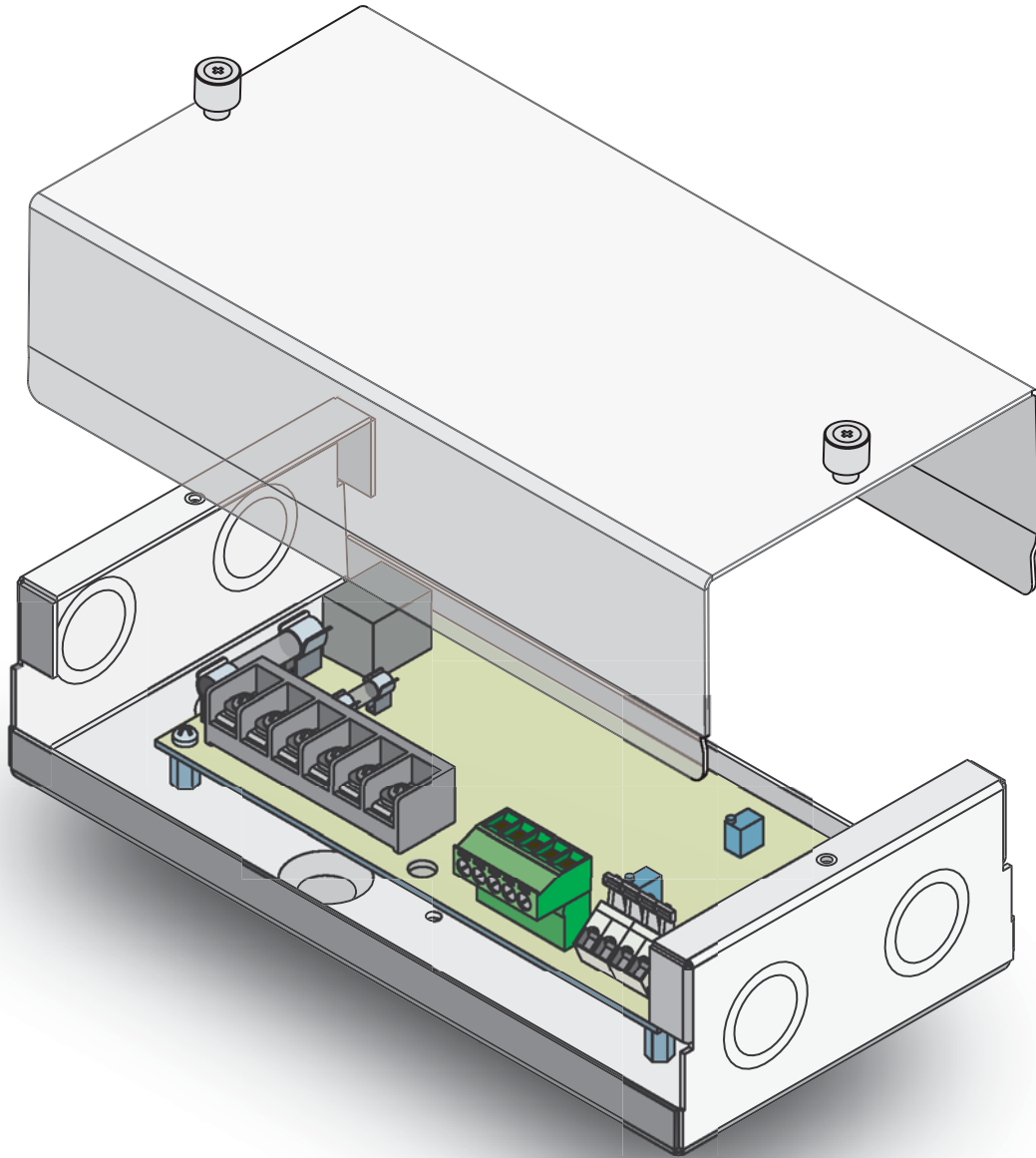


Astara I

Installation and Reference Manual



WARNING: RISK OF ELECTRIC SHOCK

The equipment described in this manual contains high voltage.
Always disconnect power to the equipment before installing,
disconnecting, or servicing the product.



**This product is for use in a dry, indoor environment only.
This product is not to be installed near water, liquid, or flammable materials.**

Usage

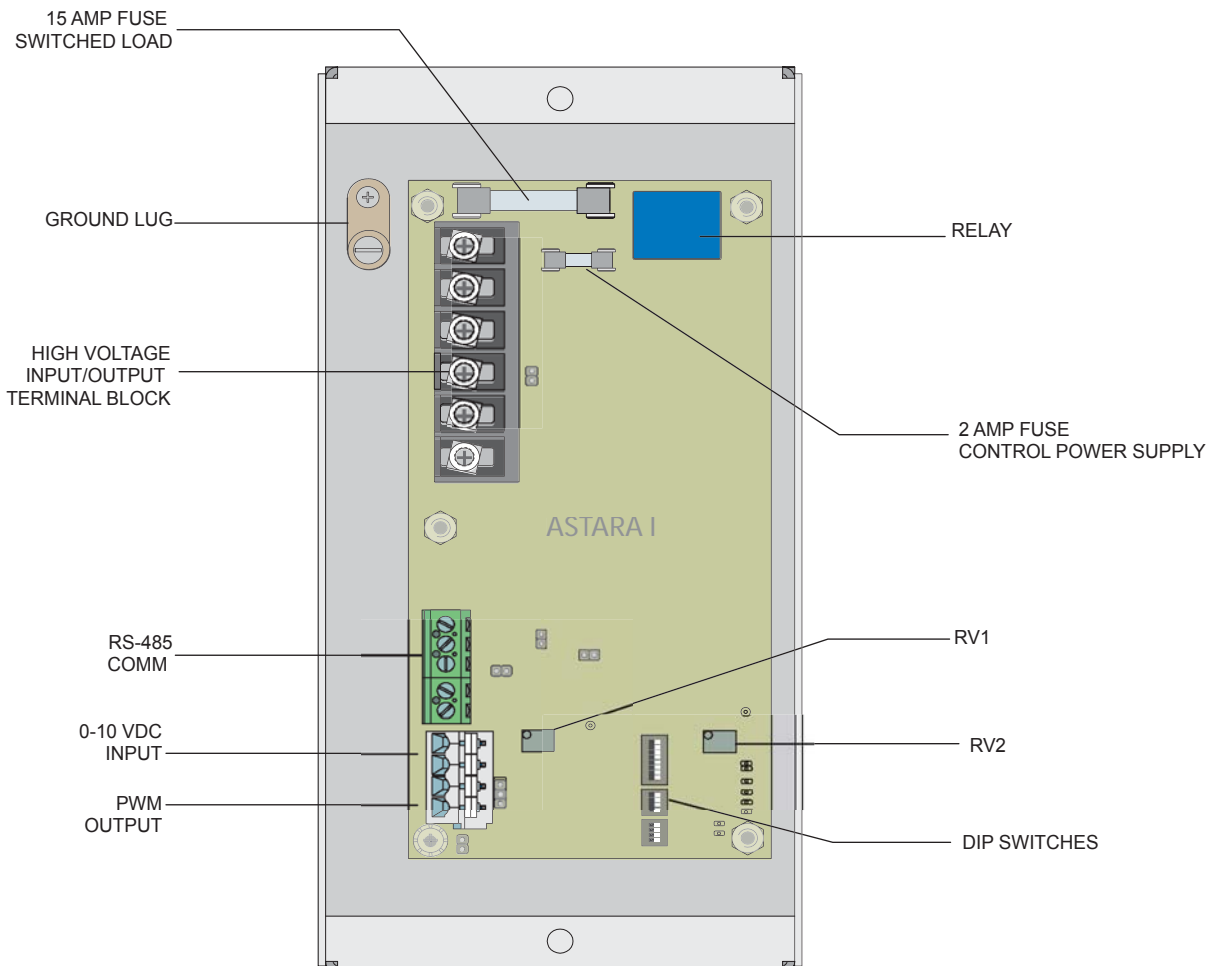
The Astaro I is a dimming interface for Nippo Seamlessline T6 fluorescent lamps with a dimmable ballast. The Astaro I converts control signals from an external controller into a PWM signal that will dim or brighten the Seamlessline luminaire.

