

0–10 V PROTOCOL

1.1 0–10 V Best Wiring Practice

Any manufacturer that makes a dimmer that sinks will work with Lumenetix modules since we source 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). We do 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: Lumenetix modules 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

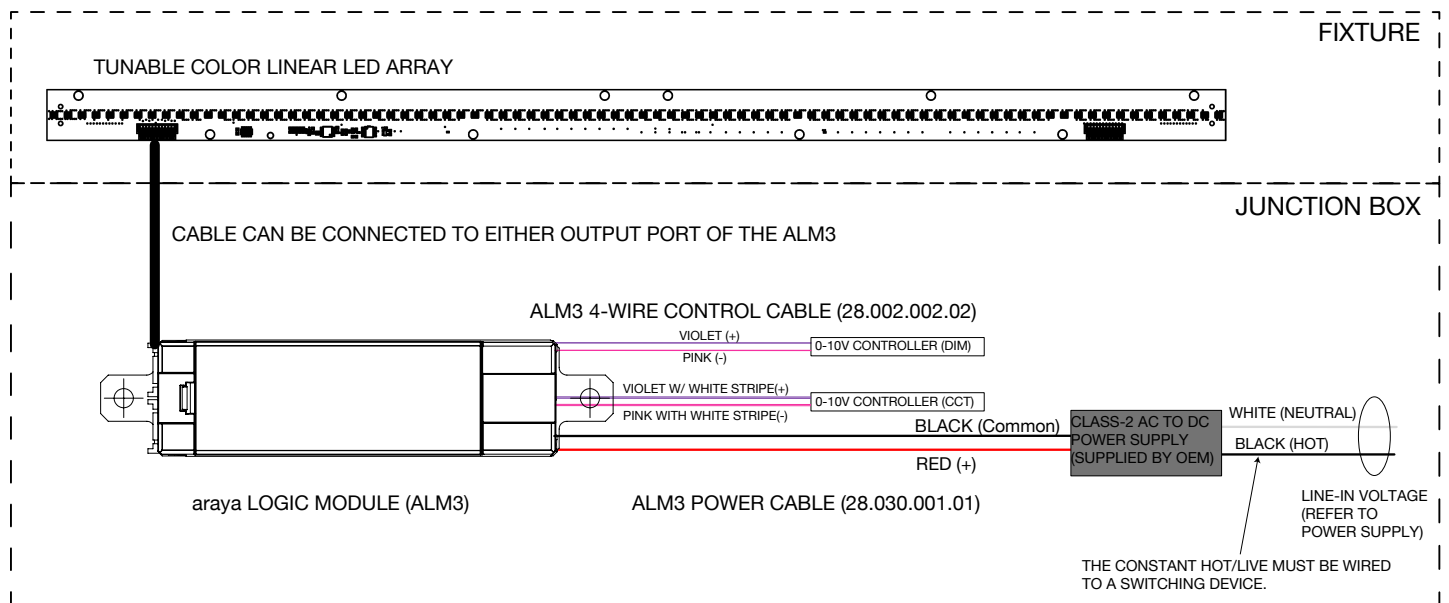
Vantage

Wattstopper

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

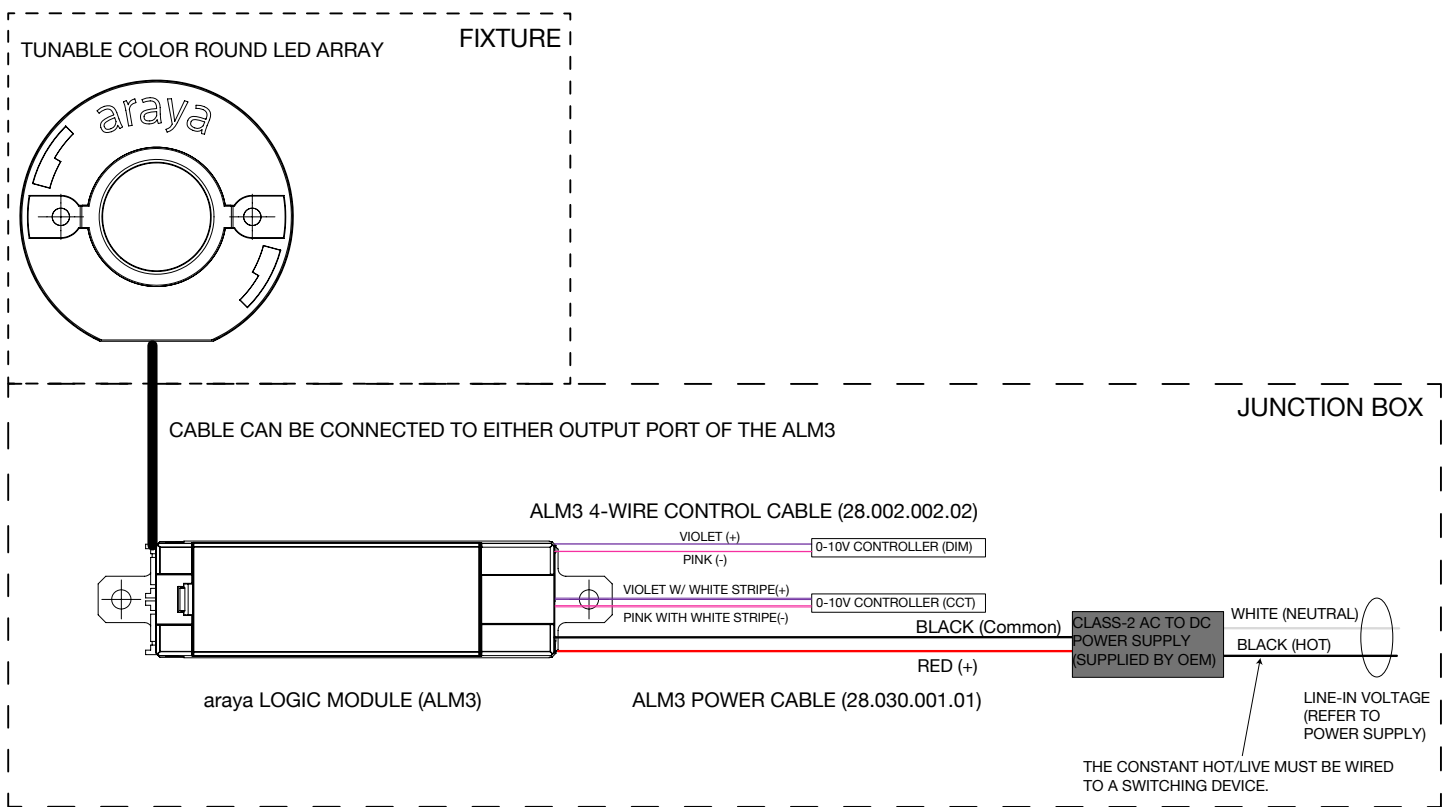
0-10 V WIRING DIAGRAMS

2.1a LTM3 Linear Array with araya Logic Module (ALM3)



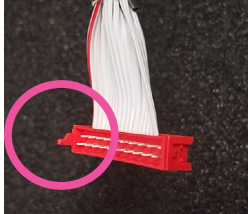
0-10 V WIRING DIAGRAMS

2.1b CTM3 Round Array with araya Logic Module (ALM3)

