0–10 V PROTOCOL

1.1 0–10 V Best Wiring Practice

Any manufacturer that makes a dimmer that sinks will work with ERP Power's Araya light engines, since ERP Power sources the voltage.

0–10 V is a topology defined by the International Electrotechnical Commission (IECR) 60929 Annex E standard and uses a varying DC voltage between 1 and 10 V to determine the lighting level. The fixture outputs a minimum light level below 1 V which is defined as low-end. Between 1 and 10 V, the signal corresponds to levels between the minimum and maximum output level. A signal above 10 V corresponds to the maximum light level. Sometimes it is referred to as 1–10 V, as that is the actual range in which the light levels will vary. Each dimmer will have their own distinct dimming profile.

Best practice is to limit the distance run for the analog control wiring from the controller to the last driver to 300', as a common 0–10 VDC wiring type is stranded-copper twisted-pair 18 AWG wiring. The wiring is stranded copper because it provides a more stable current path (as DC signals tend to be transferred by the outer edges of the conductor) while being relatively easy to work with; solid wire is usually acceptable in low-voltage systems that use AC control power.

Whenever any part of the control circuit (the driver, dimer, or wire used) is designed for use in a Class 2 installation, it is critical that the entire control circuit be kept separate from Class 1 line voltage wiring per the requirement of National Electric Code, section 725.136. The electrical drawings must be very clear that Class 1 and Class 2 wiring cannot be combined. There must be separation because: a) it is possible for higher voltage wiring to induce an AC voltage in to the low voltage signal wiring; and, b) undesirable visual artifacts in the dimmed lighting can be caused when the line and low voltage wiring is run together (especially for long distances). ERP Power does not recommend installing the low voltage signal wiring in the same conduit or raceway as line voltage wiring even when all elements of the control circuit are listed for Class 1 wiring methods.

NOTE: Araya light engines operate between 1–10 V. All dimmers that have minimum and maximum trim pots should be set at a minimum of 1 volt and a maximum of 10 volts, measuring the voltage at the end of the line.

