RFC-091)

Control Station Products:

- Touch-Plate® 2-Wire Control Stations (Ultra or Mystique Series)
- Touch-Plate® 5-Wire Control Stations (Ultra or Mystique Series)
- Contact Closure Control Stations
- Touch-Plate® Digital Smart Switch Hubs
- Touch-Plate® 2-Wire Light Sensors

Warranty

Touch-Plate® warrants this hardware product against defects in materials or workmanship, under normal use for a period of ONE (1) year from date of shipment. If a hardware defect is to arise and a valid claim is received within the Warranty Period, Touch-Plate® will repair or replace the product at no charge.

This warranty does not apply to:

- a. Damage to unit(s) caused by accident, acts of God, inappropriate installation, faulty installation, or any negligent use;
- b. Unit(s) which have been ject to being taken apart or otherwise modified;
- c. Unit not used in accordance with instructions;
- d. The finish on any portion of the product, such as surface and/or weathering, as this is considered normal wear and tear;
- e. Non-Touch-Plate hardware installed by the user;
- f. Damage caused by Non-Touch-Plate products;
- g. Damage caused by operating the product outside the permitted or intended uses described by Touch-Plate®;
or
- h. Specific plans or Specific application requirements, unless the plans and specifications have been forwarded to Touch-Plate and Touch-Plate has approved and accepted the plans in writing.

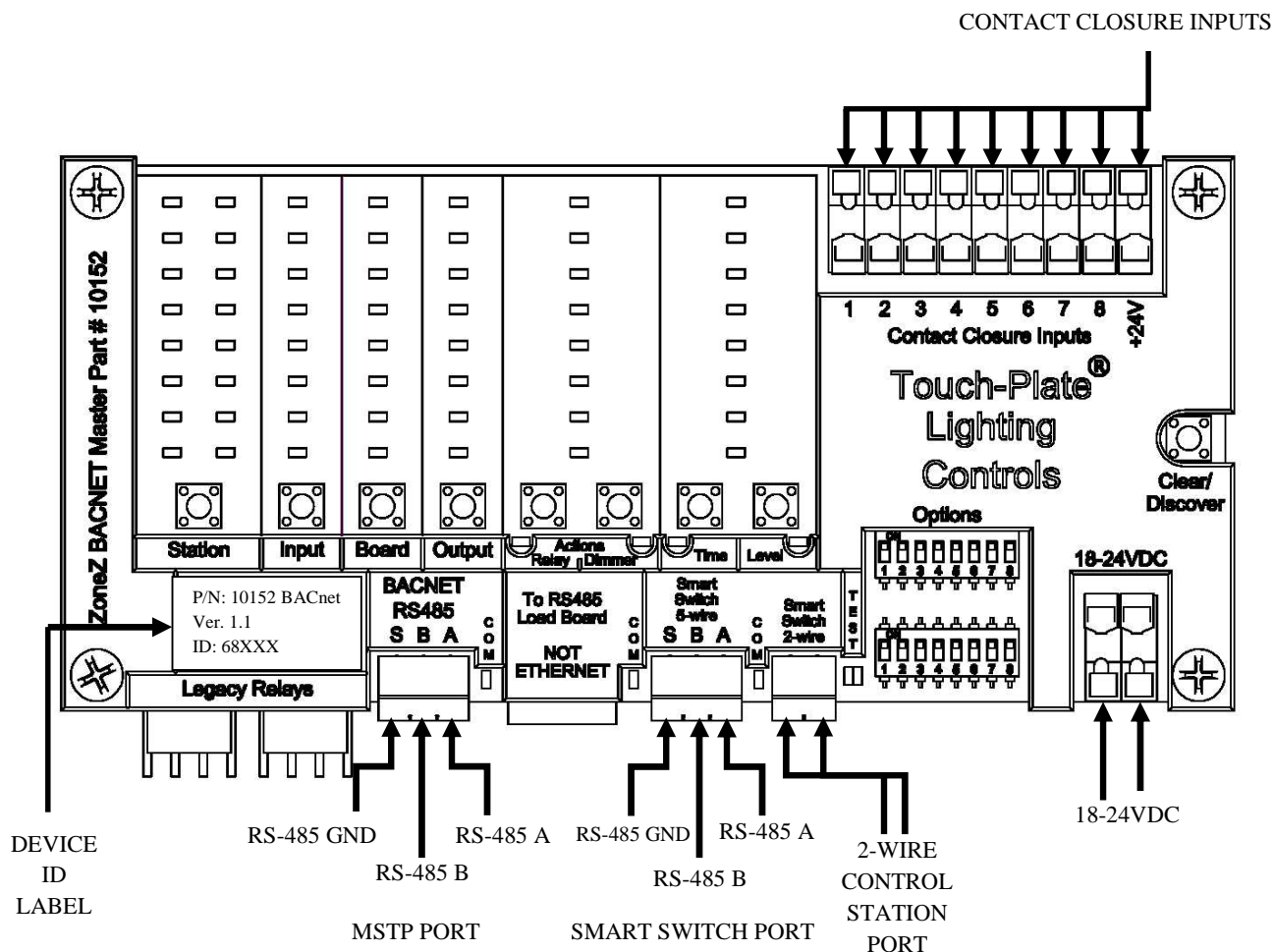
EXCEPT AS PROVIDED IN THIS WARRANTY, TOUCH-PLATE IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, INCLUDING BUT NOT LIMITED TO, INSTALLATION OR REPLACEMENT LABOR COSTS.

Introduction to BACnet Master

The BACnet Master is a very versatile and powerful lighting controller, able to control relays and dimmers. It will handle all switch and sensor signals that are connected to it in less than 100 milliseconds, making it the fastest possible response in a BACnet protocol environment. Any Touch-Plate® Wall Station can be used to control BACnet Master relays and dimmers. The BACnet Master also has a built-in Soft Patch keypad made up of buttons and LEDs to assign switches and sensors to control relays and dimmers which are attached to it. All switching data, status, COV scriptions, alarms and flags data is passed to the BACnet Master via the MSTP port.

The BACnet Master allows the control of up to 64 relays or dimmers, which may be mixed / matched from more than one enclosure. Each wall switch and sensor has a digital address (Station# and Button#) and is assigned to control relay or dimmer output addresses. Any button or sensor connected to the BACnet Master can be assigned to control any or all relays or dimmers. The BACnet Master can always override based upon its higher level programming options.

BACnet MASTER



BACnet Master Pre-Startup Test

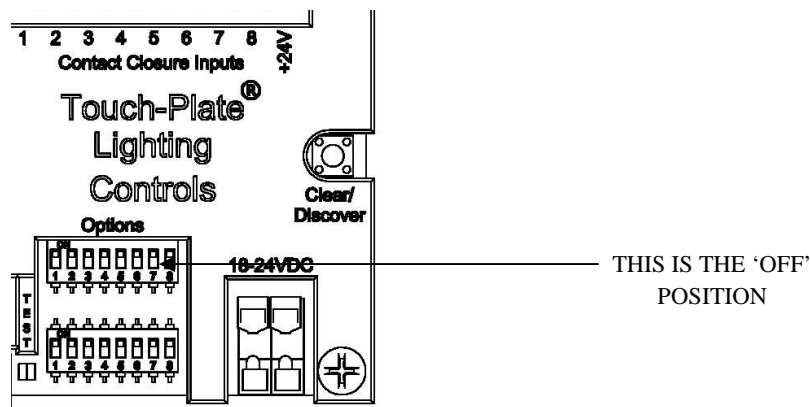
BE SURE THAT ALL ITEMS ARE INSTALLED AND ADDRESSED BEFORE RUNNING ANY TESTS ON THE BACnet MASTER

Upon installation of the BACnet Master, there is a test that can be run to help ensure that all items are hooked up and wired properly. All connections need to be made and power needs to be brought to the panel for the following pre-startup test to be run.

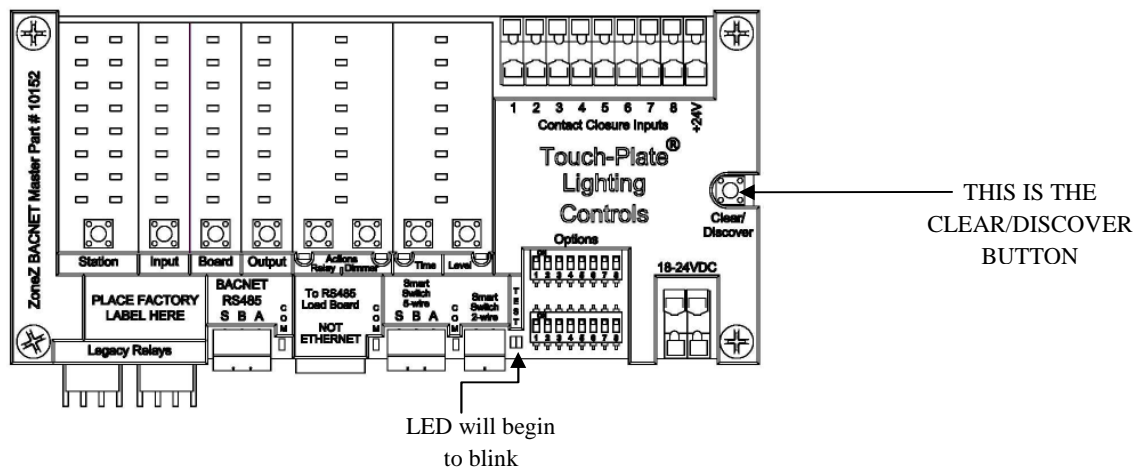
When initially inspecting the powered up BACnet Master, it is completely normal to see a LED on the left side of the BACnet Master blinking.