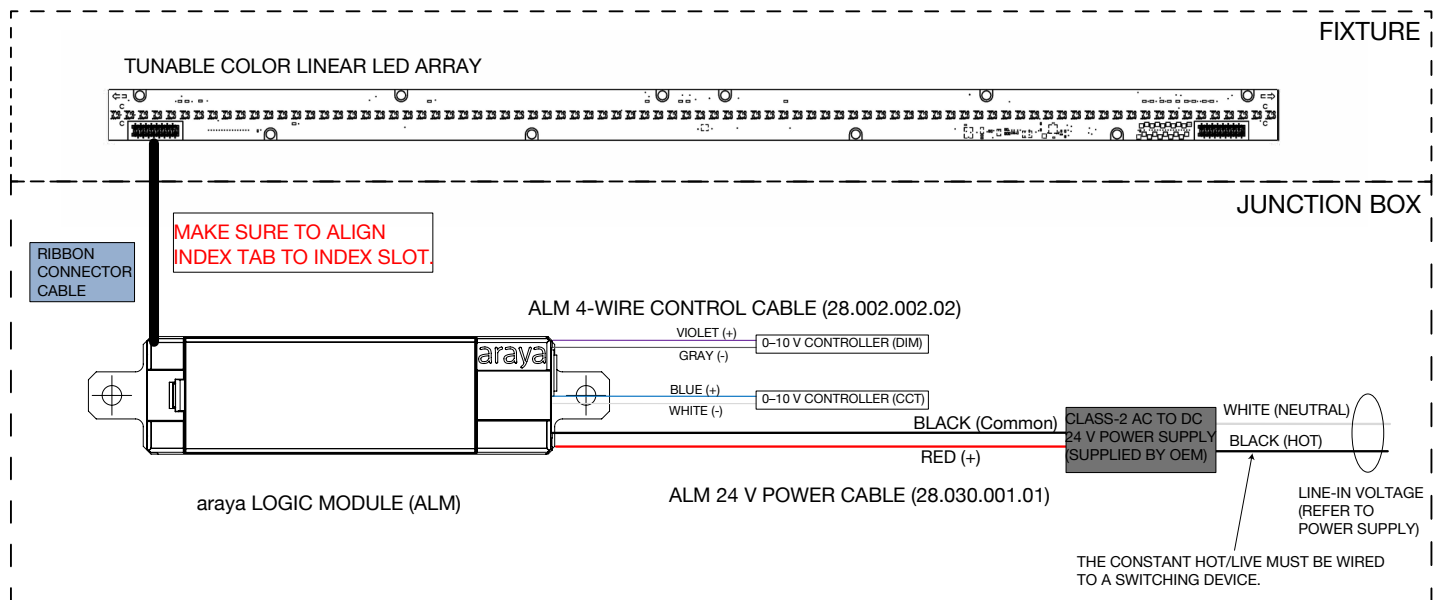


0-10 V WIRING DIAGRAMS

2.2a LTM2 Linear Array with araya Logic Module (ALM2)

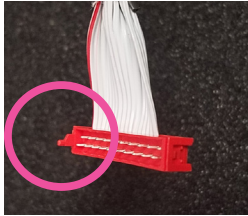


INDEX TAB ON RED END OF CABLE CONNECTOR SHOULD LINE UP WITH INDEX SLOT ON ALM.

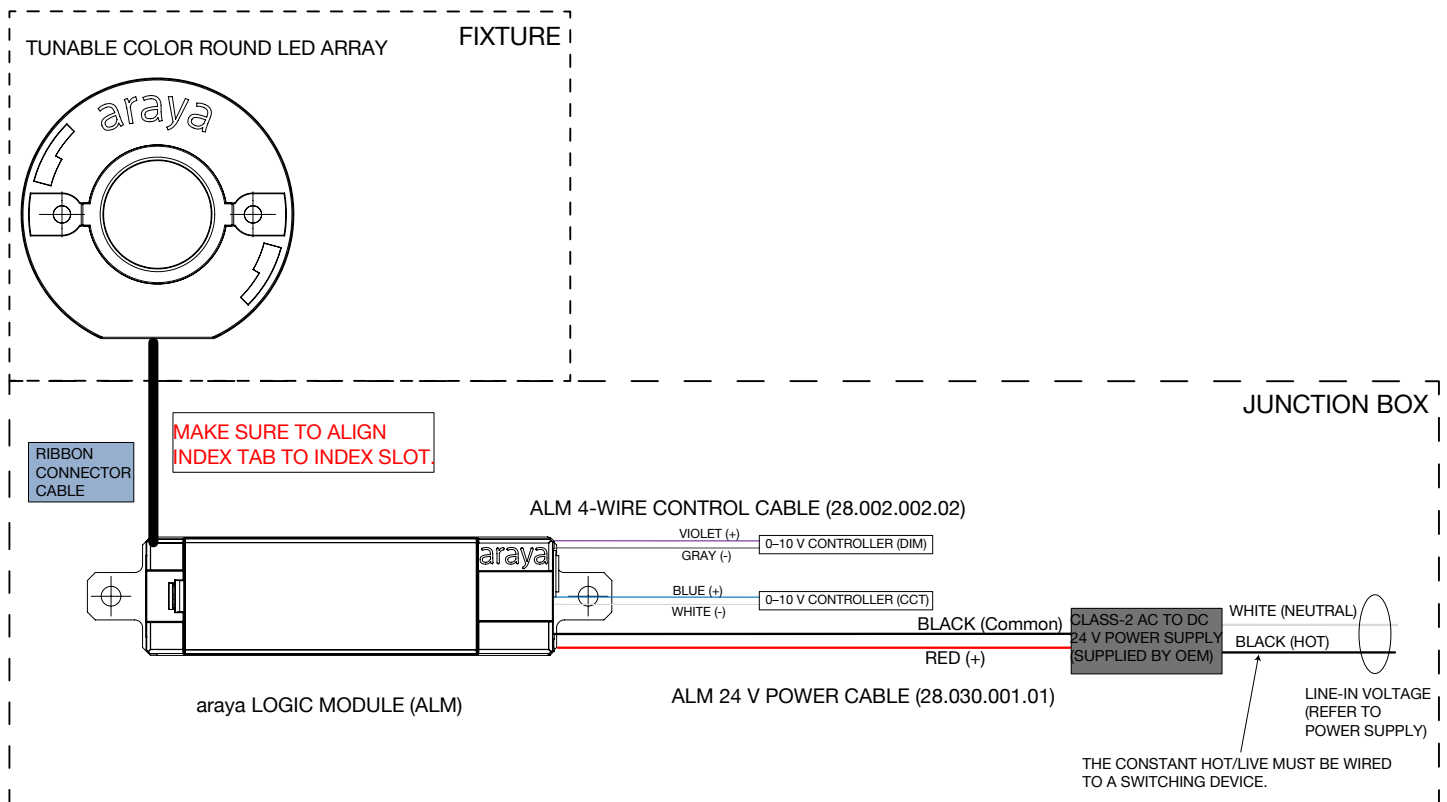


0-10 V WIRING DIAGRAMS

2.2b CTM2 / DDM2 Round Array with araya Logic Module (ALM2)



INDEX TAB ON RED END OF CABLE CONNECTOR SHOULD LINE UP WITH INDEX SLOT ON ALM.

