

## SAFETY INSTRUCTION

IMPORTANT: NEVER attempt any work without shutting off the electricity.

- Always turn off power at fuse box prior to installation to prevent electrical shock.
- Intended for indoor use. Dry and damp locations.
- Install in accordance with national electric code, and local regulations.
- Consult with local inspector to assure compliance.
- Do not submerge, or install within 5 feet of a swimming pool.
- Do not connect the tape directly to high voltage power

## CAUTION – TO REDUCE RISK OF FIRE AND ELECTRICAL SHOCK

- Read all instructions before installing.
- Handle product with care.
- Do not conceal or extend exposed conductors through a building wall
- To reduce the risk of fire and burns, do not install this lighting system where the exposed bare conductors can be shorted or contact any conductive materials
- To reduce the risk of overheating and potential fire risk, make sure all connections are tight.
- Do not install any fixture assembly closer than 6 in. from any curtain, or similar combustible material.
- Do not modify or disassemble product beyond instructions or warranty will be void.
- Failure to follow safety warnings, and installation instruction will void the warranty

## ATTENTION - AFIN DE RÉDUIRE LES RISQUES D'INCENDIE ET DE CHOC ÉLECTRIQUE

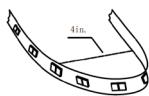
- Lire toutes les instructions avant d'installer.
- Manipuler le produit avec soin.
- Ne pas dissimuler et faire passer les conducteurs exposés à travers un mur de bâtiment.
- Afin de réduire les risques d'incendie et de brûlures, ne pas installer ce système d'éclairage là où les conducteurs dénudés peuvent être court-circuités, ou entrer en contact avec des matériaux conducteurs.
- Afin de réduire le risque de surchauffe et d'incendie potentiel, s'assurer que toutes les connexions sont bien serrées.
- Ne pas installer aucun luminaire à moins de 6 pouces d'un rideau ou d'un matériau combustible similaire.
- Ne pas modifier ou démonter le produit au-delà des instructions sous peine d'annuler la garantie.
- Ne pas respecter les avertissements de sécurité et des instructions d'installation annulera la garantie.



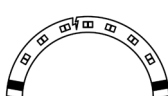
Avoid contact with sharp objects



Install on stable clean, dry surface



Do not bend the tape light to a diameter less than 4 inches



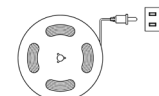
Do not bend the tape light on a horizontal plane



Do not cover LED tape light with any materials



Do not fold or twist LED Tape

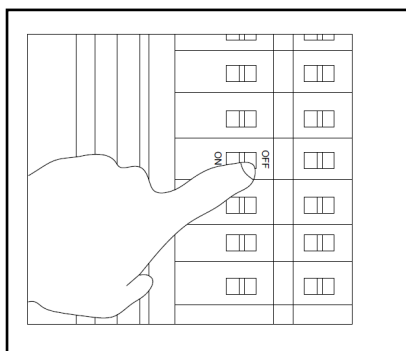


Do not power the LED tape while attached to the spool or tightly coiled

## WIRING AND INSTALLATION:

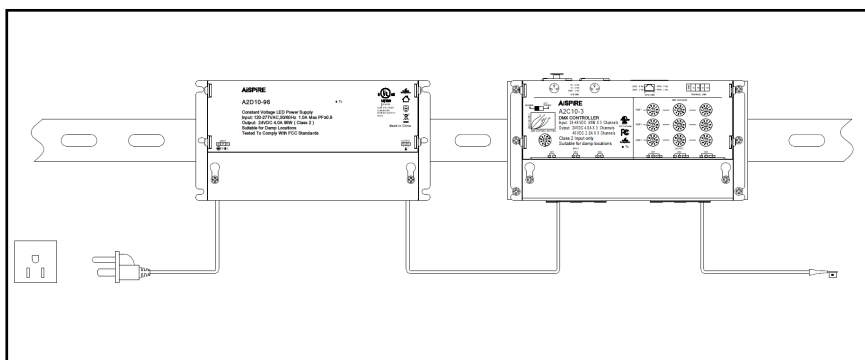
1. Turn Power off at circuit breaker (See FIG. 1)

**FIG. 1**



2. Mounting 24VDC Class 2 remote power supply and AiSPiRE DMX LED Controller at desired location. (See FIG. 2)

**FIG. 2**



3. Measured a distance between power supply and DMX controller to the beginning of the tape run. Choose between two options below to wire the power and data communication to the tape. When choosing wire, factor in voltage drop, amperage rating, shield/unshielded, and type (in-wall rated).

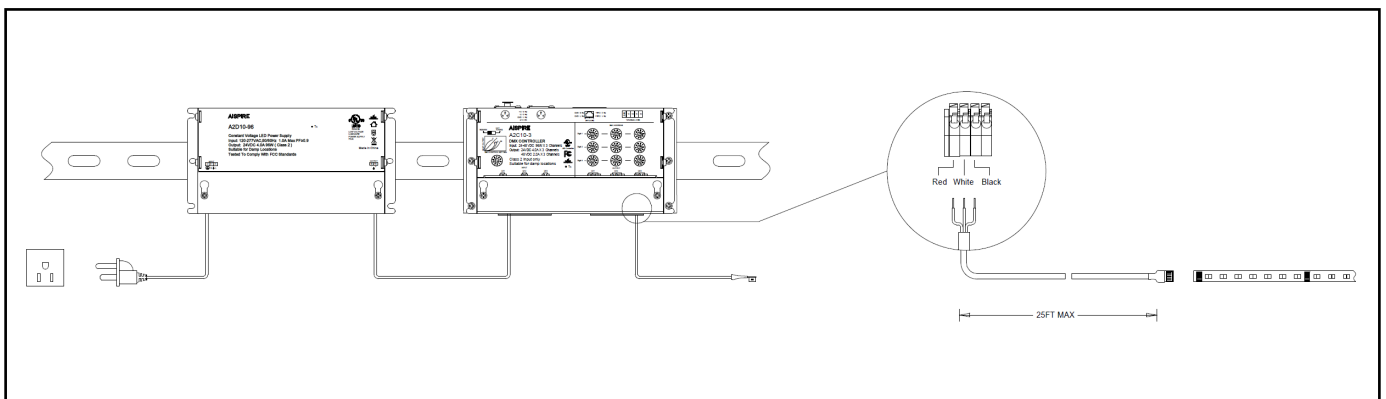
**Option A: Unshielded Cable 25 ft. maximum distance between power supply to the beginning of the tape**

The WAC AiSPIRE In wall rated 20 AWG unshielded cable can be used to wire between a power supply-DMX LED Controller to the beginning of the tape up to 25 ft. Smaller gauge wire number (bigger conductor) can be used, but the maximum run length limitation remains at 25 ft. due data communication distortion if it's run over 25 ft. (See FIG. 3) Wire color connection is shown in Table 1.