The Astaro I is compatible with a variety of external controllers, giving users and designers more flexibility in the control of lighting systems. The Astaro I has inputs for three types of controllers:

- o High voltage dimmers
- o 0-10 VDC dimmers
- o Control stations using the RS-485 serial communication protocol

This product is intended for use only with Seamlessline fixtures with the dimmable ballast option:

SAL-UW850AM	SAL-UW850CM
SAL-UW1000AM	SAL-UW1000CM
SAL-UW1250AM	SAL-UW1250CM
SAL-UW1500AM	SAL-UW1500CM



Connections

High Voltage Inputs/Outputs

H1	Hot 1 (power input for the Astara I)
S1	Switched Hot 1 (power output for Seamlessline ballast)
N1 (two terminals)	Neutral for Hot and Switched Hot inputs and outputs*
N2	Neutral for Dimmed Hot (DIM) input*
DIM	Dimmed Hot input for control when using a high voltage dimmer

* Neutrals N1 and N2 are connected by default. When the Dimmed Hot input and Hot 1 input are a separate voltage or phase, N1 must be isolated from N2 by removing the jumper on JP5.

Low Voltage Inputs/Outputs

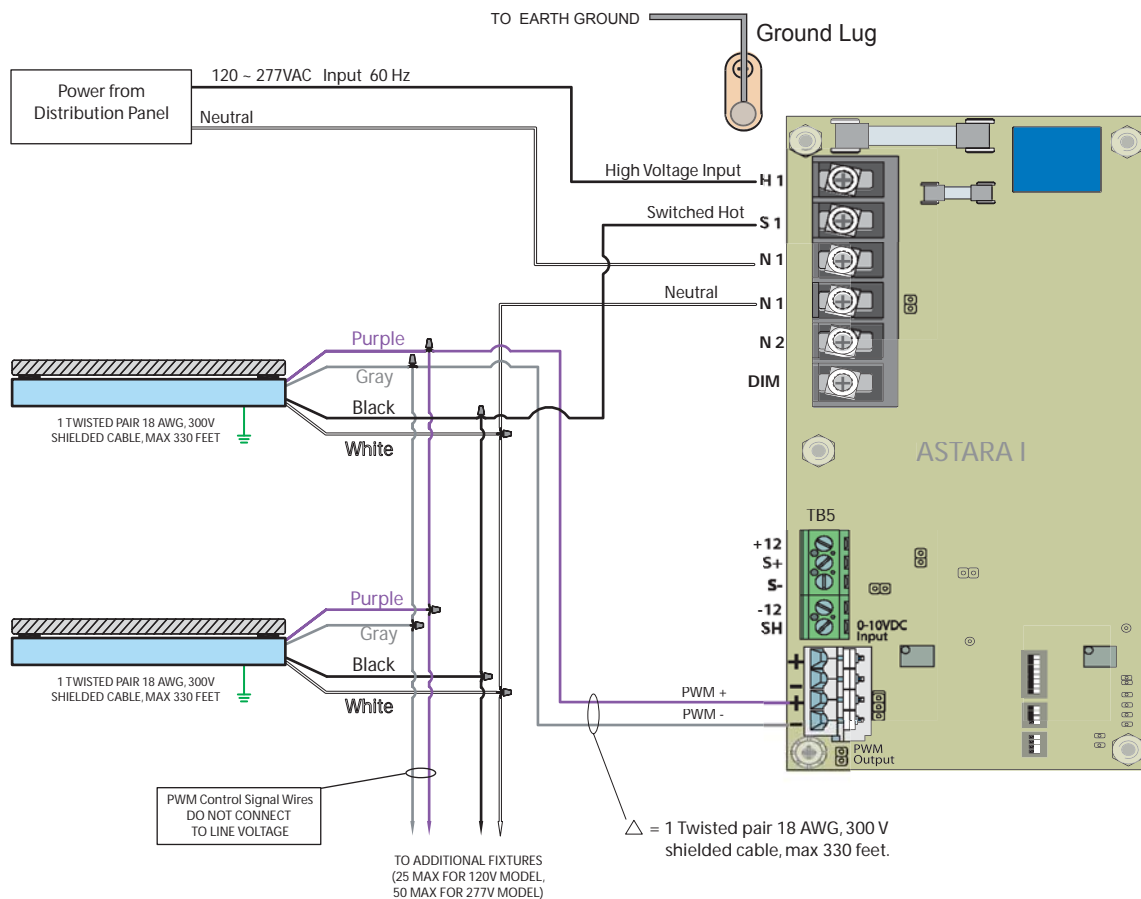
+	0-10 VDC Input	(+) and (-) input for control when using a 0-10 VDC dimmer
-		
+	PWM	(+) and (-) output for PWM channel
-		