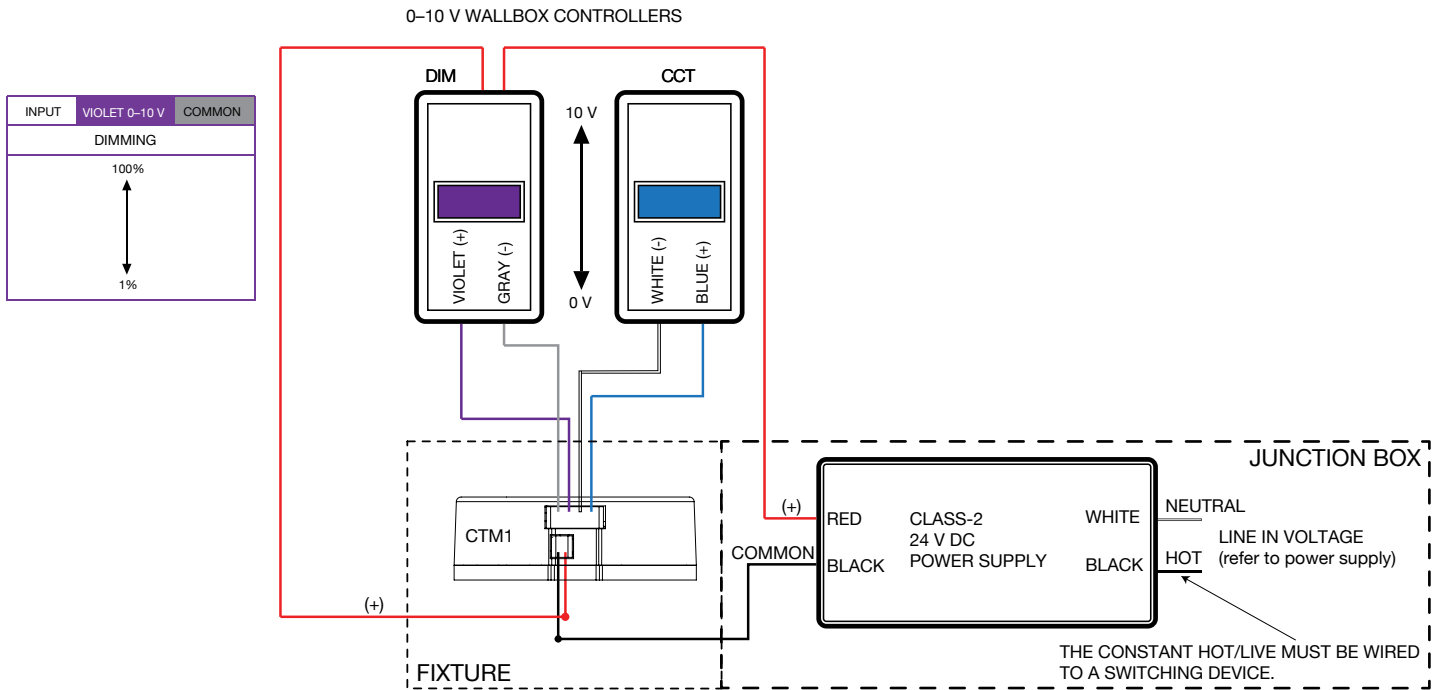


IMPORTANT:

CTM 241 IS PROVIDED WITH TWO ALMS AND REQUIRES TWO POWER CABLE ASSEMBLIES, TWO CONTROL CABLE ASSEMBLIES, AND TWO RIBBON CABLES FOR FULL FUNCTIONALITY AND PERFORMANCE. THE WIRING CONNECTIONS AND THE ALM WILL BE MIRRORED ON **TWO** CONNECTOR OPENINGS (LABELED AS LEFT AND RIGHT) ON THE MODULE. THE ALM LABELED “LEFT” AT ONE END SHOULD ONLY BE ATTACHED VIA RIBBON CABLE TO THE CONNECTOR OPENING LABELED “LEFT”. THE OTHER ALM LABELED “RIGHT” AT THE OTHER END SHOULD ONLY BE ATTACHED VIA RIBBON CABLE TO THE CONNECTOR OPENING LABELED “RIGHT”.

0-10 V WIRING DIAGRAMS

2.3a CTM1 24 V – 0-10 V Analog Control of CCT and Dimming



Lead Color and Input

Lead Color	Input
Red	Power 24 V DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)
White	Signal Common for 0-10 V Color (-)
Blue	0-10V 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 0.2mA nominal capacity.
3. *If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.

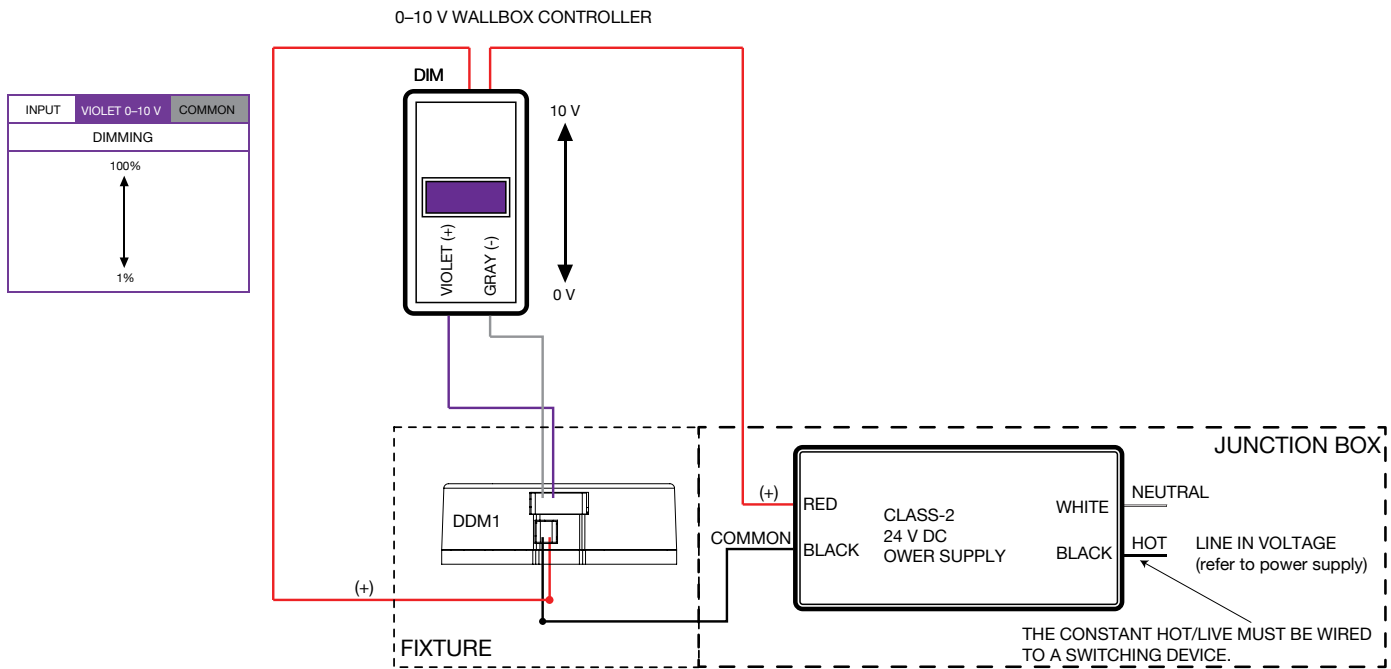
Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

0-10 V WIRING DIAGRAMS

2.4a DDM1 24 V – 0-10 V Analog Control of Dimming

0-10 V Dimming Control Only. Remove power from the DDM. Connect a 0-10 V control device to violet (+) and gray (-) wires. When the DDM is powered up, the 0-10 V control device will adjust Dimming from 100-1%. Preset controls are not available in this configuration.