**Table. 1**

Wire Color Connection		
DMX LED Controller Terminal Color	A2L03 Cable	Tape marking
RED	RED	+24VDC (RED)
WHITE	WHITE	DATA (WHITE)
BLACK	BLACK	- (BLACK)

**FIG. 3**



**Option B: Shielded data Cable 90 ft. maximum distance between power supply to the beginning of the tape**

A shield data cable shall be used to connect between the power supply-DMX LED Controller to the beginning of the tape up to 90 ft. (See FIG. 4) ICE cable model number: Control Yellow is recommended. Product information can be found below:

<https://www.icecable.com/products/control-yellow>

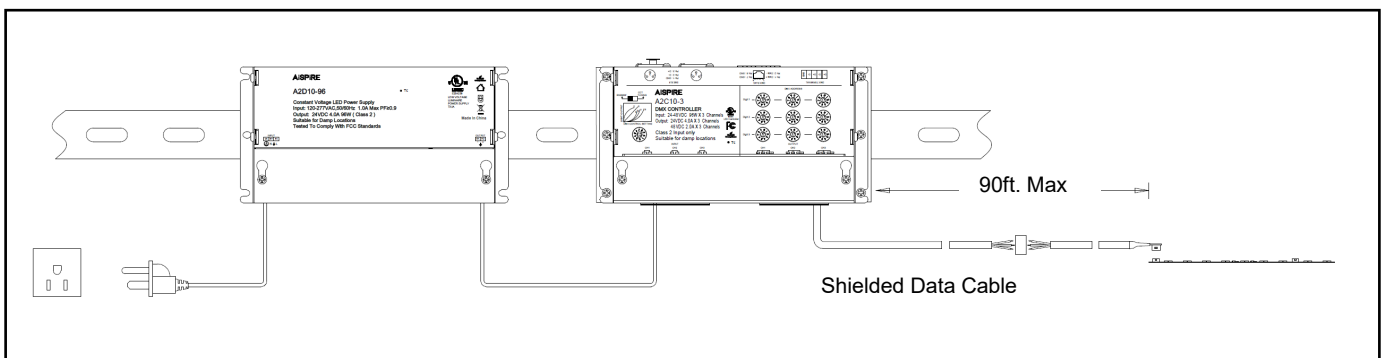
[https://icecable.s3.amazonaws.com/uber\\_products/specs/000/000/078/original/Control\\_Yellow.pdf?1435595602](https://icecable.s3.amazonaws.com/uber_products/specs/000/000/078/original/Control_Yellow.pdf?1435595602)

For Plenum spaces, ICE cable Control Yellow Plenum is recommended. <https://www.icecable.com/products/control-yellow-plenum>

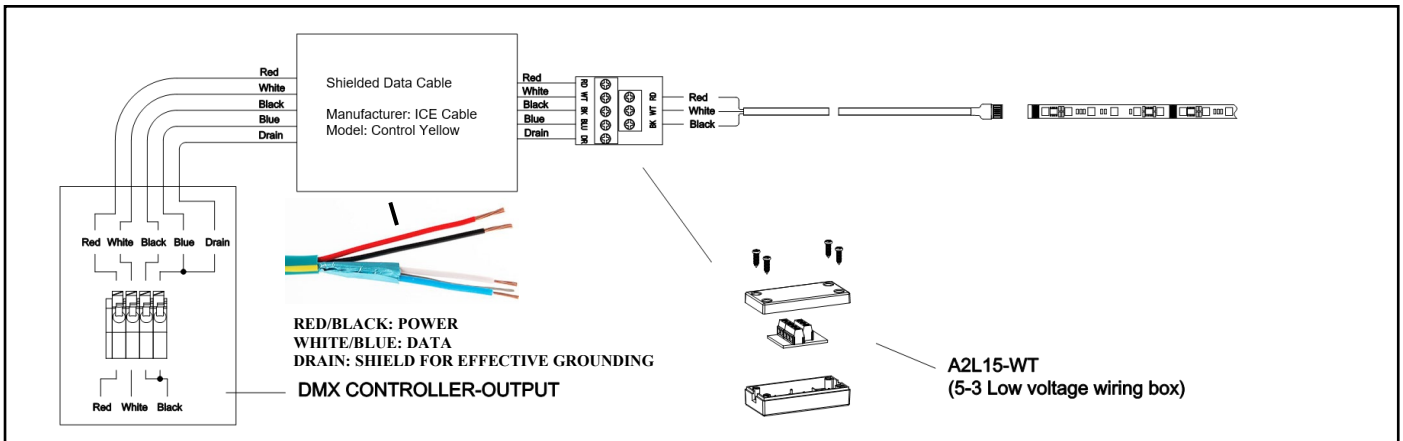
Both drain and common conductor wires shall be connected to a black terminal of DMX LED Controller. Another end shall be connected to the black wire of connector cable. The signal conductor shall be connected to the white terminal of DMX LED Controller. Another end shall be connected to the white wire of connector cable. The power cable can be either shielded or unshielded cable. The bigger conductor yields less voltage drop. The +24VDC polarity shall be connected to the red terminal on DMX LED Controller. Another end shall be connected to the red wire of connector cable. The -24VDC or common conductor wire shall be connected to a black terminal of DMX LED Controller. Another end shall be connected to the black wire of connector cable. (see FIG. 5)

A2L15-WL 5-3 terminal box may be used to connect between 5 wires of shield cable to 3 wires of linear tape connector.