Communication & Peripheral Inputs

TB5	Connector for RS-485 serial communication protocol
-----	--

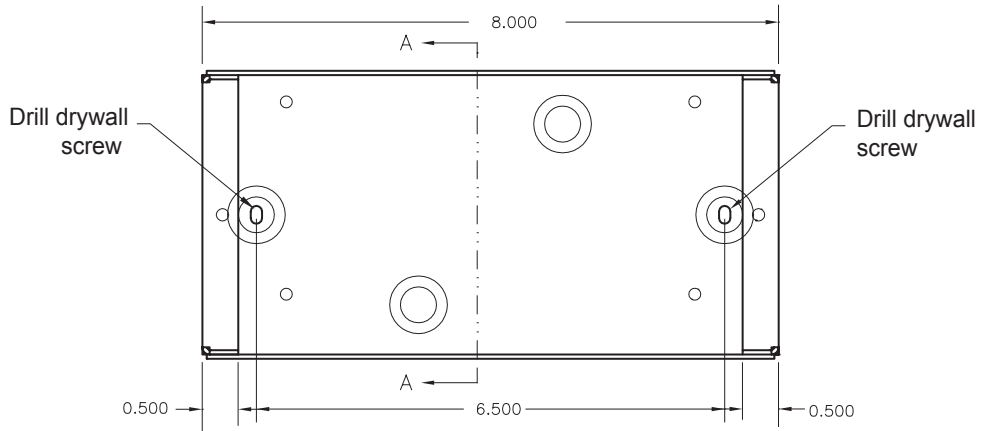
Ground

Ground Lug	Connect the ground lug to earth ground
------------	--

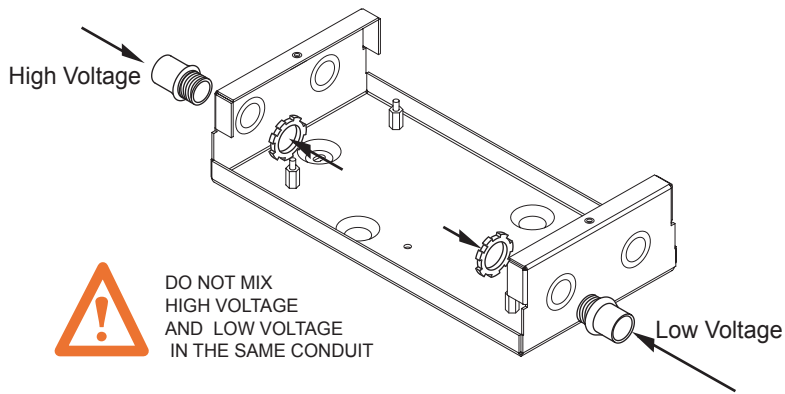


Astara I Installation

Mounting



Remove the cover and hold the Astara I in place, horizontally, against a wall. Drill two drywall screws through the holes as shown in the diagram above.

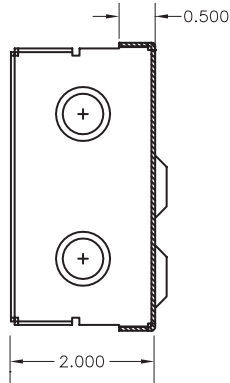


Ground Lug



CONNECT TO EARTH GROUND

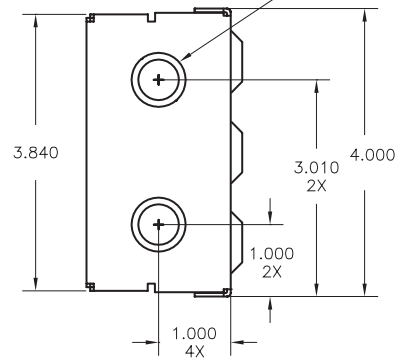
SECTION A-A



Knockouts

4X $\phi 0.75 / \phi 0.50$
DOUBLE KNOCK OUT

Side View



All wiring for the Astara I can be routed through the two circular knockouts at each side of the enclosure. Do not run high-voltage wires and low-voltage wires through the same knockout or conduit.

Conduits can be secured to the knockouts with a conduit fitting. Each side accepts 1/2" (using the singular knockout) or 3/4" (using the double knockout) conduits.

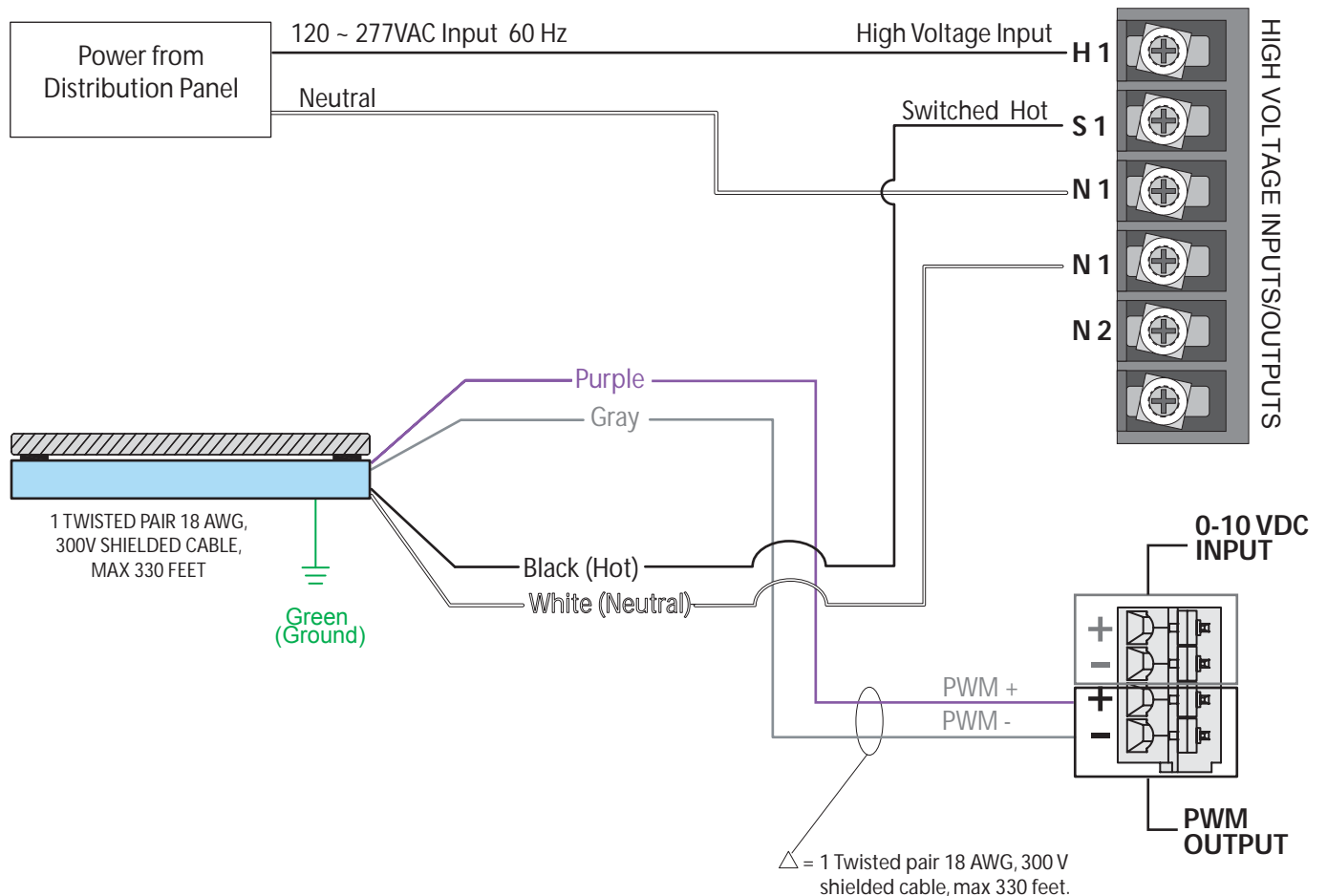
Connecting Nippo Seamlessline Fixtures



Shut off or disconnect main power before attempting the procedures below.

To connect a Seamlessline fixture to the Astar I:

1. Connect 110, 120, 240, or 277 VAC to terminal H1.
2. Connect the neutral to one of the N1 terminals.
3. Connect S1 to the Seamlessline's power supply (black wire).
4. Connect the other N1 terminal to the Seamlessline's neutral (white wire).
5. Connect PWM (+) to the Seamlessline's purple wire.
6. Connect PWM (-) to the Seamlessline's gray wire.



