HOME AUTOMATION, INC.

Model 83A00
Power Hub

Installation Manual

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INTRODUCTION

The HAI Model 83A00 Power Hub is a general purpose 12VDC power supply. It is designed to provide power to several HAI products, including the HAI Access Control Card Readers with electric or magnetic locks, Omni Consoles, OmniTouch 5.7 Touchscreens, and many other devices.

The HAI Power Hub provides battery backed power for connected devices. It has convenient connections and power terminals for a neat installation. It is designed to eliminate unsightly transformers, power strips, external power supplies, battery backup units, and complex wiring normally associated with access control installations.

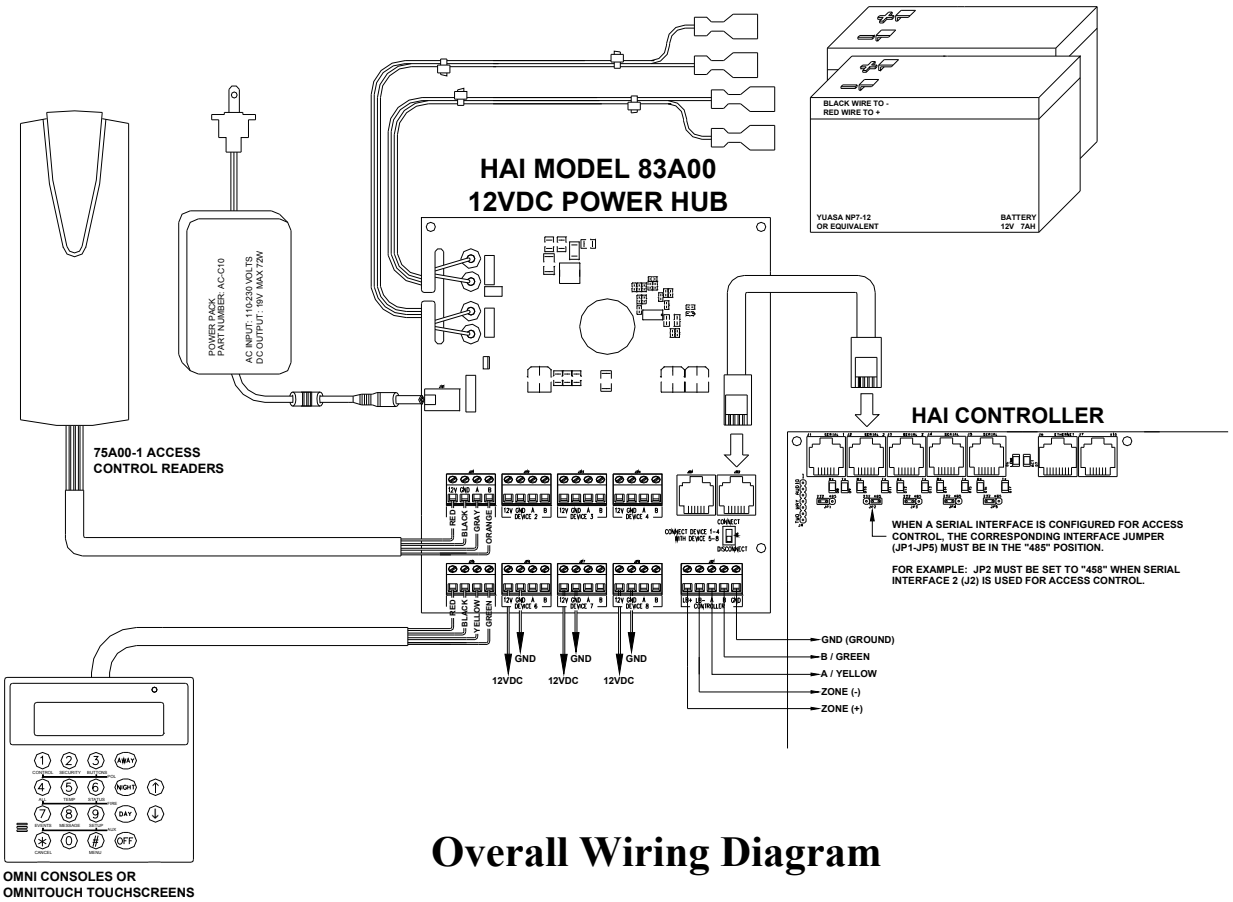
GENERAL

The HAI Power Hub is available in an HAI OmniLT Series Enclosure (83A00-1) or on the Universal Mounting Plate for installation in Structured Wiring enclosures (83A00-2). It is supplied with a sealed Power Pack, which provides power to the HAI Power Hub.