0–10 V Dimmers (recommended list)*

Crestron

ETC

Fresco

Legrand

Leviton

Lutron

Nexlight

N-Light

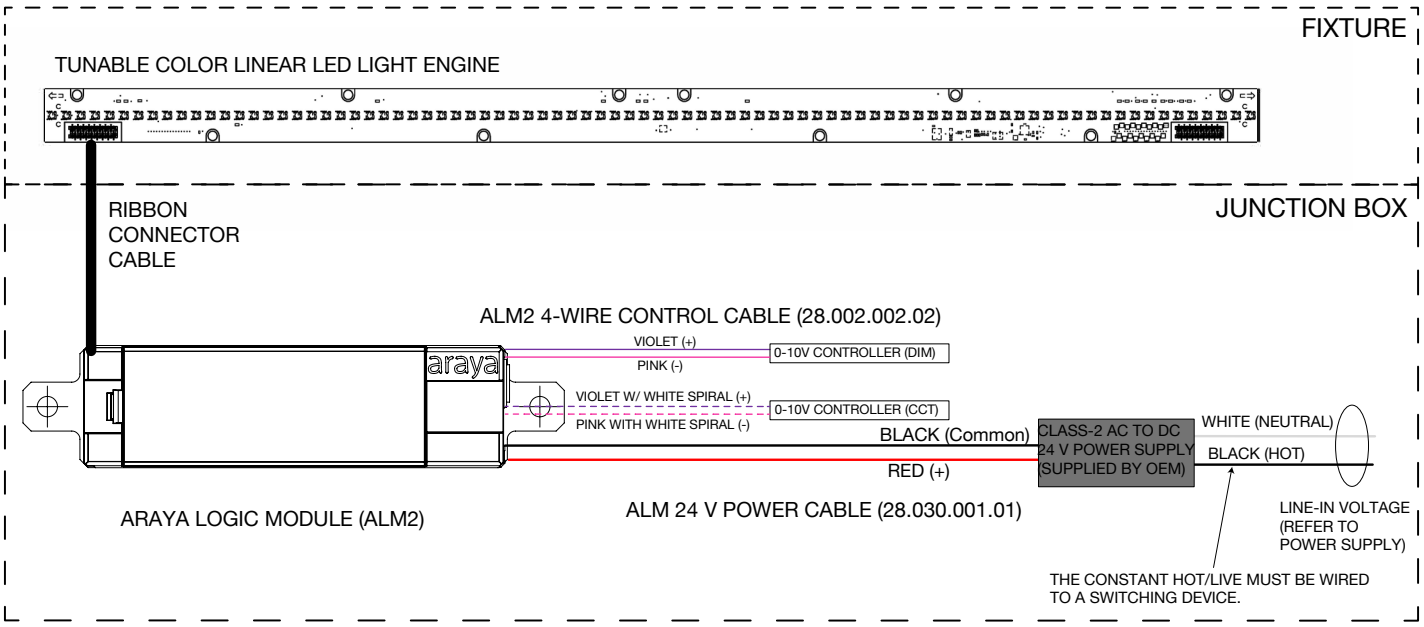
Pass & Seymour

Vantage

Wattstopper

*Recommendations are subject to change. Consult your ERP Power representative for the most updated list.

2.1a LTM2 Linear Light Engine with Araya Logic Module (ALM2)

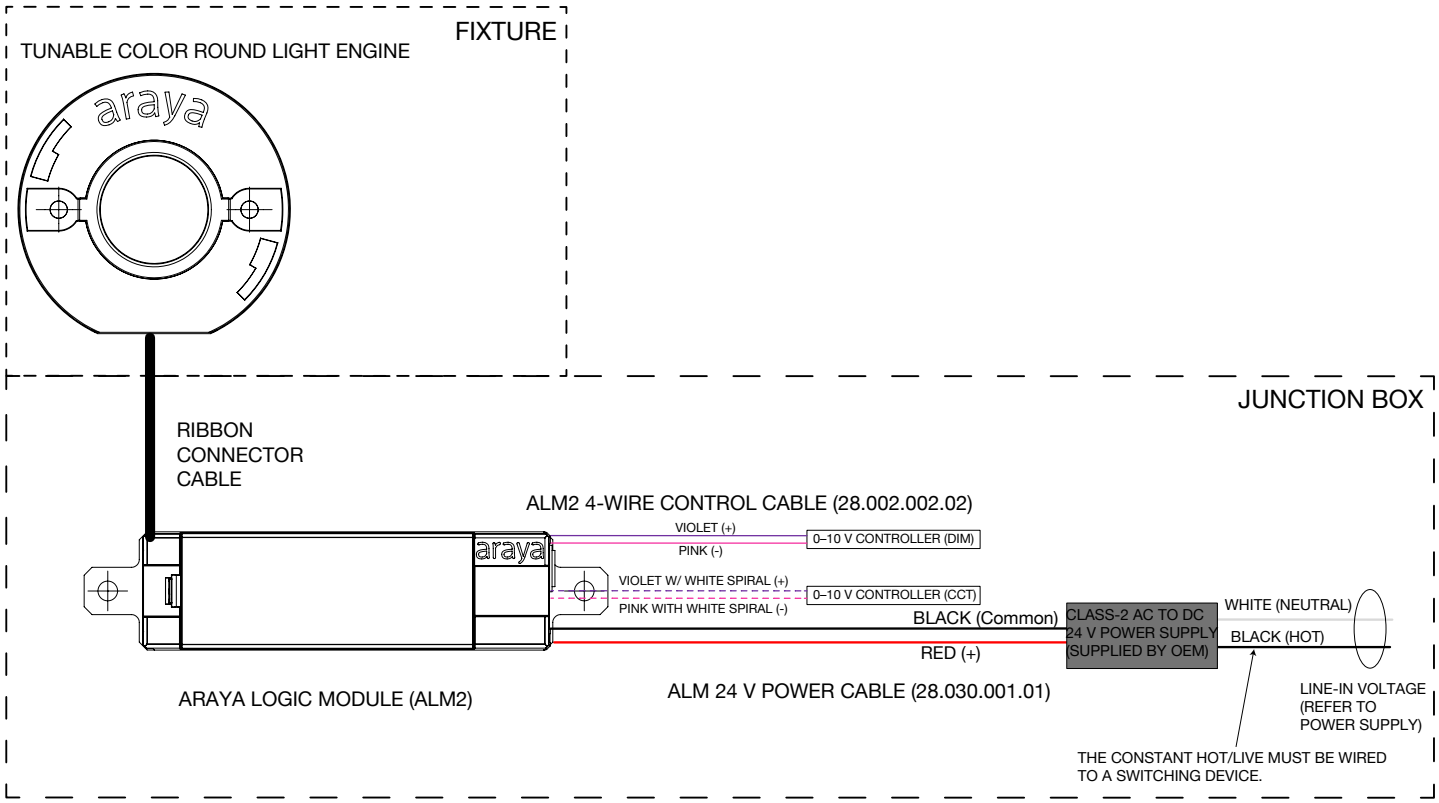


Notes:

1. Align the index tab on the ribbon cable with the index slot on the ALM header.
2. 24 V power (red/black) is Class-2 rated.