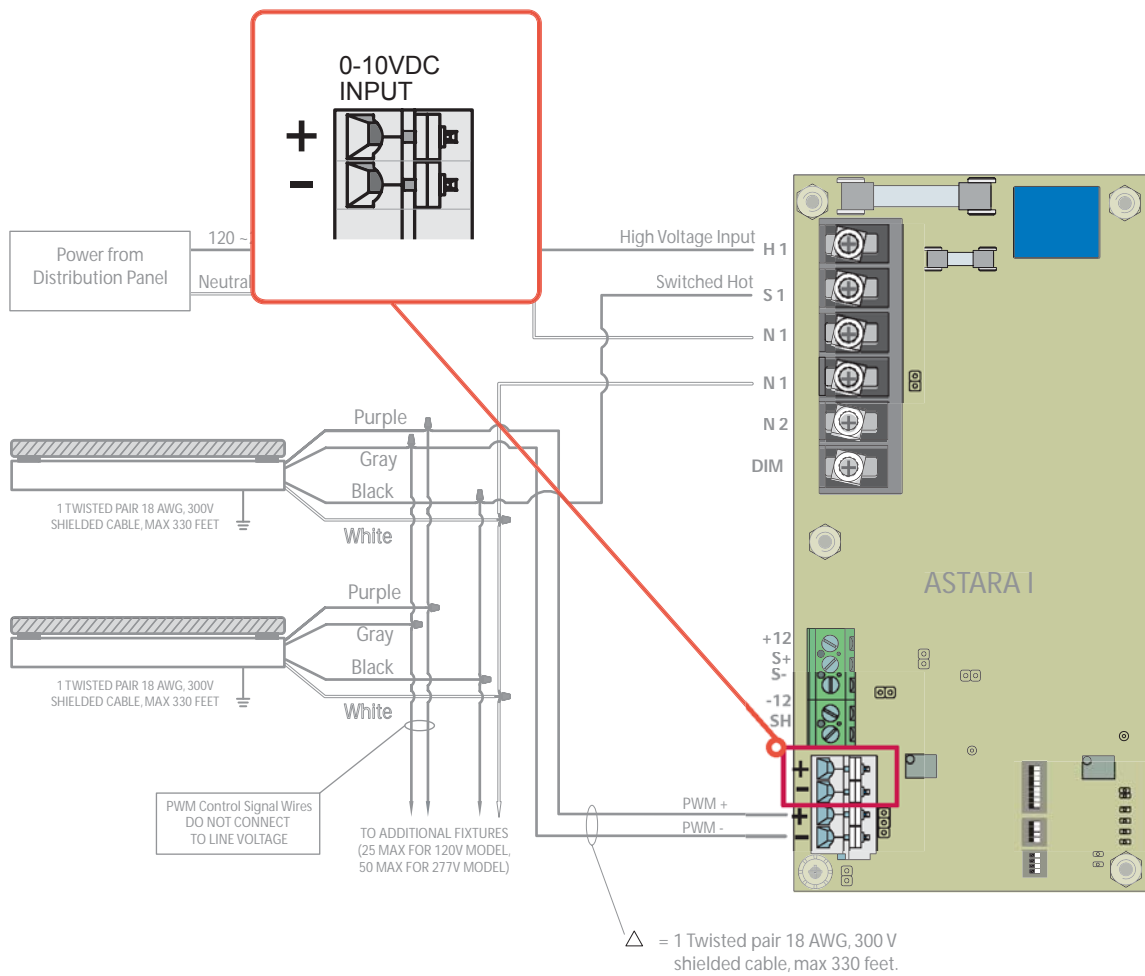
Control Installation

0-10 VDC Dimmer Control

Connecting a 0-10 VDC dimmer to the Astara I allows you to control the brightness of the fixtures from a typical 0-10 VDC control signal.

To connect a 0-10 VDC dimmer:

1. Turn off power to the Astara I board and dimmer.
2. Connect the dimmer's positive output (typically a pink wire) to +.
3. Connect the dimmer's ground (typically a gray wire) to -.
4. Turn on the Astara I board and dimmer.

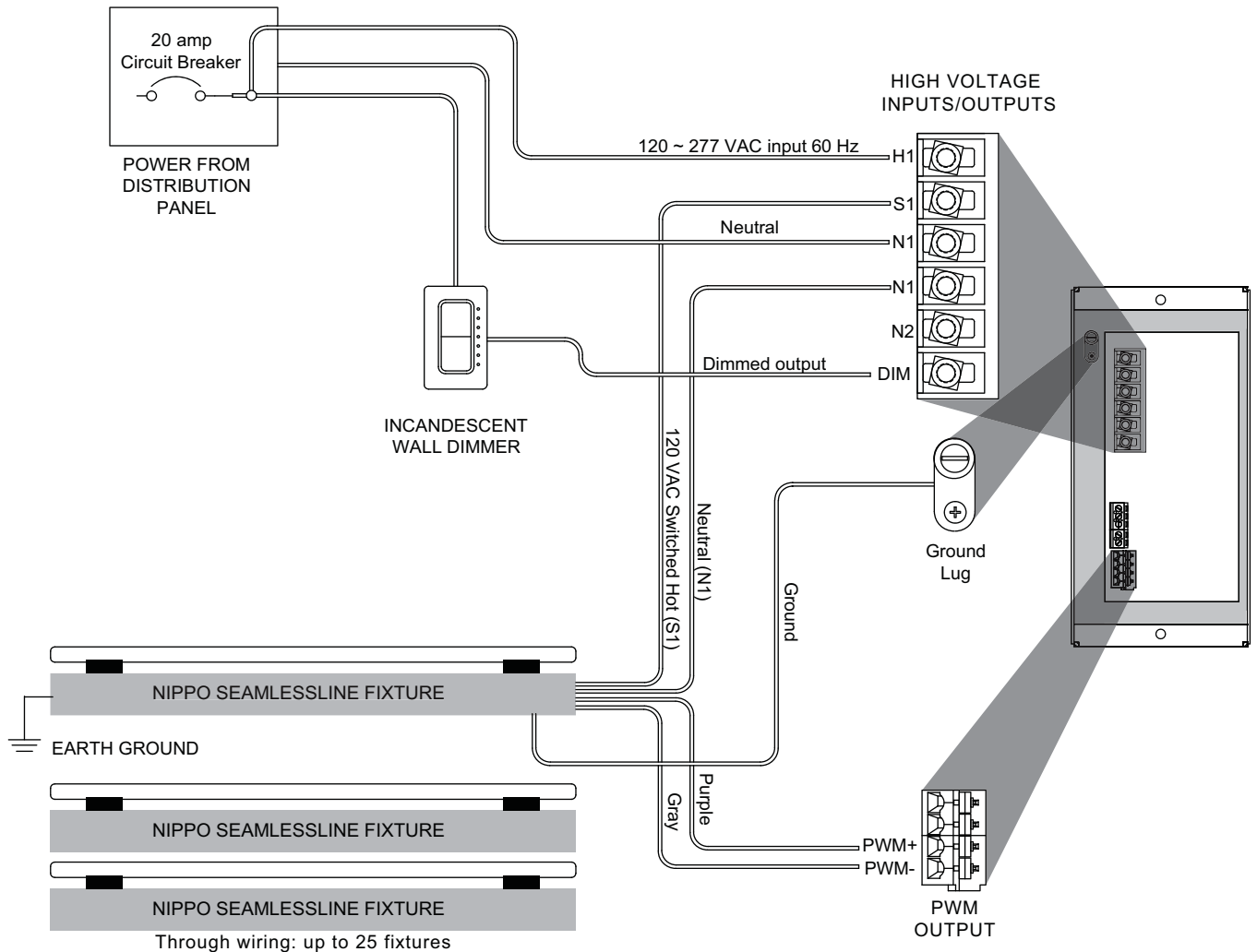


Control Installation

High Voltage Dimmer Control

Connecting a high-voltage dimmer to the Astara I allows you to control the brightness of the fixtures from a commercial grade 110 VAC, 120 VAC, 240 VAC, or 277 VAC incandescent wall dimmer or panelboard dimmer.

