

DRAMA™ SERIES SPECTRAC™ INSTALLATION INSTRUCTIONS - SAVE THESE INSTRUCTIONS

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INTRODUCTION

Times Square Lighting Drama™ Series SpecTrac™ is an attractive, robust specification grade track that features an integral Control Bus for transmitting DMX, 0-10V or DALI control signals. The track and all of its components are UL and CUL Certified.

IMPORTANT SAFETY INSTRUCTIONS - READ FIRST!

WARNING! NOT FOLLOWING THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY!

WARNING! NOT FOLLOWING THESE INSTRUCTIONS CAN RESULT IN AN ELECTRICAL SHOCK HAZARD, FIRE HAZARD, OR BOTH!

CAUTION: Read and understand these entire instructions before proceeding.

CAUTION: Do not expose the track system to any lubricants, solvents or cleaning solutions, as they may impair the strength of the product. To clean, use a damp cloth only.

CAUTION: Do not slide any track adapter along the track to change its location. The adapter must be properly removed from the track and then re-inserted into its desired location.

CAUTION: The Times Square track system is intended for use only with Times Square approved components and Times Square approved lighting fixtures. To reduce risk of fire, electrical shock or personal injury, do not use other components as part of this track system.

CAUTION: The track system is to be installed by qualified electricians only, and in accordance with the National Electrical Code and all local codes and ordinances.

CAUTION: Do not install the track system in: 1) damp or wet locations, 2) where likely to be subjected to physical damage, 3) in hazardous (classified) locations, 4) where subject to corrosive vapors, 5) in storage battery rooms, 6) where concealed or extended through walls or partitions, or 7) within a zone measured 3ft horizontally and 8ft vertically from the top of a bathtub rim or shower threshold.

CAUTION: Do not install any parts of the track system less than 5 feet above the finished floor without prior approval of the Authority Having Jurisdiction (AHJ).

CAUTION: Do not install any fixtures closer than 6 inches from combustible materials.

CAUTION: Do not use the track system with a power supply cord or convenience receptacle adapter.

CAUTION: Do not install the track system with the track energized. Similarly, disconnect power to track when installing or removing components or changing the layout of the track, excluding track adapters.

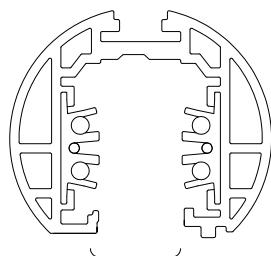
CAUTION: Do not attempt to hang, drape over, or install anything other than Times Square approved components and Times Square approved lighting fixtures to the track. To reduce the risk of fire, electrical shock or personal injury, do not attempt to connect power cords, extension cords, appliances, and the like to the track.

CAUTION: Any track section end must be terminated with a Connector, Current Limiter or Dead End.

CAUTION: Connector ends and Current Limiter ends may never be exposed. A track section must always be attached to a Connector or Current Limiter end.

CAUTION: Use 12 lbf-in (1.4N-m) torque on all 120V and 277V electrical connections.

CAUTION: Never allow paint to reach the inside of the track slot! See diagram, right. Paint guards for all track types are available. Consult Factory for more details.



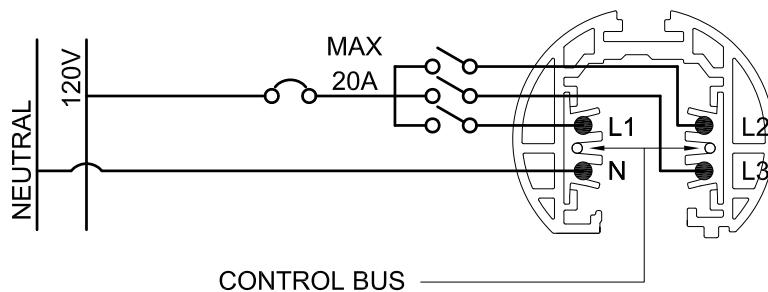
NO PAINT IN HERE!

1) ELECTRICAL POWER CONNECTIONS

NOTE: This track is designed to be fed by up to three branch circuits rated 120V, 20A max. Each circuit shares a common neutral and should be wired as shown below.

CAUTION: This track should not be used with dimmers unless the dimmers are specifically rated to work with circuits that have a common neutral.

WIRING ILLUSTRATIONS



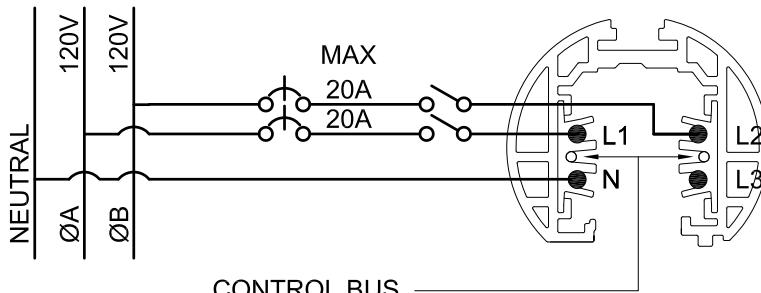
MAXIMUM LOAD: 2400 Watts*

Caution: Dimmers should not be used unless the dimmers are rated to work with circuits that have a common neutral, or, unless a *single* dimmer is interposed between the circuit breaker and any switches.

* Per the NEC, continuous loads must be derated to 80%

CAUTION: Since a common neutral is used, the two or three hot circuits MUST be connected to *different phases*, and they must be connected to a DOUBLE (2) POLE or TRIPLE (3) POLE CIRCUIT BREAKER respectively. Not doing so can result in a shock hazard, fire hazard, or both!

CAUTION: Use 12 lbf-in (1.4N-m) torque on all 120V electrical connections! Strip wire insulation 7/16-1/2".



MAXIMUM LOAD: 4800 Watts*

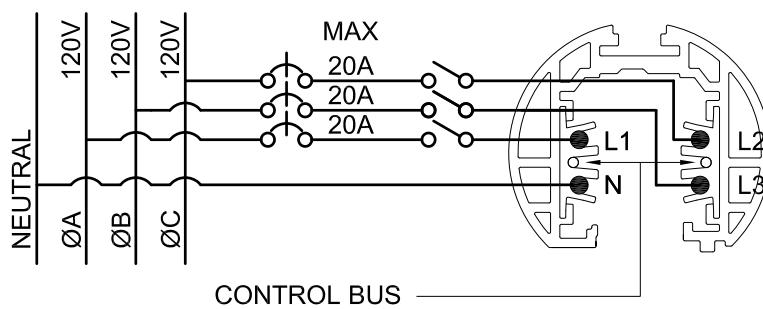
EVENLY DIVIDED BETWEEN CIRCUITS

Caution: Dimmers should not be used unless the dimmers are rated to work with circuits that have a common neutral.