Lead Color and Input

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

Notes:

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

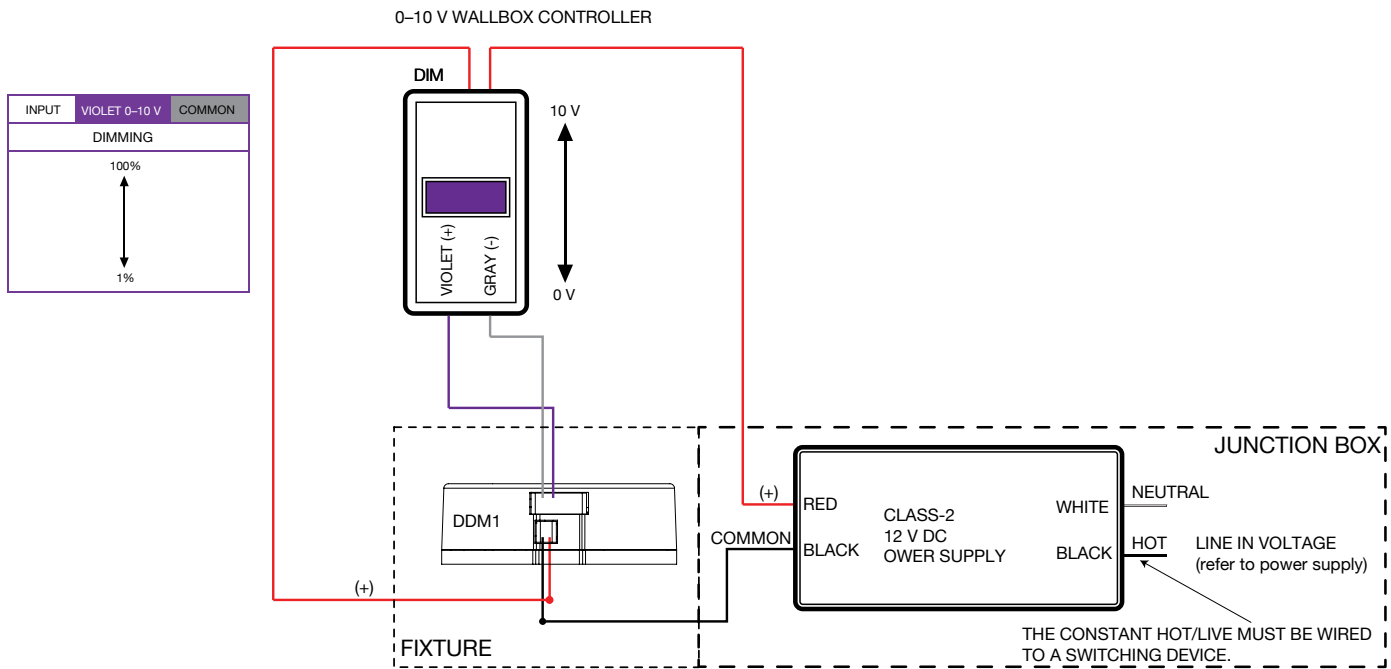
Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

0-10 V WIRING DIAGRAMS

2.4b DDM1 12 V – 0-10 V Analog Control of Dimming

0-10 V Dimming Control Only. Remove power from the DDM. Connect a 0-10 V control device to violet (+) and gray (-) wires. When the DDM is powered up, the 0-10 V control device will adjust Dimming from 100-1%. Preset controls are not available in this configuration.



Lead Color and Input

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

Notes:

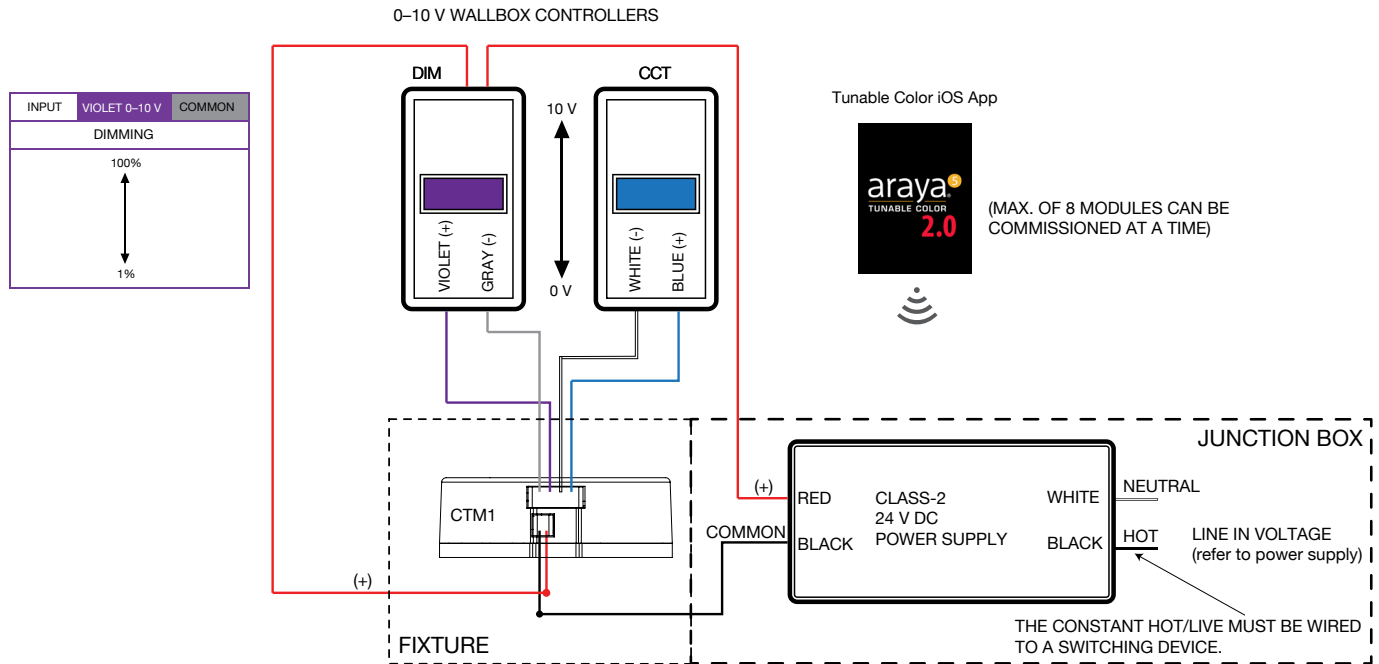
1. DDM sources current to 0-10 V control at 0.2mA nominal capacity.
2. Only pins 1 and 6 are used in the control cable assembly.

Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

0-10 V WIRING DIAGRAMS

2.5a CTM1 24 V (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 24 V DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)
White	Signal Common for 0-10 V Presets (-)
Blue	0-10 V Presets (+)

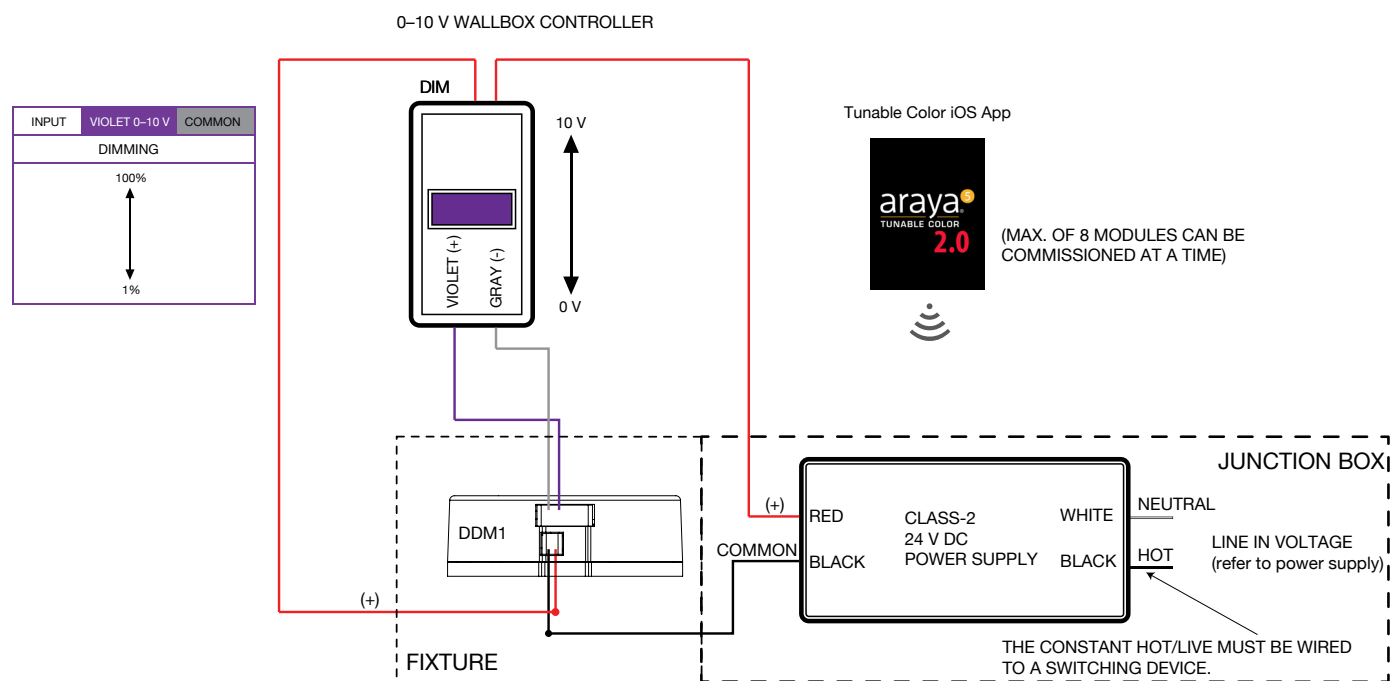
Lumenetix part #s:
28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

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 0.2mA nominal capacity.
4. *If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.

0-10 V WIRING DIAGRAMS

2.5b DDM1 24 V (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 24 V DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)

Lumenetix part #s:

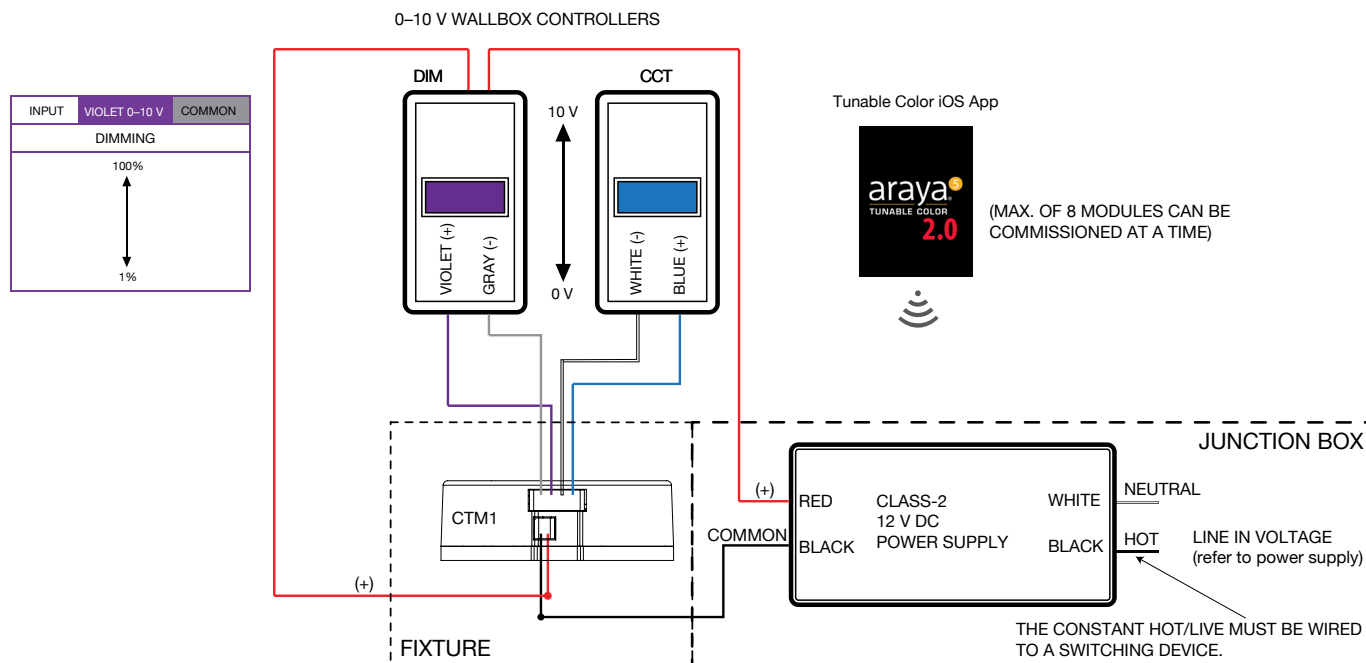
28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

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 0.2mA nominal capacity.
3. Only pins 1 and 6 are used in the control cable assembly.