Features:

1. Connections for any 12VDC devices, up to 5 Amps total
2. Connections for the following HAI equipment:
   a. 8 Model 75A00-1 Access Control Card Readers (with electric and magnetic locks), OR
   b. 8 Omni Consoles and/or OmniTouch 5.7 Touchscreens, OR
   c. 4 Model 75A00-1 Access Control Card Readers (with electric and magnetic locks), AND
      4 Omni Consoles and/or OmniTouch 5.7 Touchscreens
3. Power supply with battery back up for Access Control Card Readers (with electric and magnetic locks), Omni Consoles, and OmniTouch 5.7 Touchscreens
4. Connections for all Omni and Lumina controllers
5. Supervisory output can be connected to zone on HAI controller to indicate low battery
6. Connectors for two sealed batteries, 12 V at 4 to 8 amp-hours each (not supplied)
7. Supplied with Universal Switching Power Pack

INSTALLATION



Overall Wiring Diagram

1. GROUNDING

Each Power Hub MUST be grounded to the controller. The HAI controller and HAI Power Hub(s) must be grounded together to prevent any current from flowing through the RS-485 data bus (connections A and B). If not grounded properly, damage could occur to the HAI controller, HAI Power Hub, Access Control Card Readers, Omni Consoles, and/or OmniTouch Touchscreens.

Connect the "GND" terminal on the HAI Power Hub under the section marked "CONTROLLER", to one of the "GND" (ground) terminals on the HAI controller (See – Figure 1).

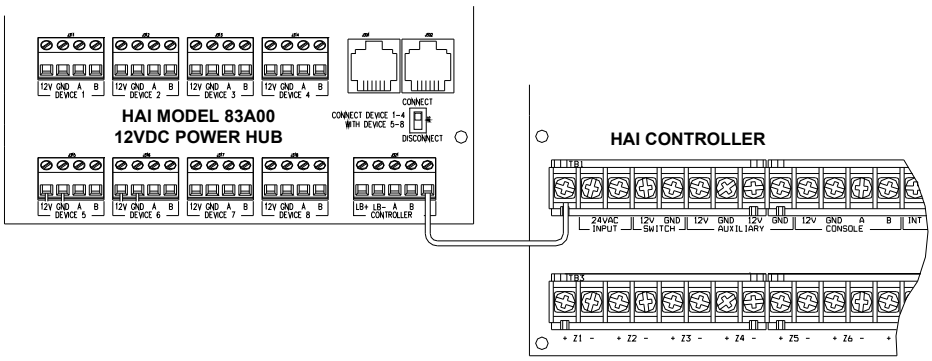


Figure 1

2. CONNECTING 12VDC DEVICES TO THE POWER HUB

Any 12VDC devices (up to 5 Amps total) can be connected to any of the "12V" and "GND" terminals under "DEVICE 1 – DEVICE 8" (See – Figure 2).