* Per the NEC, continuous loads must be derated to 80%

CAUTION: Since a common neutral is used, the two or three hot circuits MUST be connected to *different phases*, and they must be connected to a DOUBLE (2) POLE or TRIPLE (3) POLE CIRCUIT BREAKER respectively. Not doing so can result in a shock hazard, fire hazard, or both!

CAUTION: Use 12 lbf-in (1.4N-m) torque on all 120V electrical connections! Strip wire insulation 7/16-1/2".



MAXIMUM LOAD: 7200 Watts*

EVENLY DIVIDED AMONG CIRCUITS

Caution: Dimmers should not be used unless the dimmers are rated to work with circuits that have a common neutral.

* Per the NEC, continuous loads must be derated to 80%

CAUTION: Since a common neutral is used, the two or three hot circuits MUST be connected to *different phases*, and they must be connected to a DOUBLE (2) POLE or TRIPLE (3) POLE CIRCUIT BREAKER respectively. Not doing so can result in a shock hazard, fire hazard, or both!

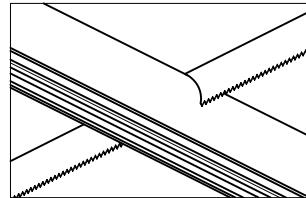
CAUTION: Use 12 lbf-in (1.4N-m) torque on all 120V electrical connections! Strip wire insulation 7/16-1/2".

2) FIELD CUTTING THE TRACK AND PREPARING THE CONDUCTOR ENDS

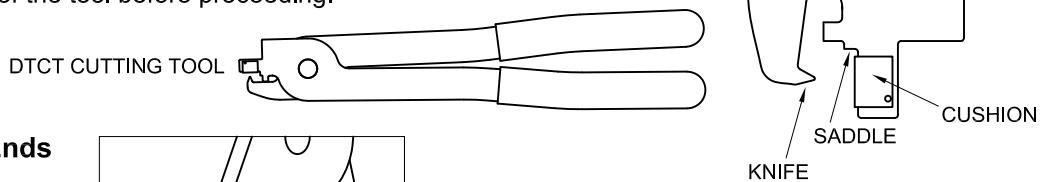
CAUTION: Any track section that is field cut must be done in the exact manner according to these instructions! All conductor ends must be prepared in the exact manner according to these instructions after a section of track has been field cut. Not following these instructions exactly may result in a shock and fire hazard or both!

Cutting the Track

With a mitered hack saw, band saw or chop saw, carefully cut the track to the desired length. Make certain that the cut is clean, straight, deburred and perpendicular to all sides. Use only saw blades that are designed to cut aluminum. See diagram, right.

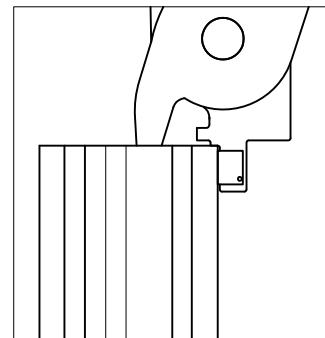
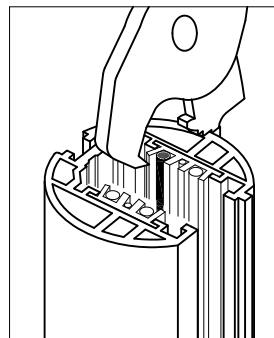
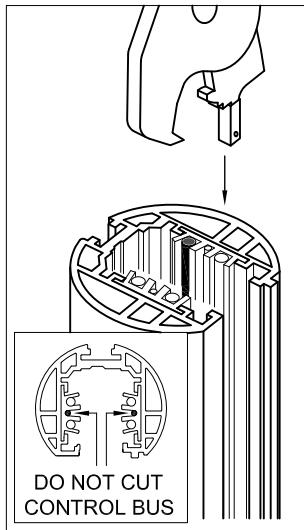


The standard lengths of track come supplied from the factory with the conductor ends trimmed to allow the proper installation of Connectors, Joiners, Dead Ends and Current Limiters (these items are discussed in detail in later Sections). However, the track can be easily field cut to different lengths with a saw designed for use with aluminum. After cutting, the conductor ends must be trimmed in the field using the DTCT Cutting Tool. Examine the diagram to the right to learn the different components of the tool before proceeding.

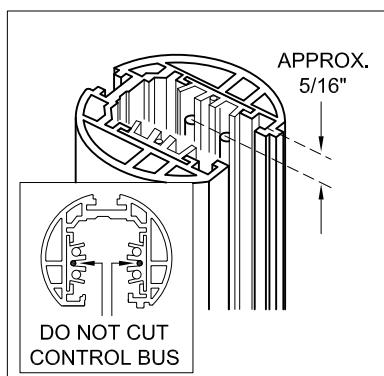


Preparing the Conductor Ends

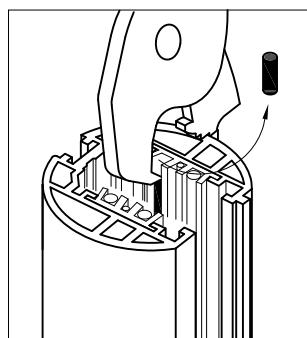
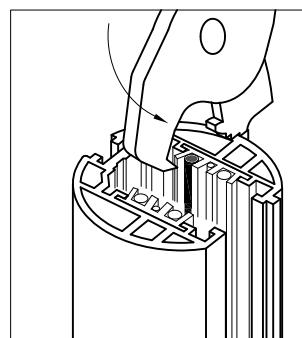
1) Beginning with any of the four conductor ends, insert the Cutting Tool such that the cushion is seated on the outside of the track directly in line with the conductor to be cut. Make certain that the Control Bus IS NOT CUT. Also, the saddle should be in contact with the edge of the track. See diagrams, right.



2) Squeeze the tool such that the knife completely sheers off the end of the conductor. Discard the sheered conductor end. See diagrams, right.



3) Repeat for the remaining three conductors. Make certain that the Control Bus IS NOT CUT. When properly sheered, there should be approximately $5/16"$ of each conductor removed from the end of the track. See diagram, left.



3) FEEDING THE DRAMA TRACK AND TRACK LAYOUTS

Drama Track can be fed electrical power via Live End Connectors (sometimes referred to as End Feeds) or Current Limiters*. The other types of connectors, which are X, T, and L Connectors, will physically and electrically connect the track sections together but cannot introduce electrical power to the track. When creating layouts with this track, it is important to keep the polarity consistent throughout the design. The track has a groove along its length to indicate polarity. The Connectors, Joiners, Dead Ends and Current limiters have screws on their tips that align and engage with the polarity grooves in the track. Dimensions, weights and part numbers are provided below and on the following pages to assist in layout design. NOTE: The factory made wiring connections within X, T, and L Connectors as well as the Current Limiters used with this track may be changed in the field to accommodate different layout designs and circuiting schemes. See Guidelines for Layouts further in this section and also see Section 7: Current Limiters for more details. **CAUTION:** To prevent electrical shock or fire hazard, care must be taken to prevent the crossing or combining of phase wires and neutrals!