0-10 V WIRING DIAGRAMS

2.6a CTM1 12 V (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 DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)
White	Signal Common for 0-10 V Presets (-)
Blue	0-10 V Presets (+)

Lumenetix part #s:

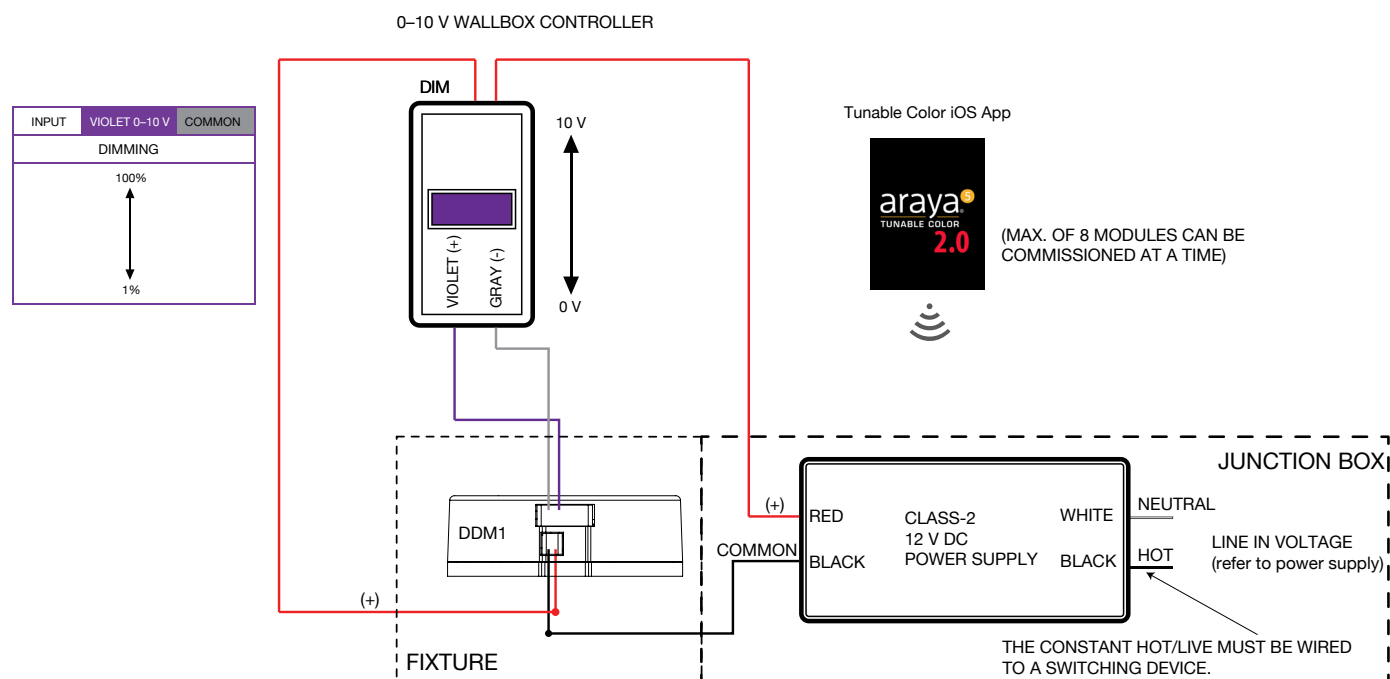
28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

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 0.2mA nominal capacity.
4. *If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.

0-10 V WIRING DIAGRAMS

2.6b DDM1 12 V (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 DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)

Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

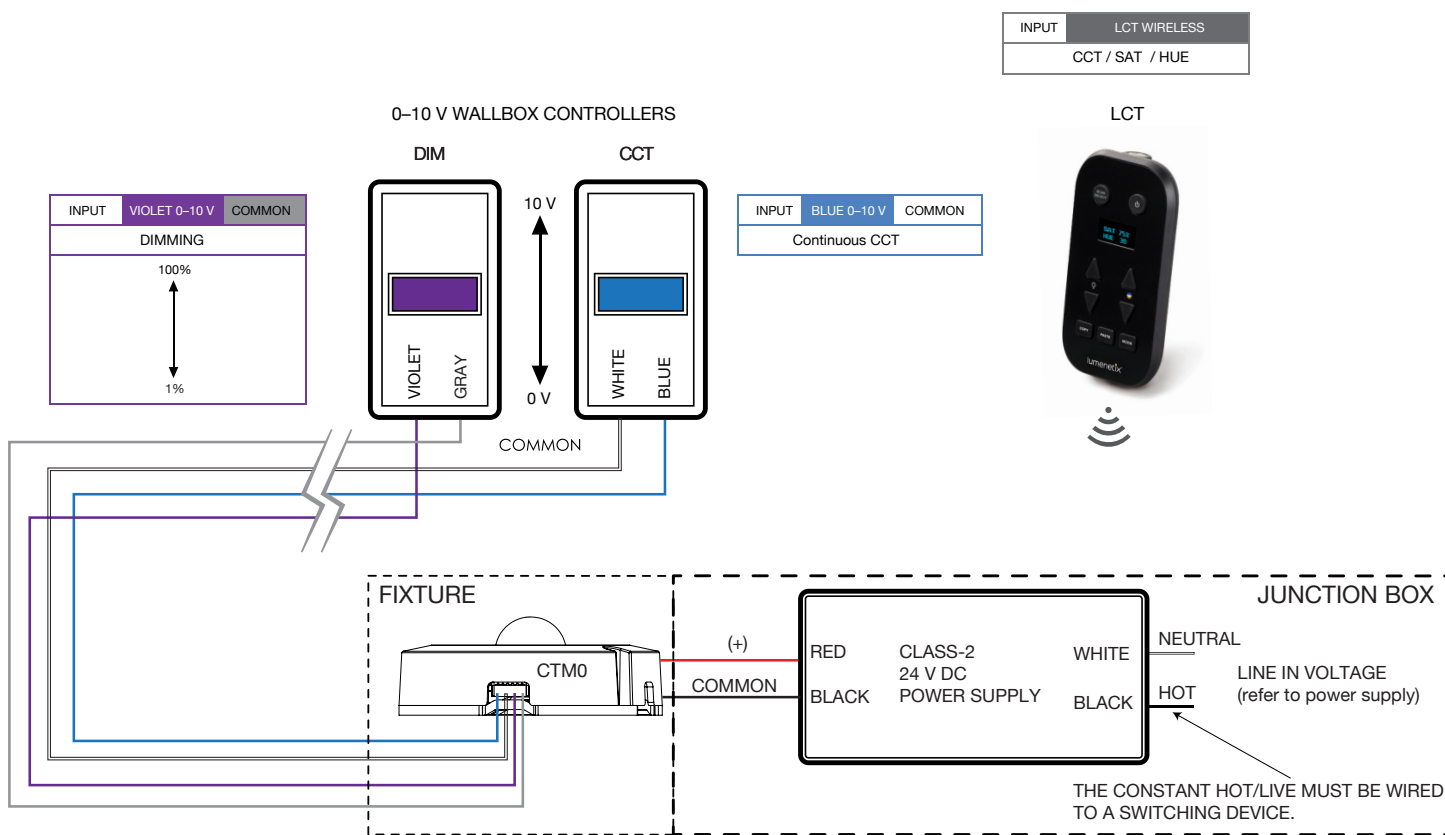
Notes:

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 0.2mA nominal capacity.
3. Only pins 1 and 6 are used in the control cable assembly.