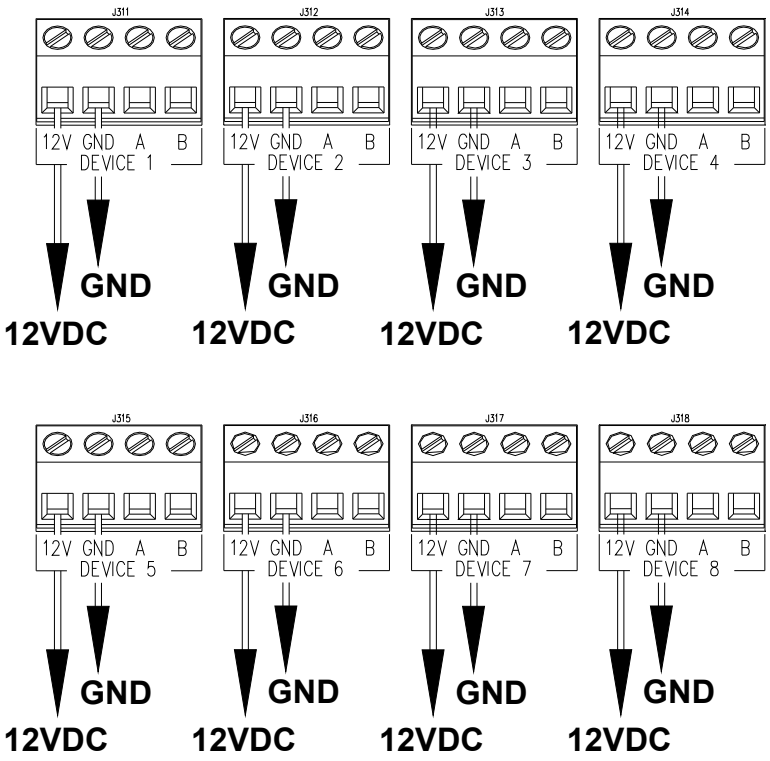


Figure 2

3. CONNECTING DEVICES THAT COMMUNICATE WITH THE AN HAI CONTROLLER

When devices that communicate with the HAI controller (i.e. 75A00-1 Access Control Readers, Consoles, or OmniTouch Touchscreens) are connected to the Power Hub, the communications path for the first row of the devices (DEVICE 1 – DEVICE 4) can be separated from the communications path for the second row of devices (DEVICE 5 – DEVICE 8). This is necessary if you are connecting devices that communicate on a different communications bus.

Connecting Devices of the Same Communications Type

For example, if <u>all</u> connected devices that communicate with the HAI controller consist of 75A00-1 Access Control Readers (which communicate on a serial port), then the communications path for the first row (DEVICE 1 – DEVICE 4) does not need to be separated from the second row (DEVICE 5 – DEVICE 8). In this case, switch "SW1" must be in the "CONNECT" position (See – Figure 3).

Likewise, if <u>all</u> connected devices that communicate with the HAI controller consist of Consoles and/or OmniTouch Touchscreens (which communicate on the console bus), the communications path for the first row (DEVICE 1 – DEVICE 4) does not need to be separated from the second row (DEVICE 5 – DEVICE 8). In this case, switch "SW1" must be in the "CONNECT" position.

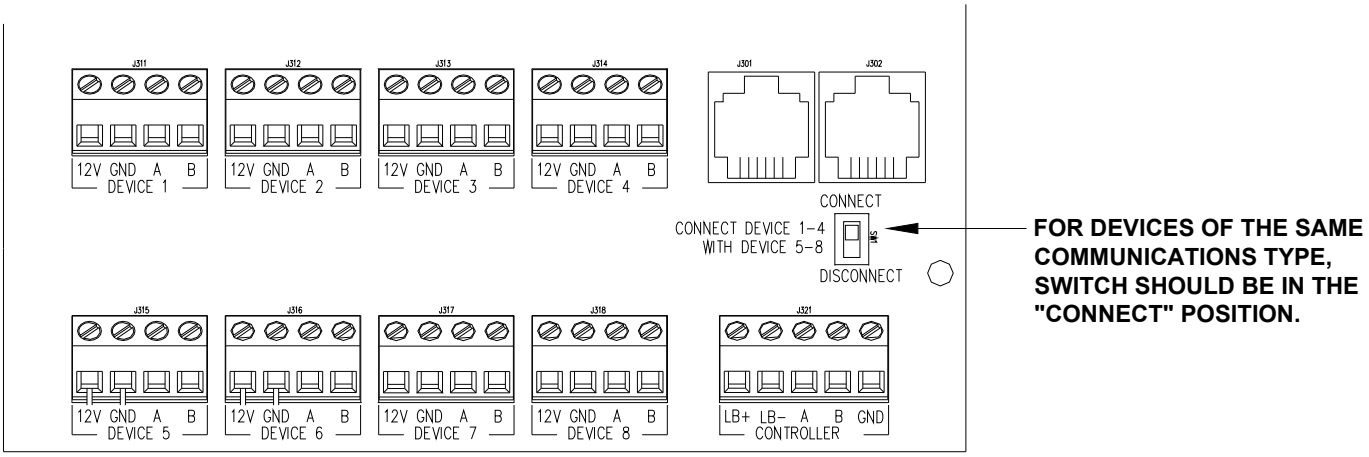


Figure 3

Connecting Devices of Different Communications Types

If a combination of 75A00-1 Access Control Readers and Consoles and/or Touchscreens are connected, then the communications path for the first row must be separated from the second row. Switch "SW1" must be in the "DISCONNECT" position (See – Figure 4).