Pre-Startup Test

1. Turn Options Dip Switch #7 to the 'ON' position. This will allow the test to be run.



2. Press the Clear/Discover button and the LED underneath the word TEST will begin to blink.
 - a. The LEDs next to the recognized Station Addresses will light up
 - b. If this does not occur, contact the factory for assistance



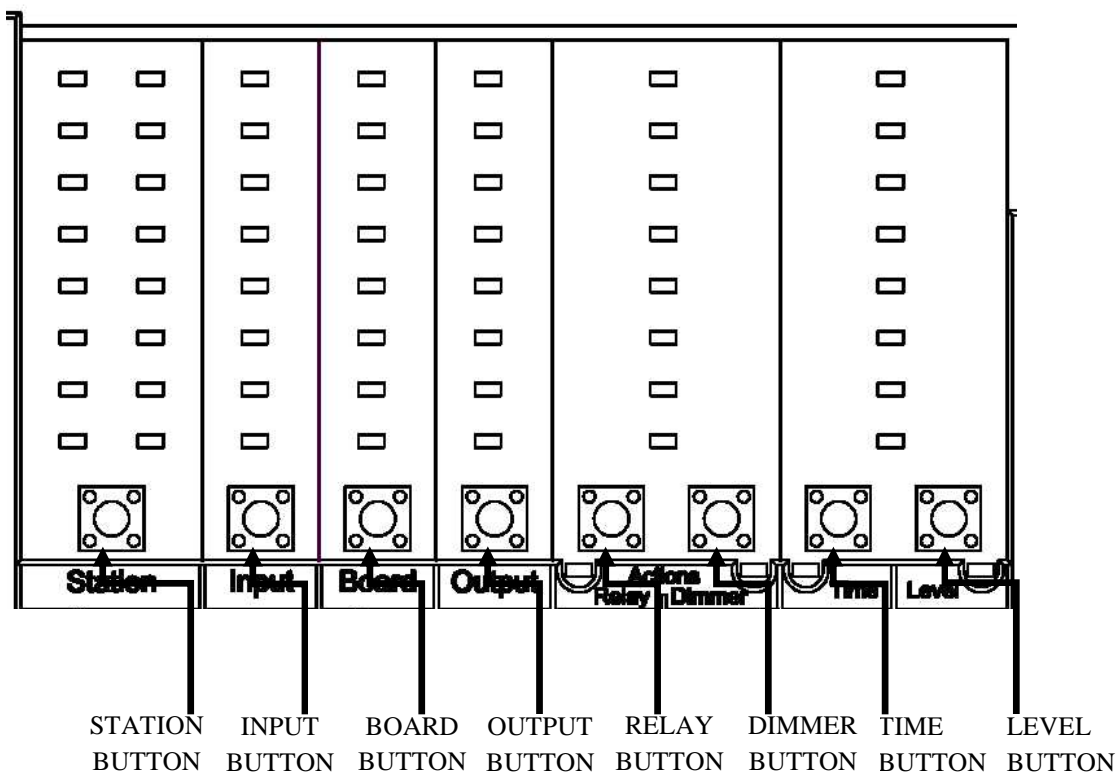
3. Press the Clear/Discover button again
 - a. The LEDs next to the recognized Board Numbers will light up
 - b. If this does not occur, contact the factory for assistance
4. If all the Wall Station addresses and Board Numbers were recognized, turn Dip Switch #7 back to the 'OFF' position.
 - a. Press the Clear/Discover button again and verify that the Test LED turns Red and the LED on the left side of the BACnet Master begins blinking again.

Introduction to BACnet Master Keypad

This is the system controller. Smart Switch and Contact Closure Input programming is accomplished here. It contains the ability to program Inputs, Actions, Times, and Levels for the relays and dimmers hooked up to the BACnet Master.

Use the following guide as an introduction to what the Buttons and Menus mean. Just remember to always follow the LED (short, green square) on each of the menus.

1. When pressed, the STATION button brings an LED up for each of the options. To move onto a new Selection, use the button at the bottom of each of the Selection choices.
2. When the desired Selection is reached, use the same button to select the values that are desired.
 - a. NOTE: SOME MENUS HAVE 2 BUTTONS. USE THE BUTTON THAT IS ON THE SAME SIDE AS THE SELECTION CHOICES.
 - b. NOTE: TIME AND LEVEL OPTIONS DO NOT ALWAYS HAVE TO BE USED

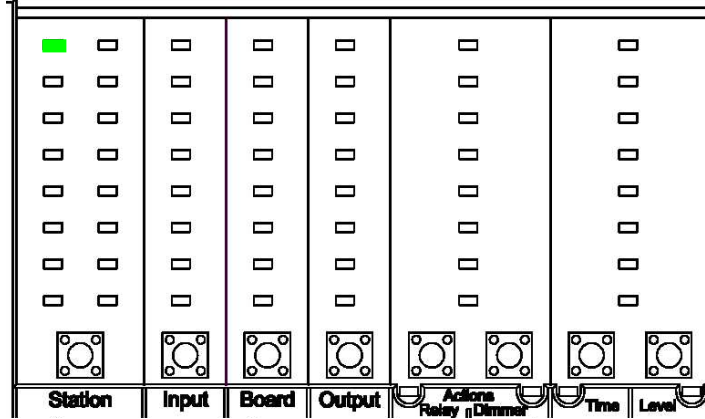


Programming Stations with BACnet Master

What is a Station? A Station is any Low Voltage Device address connected to the BACnet Master. Some examples of devices include: a Wall Station and/or Smart Switch Hub.

To program the Station, Input, Board, Output, and Action should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button and the first LED will light up on the board.



2. Select the Station Address that is desired to be edited by pressing the STATION button until the LED is lit next to the correct Station Address.
 - a. Pressing the STATION button over and over will scroll through each of the Station Addresses available to be edited.

Definition of Station #'s:

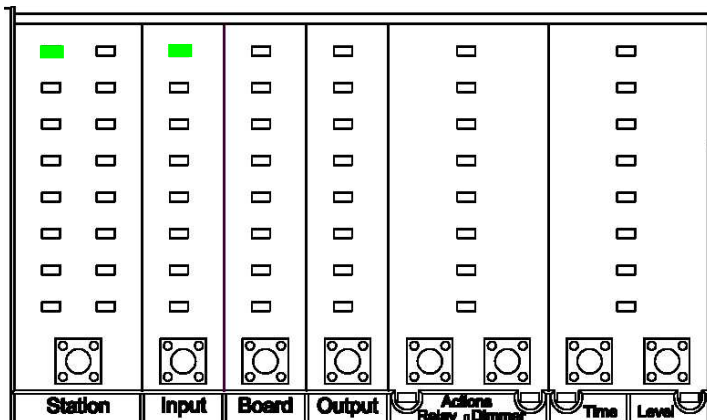
STATION	DEFINITION
1	CONTROL STATION ADDRESS #1
2	CONTROL STATION ADDRESS #2
3	CONTROL STATION ADDRESS #3
4	CONTROL STATION ADDRESS #4
5	CONTROL STATION ADDRESS #5
6	CONTROL STATION ADDRESS #6
7	CONTROL STATION ADDRESS #7
8	CONTROL STATION ADDRESS #8
9	CONTROL STATION ADDRESS #9
10	CONTROL STATION ADDRESS #10
11	CONTROL STATION ADDRESS #11
12	CONTROL STATION ADDRESS #12
13	CONTROL STATION ADDRESS #13
14	CONTROL STATION ADDRESS #14
15	CONTROL STATION ADDRESS #15
16	CONTROL STATION ADDRESS #16

Programming Inputs with BACnet Master

What is an Input? An Input is the button number from the Station Address.

To program the Input, Station, Board, Output, and Action should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button if the LEDs are not lit.



2. Select the Station Address that is desired to be edited by pressing the STATION button until the LED is lit next to the correct Station Address.
 - a. Pressing the INPUT button over and over will scroll through each of the Inputs (Buttons) available to be edited.

Definition of Input #'s:

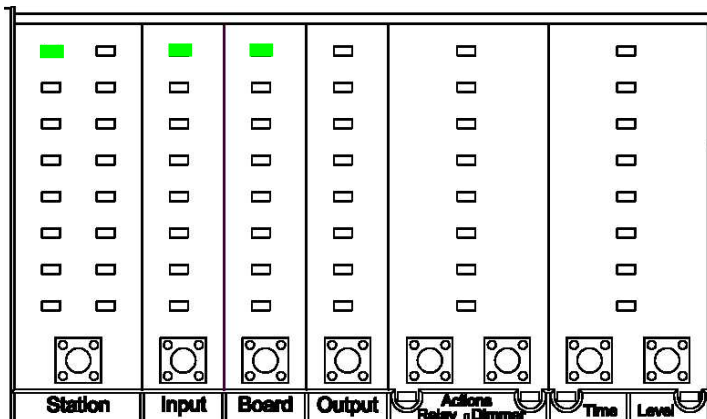
INPUT (BUTTON)	DEFINITION
1	INPUT (BUTTON) #1
2	INPUT (BUTTON) #2
3	INPUT (BUTTON) #3
4	INPUT (BUTTON) #4
5	INPUT (BUTTON) #5
6	INPUT (BUTTON) #6
7	INPUT (BUTTON) #7
8	INPUT (BUTTON) #8

Programming Boards with BACnet Master

What is a Board? A Board is the Relay or Dimmer Firing Card. These boards will come from the factory pre-labeled as to which board # they are.