0-10 V WIRING DIAGRAMS

2.7a CTM0 24 V — 0-10 V Analog Control of Continuous CCT & Dimming / LCT Control of Saturation & Hue

0-10 V Continuous CCT Control. Remove power from the CTM. Connect a 0-10 V control device to the blue (+) and white (-) wires. When the CTM is powered up, the 0-10V control will adjust the CCT over the tunable range. The Light Commissioning Tool (LCT) will control Saturation and Hue. A 0-10 V control may also be added for dimming (as shown). LCT adjustments to Dimming levels are a percentage of the 0-10 V Dim setting (Trim). If a 0-10 V control is not used for dimming, the violet (+) and gray (-) wires must be grounded together.



Lead Color and Input

Lead Color	Input
Red	Power 24 V DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)
White	Signal Common for 0-10 V Color (-)
Blue	0-10 V Color (+)

Notes:

1. If Scene Set is not activated using the LCT, the CTM defaults to 0-10 V control of the continuous CCT range.
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 0.2mA nominal capacity.
4. If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.

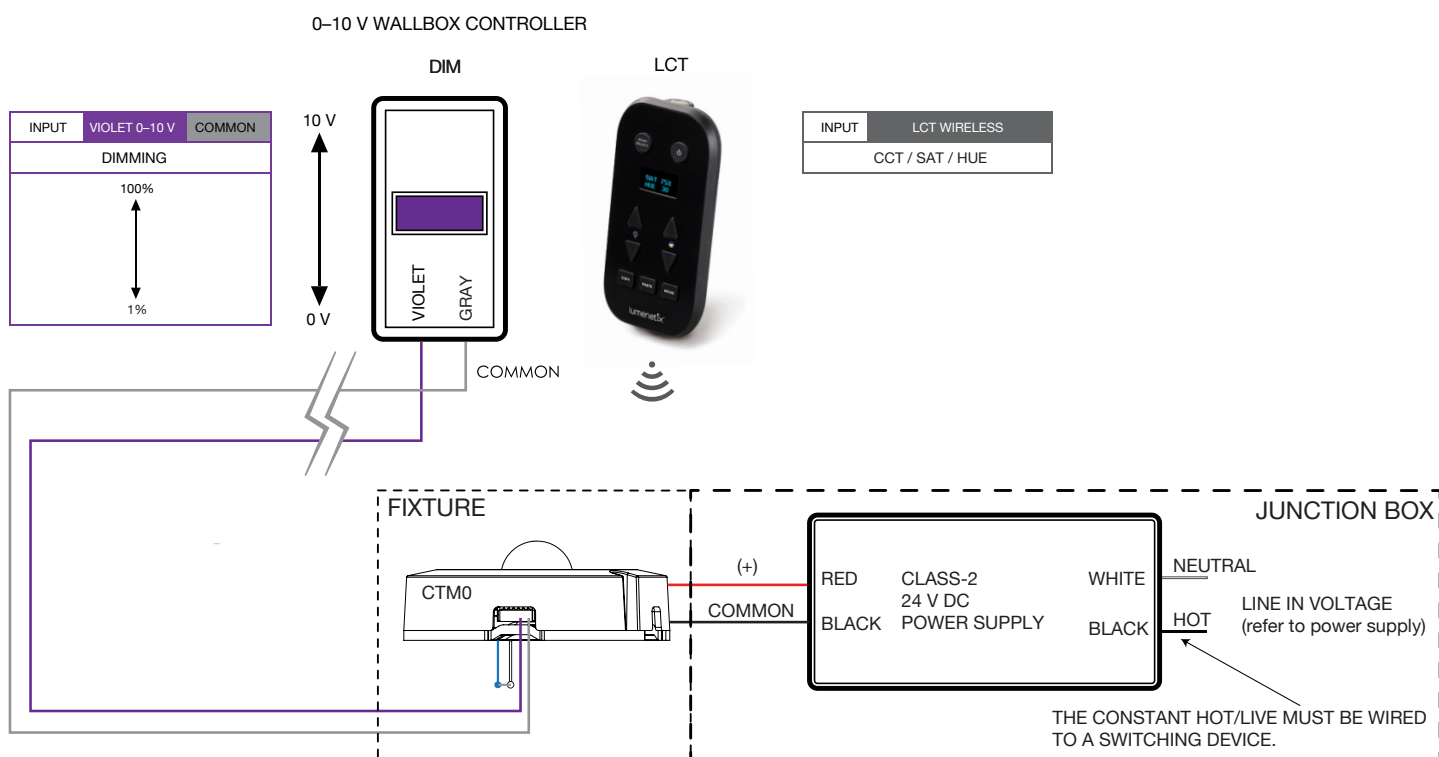
Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

0-10 V WIRING DIAGRAMS

2.7b CTM0 24 V – 0-10 V Analog Control of Dimming / LCT Control of CCT, Sat & Hue

0-10 V Dimming Control Only. Remove power from the CTM. Connect a 0-10 V control device to violet (+) and gray (-) wires. When the CTM is powered up, the 0-10V control device will adjust Dimming from 100-1%. Use the Light Commissioning Tool (LCT) to set CCT, Dimming, Saturation, and Hue to the desired levels and use Copy and Paste functions to match lamp settings. In this configuration, the LCT trims the dimming level, i.e., adjustments to Dimming levels as a percentage of the 0-10 V Dimming setting (Trim). Preset controls are not available in this configuration.



Lead Color and Input

Lead Color	Input
Red	Power 24 V DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)
White	Signal Common for 0-10 V Color (-)
Blue	0-10 V Color (Connect to White Common)

Notes:

1. CTM sources current to 0-10 V control at 0.2mA nominal capacity.
2. Only pins 1 and 6 are used on the control cable assembly.
3. If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.