**FIG. 4**

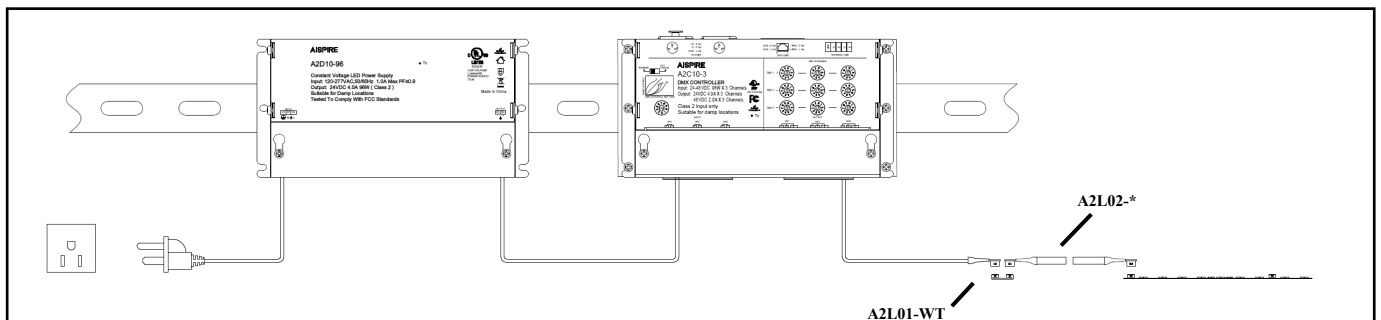


**FIG. 5**



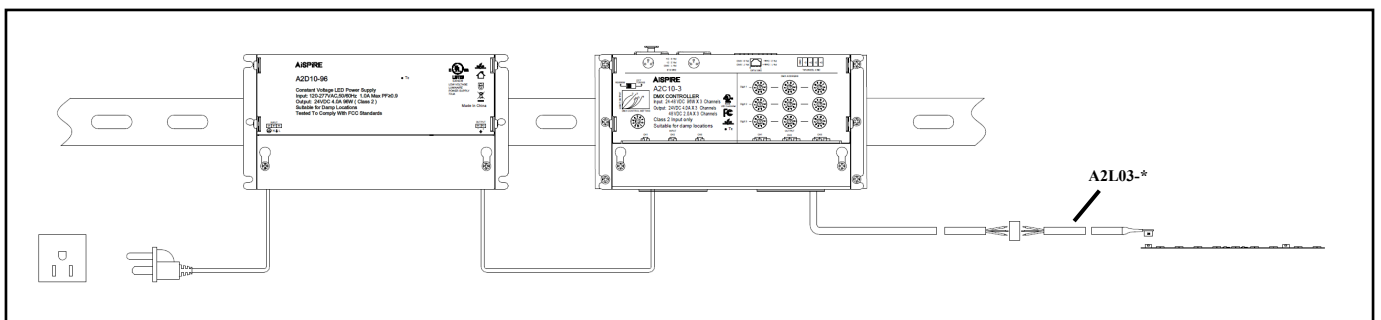
- To extend an unshielded cable length (if needed), In Wall Rated Joiner Cable (A2L02) and Joiner Cable Extender (A2L01-WT) can be used to join between sections as shown in FIG. 6

**FIG. 6**



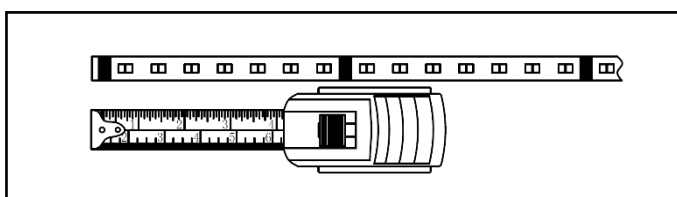
- To extend the cable length between DMX LED controller cable or a wiring box to a tape sections, (if needed), In Wall Rated Extension cable (A2L03) can be used to join between sections by soldering as shown in FIG. 7. Wire color connection is shown in the Table 1.

**FIG. 7**



- Measure the desired length of tape light and round it off to the nearest 4-inch interval. Determine necessary quantities of other accessories and power supply need for each run. (See FIG. 8)

**FIG. 8**



7. Determine the maximum run according to specific CCT range as shown in reference Table 2. A lower light output can be adjusted by lowering DMX value in the same ratio to keep the same CCT.

Note: Setting the maximum DMX value at lower number will increase the maximum run length as the tape consume less power.