Option 1: To connect a high-voltage incandescent wall dimmer



1. Turn off power to the Astara I unit and dimmer.
2. Connect the dimmer's dimmed output to DIM of the Astara I.
3. Connect the constant hot circuit to H1 of the Astara I and the hot input of the wall dimmer. Use the same circuit to feed both H1 and the wall dimmer.



H1 (hot input) and DIM (high voltage dimmer input) must be connected to the same voltage and phase.

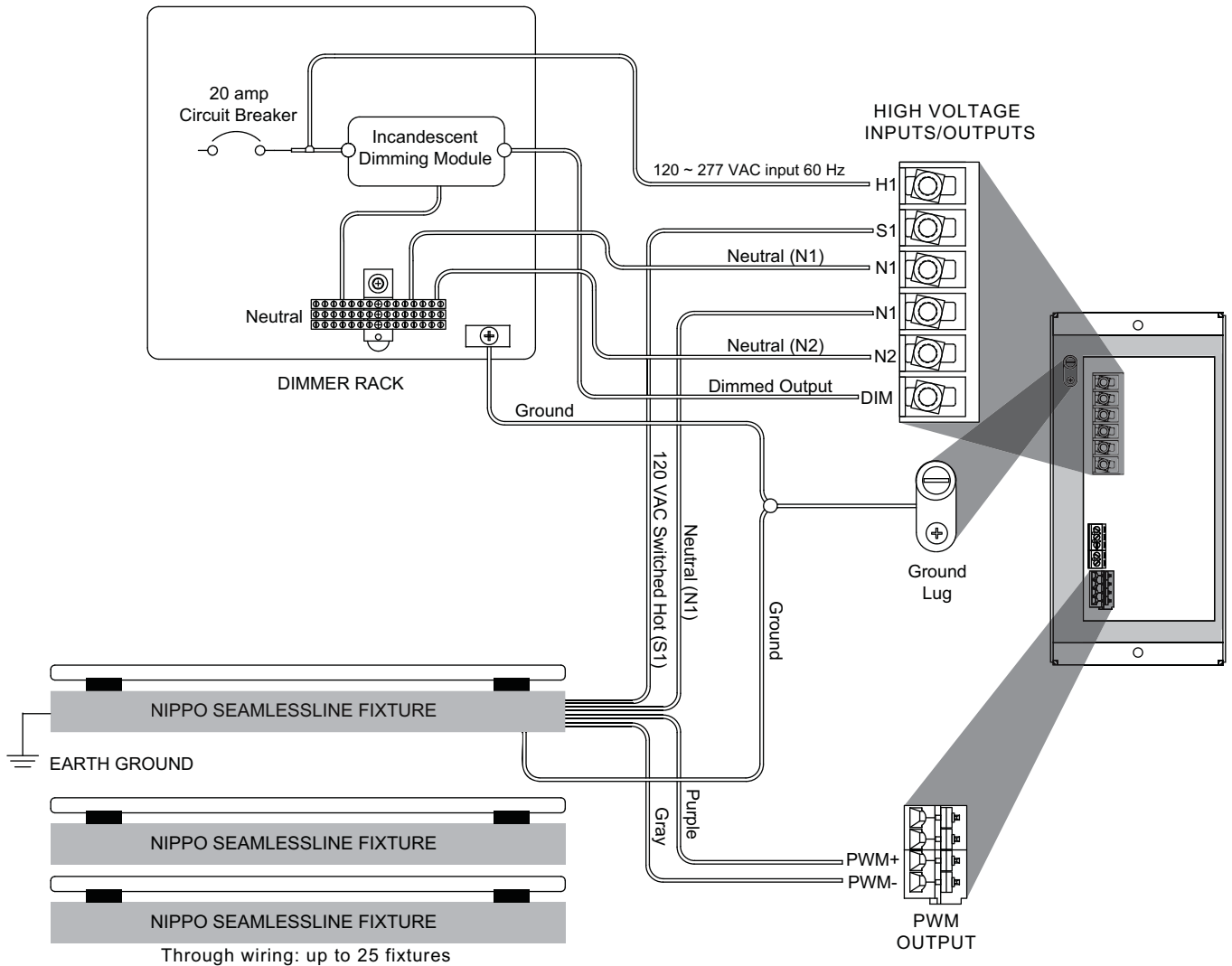
DO NOT MIX OR CONNECT TO SEPARATE VOLTAGES OR PHASES. DOING SO WILL DAMAGE THE ASTARA I.



4. Set dip switch SW3, #4 to ON if using a typical incandescent wall dimmer, or OFF if using a "smart" incandescent wall dimmer (see Appendix A).
5. Turn on the Astara I unit and wall dimmer.

High Voltage Dimmer Control

Option 2: To connect a high-voltage incandescent architectural dimming system



1. Turn off power to the Astara I and dimmer module in the dimming system.
2. Connect the dimmer's dimmed output to DIM of Astara I.
3. Connect the dimmer's neutral to N2 of Astara I.



H1 (hot input) and DIM (high voltage dimmer input) must be connected to the same voltage and phase. DO NOT MIX OR CONNECT TO SEPARATE VOLTAGES OR PHASES. DOING SO WILL DAMAGE THE ASTARA I.