DEVICE 1 – DEVICE 4:

- 75A00-1 Access Control Readers must be connected on the first row (DEVICE 1 – DEVICE 4)

DEVICE 5 – DEVICE 8:

- Consoles and/or OmniTouch Touchscreens must be connected on the second row (DEVICE 5 – DEVICE 8)

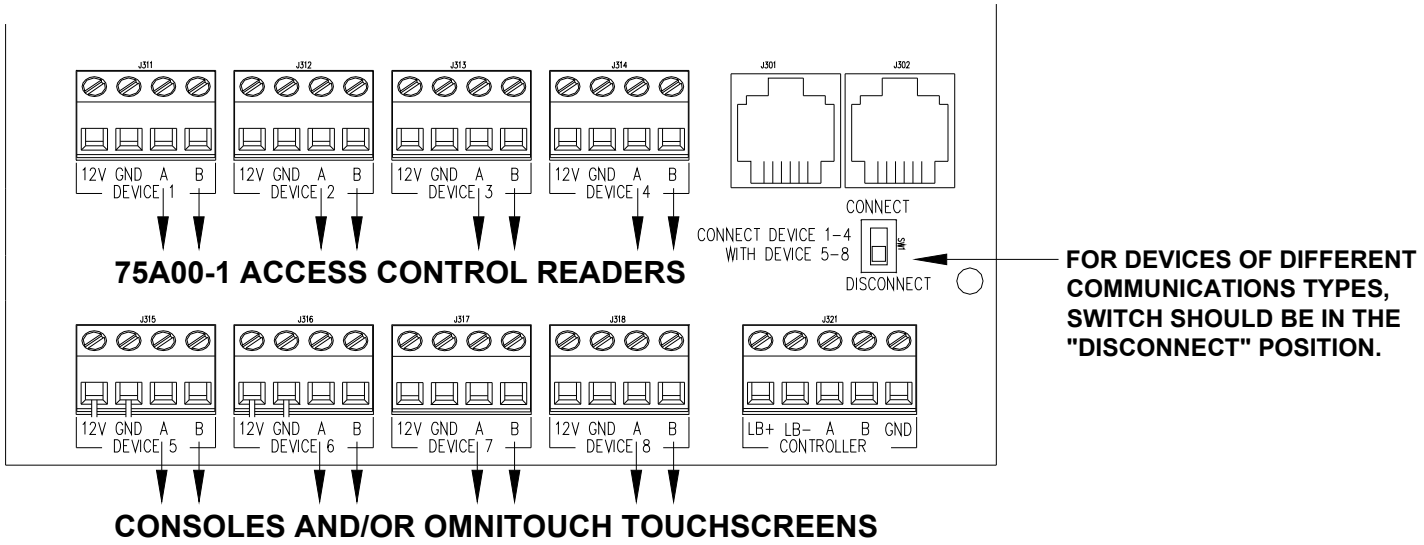


Figure 4

4. CONNECTING MODEL 75A00-1 ACCESS CONTROL CARD READERS

The 75A00-1 requires 4 wires for operation (2 for power and 2 for communications). The maximum distance between the 75A00-1 and the HAI 83A00 Power Hub is based on two factors: 1) the current draw of the connected door lock device, and 2) the wire gauge/type used. To maintain proper operation of the 75A00-1 and the connected door lock device, do not exceed the "Maximum Cable Length" based on the Total Current Draw and the Wire Gauge/Type per the table below (Table 1).

75A00-1 Only (no Door Lock connected): 150mA maximum				
Wire Gauge	Wire Type	Number of positive conductors	Number of ground conductors	Maximum Cable Length (feet)
24	solid	1	1	233
24	solid	2	2	466
24	solid	3	3	699
22	solid	1	1	413
22	solid	2	2	826
22	stranded	1	1	381
18	solid	1	1	1000
18	stranded	1	1	963
16	solid	1	1	1000
16	stranded	1	1	1000

75A00-1 and 79A00-1 Electric Door Strike (450mA): 600mA maximum				
Wire Gauge	Wire Type	Number of positive conductors	Number of ground conductors	Maximum Cable Length (feet)
24	solid	1	1	58
24	solid	2	2	117
24	solid	3	3	175
22	solid	1	1	103
22	solid	2	2	207
22	stranded	1	1	95
18	solid	1	1	261
18	stranded	1	1	241
16	solid	1	1	415
16	stranded	1	1	383

75A00-1 and Door Lock (800mA): 950mA maximum				
Wire Gauge	Wire Type	Number of positive conductors	Number of ground conductors	Maximum Cable Length (feet)
24	solid	1	1	37
24	solid	2	2	74
24	solid	3	3	110
22	solid	1	1	65
22	solid	2	2	130
22	stranded	1	1	60
18	solid	1	1	165
18	stranded	1	1	152
16	solid	1	1	262
16	stranded	1	1	242

75A00-1 and Door Lock (1A): 1.15A maximum				
Wire Gauge	Wire Type	Number of positive conductors	Number of ground conductors	Maximum Cable Length (feet)
24	solid	1	1	30
24	solid	2	2	61
24	solid	3	3	91
22	solid	1	1	54
22	solid	2	2	108
22	stranded	1	1	50
18	solid	1	1	136
18	stranded	1	1	126
16	solid	1	1	217
16	stranded	1	1	200

Table 1

Note: If cable with multiple conductors is used (such as Cat-5 cable), it is possible to connect multiple conductors together for power (i.e. the wires between Red and Black of the Access Control Reader and 12V and GND of the Power Hub) to achieve greater distance.