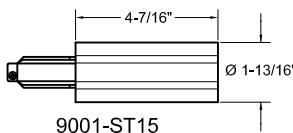
Drama Track, Connector, Joiner**, Dead End** and Current Limiter* Specifications

NOTE: ALL DIMENSIONS +/- 1/32" EXCEPT WHERE NOTED, DIAGRAMS ARE NOT TO SCALE.

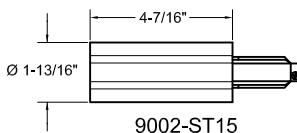
Dia. #1: Two Circuit 120 Volt Track with Independent Neutrals - Round Profile Drama Series



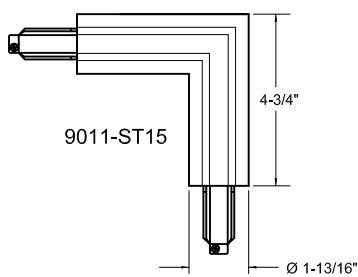
Dia. #2: Live End Connector for Round Profile Drama Track



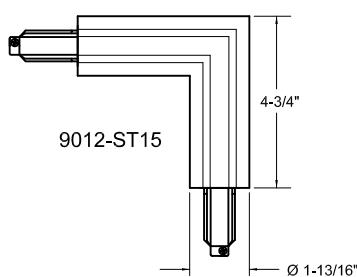
Dia. #3: Mirror Live End Connector for Round Profile Drama Track



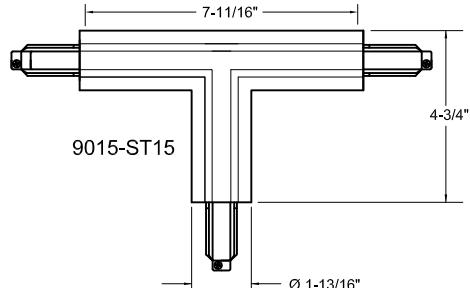
Dia. #4: L Connector for Round Profile Drama Track



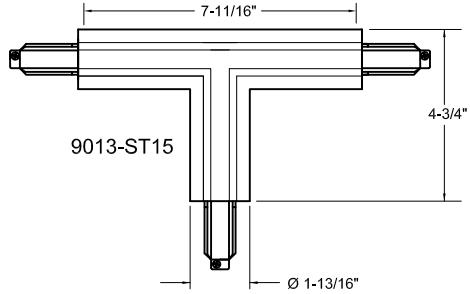
Dia. #5: L Connector for Round Profile Drama Track



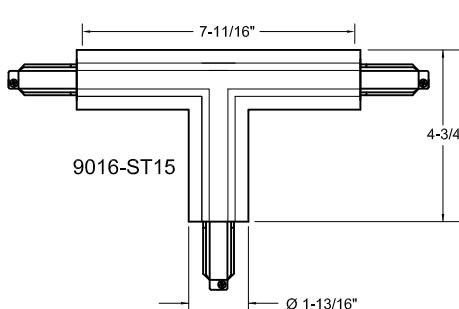
Dia. #6: T Connector for Round Profile Drama Track



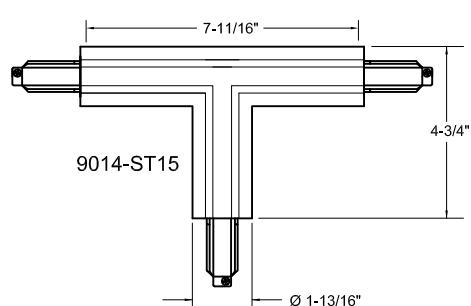
Dia. #7: T Connector for Round Profile Drama Track



Dia. #8: T Connector for Round Profile Drama Track



Dia. #9: T Connector for Round Profile Drama Track

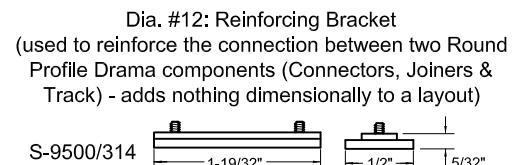
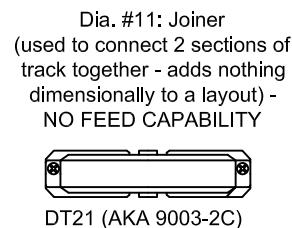
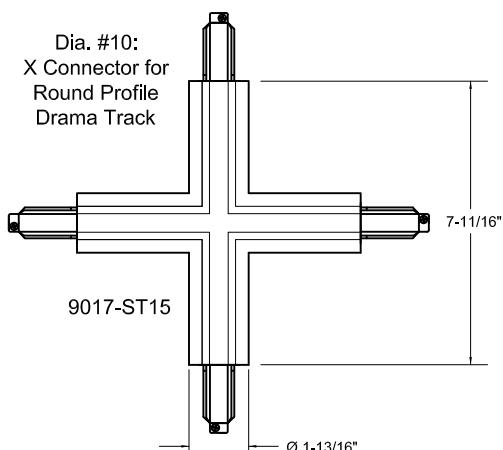


Specifications continued on next page

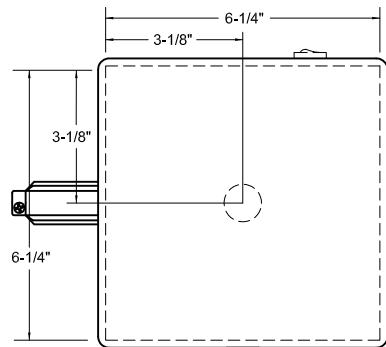
* Current Limiters are described in more detail in Section 7: CURRENT LIMITERS.

** Joiners and Dead Ends are described in more detail in Section 5: INSTALLING CONNECTORS, JOINERS, & DEAD ENDS TO THE TRACK.