0–10 V WIRING DIAGRAMS

2.1b CTM2 / DDM2 Round Light Engine with Araya Logic Module (ALM2)

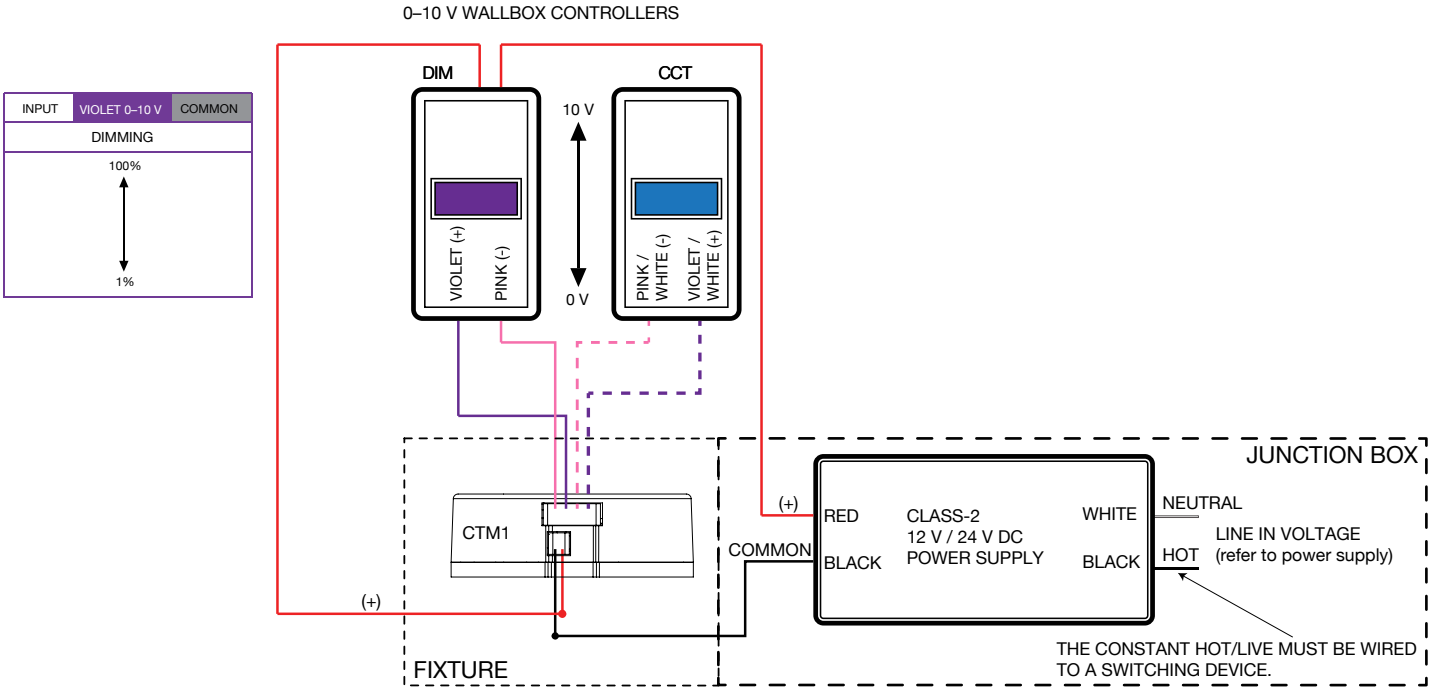


Notes:

1. Align the index tab on the ribbon cable with the index slot on the ALM header.
2. 24 V power (red/black) is Class-2 rated.