Connections

Connect the Red, Black, Gray, and Orange wires from the 75A00-1 Access Control Reader to the 12V, GND, A, and B terminals of the HAI Model 83A00-1 Power Hub, respectively (See – Figure 5).

When connecting Access Control Readers, only use terminals labeled DEVICE 1 – DEVICE 4, unless Switch "SW1" is in the "CONNECT" position. If "SW1" is in the "CONNECT" position, then DEVICE 5 – DEVICE 8 may also be used for Access Control Readers.

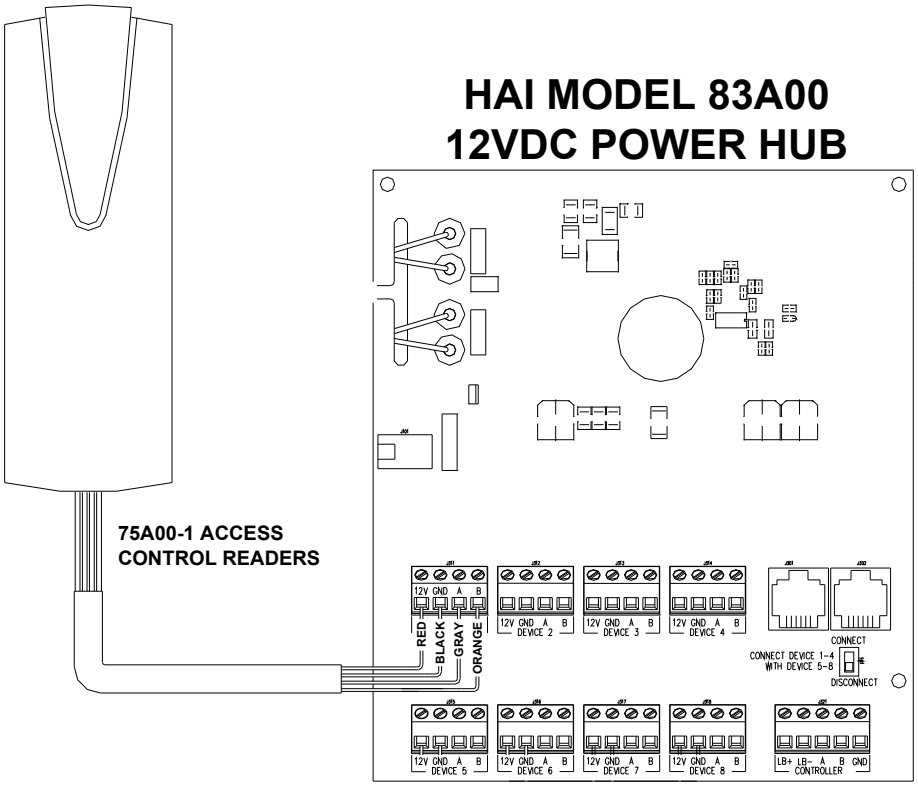


Figure 5

Connect the supplied 4-conductor modular cable between one of the modular connectors (J301 or J302) on the Power Hub and a serial port (J1 – J5) on the HAI controller (See – Figure 6).

The serial port that is used for HAI Access Control must be configured for RS-485 communications. The corresponding interface jumper (JP1-JP5) must be in the "485" position. For example: JP2 must be set to "485" when serial port 2 (J2) is used for HAI Access Control.

WARNING:

Do not connect either modular connector "J301" or "J302" to a serial port (J1 – J5) on the HAI controller if:

a) "SW1" is in the "CONNECT" position, AND

b) Terminals "A" and "B" under the section marked "CONTROLLER" on the Power Hub is connected to the "A" and "B" terminals under the section marked "CONSOLE" on the HAI controller.