**Table 2.**

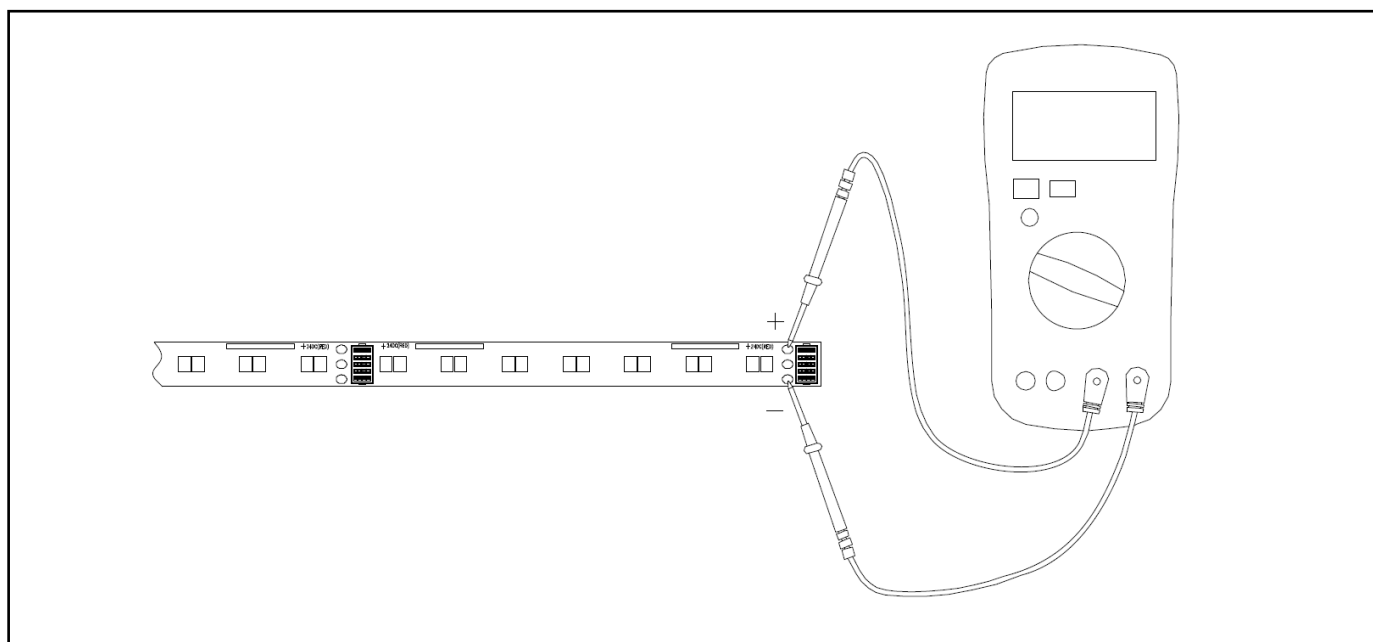
CCT (K)	Current (A/ft)	Power (W/ft)	Max Run (ft)	Lumen	DMX Value		
					CH1: 1800K	CH2: 2700K	CH3: 5000K
1800	0.1429	3.38	28	170	255	0	
1900	0.1739	4.15	23	220	255	59	
2000	0.2000	4.77	20	260	255	120	
2100	0.2500	5.70	16	314	255	210	
2200	0.2222	5.31	18	295	170	255	
2300	0.2105	4.83	19	270	123	255	
2400	0.1818	4.33	22	240	75	255	
2500	0.1667	3.86	24	212	35	255	
2600	0.1538	3.58	26	196	13	255	
2700	0.1429	3.37	28	183		255	0
2800	0.1538	3.57	26	198		255	12
2900	0.1600	3.74	25	210		255	25
3000	0.1667	3.91	24	222		255	38
3100	0.1739	4.15	23	238		255	60
3200	0.1905	4.45	21	259		255	87
3300	0.2000	4.76	20	280		255	115
3400	0.2105	5.01	19	296		255	140
3500	0.2353	5.39	17	327		255	180
3600	0.2500	5.80	16	351		255	220
3700	0.2667	6.03	15	367		240	255
3800	0.2500	5.70	16	347		210	255
3900	0.2353	5.41	17	330		180	255
4000	0.2222	5.12	18	311		150	255
4100	0.2105	4.85	19	293		123	255
4200	0.2000	4.60	20	278		100	255
4300	0.1905	4.45	21	269		85	255
4400	0.1818	4.30	22	260		72	255
4500	0.1739	4.13	23	248		56	255
4600	0.1739	4.01	23	241		46	255
4700	0.1667	3.87	24	232		35	255
4800	0.1600	3.75	25	224		25	255
4900	0.1538	3.66	26	217		16	255
5000	0.1538	3.57	26	213		11	255

Any CCT or CCT mixing in between will maintain the light output as long as the tape voltage is higher than 20.4VDC. The light output (Lumens) starts to degrade as a tape voltage gets lower as shown in FIG. 10

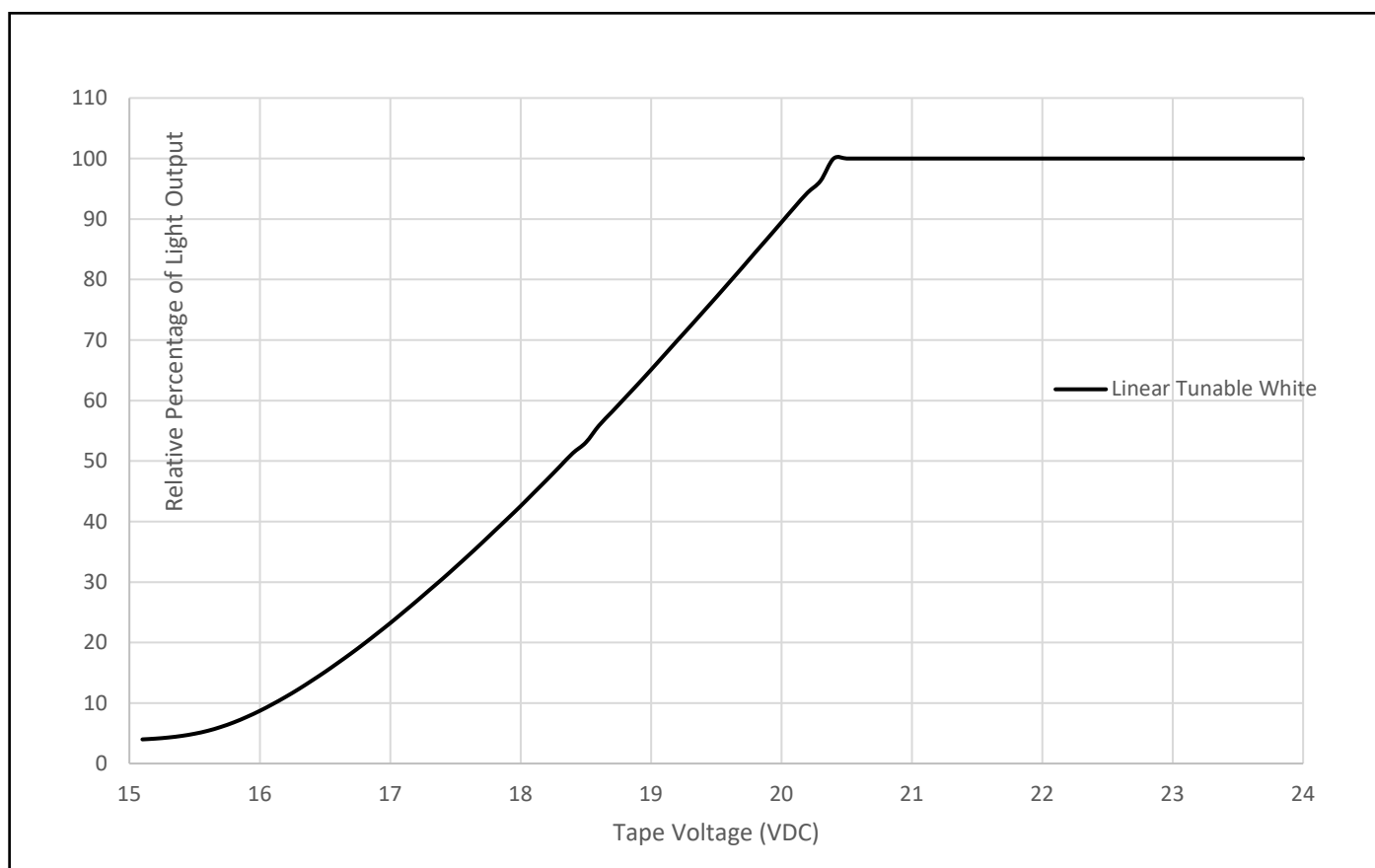
The tape voltage can be checked using voltage meter probe to measure the DC voltage between soldering point of RED and BLACK on the tape as shown in FIG. 9