0–10 V WIRING DIAGRAMS

2.2 CTM1C — 0–10 V Analog Control of CCT and Dimming



Lead Color and Input

Lead Color	Input
Red	Power 12 V / 24 V DC (+)
Black	Power Common (-)
Violet	0–10 V Dimming (+)
Pink	Signal Common for 0–10 V Dimming (-)
Pink with White Spiral	Signal Common for 0–10 V Color (-)
Violet with White Spiral	0–10 V Color (+)

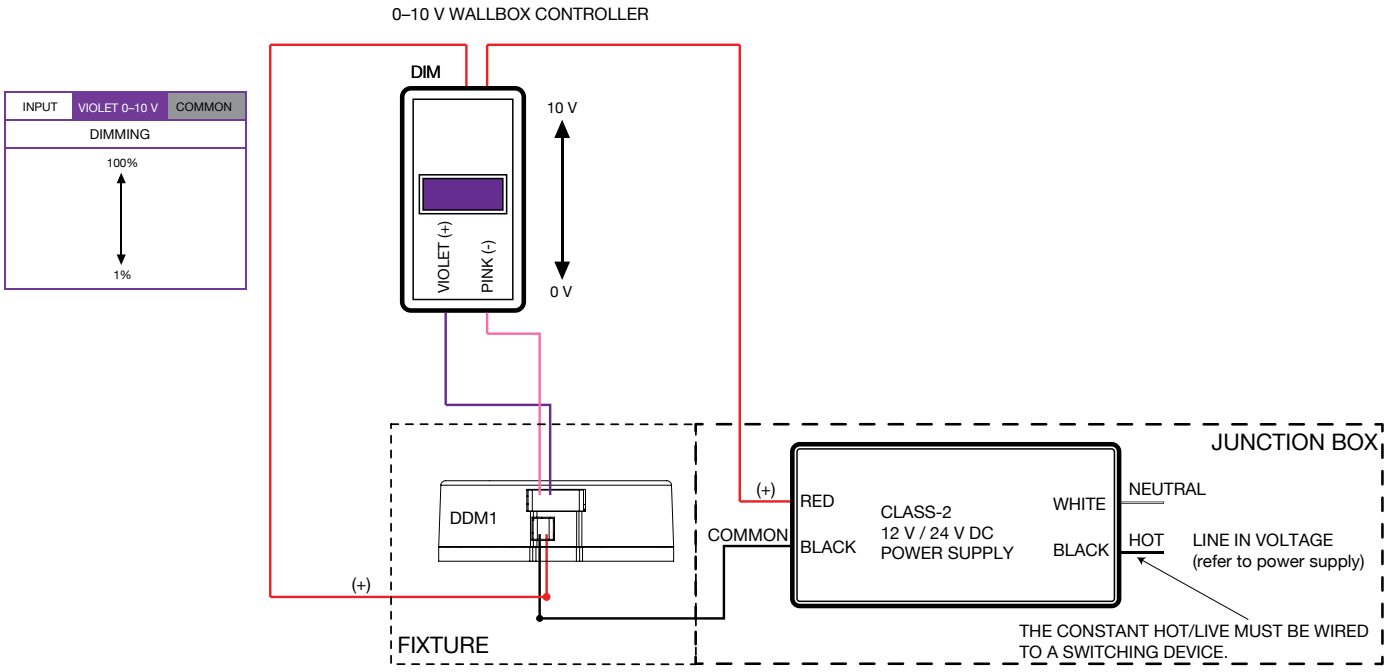
Notes:

1. If 0–10 V control is not being used for dimming, the violet control lead must be grounded to gray common lead.
2. CTM sources current to 0–10 V control at 0.2 mA nominal capacity.
3. *If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.
4. Some older versions of the 7-wire control cable assembly may be shipped with differently colored leads.