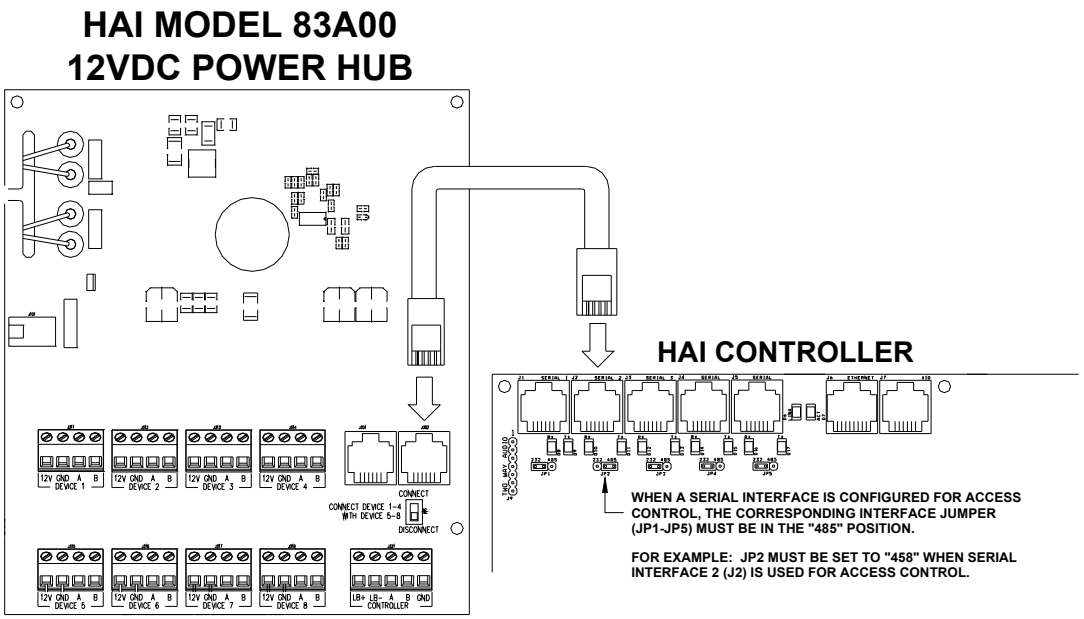


Figure 6

Connecting Additional HAI Power Hubs

When connecting more than 8 Model 75A00-1 Access Control Card Readers to an HAI OmniPro II or HAI Lumina Pro controller, if additional power is needed to control the required Access Control Readers and connected locks, or if there are long distances between Access Control Readers and the HAI controller, multiple HAI Power Hubs may be used.

To connect multiple Power Hubs together, connect the supplied 4-conductor modular cable between the modular connector labeled "J302" on the first Power Hub to modular connector "J301" on the second Power Hub. If additional Power Hubs are required, connect "J302" from the second to "J301" of the third, and so on. Connect "J302" from the last Power Hub to a serial port (J1 – J5) on the HAI controller (See – Figure 7).

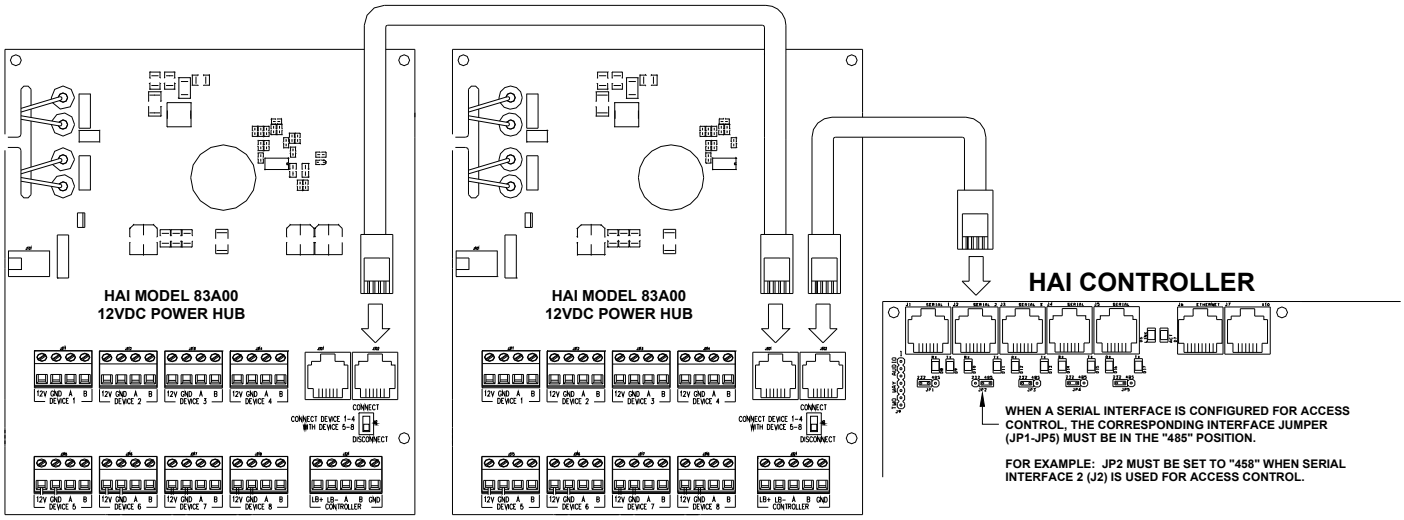


Figure 7

5. CONNECTING CONSOLES AND OMNITOUCH TOUCHSCREENS

Omni Consoles and OmniTouch Touchscreens require a minimum of 4 wires for operation (2 for power and 2 for communications).