In order to maintain a voltage or having less voltage drop on the tape, bigger conductor wire or lower gauge wire number is recommended.

**FIG. 9**



**FIG. 10**



If need, a tape voltage drop along the run length can be calculated using the Table 3 below. The voltage drop value in the table shown is at maximum brightness condition. Lowering the light output will lower the voltage drop along the tape.

**Table 3.**

Tape Distance →	Voltage Drop at different Tape Distance (VDC) @Full light output																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1800K	0.07	0.07	0.13	0.20	0.26	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99	1.06	1.12	1.19	1.25	1.32
1900K	0.09	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.27	1.36	1.45	1.54	1.63	1.72	1.81
2000K	0.09	0.09	0.18	0.28	0.37	0.46	0.55	0.64	0.74	0.83	0.92	1.01	1.10	1.20	1.29	1.38	1.47	1.56	1.66	1.75	1.84
2100K	0.09	0.09	0.18	0.28	0.37	0.46	0.55	0.65	0.74	0.83	0.92	1.02	1.11	1.20	1.29	1.39	1.48	1.57	1.66	1.75	1.85
2200K	0.09	0.09	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.82	0.92	1.01	1.10	1.19	1.28	1.37	1.46	1.56	1.65	1.74	1.83
2300K	0.09	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35	1.44	1.54	1.63	1.72	1.81
2400K	0.09	0.09	0.18	0.27	0.35	0.44	0.53	0.62	0.71	0.80	0.88	0.97	1.06	1.15	1.24	1.33	1.42	1.50	1.59	1.68	1.77
2500K	0.08	0.08	0.15	0.23	0.31	0.39	0.46	0.54	0.62	0.70	0.77	0.85	0.93	1.00	1.08	1.16	1.24	1.31	1.39	1.47	1.54
2600K	0.07	0.07	0.14	0.21	0.29	0.36	0.43	0.50	0.57	0.64	0.71	0.79	0.86	0.93	1.00	1.07	1.14	1.21	1.29	1.36	1.43
2700K	0.07	0.07	0.13	0.20	0.26	0.33	0.39	0.46	0.53	0.59	0.66	0.72	0.79	0.85	0.92	0.99	1.05	1.12	1.18	1.25	1.32
2800K	0.08	0.08	0.16	0.23	0.31	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17	1.25	1.33	1.40	1.48	1.56
2900K	0.08	0.08	0.17	0.25	0.33	0.41	0.50	0.58	0.66	0.75	0.83	0.91	0.99	1.08	1.16	1.24	1.33	1.41	1.49	1.57	1.66
3000K	0.09	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35	1.44	1.53	1.62	1.71	1.80
3100K	0.09	0.09	0.18	0.27	0.36	0.45	0.54	0.64	0.73	0.82	0.91	1.00	1.09	1.18	1.27	1.36	1.45	1.54	1.63	1.72	1.81
3200K	0.09	0.09	0.18	0.27	0.36	0.46	0.55	0.64	0.73	0.82	0.91	1.00	1.09	1.18	1.28	1.37	1.46	1.55	1.64	1.73	1.82
3300K	0.09	0.09	0.18	0.28	0.37	0.46	0.55	0.64	0.73	0.83	0.92	1.01	1.10	1.19	1.28	1.38	1.47	1.56	1.65	1.74	1.83
3400K	0.09	0.09	0.18	0.28	0.37	0.46	0.55	0.65	0.74	0.83	0.92	1.02	1.11	1.20	1.29	1.39	1.48	1.57	1.66	1.76	1.85
3500K	0.09	0.09	0.18	0.28	0.37	0.46	0.55	0.65	0.74	0.83	0.92	1.02	1.11	1.20	1.29	1.38	1.48	1.57	1.66	1.75	1.85
3600K	0.09	0.09	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.82	0.92	1.01	1.10	1.19	1.28	1.37	1.47	1.56	1.65	1.74	1.83
3700K	0.09	0.09	0.18	0.28	0.37	0.46	0.55	0.65	0.74	0.83	0.92	1.02	1.11	1.20	1.29	1.38	1.48	1.57	1.66	1.75	1.85
3800K	0.09	0.09	0.18	0.28	0.37	0.46	0.55	0.65	0.74	0.83	0.92	1.02	1.11	1.20	1.29	1.38	1.48	1.57	1.66	1.75	1.85
3900K	0.09	0.09	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.82	0.92	1.01	1.10	1.19	1.28	1.37	1.47	1.56	1.65	1.74	1.83
4000K	0.09	0.09	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.82	0.91	1.00	1.10	1.19	1.28	1.37	1.46	1.55	1.64	1.73	1.83
4100K	0.09	0.09	0.18	0.27	0.36	0.45	0.55	0.64	0.73	0.82	0.91	1.00	1.09	1.18	1.27	1.36	1.45	1.55	1.64	1.73	1.82
4200K	0.09	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35	1.44	1.53	1.62	1.71	1.80
4300K	0.09	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.16	1.25	1.34	1.43	1.52	1.61	1.70	1.79
4400K	0.09	0.09	0.17	0.26	0.35	0.44	0.52	0.61	0.70	0.79	0.87	0.96	1.05	1.13	1.22	1.31	1.40	1.48	1.57	1.66	1.74
4500K	0.08	0.08	0.17	0.25	0.34	0.42	0.51	0.59	0.67	0.76	0.84	0.93	1.01	1.10	1.18	1.26	1.35	1.43	1.52	1.60	1.69