4. Turn on the Astara I and dimmer module in the dimming system.

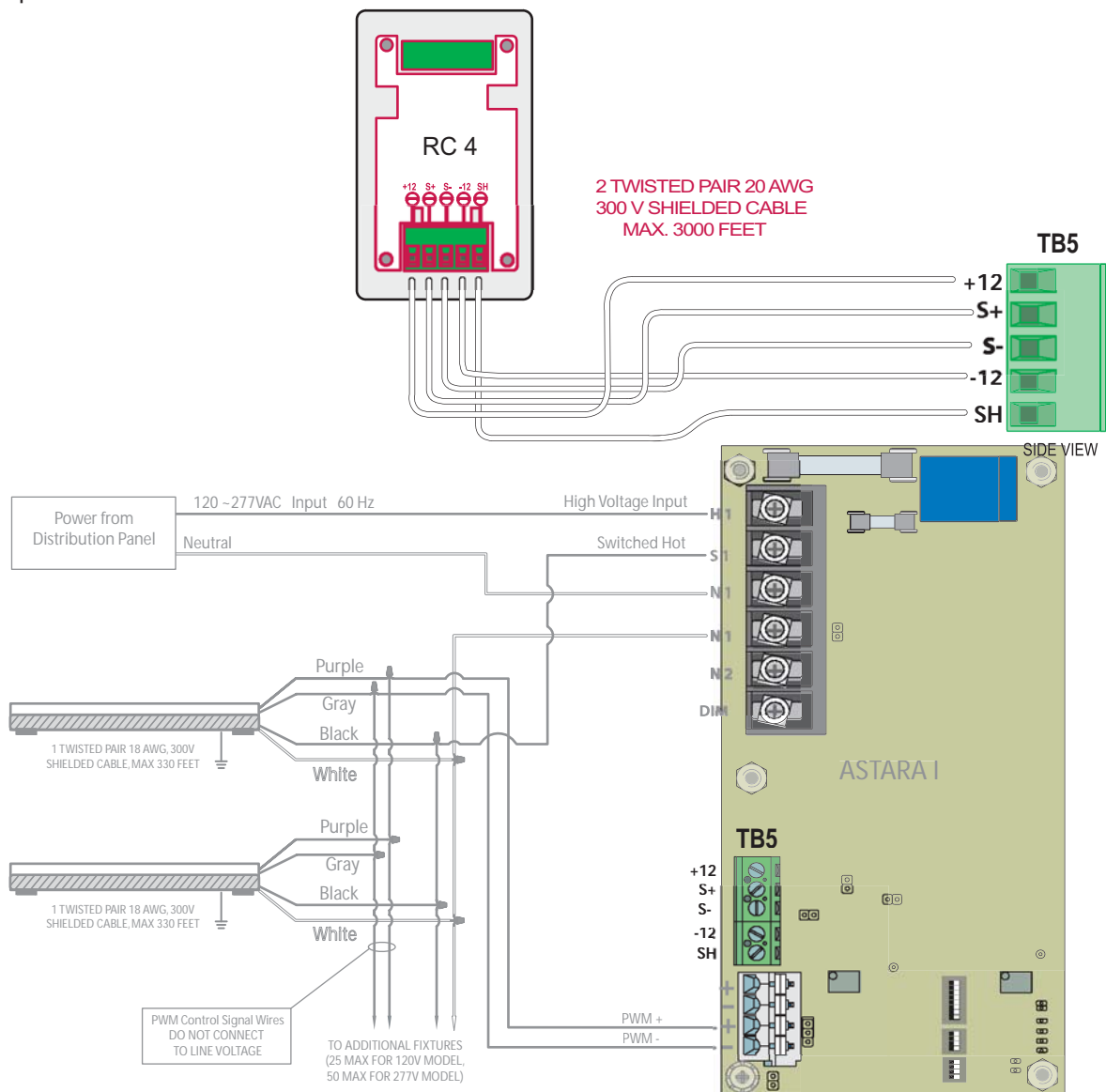
Control Installation

RS-485 SERIAL COMMUNICATION

The TB5 connector allows you to control the Astara I from the RC 4 controller. The RC 4 can adjust the brightness of the PWM channel and save light levels as presets, or scenes.

To connect the RC 4:

1. Turn off power to the Astara I board.
2. Using a two-twisted pair, 20 gauge, shielded cable, connect the RC 4's +12 terminal to the Astara I's +12 terminal.
3. Connect the RC 4's S+ terminal to the Astara I's S+ terminal.
4. Connect the RC 4's S- terminal to the Astara I's S- terminal.
5. Connect the RC 4's -12 terminal to the Astara I's -12 terminal.
6. Connect the RC 4's shield terminal to the Astara I's shield terminal.
7. Turn on power to the Astara I board.

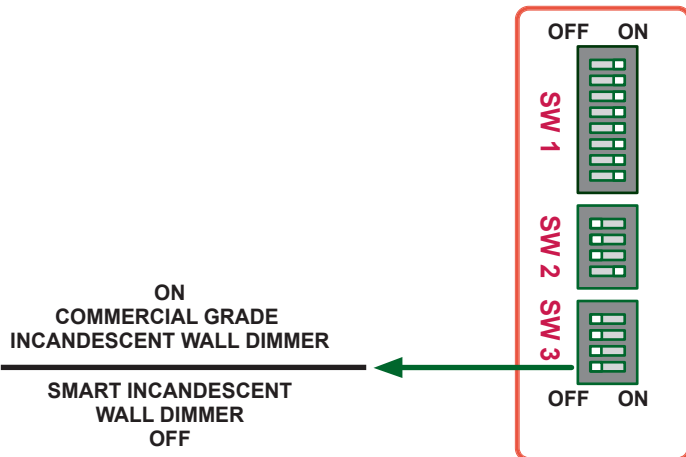
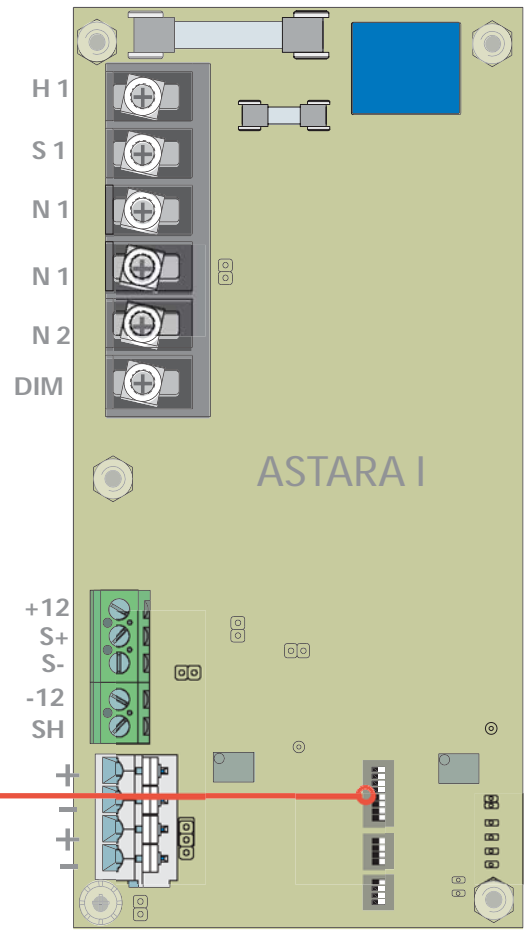


Appendix A: Dip Switches

SW1	Sets the Astara's physical address on the RS-485 communication network (default is 0x00, or all ON)
SW2	Switch 1: Adds 2% to the low-end cutoff light level Switch 2: Adds 4% to the low-end cutoff light level Switch 3: Adds 8% to the low-end cutoff light level Switch 4: Adds 16% to the low-end cutoff light level (default ON)
SW3	Switch 1, 2, 3 not used. Switch 4 (default OFF -smart incandescent dimmer)