To program the Board, Station, Input, Output, and Action should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button if the LEDs are not lit.



2. Select the Board that is desired to be edited by pressing the BOARD button until the LED is lit next to the correct Board Number.
 - a. Pressing the BOARD button over and over will scroll through each of the Boards available to be edited.

Definition of Board #'s:

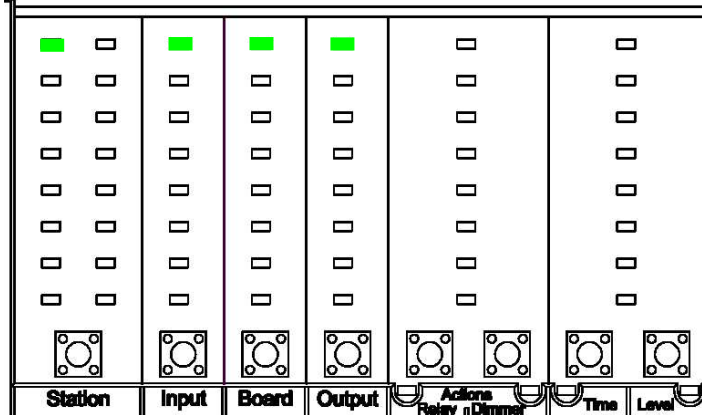
BOARD	DEFINITION
1	BOARD #1
2	BOARD #2
3	BOARD #3
4	BOARD #4
5	BOARD #5
6	BOARD #6
7	BOARD #7
8	BOARD #8

Programming Outputs with BACnet Master

What is an Output? An Output is the Relay or Dimmer. The BACnet Master only shows eight (8) Relays or Dimmers as options. This means that up to eight (8) Relays or Dimmers can be connected to each Relay or Dimmer Firing Card.

To program the Output, Station, Input, Board, and Action should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button if the LEDs are not lit.



2. Select the Relay or Dimmer that is desired to be edited by pressing the OUTPUT button until the LED is lit next to the correct Output Number.
 - a. Pressing the OUTPUT button over and over will scroll through each of the Outputs (Relays or Dimmers) available to be edited.

Definition of Output #'s:

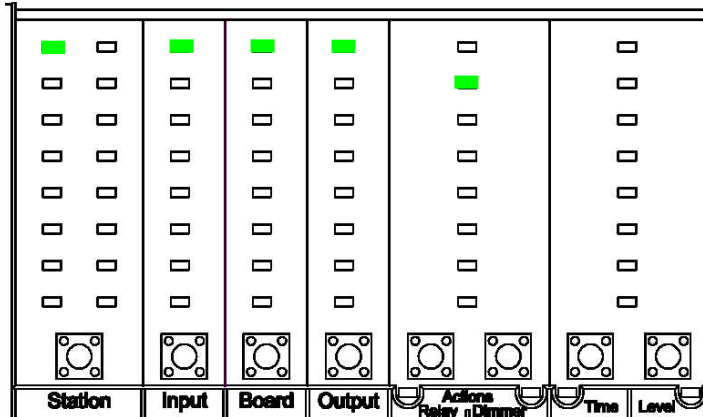
OUTPUT	DEFINITION
1	RELAY OR DIMMER #1
2	RELAY OR DIMMER #2
3	RELAY OR DIMMER #3
4	RELAY OR DIMMER #4
5	RELAY OR DIMMER #5
6	RELAY OR DIMMER #6
7	RELAY OR DIMMER #7
8	RELAY OR DIMMER #8

Programming Relay Actions with BACnet Master

What is a Relay Action? A Relay Action is the function of the Output (Relay).

To program the Action, Station, Input, Board, and Output should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button if the LEDs are not lit.



FOR RELAYS

2. Select the Relay Action that is desired to be edited by pressing the RELAY ACTION button until the LED is lit next to the correct Action.
 - a. Pressing the ACTION button over and over will scroll through each of the Actions available to be chosen.

Definition of Relay Actions:

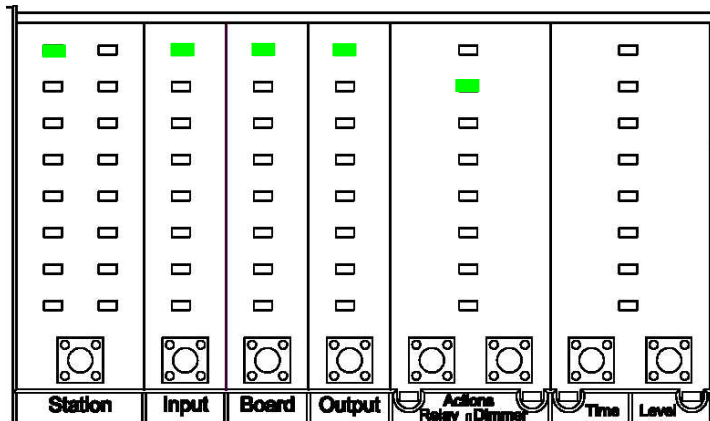
RELAY ACTION	DEFINITION
NONE	NO ACTION – THE RELAY WILL DO NOTHING
ON	THE RELAY WILL TURN ON
OFF	THE RELAY WILL TURN OFF
CYCLE	NORMAL FUNCTION – TURNS OFF & ON
MTN NO	RELAY WILL BE NORMALLY OPEN (TYPICAL FOR A MOTION SENSOR)
MTN NC	RELAY WILL BE NORMALLY CLOSED (TYPICAL FOR AN EMERGENCY SENSOR)
BLINK OFF	RELAY WILL TURN OFF IN 5 MINS. IF NO BUTTON IS PRESSED ON THE CONTROL STATION
AUTO OFF	RELAY WILL AUTOMATICALLY TURN OFF AFTER A SET PERIOD OF TIME

Programming Dimmer Actions with BACnet Master

What is a Dimmer Action? A Dimmer Action is the function of the Output (Dimmer).

To program the Action, Station, Input, Board, and Output should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button if the LEDs are not lit.



FOR DIMMERS

2. Select the Dimmer Action that is desired to be edited by pressing the DIMMER ACTION button until the LED is lit next to the correct Action.
 - a. Pressing the ACTION button over and over will scroll through each of the Actions available to be chosen.

Definition of Dimmer Actions:

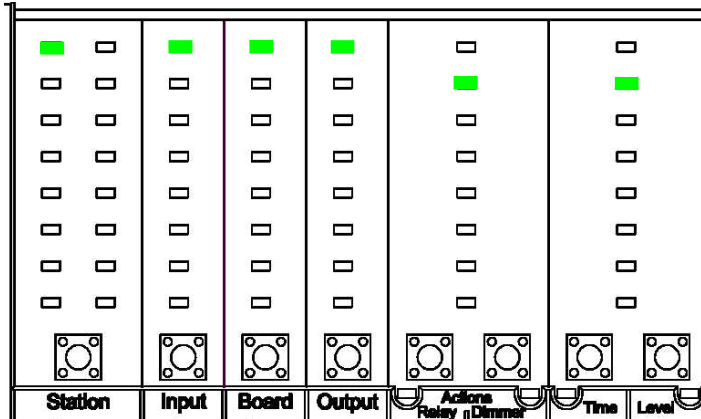
DIMMER ACTION	DEFINITION
NONE	NO ACTION – THE DIMMER WILL DO NOTHING
UP	DIMMER WILL RAMP UP FROM START LEVEL WHEN CONTROL STATION BUTTON IS HELD
DOWN	DIMMER WILL RAMP DOWN FROM START LEVEL WHEN CONTROL STATION BUTTON IS HELD
DIM CYCLE	NORMAL FUNCTION – DIMS UP & DOWN WHEN HELD (TAP to PRESET, TAP to OFF, or TAP to ON)
MTN NO	DIMMER WILL BE OFF UNTIL THE BUTTON IS RELEASED (TYPICAL FOR A MOTION SENSOR)
MTN NC	DIMMER WILL BE ON UNTIL THE BUTTON IS RELEASED (TYPICAL FOR AN EMERGENCY SENSOR)
TO	DIMMER WILL GO UP OR DOWN TO A SPECIFIED LEVEL
AUTO OFF	DIMMER WILL AUTOMATICALLY TURN OFF AFTER A SET PERIOD OF TIME

Programming Auto OFF Time with BACnet Master

What is Auto OFF Time? Time is the duration ON until the Relays or Dimmers turn OFF. The only way to use this function for Relays is to set the Action to “AUTO OFF”. The way to use this function for Dimmers is to set the Action to “AUTO OFF” or “LEVEL”.

To program the Time, Action, Station, Input, Board, and Output should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button if the LEDs are not lit.



2. Select the Time that is desired to be edited by pressing the TIME button until the LED is lit next to the correct Time.
 - a. Pressing the TIME button over and over will scroll through each of the Times available to be chosen.