Part Number(s):
28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

0–10 V WIRING DIAGRAMS

2.3 DDM1C — 0–10 V Analog Control of Dimming



Lead Color and Input

Lead Color	Input
Red	Power 12 V / 24 V DC (+)
Black	Power Common (-)
Violet	0–10 V Dimming (+)
Pink	Signal Common for 0–10 V Dimming (-)

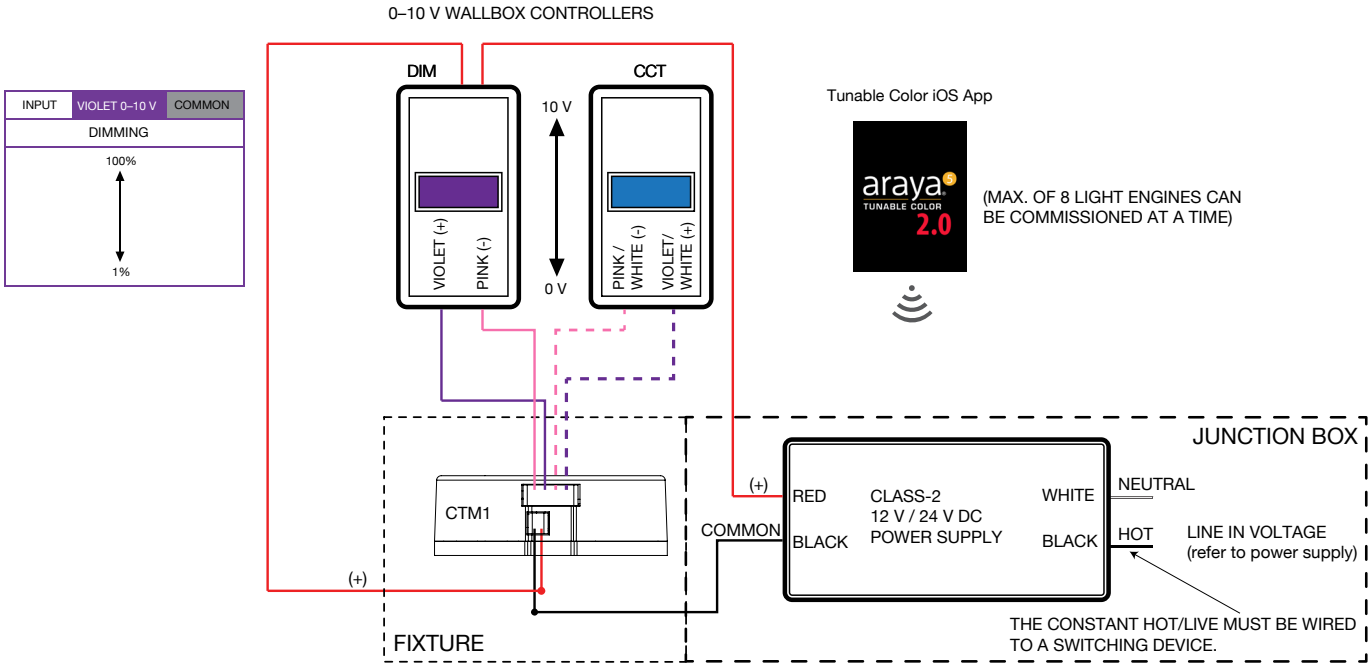
Notes:

1. DDM sources current to 0–10 V control at 0.2 mA nominal capacity.
2. Only pins 1 and 6 are used in the control cable assembly.

Part Number(s):
28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

NOTE: SOME OLDER VERSIONS OF THE 7-WIRE CONTROL CABLE ASSEMBLY MAY BE SHIPPED WITH DIFFERENTLY COLORED LEADS.