Dtama Track, Connector, Joiner, Dead End and Current Limiter Specifications (Continued)

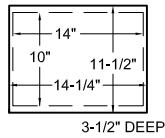


Dia. #14: 120V Surface/Suspension Mount
Current Limiter with Live End Connector



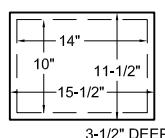
TSC-Q-E (1 OR 3 CIRCUIT)

Dia. #15: 16 Circuit
Surface Remote
Current Limiter Panel



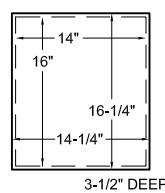
TSCP-16-S

Dia. #16: 16 Circuit
Flush Remote Current
Limiter Panel



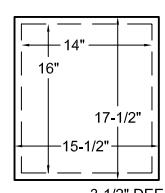
TSCP-16-F

Dia. #17: 32
Circuit Surface
Remote Current
Limiter Panel



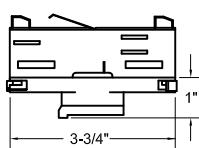
TSCP-32-S

Dia. #18: 32
Circuit Flush
Remote Current
Limiter Panel

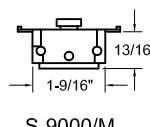


TSCP-32-F

Dia. #19: 3 Circuit
Electrical Track
Adapter - supports
22.5 lb maximum



Dia. #20: Mechanical Track
Adapter (used for support
only, provides no electrical
power) - supports 33.7 lb
maximum

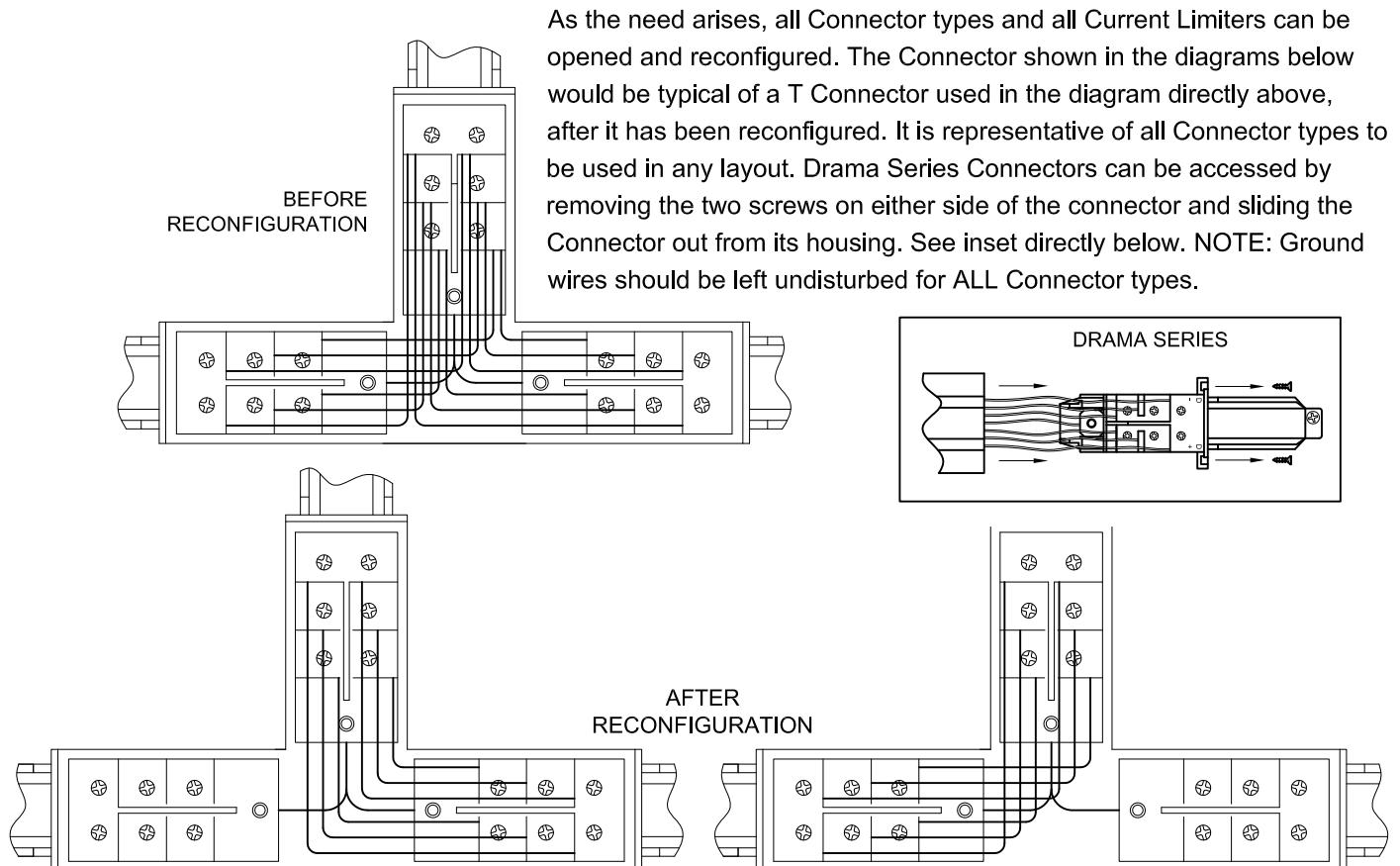
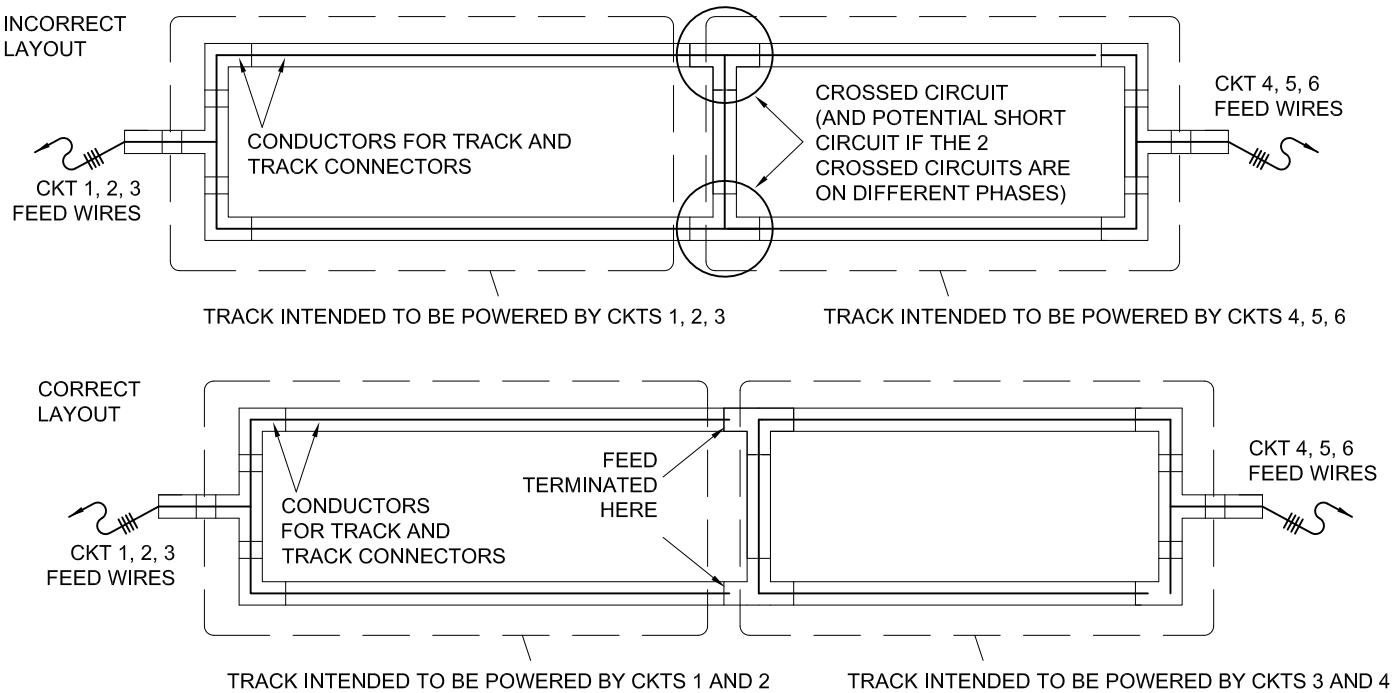