Definition of Times:

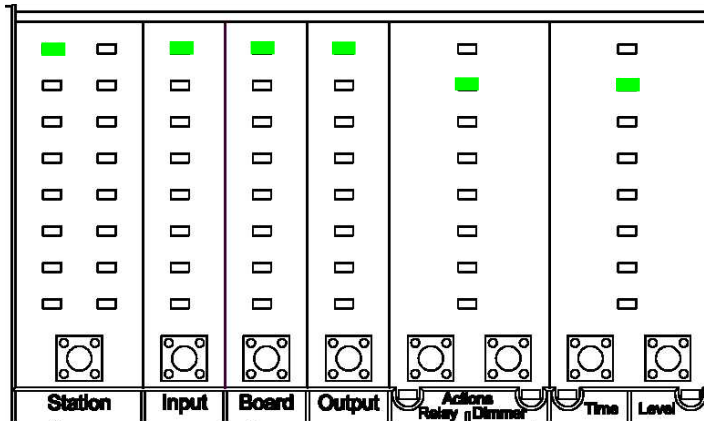
TIME	DEFINITION
8 HOURS	RELAY OR DIMMER TURNS OFF IN 8 HOURS
4 HOURS	RELAY OR DIMMER TURNS OFF IN 4 HOURS
2 HOURS	RELAY OR DIMMER TURNS OFF IN 2 HOURS
1 HOUR	RELAY OR DIMMER TURNS OFF IN 1 HOUR
30 MINS	RELAY OR DIMMER TURNS OFF IN 30 MINUTES
15 MINS	RELAY OR DIMMER TURNS OFF IN 15 MINUTES
5 MINS	RELAY OR DIMMER TURNS OFF IN 5 MINUTES
1 MIN	RELAY OR DIMMER TURNS OFF IN 1 MINUTE

Programming Levels with BACnet Master

What is a Level? A Level is the desired brightness of the Dimmer. This function is only available for Dimmers.

To program the Level, Action, Station, Input, Board, and Output should be pre-determined. Use the following instructions to program the BACnet Master.

1. Press the STATION button if the LEDs are not lit.



2. Select the Level that is desired to be edited by pressing the LEVEL button until the LED is lit next to the correct Level.
 - a. Pressing the LEVEL button over and over will scroll through each of the Levels available to be chosen.

Definition of Levels:

LEVEL	DEFINITION
100%	DIMMER WILL TURN FULL ON
90%	DIMMER WILL DIM TO 90%
75%	DIMMER WILL DIM TO 75%
50%	DIMMER WILL DIM TO 50%
25%	DIMMER WILL DIM TO 25%
5%	DIMMER WILL DIM TO 5%
3%	DIMMER WILL DIM TO 3%
0%	DIMMER FADES TO OFF

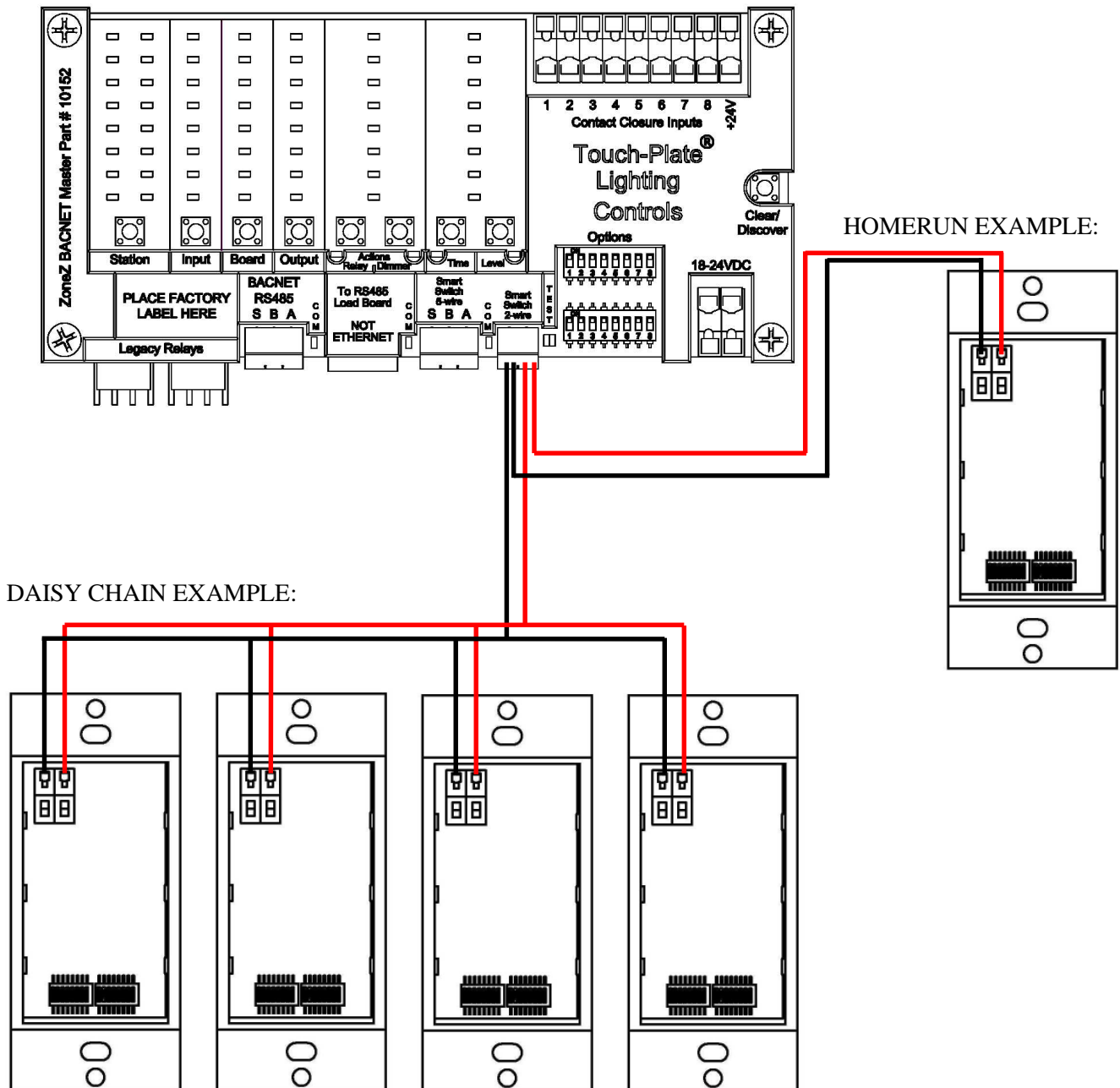
Wiring the BACnet Master to a 2-Wire Control Station

There is a limit of up to sixteen (16) digital addresses allowed per BACnet Master. Under normal circumstances up to 16 2-Wire Control Stations can be wired directly to the BACnet Master. This can be in any combination of Smart Control Stations, Contact Closure Control Stations, and Smart Switch Hubs.

INSTRUCTIONS

The third (3rd) port at the bottom of the BACnet Master is the connection for the 2-Wire Control Station(s).

- The 2-Wire Control Stations are non-polarized and topology free. This means that the control station wires do not have to be wired a certain way.
- There is no need for extra power to be brought to the 2-Wire Control Stations, as power is passed through the wire from the BACnet Master.



Wiring the BACnet Master to a 5-Wire Control Station

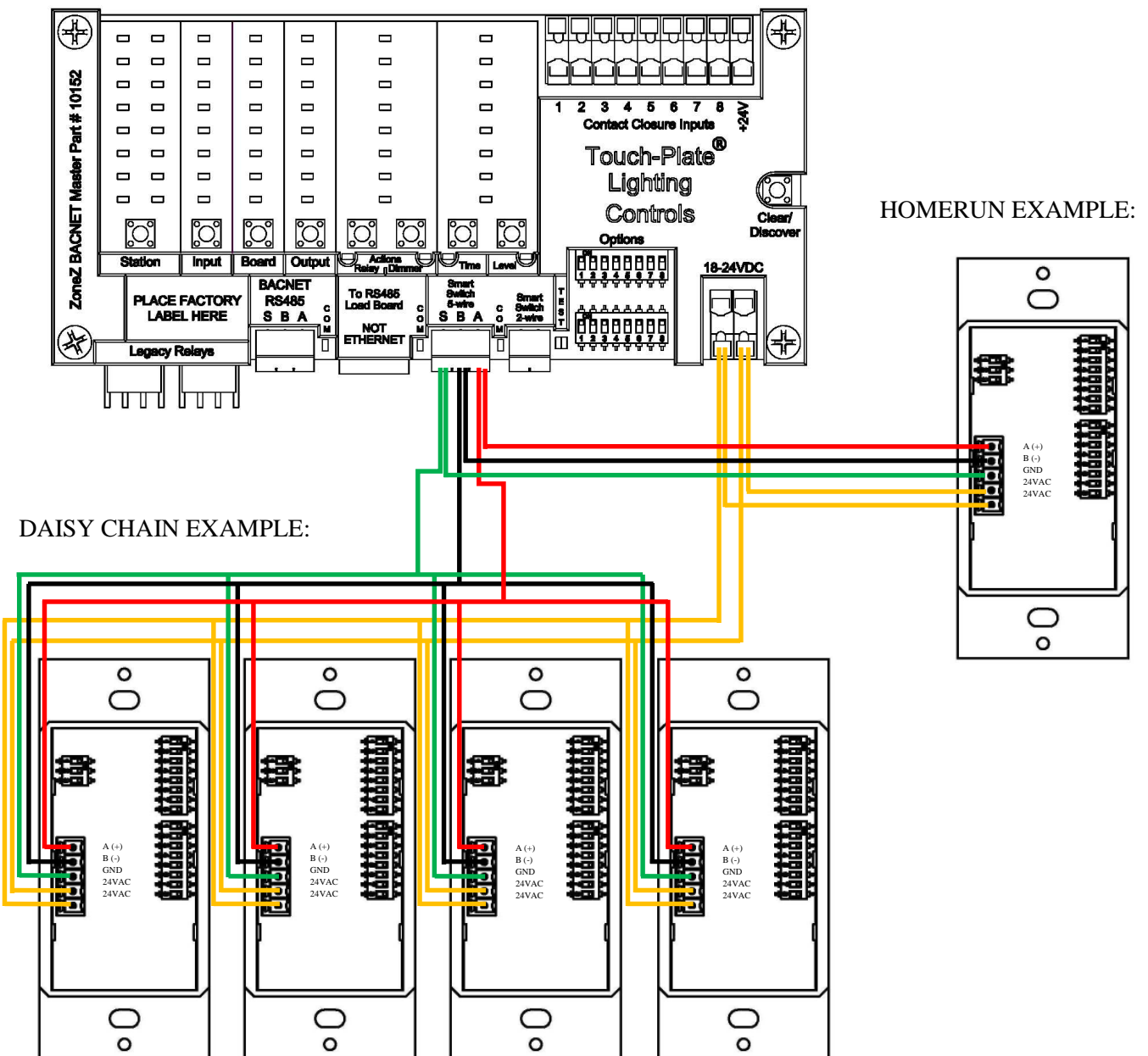
There is a limit of up to sixteen (16) digital addresses allowed per BACnet Master. Under normal circumstances up to 16 5-Wire Control Stations can be wired directly to the BACnet Master. This can be in any combination of Smart Control Stations, Contact Closure Control Stations, and Smart Switch Hubs.