#### Example:

Project: 1800K – 5000K Linear Light  
 Distance between DMX Controller to beginning of the tape: 50 ft using 20 AWG  
 Linear Tunable White Tape Max Run: 15 ft.

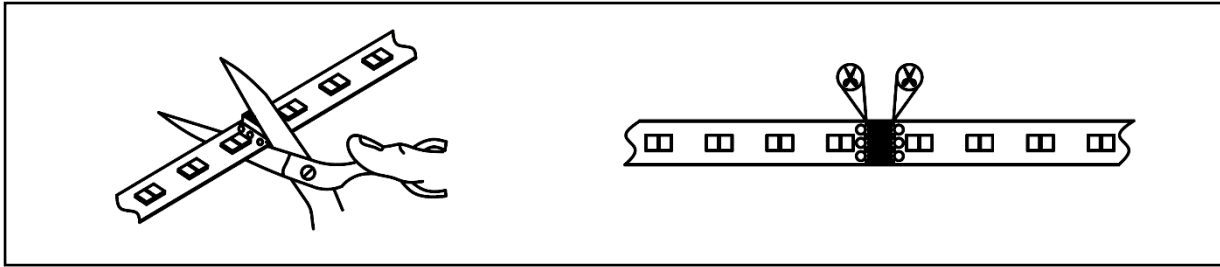
1ft. Tape Current (Worst case at 3700K): 0.2667 A  
 15 ft. Tape Current: 0.2751 X 15 = 4 A  
 Resistane of 20AWG (WAC's Unshielded cable) per ft: 0.0206 Ω  
 Voltage drop from wires between DMX Controller to tape: 4 X (50 X 0.0206) = 4.12V  
 Voltage at beginning of the tape: 24 – 4.12 = 19.88V  
 Light Output at beginning of the tape: According to FIG. 10, it's at around 90% with 19.8V. So you would expect 90% of light output that shown in Table 2.

Voltage at the end of linear tape: According to Table 3, the 15ft tape voltage drop is 1.29V at 3700K, thus 19.8 – 1.29 = 18.51 VDC

Light Output at the end of linear tape: According to FIG. 10, it's around 57% at 18.51V. So you would expect 57% of light output that shown in Table 2.

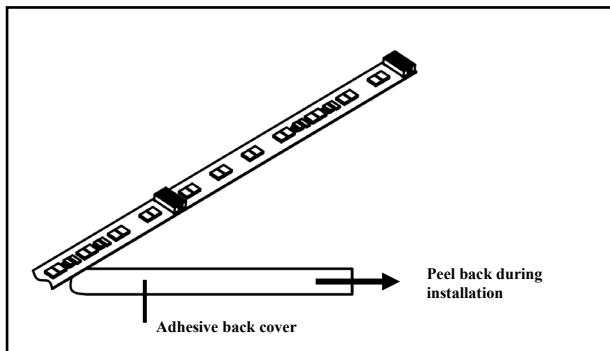
8. If necessary, cut linear TUNABLE WHITE tape light to desired length at line indicated with scissors icon. The tape allows for a cut every 4-inch interval. The cut line is shown on both sides of connector. (See FIG. 11)

**FIG. 11**



9. Mount linear TUNABLE WHITE tape light: Clean surface before mounting. Peel off 3M VHB adhesive backing cover off as strip is installed, pressing firmly to mounting surface in increments. (See FIG. 12)

**FIG. 12**



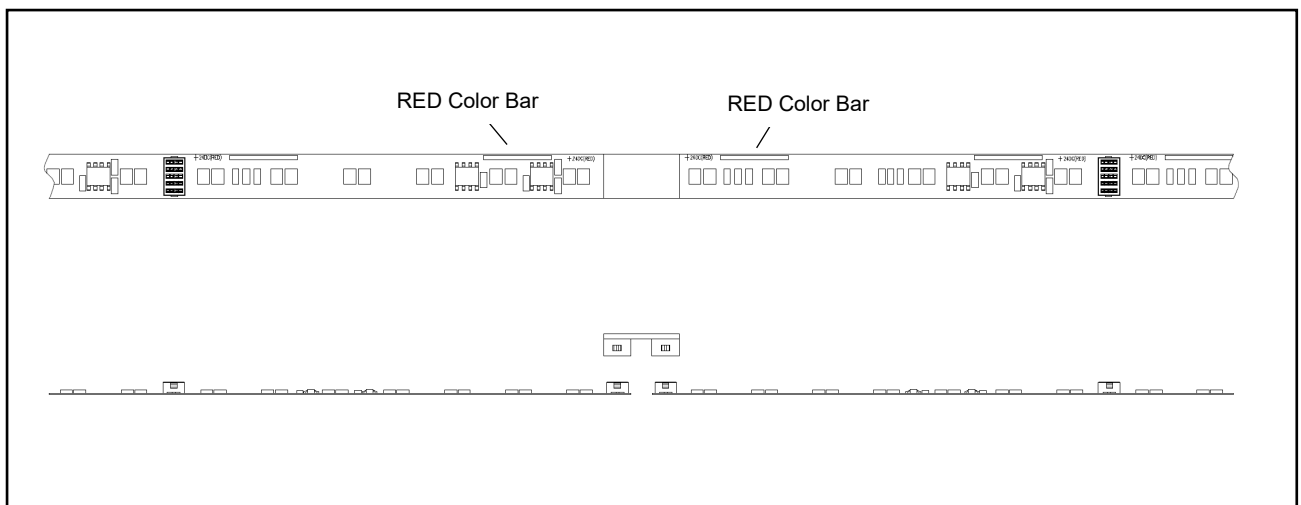
10. Joining between linear TUNABLE WHITE tape light

Linear TUNABLE WHITE tape light has a polarity which means the red color bar has to be same side (See FIG. 13). Joining a tape in an opposite direction will lose an ability to control the tape even though the tape lit up.