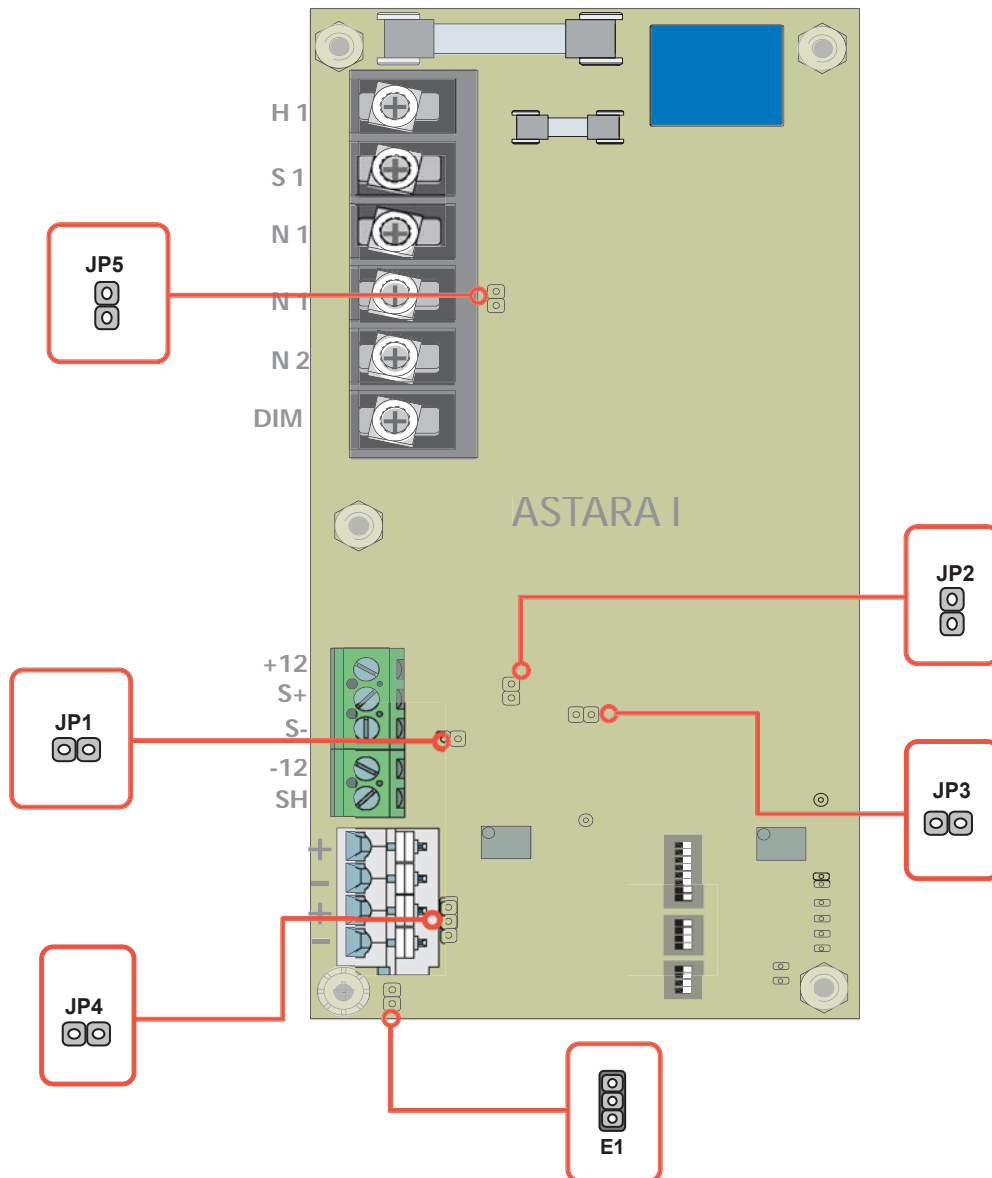
Summary of Low-End Cutoff Light Level Settings

Cutoff %	Dip Switch			
	1	2	3	4
0%	OFF	OFF	OFF	OFF
2%	ON	OFF	OFF	OFF
4%	OFF	ON	OFF	OFF
6%	ON	ON	OFF	OFF
8%	OFF	OFF	ON	OFF
10%	ON	OFF	ON	OFF
12%	OFF	ON	ON	OFF
14%	ON	ON	ON	OFF
16%	OFF	OFF	OFF	ON
18%	ON	OFF	OFF	ON
20%	OFF	ON	OFF	ON
22%	ON	ON	OFF	ON
24%	OFF	OFF	ON	ON
26%	ON	OFF	ON	ON
28%	OFF	ON	ON	ON
30%	ON	ON	ON	ON



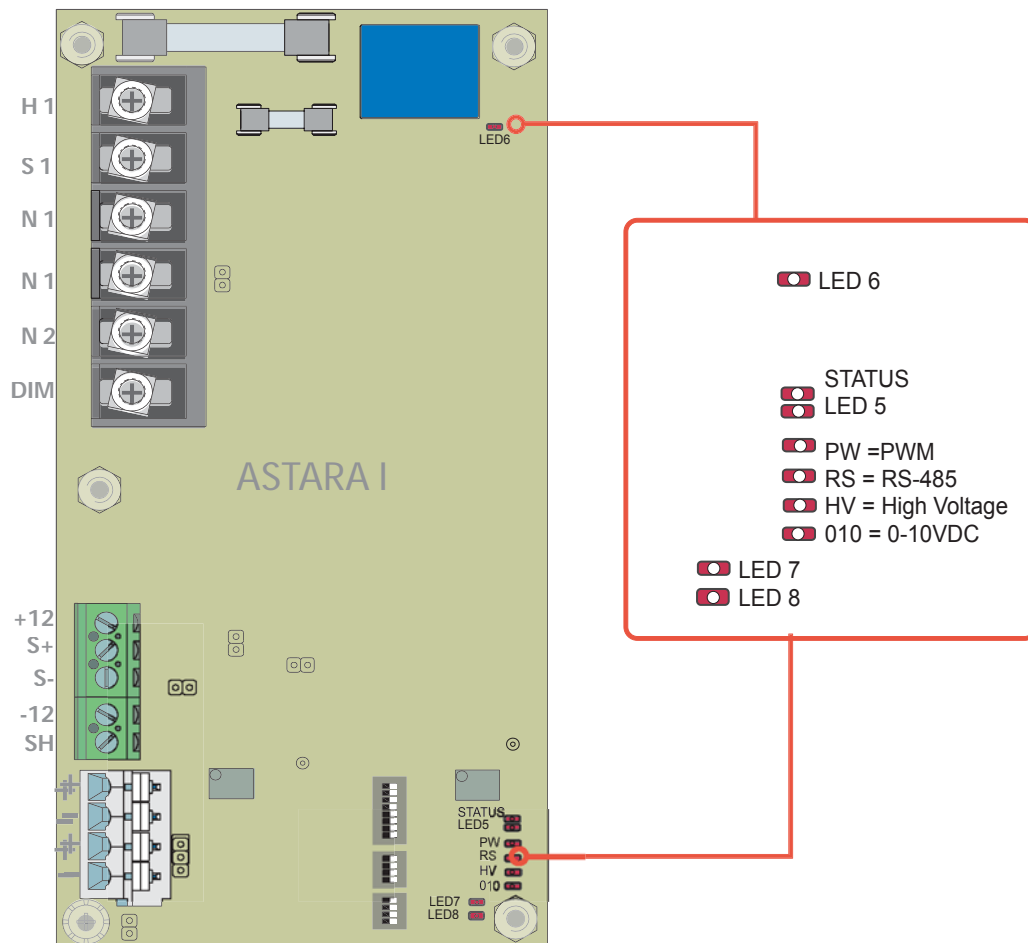
Appendix B: Jumper Settings

E1	1-2 closed: for use with source-type 0-10 VDC controllers 2-3 closed: for use with sink-type 0-10 VDC controllers (default setting)
JP1	Factory setting: open (terminates the RS-485 serial communication channel when closed)
JP2	Factory setting: open (resets the board when closed)
JP3	Factory setting: closed (enables the watchdog timer when closed)
JP4	Factory setting: open (ties the shield on the RS-485 serial communication input to ground when closed)
JP5	Factory default: closed (ties the N1 and N2 neutrals together when closed, see page 6 for high voltage connections)