INSTRUCTIONS

The port (Dinkles) at the very bottom right of the BACnet Master is the power connection to the 5-Wire Control Station.

The second (2nd) port on the bottom of the BACnet Master is the RS485 connection to the 5-Wire Control Station.

- The first (1st) terminal on the BACnet Master is the Ground (GND).
- The second (2nd) terminal on the BACnet Master is the Inverted Signal (-).
- The third (3rd) terminal on the BACnet Master is the Non-Inverted Signal (+).



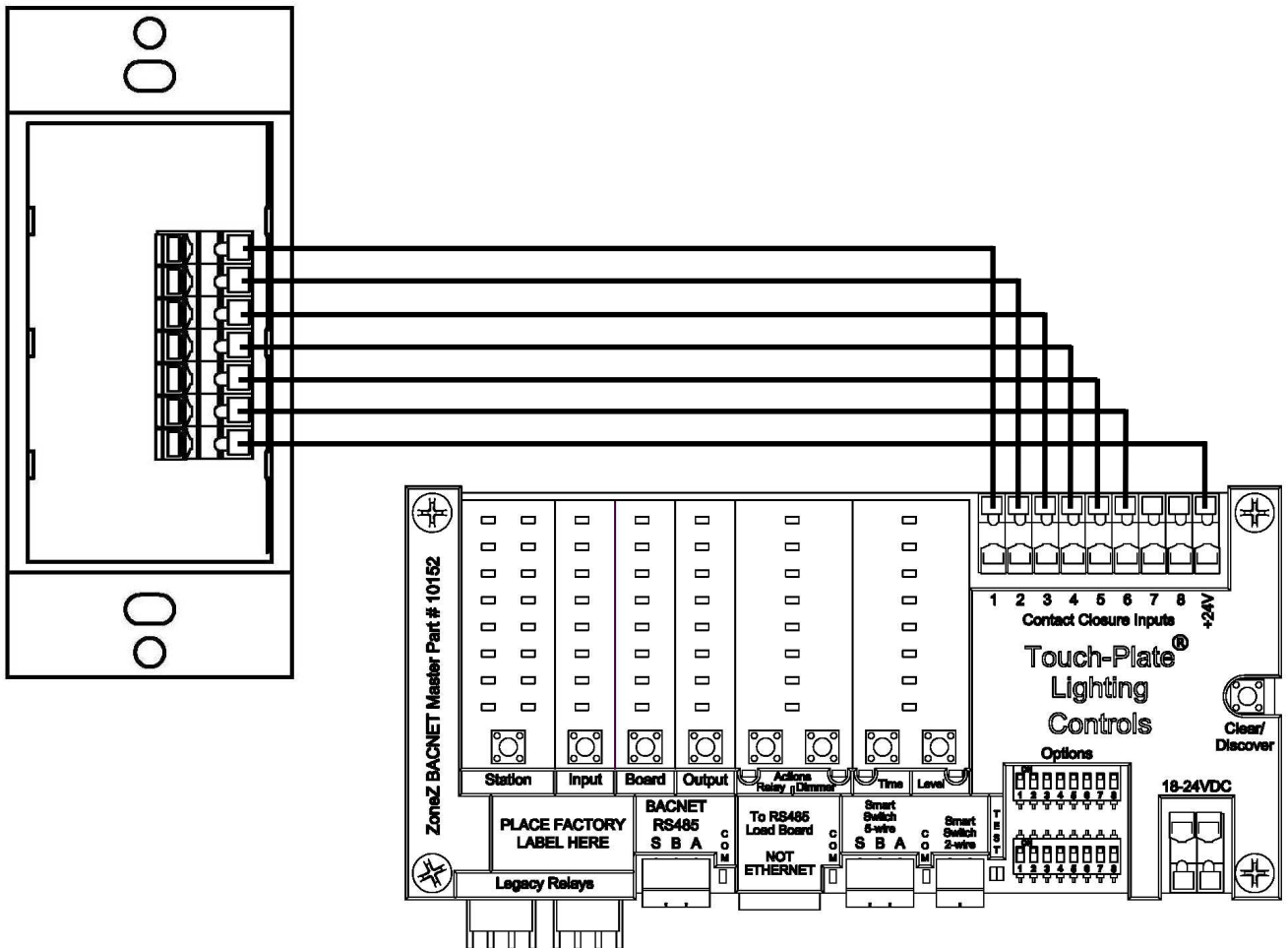
Wiring the BACnet Master to a Contact Closure Control Station

There is a limit of up to sixteen (16) digital addresses allowed per BACnet Master. Under normal circumstances up to eight (8) buttons from Contact Closure Control Stations can be wired directly to the BACnet Master. There can be multiple Contact Closure Control Stations wired directly to the BACnet Master, but they all share the same inputs and use only one (1) digital address. The other fifteen (15) digital addresses can be in any combination of Smart Control Stations and Smart Switch Hubs.

INSTRUCTIONS

The 9 colored connectors on the top right of the BACnet Master are the inputs for the Contact Closure Control Stations.

- The first (1st) terminal (beginning on Left side) on the BACnet Master is for button #1.
- The second (2nd) terminal on the BACnet Master is for button #2.
- The third (3rd) terminal on the BACnet Master is for button #3.
- The fourth (4th) terminal on the BACnet Master is for button #4.
- The fifth (5th) terminal on the BACnet Master is for button #5.
- The sixth (6th) terminal on the BACnet Master is for button #6.
- The seventh (7th) terminal on the BACnet Master is for button #7.
- The eighth (8th) terminal on the BACnet Master is for button #8.
- The ninth (9th) terminal on the BACnet Master is for the common wire(s).



Wiring the BACnet Master to a Smart Switch Hub

There is a limit of up to sixteen (16) digital addresses allowed per BACnet Master. Under normal circumstances up to 16 Smart Switch Hubs can be wired directly to the BACnet Master. This can be in any combination of Smart Control Stations, Contact Closure Control Stations, and Smart Switch Hubs.

INSTRUCTIONS

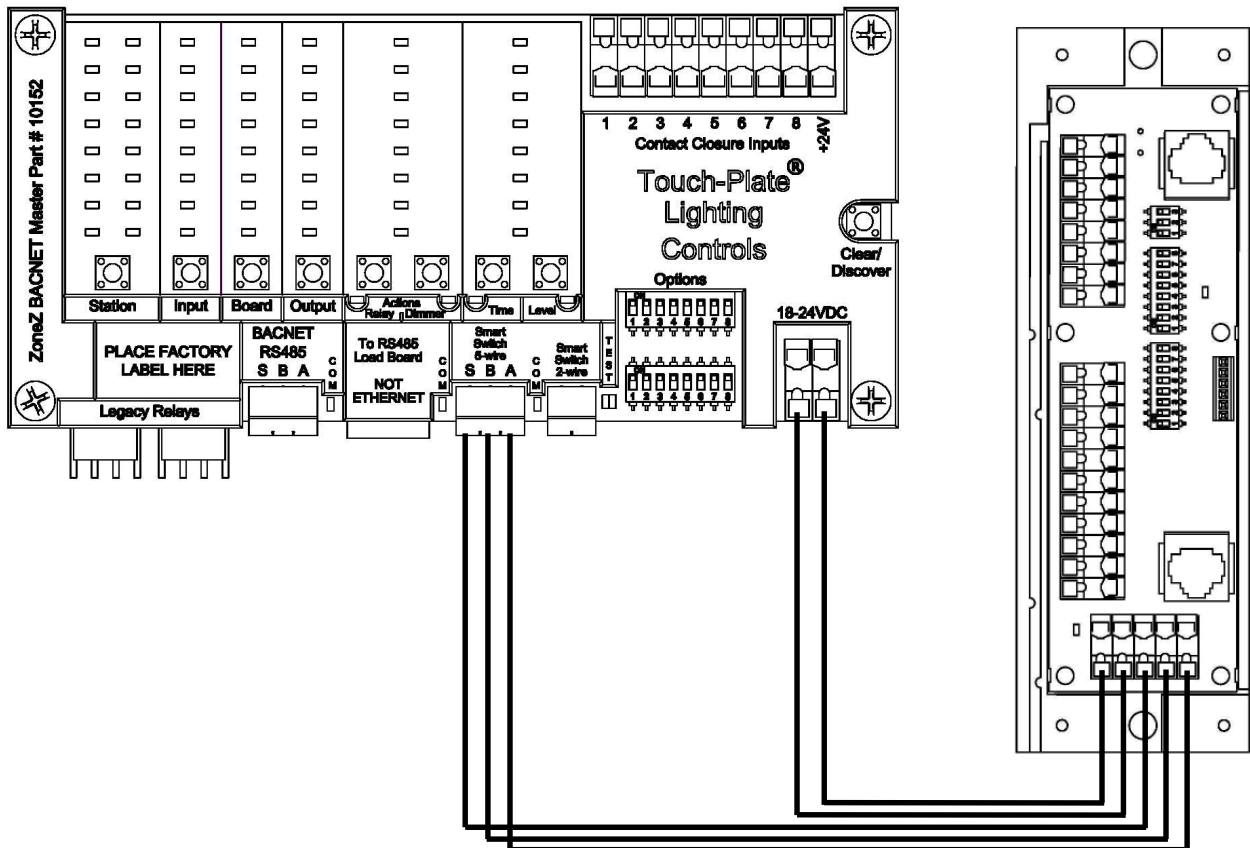
The port (Dinkles) at the bottom of the Smart Switch Hub is the RS485 connection to the BACnet Master.