Joining tape together (If necessary), the following accessories can be used to join between tapes section depending on your application:

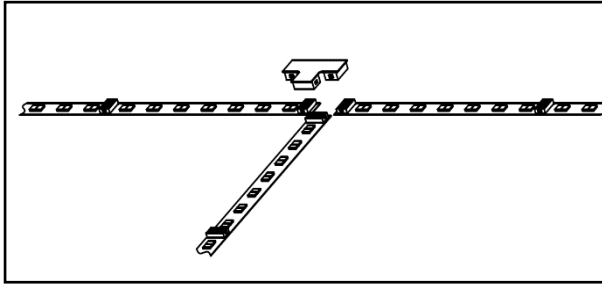
Tape to Tape Connector (A2L00-WT), See FIG. 13

**FIG. 13**



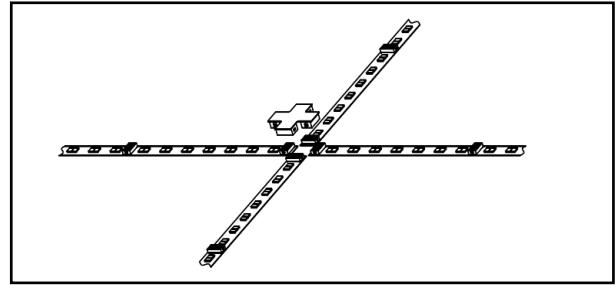
Tape to Tape T Connector (A2L06-WT), See FIG. 14

**FIG. 14**



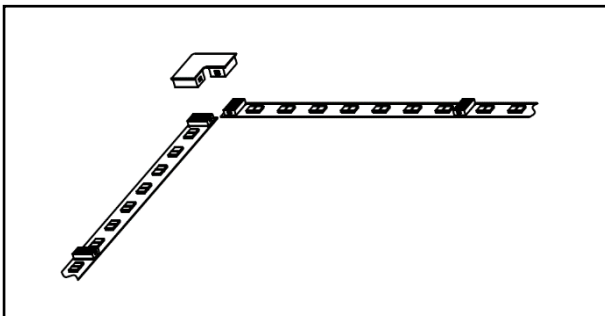
Tape to Tape X Connector (A2L07-WT), See FIG. 15

**FIG. 15**



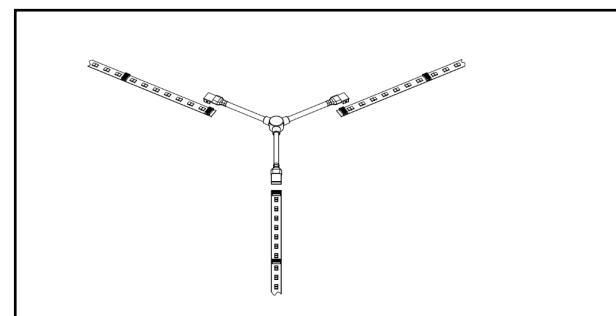
Tape to Tape L Connector (A2L05-WT), See FIG. 16

**FIG. 16**



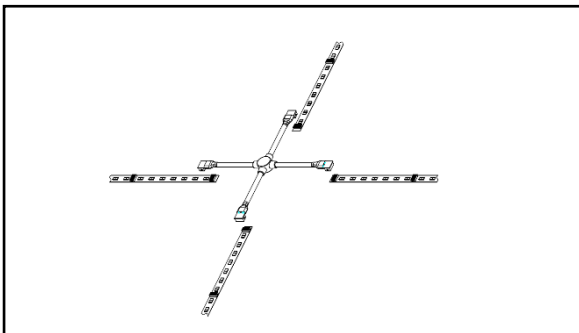
Flex Tape to Tape Y Connector (A2L08-WT), See FIG. 17

**FIG. 17**



Flex Tape to Tape X Connector (A2L09), See FIG. 18

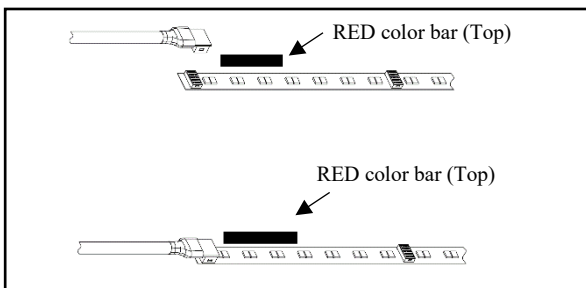
**FIG. 18**



11. Connect electrical power feed connector to any connector on the tape or accessories. Make sure the connection direction is correct.

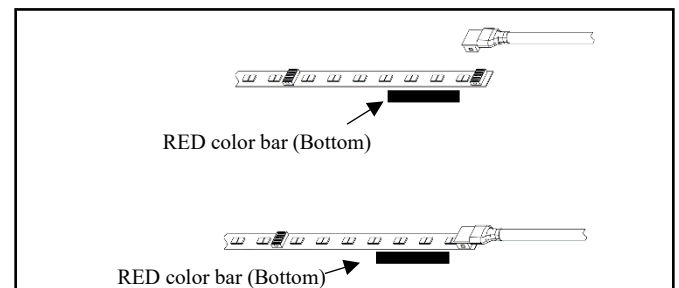
**Feed power from the left**  
(RED Color Bar shall be on the top of the tape, See FIG. 19)