2.4 CTM1C (Bluetooth-integrated) — 0–10 V Analog Control of Scenes / Tunable Color iOS App to Set or Amend Scenes



Lead Color and Input

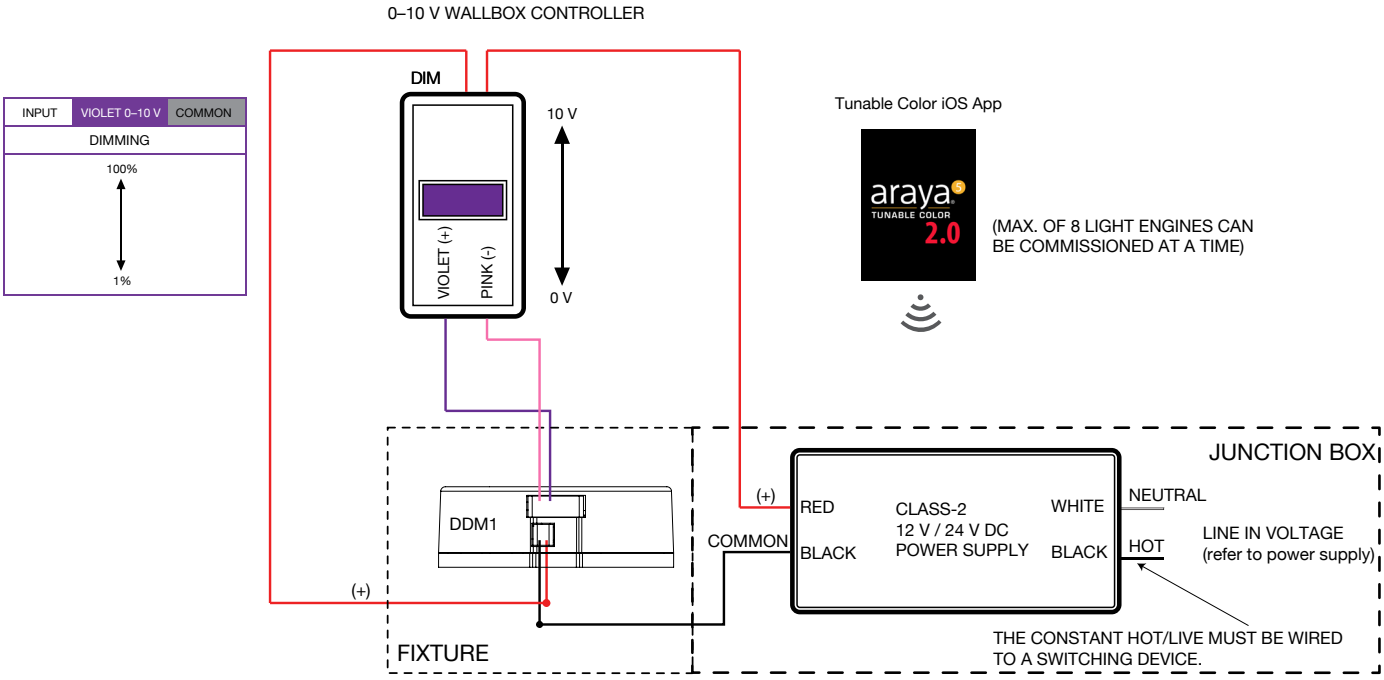
Lead Color	Input
Red	Power 12 V / 24 V DC (+)
Black	Power Common (-)
Violet	0–10 V Dimming (+)
Pink	Signal Common for 0–10 V Dimming (-)
Pink with White Spiral	Signal Common for 0–10 V Presets (-)
Violet with White Spiral	0–10 V Presets (+)

Part Number(s):
28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

Notes:

1. When the lamp is connected to a 0–10 V line, the default is control of the continuous CCT range. The 0–10 V line can instead be set to control scene set by sliding the Stored Scenes button to the “on” position in the Tunable Color iOS App. In this mode, the 0–10 V control will toggle the light between up to 5 preset scenes. A scene is comprised of a CCT, Dim, Saturation & Hue level. Individual preset scenes can also be modified and activated with the iOS app.
   See Tunable Color Instruction Manual for more instructions.
2. If 0–10 V control is not being used for dimming, the violet control lead must be grounded to gray common lead.
3. CTM sources current to 0–10 V control at 0.2 mA nominal capacity.
4. *If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.
5. Some older versions of the 7-wire control cable assembly may be shipped with differently colored leads.

2.5 DDM1C (Bluetooth-integrated) — 0–10 V Analog Control of Scenes / Tunable Color iOS App to Set or Amend Scenes



Lead Color and Input

Lead Color	Input
Red	Power 12 V / 24 V DC (+)
Black	Power Common (-)
Violet	0–10 V Dimming (+)
Pink	Signal Common for 0–10 V Dimming (-)

Part Number(s):
28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

Notes:

1. The 0–10 V line can be set to control scene set by sliding the Stored Scenes button to the “on” position in the Tunable Color iOS App. In this mode, the 0–10 V control will toggle the light between up to 5 preset scenes. A scene is comprised of a Dim level. Individual preset scenes can also be modified and activated with the iOS app.
   See Tunable Color Instruction Manual for more instructions.
2. DDM sources current to 0–10 V control at 0.2 mA nominal capacity.
3. Only pins 1 and 6 are used in the control cable assembly.

NOTE: SOME OLDER VERSIONS OF THE 7-WIRE CONTROL CABLE ASSEMBLY MAY BE SHIPPED WITH DIFFERENTLY COLORED LEADS.