- The yellow terminals on the Smart Switch Hub are to pass power from the BACnet Master to the Smart Switch Hub.
- The green terminal on the Smart Switch Hub is the Ground (GND).
- The black terminal on the Smart Switch Hub is the Inverted Signal (-).
- The red terminal on the Smart Switch Hub is the Non-Inverted Signal (+).

The port (Dinkles) at the very bottom right of the BACnet Master is the power connection to the Smart Switch Hub.

The second (2nd) port on the BACnet Master is the RS485 connection to the Smart Switch Hub.

- The first (1st) terminal on the BACnet Master is the Ground (GND).
- The second (2nd) terminal on the BACnet Master is the Inverted Signal (-).
- The third (3rd) terminal on the BACnet Master is the Non-Inverted Signal (+).



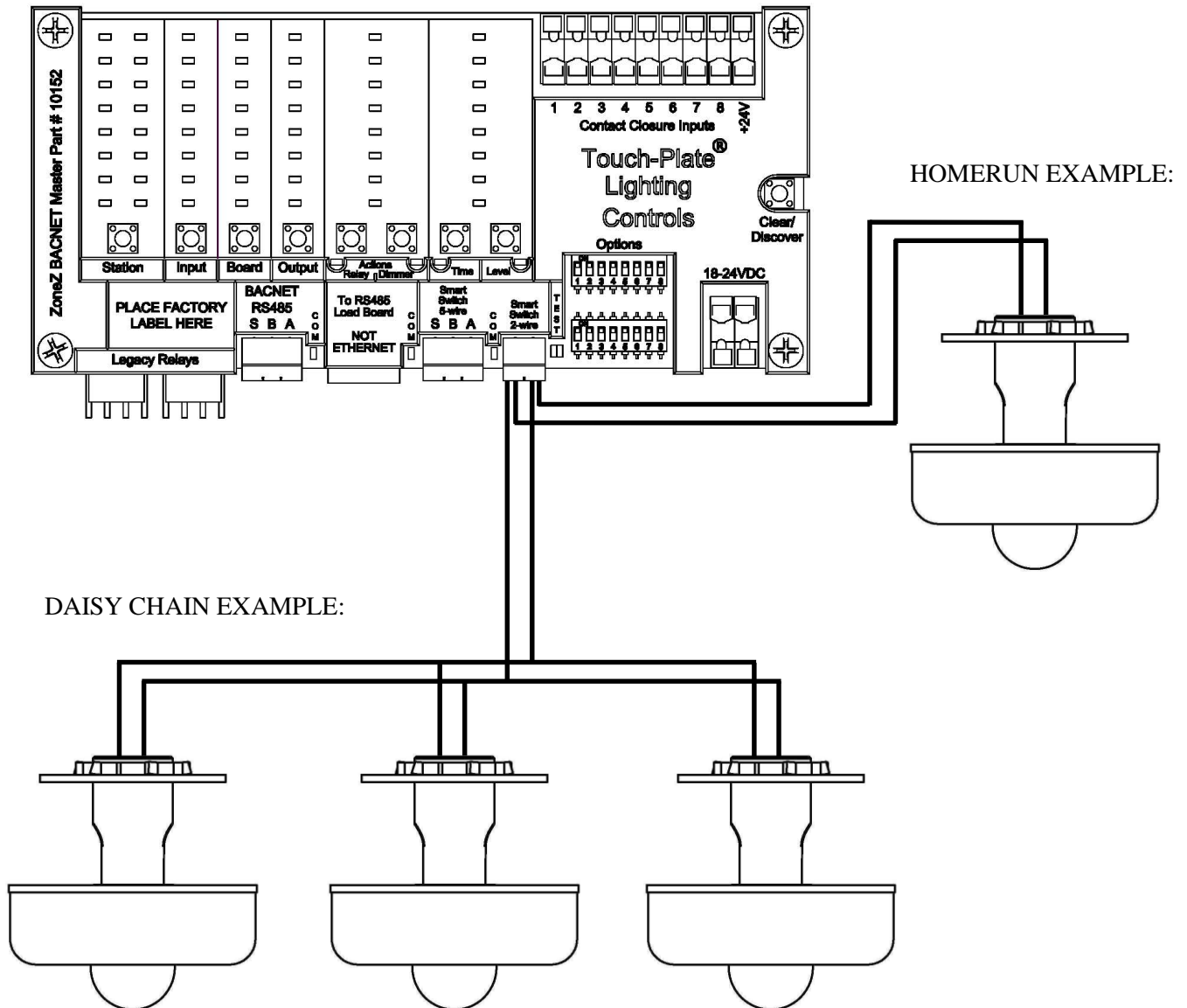
Wiring the BACnet Master to a 2-Wire Light Sensor

There is a limit of up to sixteen (16) digital addresses allowed per BACnet Master. Under normal circumstances up to 16 Smart Switch Hubs can be wired directly to the BACnet Master. This can be in any combination of Smart Control Stations, Contact Closure Control Stations, and Smart Switch Hubs.

INSTRUCTIONS

The third (3rd) port at the bottom of the BACnet Master is the connection for the 2-Wire Light Sensors.

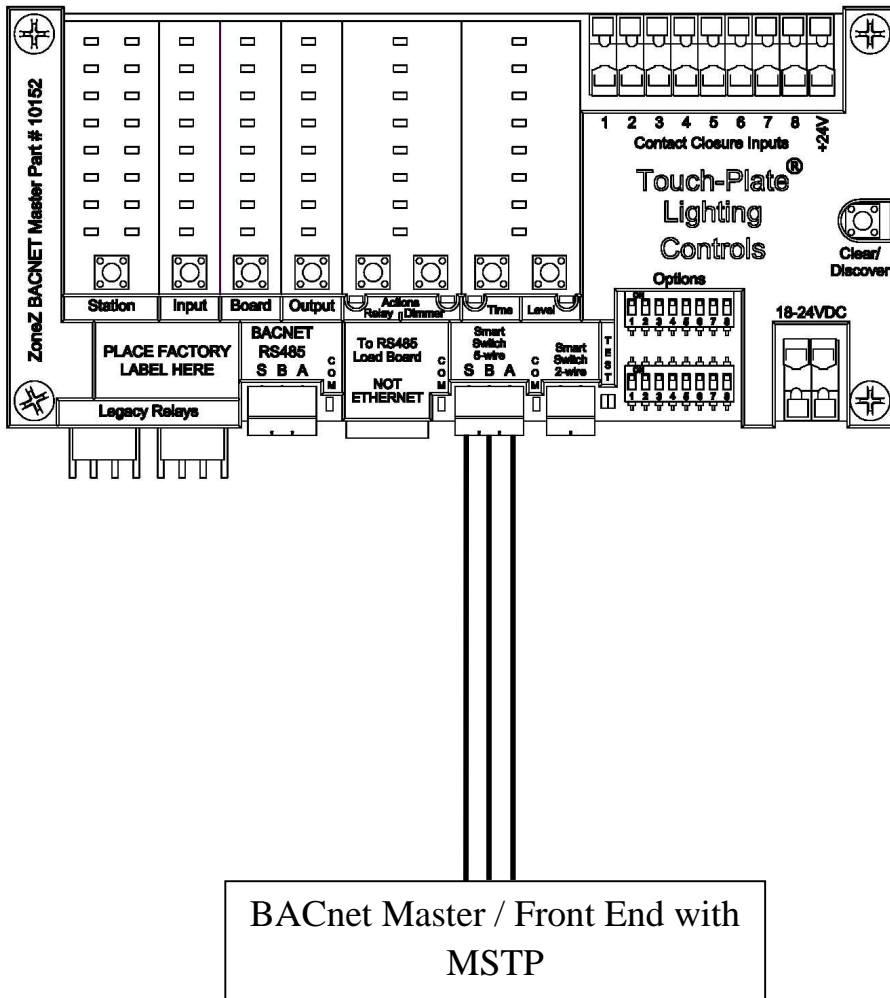
- The 2-Wire Light Sensors are non-polarized and topology free. This means that the light sensors may be home-run, daisy-chained, or star-wired.
- There is no need for extra power to be brought to the 2-Wire Light Sensors, as power is passed through the wire from the BACnet Master.



Wiring the BACnet Master to a BACnet Master Controller

The BACnet Master has the capability to communicate with many different BACnet Master Controllers. Some of the companies that BACnet Master can communicate with are:

- Johnson Controls
- Tridium JACE
- Alerton
- Reliable Controls
- KMC Controls
- Teletrol



MS/TP BACnet Network Address Dip Switch Settings

Use the following tables as a guide to what the different Dip Switches mean.