Drama Track and Track System Component Matrix

Item	Part Number	Dia. No.
Track Type	9000-UL/ST15	1
Track Voltage / Amperes per Circuit	120VAC / 20A	
Track Circuitry	1, 2, or 3 Circuit	
Track Neutral(s)	Common	
Surface / Ceiling Grid / Cable / Thrd Rod Mounting	No	
Pendant Mounting	Yes	
Recessed Mounting, Flanged	No	
Recessed Mounting, Flangeless	No	
Available with Lite Channel™	No	
Track Support Distance	4' Maximum	
Track Loading	11lb/ft Maximum	
Track Profile	Round (Drama Ser.)	
Available Track Lengths	4' and 8'	
Track Weight	1.0 lb/ft	
Available Track Colors	Black & White	
Live End Connector	9001-ST15	2
Mirror Live End Connector	9002-ST15	3
L Connector, Inside Polarity	9011-ST15	4
L Connector, Outside Polarity	9012-ST15	5
T Connector, Inside Polarity	9015-ST15	6
T Connector, Outside Polarity	9013-ST15	7
T Connector, Inside Polarity, Mirror	9016-ST15	8
T Connector, Outside Polarity, Mirror	9014-ST15	9
X Connector	9017-ST15	10
Joiner	DT21 (AKA 9003-2C)	11
Reinforcing Bracket	S-9500/314	12
Dead End	9004-ST15	13
Current Limiter, Suspension Mount, End Feed	TSC-Q-E	14
Remote Current Limiter Panel, 16 Circuit Max, Flush	TSCP-16-F-120	15
Remote Current Limiter Panel, 16 Circuit Max, Surface	TSCP-16-S-120	16
Remote Current Limiter Panel, 32 Circuit Max, Flush	TSCP-32-F-120	17
Remote Current Limiter Panel, 32 Circuit Max, Surface	TSCP-32-S-120	18
Corresponding Electrical Track Adapter	DT3	19
Corresponding Mechanical Track Adapter	S-9000/M	20

Guidelines for Track System Layouts

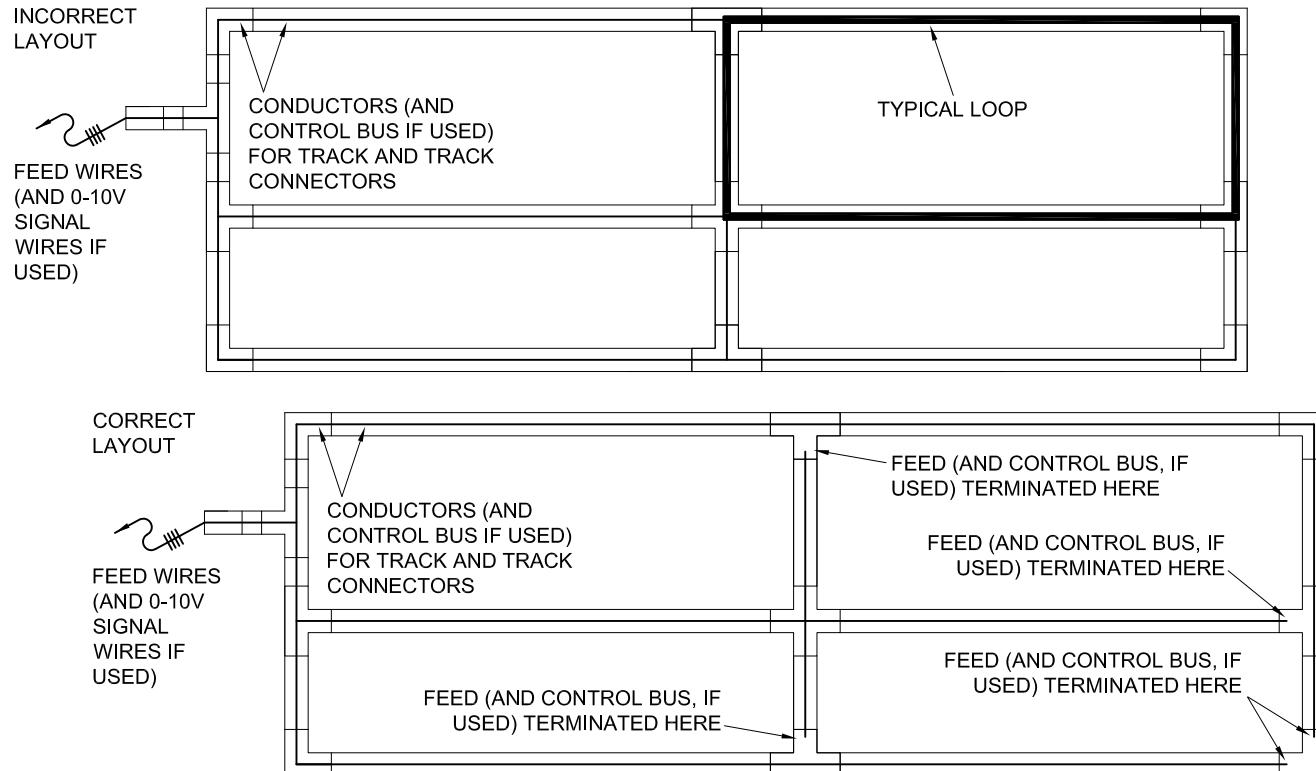
Complex layouts often have more than one feed point, and the potential exists for short or crossed circuits. The first diagram below shows how short or crossed circuits can be created. The second diagram below illustrates how short circuits can be avoided.