**FIG. 19**



**Feed power from the right**  
(RED Color Bar shall be at the bottom of the tape, See FIG. 20)

**FIG. 20**

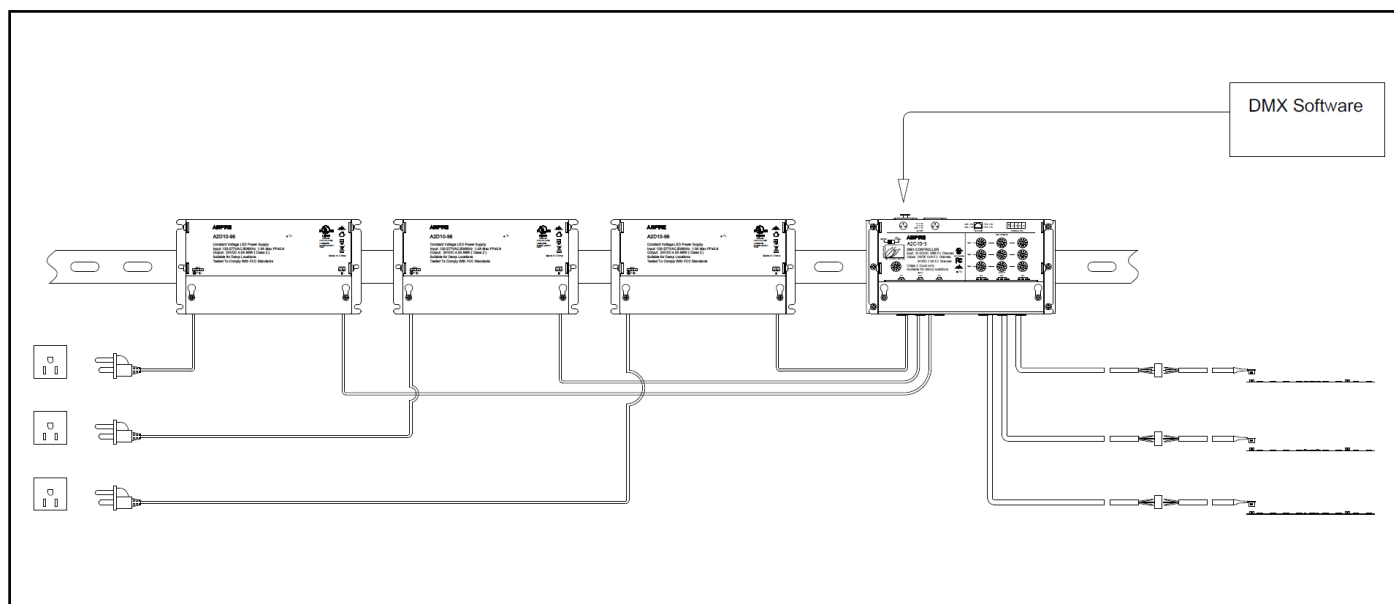




**SYSTEM DIAGRAM:**

Linear TUNABLE WHITE shall be used with AiSPiRE DMX LED Controller at all times. Using other DMX LED controller brands will result in losing an ability to control linear TUNABLE WHITE tape light. The following diagram is provided as example system design. (See FIG. 21)

**FIG. 21**



#### TROUBLESHOOTING

Symptom	Common Cause and Solution
Light Output turns on/off repeatedly or flashing	The tape consume too much power than a capacity of power supply. WAC AiSPiRE power supply has an overload protection that will trip the internal auto-reset. Exceeding power capacity will repeatedly reset the power supply until an overload condition is removed.
Light output flashes wildly with different CCT	The data signal communication between DMX LED Controller and linear TUNABLE WHITE tape has a high distortion due to a long run of wires between Power Supply-DMX LED Controller and Linear Tape. The shield data cable is recommended to use to maintain a good quality data signal. Reducing the run length between DMX LED controller to the tape will help solving the problem.
No light from one section to the end of the run / Light output flashes wildly with different CCT from one section to the end of the run	The linear TUNABLE WHITE tape may be damaged due to high degree of bending angle and cause a soldering on the tape to crack and lose electrical solution. To solve this issue quickly is by cutting and remove the first unlit 4 inches long section out and reconnecting the rest of the tape.
Light output at the end of the run is dim High contrast between beginning and the end of run.	<p>This is the voltage drop effects. Using a thicker conductor wire or smaller gauge wire number yields less voltage drop and boost light output up.</p> <p>Another way is to lower a maximum DMX value to reduce the current consumption to linear TUNABLE WHITE tape. Thus a contrast between beginning and the end of linear tape run will be smaller.</p> <p>Make sure that no ELV/TRIAC dimmer is connected to power supply. Linear TUNABLE WHITE is only control through DMX LED Controller</p>
Linear Tunable White light overheats	<p>Incorrect voltage pairing, ensure 24V tape light are not paired with a power supply with higher voltage</p> <p>Incorrect ambient temperature. Ensure tape light is installed in environment -4° - 104°F (-20°C - 40°C)</p> <p>Lower the maximum light output down to acceptable ranges as recommended in Table. 2</p>
Linear Tunable White does not illuminate	<p>Power Supply Failure, using voltage meter to check.</p> <p>Incorrect wiring, polarity of positive and negative are reversed.</p> <p>Incorrect DMX Channel setup, Check the DMX channel setup and properly activate the right channel.</p>
Unable to dim Linear Tunable White light	<p>Make sure a right connection between power feed to tape (See FIG. 19-20)</p> <p>Make sure a RED color bar is on a right side for all connections between tape to tape.</p>
Sudden Loss control over Linear Tunable White Light	<p>This scenario may happens when you lose control over linear tunable white suddenly as you ramp up the brightness or increase the power to the tape. This cause by a combination of voltage drop and data quality loss.</p> <p>To regain control over tape light, please remove the power to the tape, lower the DMX value, and use shield data cable. Make sure that both common and drain wires are all connected on both ends. Or reduce the run length between DMX LED controller to the tape.</p>
Unable to light up all 3 CCTs (1800K, 2700K, 5000K) at the same time	This feature has been designed in the DMX LED Controller A2C10-3 to prevent an overflow of power to Linear Tunable White tape that will cause an overheat. Thus, only two CCTs can be on at the same time by turning off one of CH1 to CH3 to zero. CH1 (1800K) has highest priority. CH2 (2700K) has second priority and CH3 (5000K) is at last.