***0, 248-255 are not valid addresses!**

ADDR	1	2	3	4	5	6	7	8
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF

ADDR	1	2	3	4	5	6	7	8
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
39	ON	ON	ON	OFF	OFF	ON	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF

ADDR	1	2	3	4	5	6	7	8
41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON	OFF	OFF
44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
45	ON	OFF	ON	ON	OFF	ON	OFF	OFF
46	OFF	ON	ON	ON	OFF	ON	OFF	OFF
47	ON	ON	ON	ON	OFF	ON	OFF	OFF
48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
51	ON	ON	OFF	OFF	ON	ON	OFF	OFF
52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
53	ON	OFF	ON	OFF	ON	ON	OFF	OFF
54	OFF	ON	ON	OFF	ON	ON	OFF	OFF
55	ON	ON	ON	OFF	ON	ON	OFF	OFF
56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
57	ON	OFF	OFF	ON	ON	ON	OFF	OFF
58	OFF	ON	OFF	ON	ON	ON	OFF	OFF
59	ON	ON	OFF	ON	ON	ON	OFF	OFF
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF

ADDR	1	2	3	4	5	6	7	8
61	ON	OFF	ON	ON	ON	ON	OFF	OFF
62	OFF	ON	ON	ON	ON	ON	OFF	OFF
63	ON	ON	ON	ON	ON	ON	OFF	OFF
64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
71	ON	ON	ON	OFF	OFF	OFF	ON	OFF
72	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
73	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
74	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
75	ON	ON	OFF	ON	OFF	OFF	ON	OFF
76	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
77	ON	OFF	ON	ON	OFF	OFF	ON	OFF
78	OFF	ON	ON	ON	OFF	OFF	ON	OFF
79	ON	ON	ON	ON	OFF	OFF	ON	OFF
80	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF

ADDR	1	2	3	4	5	6	7	8
81	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
82	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
83	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
84	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
85	ON	OFF	ON	OFF	ON	OFF	ON	OFF
86	OFF	ON	ON	OFF	ON	OFF	ON	OFF
87	ON	ON	ON	OFF	ON	OFF	ON	OFF
88	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
89	ON	OFF	OFF	ON	ON	OFF	ON	OFF
90	OFF	ON	OFF	ON	ON	OFF	ON	OFF
91	ON	ON	OFF	ON	ON	OFF	ON	OFF
92	OFF	OFF	ON	ON	ON	OFF	ON	OFF
93	ON	OFF	ON	ON	ON	OFF	ON	OFF
94	OFF	ON	ON	ON	ON	OFF	ON	OFF
95	ON	ON	ON	ON	ON	OFF	ON	OFF
96	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
97	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
98	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
99	ON	ON	OFF	OFF	OFF	ON	ON	OFF
100	OFF	OFF	ON	OFF	OFF	ON	ON	OFF

ADDR	1	2	3	4	5	6	7	8
101	ON	OFF	ON	OFF	OFF	ON	ON	OFF
102	OFF	ON	ON	OFF	OFF	ON	ON	OFF
103	ON	ON	ON	OFF	OFF	ON	ON	OFF
104	OFF	OFF	OFF	ON	OFF	ON	ON	OFF
105	ON	OFF	OFF	ON	OFF	ON	ON	OFF
106	OFF	ON	OFF	ON	OFF	ON	ON	OFF
107	ON	ON	OFF	ON	OFF	ON	ON	OFF
108	OFF	OFF	ON	ON	OFF	ON	ON	OFF
109	ON	OFF	ON	ON	OFF	ON	ON	OFF
110	OFF	ON	ON	ON	OFF	ON	ON	OFF
111	ON	ON	ON	ON	OFF	ON	ON	OFF
112	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
113	ON	OFF	OFF	OFF	ON	ON	ON	OFF
114	OFF	ON	OFF	OFF	ON	ON	ON	OFF
115	ON	ON	OFF	OFF	ON	ON	ON	OFF
116	OFF	OFF	ON	OFF	ON	ON	ON	OFF
117	ON	OFF	ON	OFF	ON	ON	ON	OFF
118	OFF	ON	ON	OFF	ON	ON	ON	OFF
119	ON	ON	ON	OFF	ON	ON	ON	OFF
120	OFF	OFF	OFF	ON	ON	ON	ON	OFF

MS/TP BACnet Network Address Dip Switch Settings (cont.)

Use the following tables as a guide to what the different Dip Switches mean.

ADDR	1	2	3	4	5	6	7	8
121	ON	OFF	OFF	ON	ON	ON	ON	OFF
122	OFF	ON	OFF	ON	ON	ON	ON	OFF
123	ON	ON	OFF	ON	ON	ON	ON	OFF
124	OFF	OFF	ON	ON	ON	ON	ON	OFF
125	ON	OFF	ON	ON	ON	ON	ON	OFF
126	OFF	ON	ON	ON	ON	ON	ON	OFF
127	ON	ON	ON	ON	ON	ON	ON	OFF
128	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
129	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
130	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
131	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
132	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
133	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
134	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
135	ON	ON	ON	OFF	OFF	OFF	OFF	ON
136	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
137	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
138	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
139	ON	ON	OFF	ON	OFF	OFF	OFF	ON
140	OFF	OFF	ON	ON	OFF	OFF	OFF	ON

ADDR	1	2	3	4	5	6	7	8
141	ON	OFF	ON	ON	OFF	OFF	OFF	ON
142	OFF	ON	ON	ON	OFF	OFF	OFF	ON
143	ON	ON	ON	ON	OFF	OFF	OFF	ON
144	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
145	ON	OFF	OFF	OFF	ON	OFF	OFF	ON
146	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
147	ON	ON	OFF	OFF	ON	OFF	OFF	ON
148	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
149	ON	OFF	ON	OFF	ON	OFF	OFF	ON
150	OFF	ON	ON	OFF	ON	OFF	OFF	ON
151	ON	ON	ON	OFF	ON	OFF	OFF	ON
152	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
153	ON	OFF	OFF	ON	ON	OFF	OFF	ON
154	OFF	ON	OFF	ON	ON	OFF	OFF	ON
155	ON	ON	OFF	ON	ON	OFF	OFF	ON
156	OFF	OFF	ON	ON	ON	OFF	OFF	ON
157	ON	OFF	ON	ON	ON	OFF	OFF	ON
158	OFF	ON	ON	ON	ON	OFF	OFF	ON
159	ON	ON	ON	ON	ON	OFF	OFF	ON
160	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON

ADDR	1	2	3	4	5	6	7	8
161	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
162	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
163	ON	ON	OFF	OFF	OFF	ON	OFF	ON
164	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
165	ON	OFF	ON	OFF	OFF	ON	OFF	ON
166	OFF	ON	ON	OFF	OFF	ON	OFF	ON
167	ON	ON	ON	OFF	OFF	ON	OFF	ON
168	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
169	ON	OFF	OFF	ON	OFF	ON	OFF	ON
170	OFF	ON	OFF	ON	OFF	ON	OFF	ON
171	ON	ON	OFF	ON	OFF	ON	OFF	ON
172	OFF	OFF	ON	ON	OFF	ON	OFF	ON
173	ON	OFF	ON	ON	OFF	ON	OFF	ON
174	OFF	ON	ON	ON	OFF	ON	OFF	ON
175	ON	ON	ON	ON	OFF	ON	OFF	ON
176	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
177	ON	OFF	OFF	OFF	ON	ON	OFF	ON
178	OFF	ON	OFF	OFF	ON	ON	OFF	ON
179	ON	ON	OFF	OFF	ON	ON	OFF	ON
180	OFF	OFF	ON	OFF	ON	ON	OFF	ON

ADDR	1	2	3	4	5	6	7	8
181	ON	OFF	ON	OFF	ON	ON	OFF	ON
182	OFF	ON	ON	OFF	ON	ON	OFF	ON
183	ON	ON	ON	OFF	ON	ON	OFF	ON
184	OFF	OFF	OFF	ON	ON	ON	OFF	ON
185	ON	OFF	OFF	ON	ON	ON	OFF	ON
186	OFF	ON	OFF	ON	ON	ON	OFF	ON
187	ON	ON	OFF	ON	ON	ON	OFF	ON
188	OFF	OFF	ON	ON	ON	ON	OFF	ON
189	ON	OFF	ON	ON	ON	ON	OFF	ON
190	OFF	ON	ON	ON	ON	ON	OFF	ON
191	ON	ON	ON	ON	ON	ON	OFF	ON
192	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
193	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
194	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
195	ON	ON	OFF	OFF	OFF	OFF	ON	ON
196	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
197	ON	OFF	ON	OFF	OFF	OFF	ON	ON
198	OFF	ON	ON	OFF	OFF	OFF	ON	ON
199	ON	ON	ON	OFF	OFF	OFF	ON	ON
200	OFF	OFF	OFF	ON	OFF	OFF	ON	ON