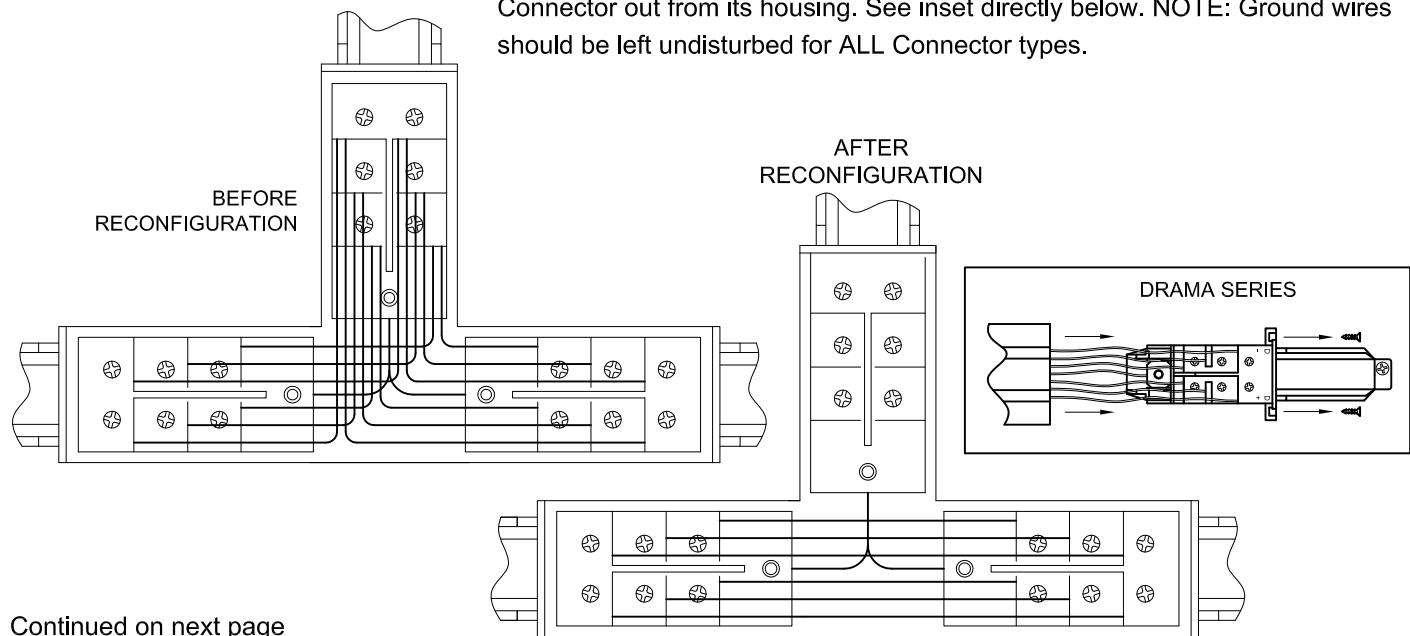
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Guidelines for Track System Layouts (Continued)

It is good practice to eliminate wiring loops for power conductors and the control bus conductors on complex layouts. The first diagram below shows how loops are created, with a typical loop highlighted for clarity. The second diagram below illustrates how loops can be avoided. Complex layouts using DMX control wiring will be discussed on the next two pages. Also, see Page 11 for more requirements on Data Track using 0-10V control and DALI.



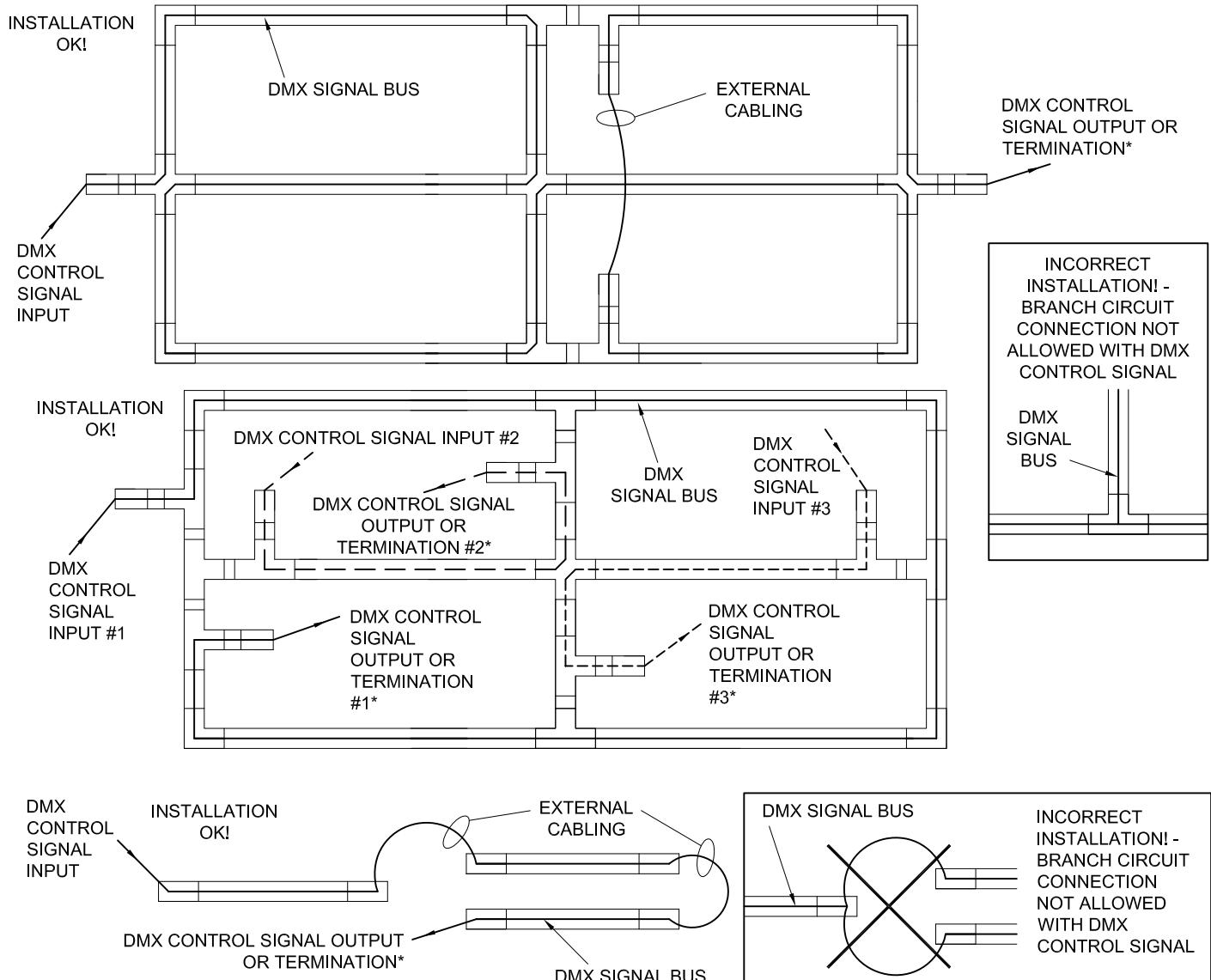
As previously stated, all Connector types and all Surface/Suspension Mount Current Limiters can be opened and reconfigured. The Connector shown in the diagrams below would be typical of a T Connector used in three places in the diagram directly above, after it has been reconfigured. It is representative of all Connector types to be used in any layout. Drama Series Connectors can be accessed by removing the two screws on either side of the connector and sliding the Connector out from its housing. See inset directly below. NOTE: Ground wires should be left undisturbed for ALL Connector types.