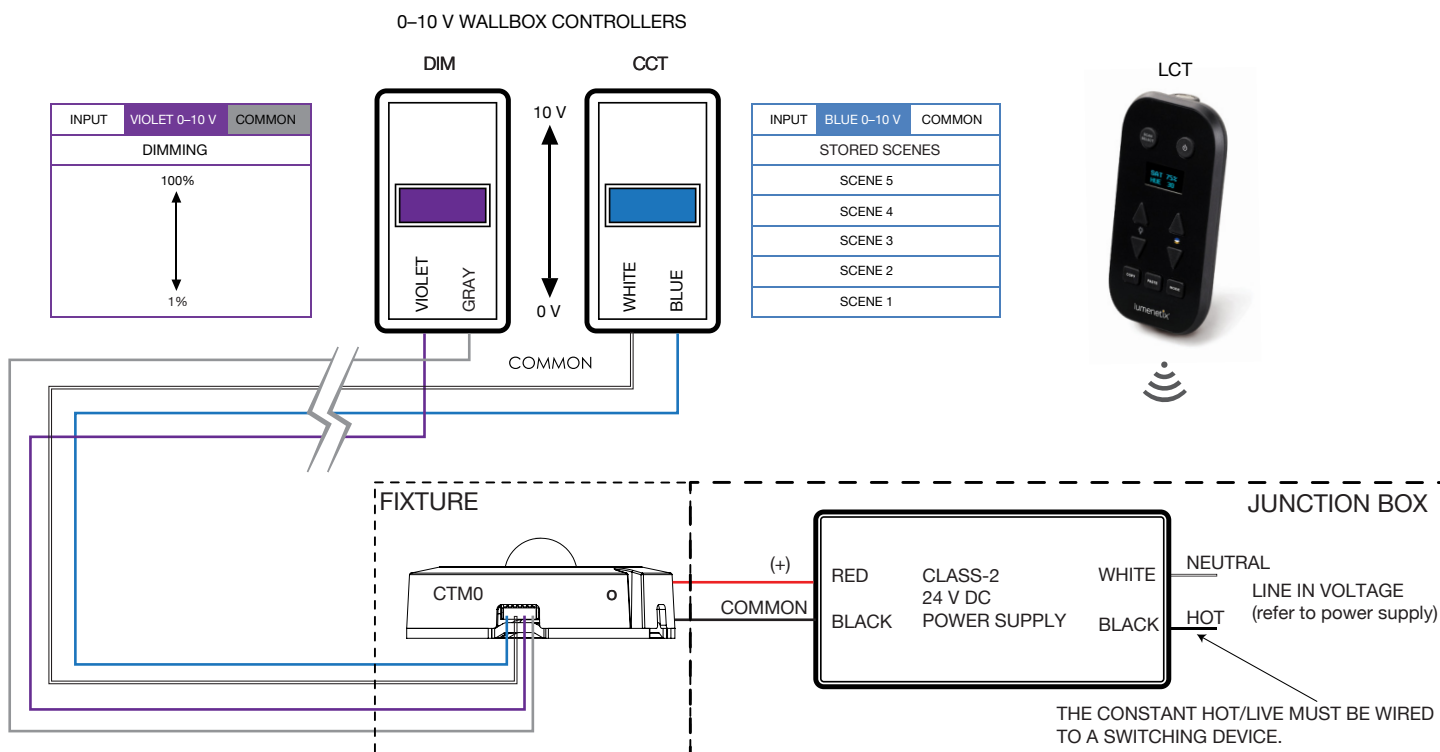
Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

0-10 V WIRING DIAGRAMS

2.7c CTM0 24 V – 0-10 V Analog Control of Scenes / LCT to Set or Amend Scenes

0-10 V Preset Control. Remove power from the CTM. Connect a 0-10 V control device to the blue (+) and white (common) wires. Use the Light Commissioning Tool (LCT) to set, store and enable up to five preset scenes comprised of CCT, Dimming, Saturation and Hue levels. The 0-10 V control will toggle between the preset scenes. A 0-10 V control may also be added for dimming (as shown) and will proportionally Dim from the stored value in the preset. If a 0-10 V control is not used for dimming, the violet (+) and gray (common) wires must be grounded together.



Lead Color and Input

Lead Color	Input
Red	Power 24 V DC (+)
Black	Power Common (-)
Violet	0-10 V Dimming (+)
Gray	Signal Common for 0-10 V Dimming (-)
White	Signal Common for 0-10 V Presets (-)
Blue	0-10 V Presets (+)

Notes:

1. Scene set is commissioned and activated using the LCT. See LCT operating 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 0.2mA nominal capacity.
4. *If using a wall box dimmer, power only the DIM unit. The CCT unit does not get line-in voltage.

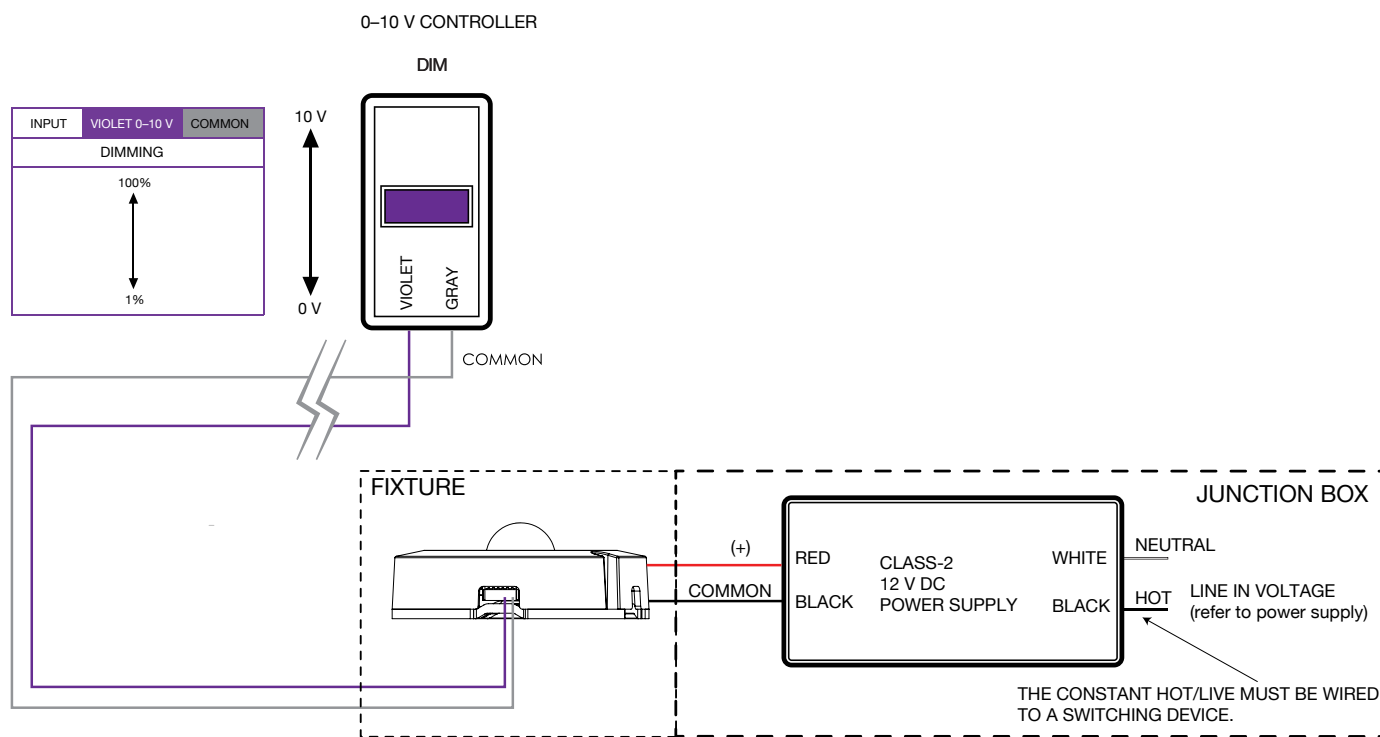
Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)

0-10 V WIRING DIAGRAMS

2.8 DDM0 24 V — 0-10 V Analog Control of Dimming

0-10 V Dimming Control Only. Remove power from the DDM. Connect a 0-10 V control device to violet (+) and gray (-) wires. When the DDM is powered up, the 0-10 V control device will adjust Dimming from 100-1%. Preset controls are not available in this configuration.



Lead Color and Input

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

Notes:

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

Lumenetix part #s:

28.002.001.01 (power cable assembly)
28.002.002.01 (control cable assembly)