ADDR	1	2	3	4	5	6	7	8
201	ON	OFF	OFF	ON	OFF	OFF	ON	ON
202	OFF	ON	OFF	ON	OFF	OFF	ON	ON
203	ON	ON	OFF	ON	OFF	OFF	ON	ON
204	OFF	OFF	ON	ON	OFF	OFF	ON	ON
205	ON	OFF	ON	ON	OFF	OFF	ON	ON
206	OFF	ON	ON	ON	OFF	OFF	ON	ON
207	ON	ON	ON	ON	OFF	OFF	ON	ON
208	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
209	ON	OFF	OFF	OFF	ON	OFF	ON	ON
210	OFF	ON	OFF	OFF	ON	OFF	ON	ON
211	ON	ON	OFF	OFF	ON	OFF	ON	ON
212	OFF	OFF	ON	OFF	ON	OFF	ON	ON
213	ON	OFF	ON	OFF	ON	OFF	ON	ON
214	OFF	ON	ON	OFF	ON	OFF	ON	ON
215	ON	ON	ON	OFF	ON	OFF	ON	ON
216	OFF	OFF	OFF	ON	ON	OFF	ON	ON
217	ON	OFF	OFF	ON	ON	OFF	ON	ON
218	OFF	ON	OFF	ON	ON	OFF	ON	ON
219	ON	ON	OFF	ON	ON	OFF	ON	ON
220	OFF	OFF	ON	ON	ON	OFF	ON	ON

ADDR	1	2	3	4	5	6	7	8
221	ON	OFF	ON	ON	ON	OFF	ON	ON
222	OFF	ON	ON	ON	ON	OFF	ON	ON
223	ON	ON	ON	ON	ON	OFF	ON	ON
224	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
225	ON	OFF	OFF	OFF	OFF	ON	ON	ON
226	OFF	ON	OFF	OFF	OFF	ON	ON	ON
227	ON	ON	OFF	OFF	OFF	ON	ON	ON
228	OFF	OFF	ON	OFF	OFF	ON	ON	ON
229	ON	OFF	ON	OFF	OFF	ON	ON	ON
230	OFF	ON	ON	OFF	OFF	ON	ON	ON
231	ON	ON	ON	OFF	OFF	ON	ON	ON
232	OFF	OFF	OFF	ON	OFF	ON	ON	ON
233	ON	OFF	OFF	ON	OFF	ON	ON	ON
234	OFF	ON	OFF	ON	OFF	ON	ON	ON
235	ON	ON	OFF	ON	OFF	ON	ON	ON
236	OFF	OFF	ON	ON	OFF	ON	ON	ON
237	ON	OFF	ON	ON	OFF	ON	ON	ON
238	OFF	ON	ON	ON	OFF	ON	ON	ON
239	ON	ON	ON	ON	OFF	ON	ON	ON
240	OFF	OFF	OFF	OFF	ON	ON	ON	ON

ADDR	1	2	3	4	5	6	7	8
241	ON	OFF	OFF	OFF	ON	ON	ON	ON
242	OFF	ON	OFF	OFF	ON	ON	ON	ON
243	ON	ON	OFF	OFF	ON	ON	ON	ON
244	OFF	OFF	ON	OFF	ON	ON	ON	ON
245	ON	OFF	ON	OFF	ON	ON	ON	ON
246	OFF	ON	ON	OFF	ON	ON	ON	ON
247	ON	ON	ON	OFF	ON	ON	ON	ON
248*	OFF	OFF	OFF	ON	ON	ON	ON	ON
249*	ON	OFF	OFF	ON	ON	ON	ON	ON
250*	OFF	ON	OFF	ON	ON	ON	ON	ON
251*	ON	ON	OFF	ON	ON	ON	ON	ON
252*	OFF	OFF	ON	ON	ON	ON	ON	ON
253*	ON	OFF	ON	ON	ON	ON	ON	ON
254*	OFF	ON	ON	ON	ON	ON	ON	ON
255*	ON	ON	ON	ON	ON	ON	ON	ON

BACnet Object Map

OBJECT	OBJECT IDs	NOTES
AV Pilot Modes	1-128	Bit Pattern: Same Flash/Color/Intensity as other smart switches
AV Device Options	1000	Bits: ??
AV Control Regs.	1001-1003	AV1001 – Input Change Buffer AV1002 – Relay Override AV1003 – Device ID AV1004 – Input Emulation
AV Control Regs.	1005-1018	Future Enhancement AV1005 – # of relay firing cards AV1006 – # of input cards AV1007 – Slave device band AV1008 – Reserved AV1009 – Reserved AV1010 – Reserved AV1011 – Device 1 Active Outputs AV1012 – Device 2 Active Outputs AV1013 – Device 3 Active Outputs AV1014 – Device 4 Active Outputs AV1015 – Device 5 Active Outputs AV1016 – Device 6 Active Outputs AV1017 – Device 7 Active Outputs AV1018 – Device 8 Active Outputs
AV Relay Feedbacks	2001-2064	0 = Relay Off, 1 = Relay On
AV Dimmer Rates	3001-3064	Future Enhancement
AV Scene Status	4001-4128	Future Enhancement
AV Scene Data	10101-22864	Future Enhancement Addressing Format SSSEE where SSS – 101 to 228 scenes 1 to 128 EE – Outputs 1 to 64
AO Dimmers	1-64	Future Enhancement
BI Momentary Inputs	1-128	
BI Maintain Inputs	1001-1128	
BO Relays	1-64	
BO Scene Controls	4001-4128	Future Enhancement Present_Value = Run Feedback_Value = Status (Pilot)

BACnet Button Color/Intensity/Flash Pattern Codes

Color	Intensity	Slow Flash		Slow Flash Reverse		Fast Flash		Fast Flash Reverse		Wink		Wink Reverse		On	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Red	25%	09	09	10	0A	11	0B	12	0C	13	0D	14	0E	15	0F
Red	50%	73	49	74	4A	75	4B	76	4C	77	4D	78	4E	79	4F
Red	75%	137	89	138	8A	139	8B	140	8C	141	8D	142	8E	143	8F
Red	100%	201	C9	202	CA	203	CB	204	CC	205	CD	206	CE	207	CF
Green	25%	17	11	18	12	19	13	20	14	21	15	22	16	23	17
Green	50%	81	51	82	52	83	53	84	54	85	55	86	56	87	57
Green	75%	145	91	146	92	147	93	148	94	149	95	150	96	151	97
Green	100%	209	D1	210	D2	211	D3	212	D4	213	D5	214	D6	215	D7
Blue	25%	25	19	26	1A	27	1B	28	1C	29	1D	30	1E	31	1F
Blue	50%	89	59	90	5A	91	5B	92	5C	93	5D	94	5E	95	5F
Blue	75%	153	99	154	9A	155	9B	156	9C	157	9D	158	9E	159	9F
Blue	100%	217	D9	218	DA	219	DB	220	DC	221	DD	222	DE	223	DF
Yellow	25%	33	21	34	22	35	23	36	24	37	25	38	26	39	27
Yellow	50%	97	61	98	62	99	63	100	64	101	65	102	66	103	67
Yellow	75%	161	A1	162	A2	163	A3	164	A4	165	A5	166	A6	167	A7
Yellow	100%	225	E1	226	E2	227	E3	228	E4	229	E5	230	E6	231	E7
Purple	25%	41	29	42	2A	43	2B	44	2C	45	2D	46	2E	47	2F
Purple	50%	105	69	106	6A	107	6B	108	6C	109	6D	110	6E	111	6F
Purple	75%	169	A9	170	AA	171	AB	172	AC	173	AD	174	AE	175	AF
Purple	100%	233	E9	234	EA	235	EB	236	EC	237	ED	238	EE	239	EF
Cyan	25%	49	31	50	32	51	33	52	34	53	35	54	36	55	37
Cyan	50%	113	71	114	72	115	73	116	74	117	75	118	76	119	77
Cyan	75%	177	B1	178	B2	179	B3	180	B4	181	B5	182	B6	183	B7
Cyan	100%	241	F1	242	F2	243	F3	244	F4	245	F5	246	F6	247	F7
White	25%	57	39	58	3A	59	3B	60	3C	61	3D	62	3E	63	3F
White	50%	121	79	122	7A	123	7B	124	7C	125	7D	126	7E	127	7F
White	75%	185	B9	186	BA	187	BB	188	BC	189	BD	190	BE	191	BF
White	100%	249	F9	250	FA	251	FB	252	FC	253	FD	254	FE	255	FF

Frequently Asked Questions

1. What is the RJ-45 jack on the bottom of the BACnet Master for?
 - a. The RJ-45 jack is to pass power and communication to the Relay Firing Cards. **IT IS NOT AN ETHERNET PORT.**
2. What does Address mean?
 - a. The numbers mean the following:

ATP	VALUE
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128

See pages 14-15 for further explanation

3. How can I clear the Wall Station programming on the BACnet Master?
 - a. To clear the current programming on BACnet Master, press and hold the STATION button. The LEDs on the board will start to turn on from bottom to top. Once the LEDs have gone all the way to the top, the programming is cleared.

BACnet Front End Interface Frequently Asked Questions

1. I just want to make sure that if we use the BACnet Master controller, will we be able to manipulate the system through our Alerton programming to fit our needs if the on board programming is not versatile enough for the application? Is it an all or nothing system as far as programming is concerned?
 - a. Your front end can control a relay at any time by writing to the BO at the same or higher priority level that is used by the switches locally (we use the lowest priority, level 16). If you write at a higher priority you will have to relinquish control before the local switch will work again.

On AV1002, the overrides we are referring to is someone manually overriding a relay by walking up to the panel and changing the state by using the built in switch. The new relays are mechanically latching and use the slide switch on the top, which can be used to open or close, even when not powered. When you read AV1002 it returns the number of last manually overridden relay in the panel. Writing a zero to AV1002 will clear all override status flags, but the state of the relay is not changed. AV1002 was added because some of our customers did not have the ability to read the status flags of a BO (every BO has a status flags property which contains the override info).

If you want to be notified automatically that a relay has been manually overridden, you can use a COV scription to the relays BO object. When the relay changes the COV will report the following information:

- Present Value (last commanded value)
- Feedback Value (the actual state of the relay)
- Status Flags (which contain override and error information)