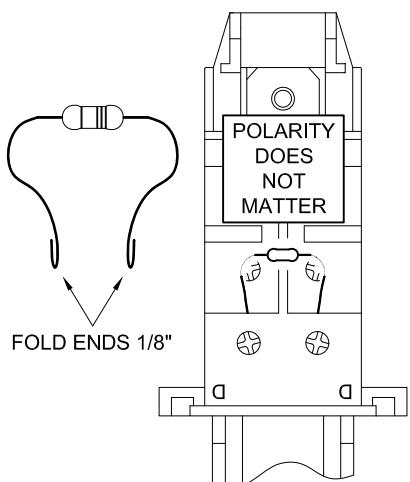
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Guidelines for Track System Layouts (Continued)

It is imperative that all DMX control wiring on any layout be run in a daisy chain fashion. No loops or branches such as T's or X's are allowed. The layout possibilities are endless, but the diagrams below show the basics of how loops and branch circuits are avoided. See the next page for more requirements on Data Track using DMX control.



* All DMX control runs must be terminated with a $120\ \Omega$ resistor. If the end of the DMX control run is within the track layout, then this can be accomplished in two ways: 1) By adding a track adapter with a terminating resistor pre-installed at the very end of the track, closest to the last connector or the dead end in the run (All Drama track adapter are available with resistors installed from the factory by adding "-TERM" at the end of the part number), or, 2) By installing the resistor across the D+ and D- screw terminals on the last connector in the run (All Drama Live Ends and Mirror Live Ends are available with resistors installed from the factory by adding "-TERM" at the end of the part number). See diagrams to right. The polarity of the resistor does not matter.



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Guidelines for Track System Layouts (Continued)

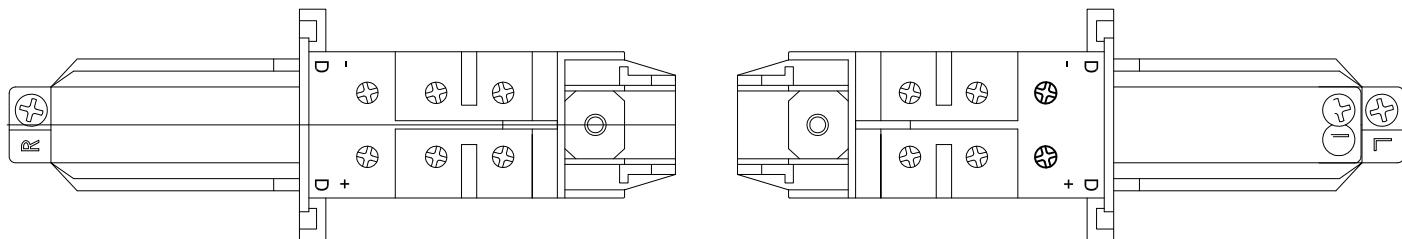
SPECIAL CONSIDERATIONS FOR DMX CONTROL

DMX control runs should be limited to 1000 feet maximum, including track and all intermediate control cabling. There should be no more than 32 fixtures and devices (including splitters) on a single DMX control run. The control bus in the track has a capacitance that can affect signal integrity compared to runs composed of cable only. Therefore, when using fixtures with DMX that have Remote Device Management (RDM) capability, there should be no more than 20 fixtures and devices (including splitters) on a single DMX/RDM control run.

The control bus in the track has only two conductors. Typical DMX systems consist of three conductors: Data +, Data - and Signal Common. If the intermediate control cabling to, from, or between the track consists of shielded twisted pairs, then the shield is Signal Common. The Signal Common when using this track is not used. Make certain that NO portion of the shield or shield wire (aka drain wire) is connected to the track, or bonded to or incidentally in contact with Ground, or anything electrically connected to Ground. If the intermediate control cabling to, from, or between the track consists of unshielded twisted pairs, such as Cat5, Cat5e, Cat6 or Cat6e, then only the Orange / White (Data +) and the Orange (Data -) wires are to be used. See chart below.

Data Track Connector	Shielded Twisted Pair with Standard DMX Connector (XLR)	Unshielded Twisted Pair (Cat5, Cat5e, Cat6 or Cat6e)
D+ D- not used	Data + [Any Color], Pin 3 on XLR Conn. Data - [Any Color], Pin 2 on XLR Conn. Signal Common (bare drain wire), Pin 1 on XLR Conn.	Orange / White Orange Brown / White

Depending on the polarity of the Connector, D+ and D- are located as shown below:



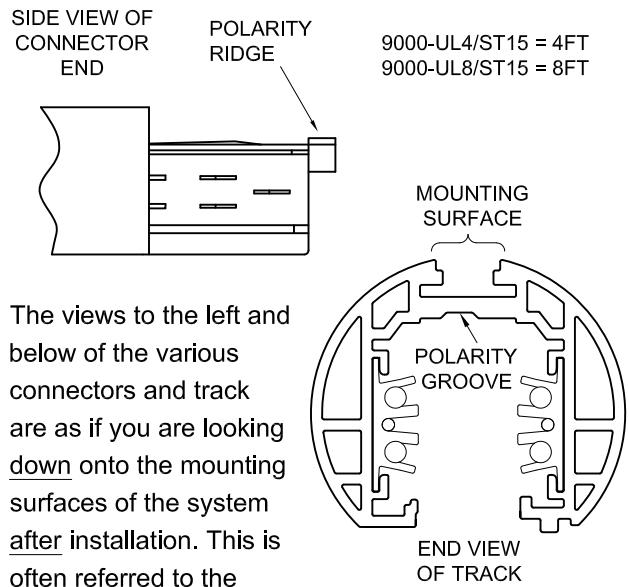
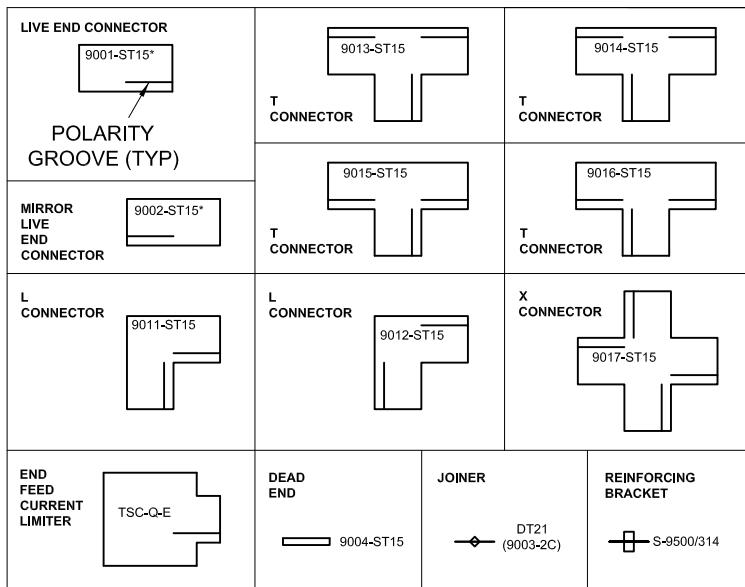
SPECIAL CONSIDERATIONS FOR 1-10V CONTROL

It is important to remember that although all track has multiple power circuits, there is only one signal bus circuit. For fixtures requiring 0-10V dimming controls, all fixtures connected to the 0-10V bus will receive the same dimming signal regardless of what power circuit they are on. The maximum number of fixtures on a control run depends on the 0-10V control device that is used.