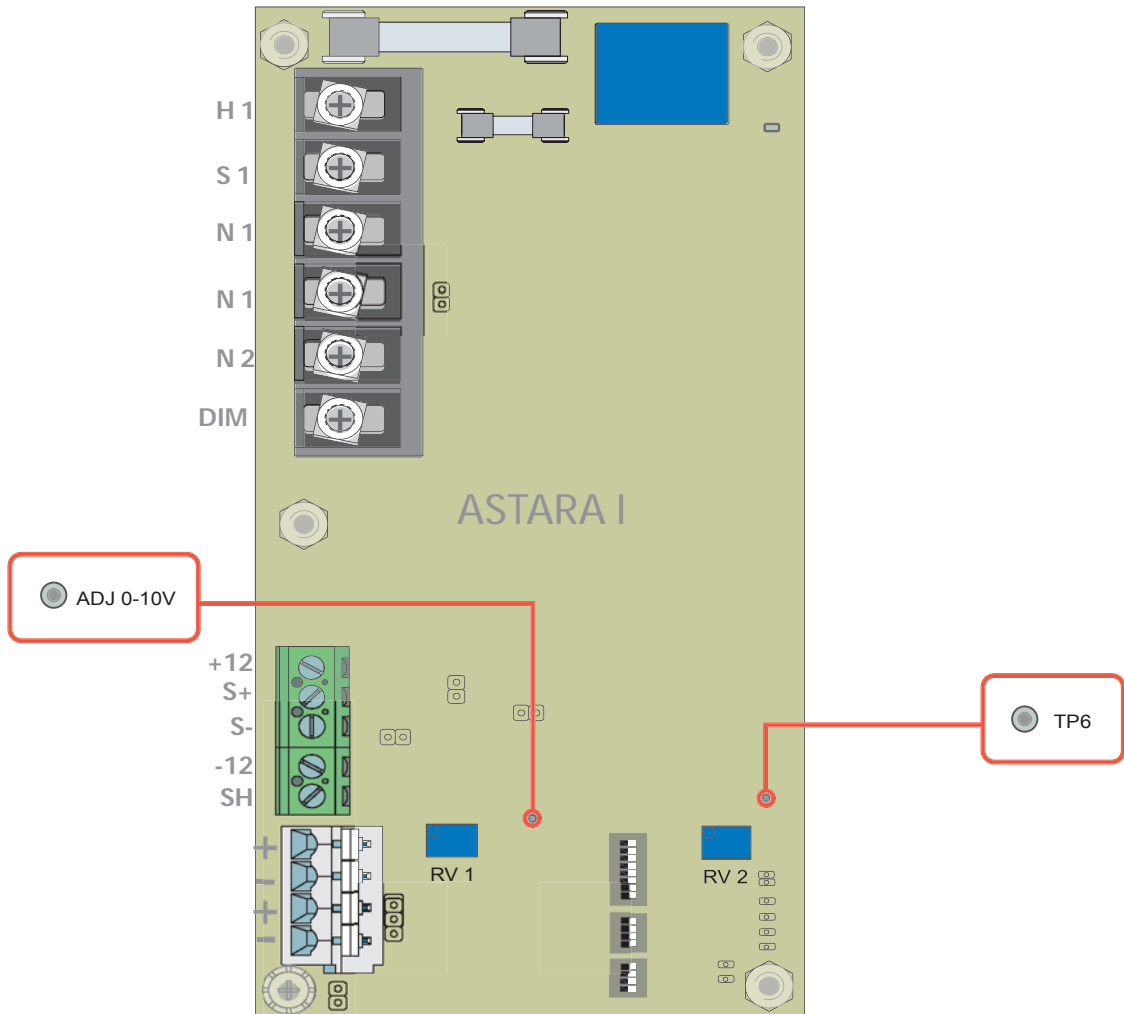
Appendix C: System Status LEDs

STATUS LED5	Blinks when the Astara I is powered on and running
PW	Indicates activity on PWM channel
RS	Blinks to indicate RS-485 serial communication
HV	Indicates use of high-voltage input
010	Indicates use of the 0-10 VDC input
LED7 (+5V)	Indicates presence of internal 5 VDC power supply
LED8 (+12V)	Indicates presence of internal 12 VDC power supply
LED6	Indicates when the relay is closed (on)



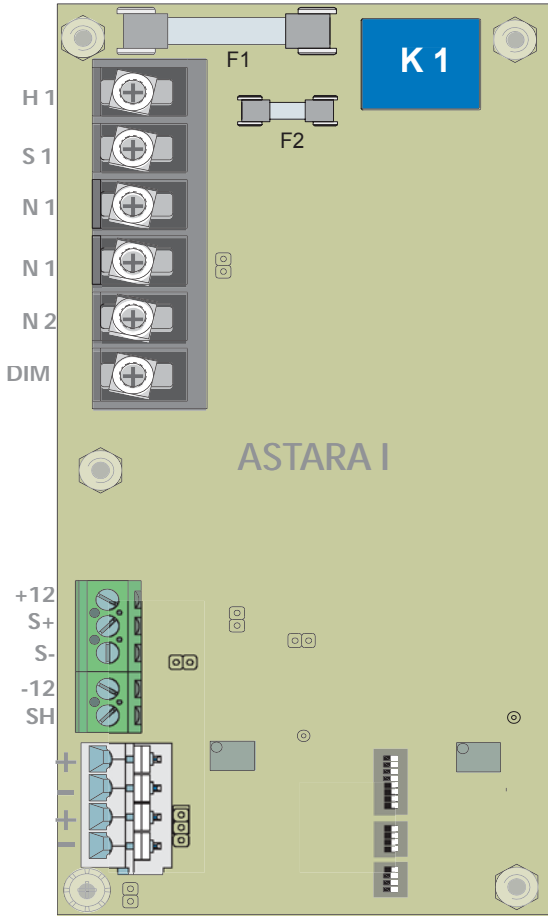
Appendix D: Adjustments

RV1	Calibrates the 0-10 VDC input. The test point ADJ0-10V should read +5 VDC when +10 VDC is applied at the 0-10 VDC input.
RV2	Calibrates the on-board +5 VDC reference. TP6 (test point 6, +5Vr) should read exactly +5 VDC.



Appendix E: Relays and Fuses

K1	Relay for switched hot output 1 (S1) 15A/120 VAC 6.5A/277 VAC
F1	Fuse for switched hot output 1 (S1) 15 A (120 VAC), 2 AG
F2	Fuse for hot input 1 (H1) and board power 2 A (277 VAC), 2 AG



Appendix F: Technical Specifications

Input voltage	110-277 VAC, 50/60 Hz
Internal power supply rating	2 A
Switched hot output (S1) rating	15A/120 VAC, 6.5A/277 VAC (1800VA)
Max total input	17 A
PWM control output rating	1 A
Dimmed hot input	110-277 VAC, 50/60 Hz
Fuse ratings	15A/120 VAC (F1) 2A/277 VAC (F2)
Relay rating	15A/120 VAC 6.5A/277 VAC
Load type	Nippo Seamlessline fixtures with dimmable ballast
Enclosure dimensions	8" W x 4" H x 2" D
Operating environment	For indoor use only
Ambient temperature	-30°F to 120°F
Communication	RS-485
Wiring	High voltage wiring: 12-16 AWG cable PWM output wiring: 18-20 AWG shielded cable RS-485 wiring: Belden #9402 (2-twisted pair, shielded cable)