The required distance between the Power Hub and OmniTouch Touchscreen will determine the wire gauge/type you should use. To prevent the OmniTouch Touchscreen from drawing more than the specified maximum current from the Power Hub, do not exceed the "Maximum Cable Length" based on the wire gauge/type according to the “Table 2”.

TABLE 2
MAXIMUM CABLE LENGTH BASED ON WIRE GAUGE / TYPE

Wire Gauge	Solid/ Stranded	Number of positive conductors	Number of ground conductors	Maximum Cable Length (feet)
24	solid	1	1	113
24	solid	2	2	227
24	solid	3	3	340
22	solid	1	1	180
22	solid	2	2	360
22	stranded	1	1	166
20	solid	1	1	287
20	stranded	1	1	267
18	solid	1	1	456
18	stranded	1	1	420
16	solid	1	1	724
16	stranded	1	1	669

Notes:

1. If cable with multiple conductors is used (such as Cat-5 cable), it is possible to connect multiple conductors together to achieve greater distance. For example, using only one of the 24 gauge conductor in the Cat-5 cable for power (1 for positive and 1 for ground), the maximum distance between the controller and the touchscreen is 113 feet.
2. The distance between the Power Hub and HAI controller combined with the distance between the Power Hub and a touchscreen, must never exceed a maximum distance of 1000 feet. When calculating the distance between the Power Hub and a touchscreen, you must subtract the distance between the Power Hub and the HAI controller from the “Maximum Cable Length” as listed in “Table 2”.

Connections

Connect the "Red", "Black", "Yellow", and "Green" wires from the touchscreen to the “12V”, “GND”, "A" and "B" terminals on the Power Hub, respectively (See – Figure 8).

If Omni Consoles or OmniTouch Touchscreens are being connected to the Power Hub, connect the terminals labeled “A” and “B” on the HAI Power Hub under the section marked “CONTROLLER”, to the “A” and “B” terminals on the HAI controller.

Note: When connecting to an OmniLT, the terminal labeled “A” on the Power Hub connects to the “YEL” terminal and the terminal labeled “B” on the Power Hub connects to the ”GRN” terminal under the section marked “CONSOLE” on the OmniLT controller.

When connecting Omni Consoles and/or OmniTouch Touchscreens, only use terminals labeled DEVICE 5 – DEVICE 8, unless Switch "SW1" is in the "CONNECT" position. If "SW1" is in the "CONNECT" position, then DEVICE 1 – DEVICE 4 may also be used Omni Consoles and/or OmniTouch Touchscreens.

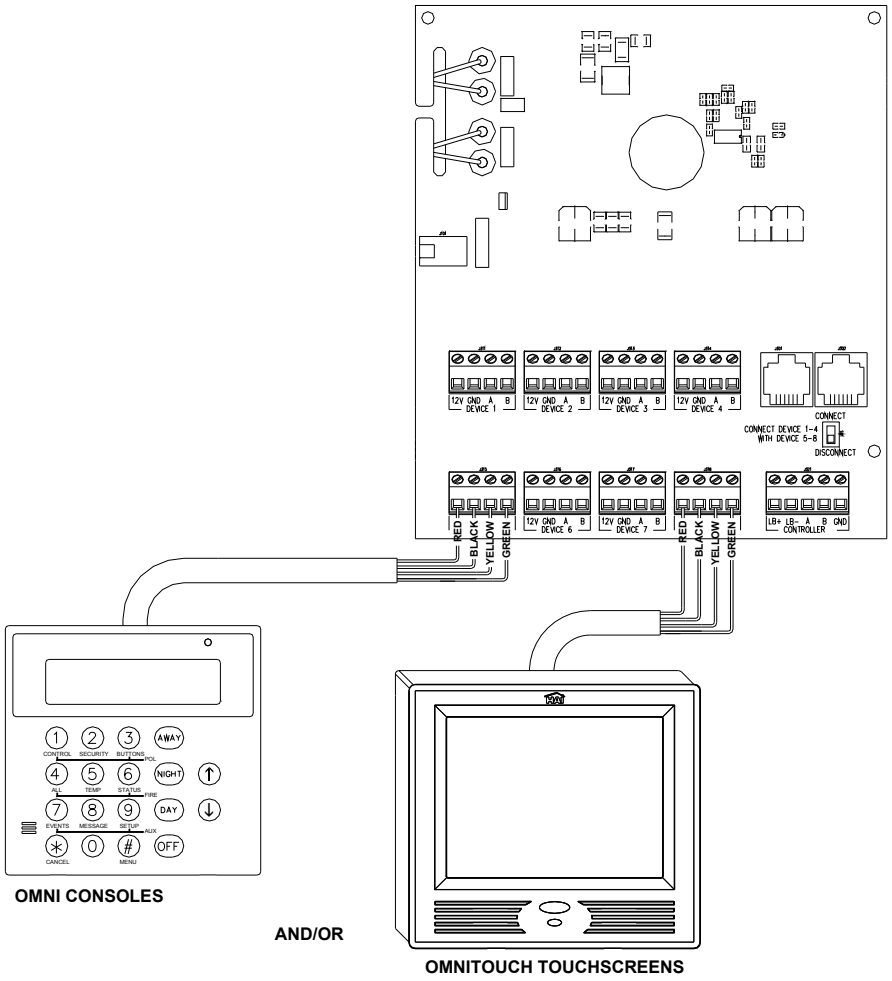


Figure 8

Connect the terminals labeled "A" and "B" under the section marked "CONTROLLER" on the Power Hub to the terminals labeled "A" and "B" under the section marked "CONSOLE" on the HAI controller, respectively.

WARNING:

Do not connect terminals "A" or "B" under the section marked "CONTROLLER" on the Power Hub to the terminals labeled "A" and "B" under the section marked "CONSOLE" on the HAI controller if

a) "SW1" is in the "CONNECT" position, AND

b) Either modular connector "J301" or "J302" is connected to a serial port (J1 – J5) on the HAI controller.

6. LOW BATTERY INDICATOR (Optional Connection)

When the backup batteries connected to the Power Hub become depleted, there are terminals on the Power Hub that are used to send a signal to the HAI controller to alert you of the low battery condition. To take advantage of this feature, you must have an extra pair of wire between the Power Hub and the HAI controller, and an available zone on the HAI controller.

Connect the terminals labeled "LB+" and "LB-" under the section marked "CONTROLLER" on the Power Hub to the "+" and "-" zone terminals of an available zone on the HAI controller. Do not use an end-of-line resistor on the zone. The touchscreen has a built-in 1K ohm resistor for this output. Configure the zone as a "Trouble" zone.

When the batteries on the Power Hub fall below a certain voltage threshold, the terminals "LB+" and "LB-" will open causing the zone on the HAI controller to trip, indicating a low battery condition on the Power Hub.

7. POWER CONNECTIONS

The supplied Power Pack is used to power the HAI Power Hub. An AC power outlet should be located within 5 feet. One or two sealed, rechargeable batteries (not included) can be used to backup connected devices. The two battery cables are in parallel, so by adding a second battery you will increase the battery backup time.

1. Connect one or two 12VDC batteries using the supplied battery terminals. Connect the BLACK battery wire to the minus (-) terminal on the battery and connect the RED battery wire to the plus (+) terminal on the battery. DO NOT reverse the connections; the battery fuse will blow. Note that the unit will NOT START on the battery alone.

2. Plug the connector for the Power Pack into the mating connector of the HAI Power Hub marked "J101".

3. Plug the power cord from the Power Pack into an electrical outlet. The "POWER ON" LED should illuminate.

4. Unplug the Power Pack. The Power Hub should continue to run off of the battery backup. The "POWER ON" LED should turn off.

5. Plug in the Power Pack. The system should start. The "POWER ON" LED should illuminate.

SPECIFICATIONS

Operating Ranges:	32 - 120 degrees F (0 - 49 degrees C) 10 - 85 % relative humidity, non-condensing
Power Pack:	Output 19VDC, 4.74 Amps, Max 90W Input 100-240VAC, 1.5A Amps, 50/60Hz
Output Power:	Nominal Voltage 12VDC Maximum Current 5A
Batteries:	Sealed, Rechargeable, 12 Volts, 4 - 8 Amp-Hours, each
Low Voltage Cut Out:	9.5VDC
Main Fuse:	4A Polyfuse
Battery Fuses:	6A Polyfuse
	Polyfuses are permanent fuses that do not need replacement.