SPECIAL CONSIDERATIONS FOR DALI CONTROL

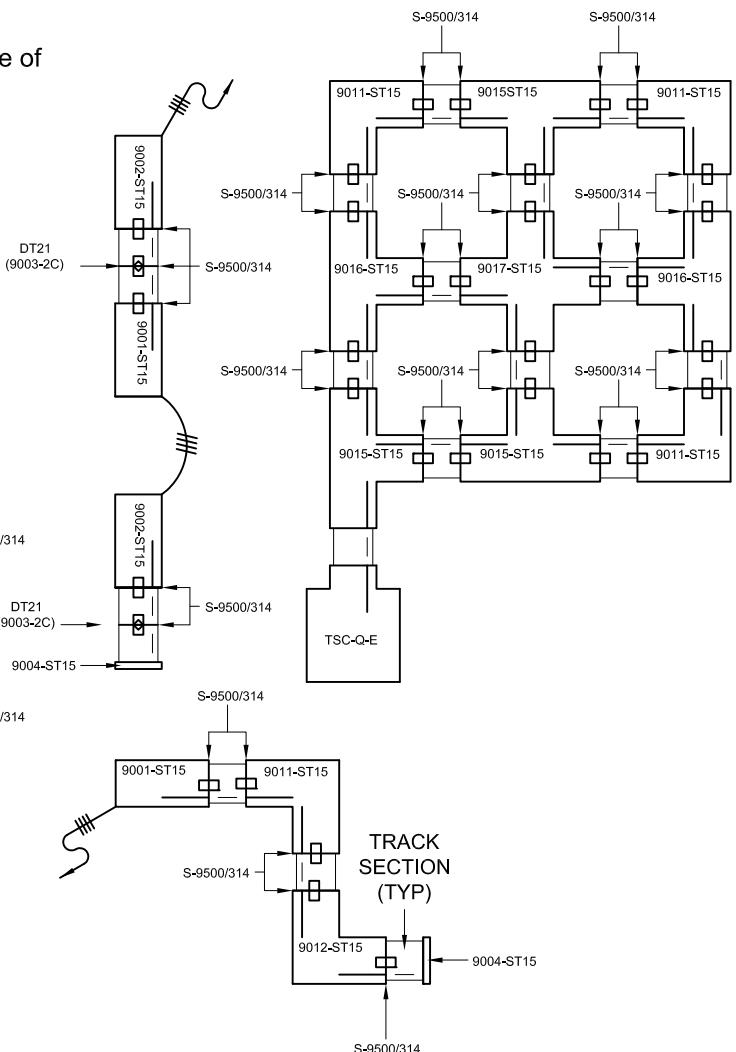
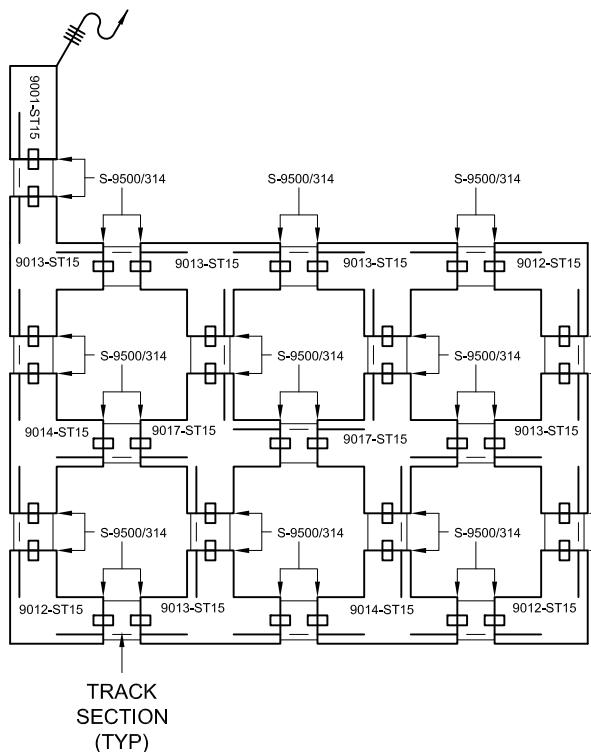
The maximum control run between the first and the last DALI components may not exceed 984 feet. The maximum number of fixtures on a control run depends on the DALI control device that is used. The DALI standard specifies a voltage of 16V DC (typical), 22.5V MAX and a current of 250mA. The voltage drop may not exceed 2V. DALI fixtures should have a maximum consumption of 2mA. DALI control wiring on any layout may be run in a daisy chain or a star arrangement or in mixed form. The control signal has no polarity.

Three Circuit 120 Volt Track with Common Neutral - Round Profile Drama Series POLARITY ILLUSTRATIONS AND SAMPLE LAYOUTS



The views to the left and below of the various connectors and track are as if you are looking down onto the mounting surfaces of the system after installation. This is often referred to the "Reflected Ceiling View."

* Drama track connectors are intended to be fed with hard service cords. If another type of feed is to be used, such as conduit or armored cable for example, then 9001-ST15 and 9002-ST15 can be substituted with 9001-3C and 9002-3C respectively. This will however alter the overall appearance of the layout at the feed location(s).

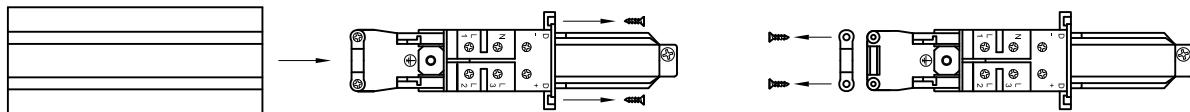


4) INSTALLING WIRES TO CONNECTORS

Follow the steps below to install all Drama Series Connectors to junior hard service cables with an outside diameter of 0.47" or less, e.g. 12/3SJ, 14/3SJ, 14/4SJ and 14/5SJ. NOTE: These cable types may include the suffix O, OW, OO, or OOW. **CAUTION:** Use 12 lbf-in (1.4N-m) torque on all 120V electrical connections!

Standard electrical fittings are not to be used on Drama Connectors as the Drama Connectors have an integral strain relief for the cord. Where a control signal cable is required, there are two ways to bring that cable into the Drama Connector: 1) Through the provided electrical power cable entry opening in the Connector cover, given that the combined width of the electrical power cable and control signal cable is less than 0.62", or, 2) Through a hole drilled in the rear of the Connector cover and using that hole as an entry for the control signal cable. The hole should be just large enough to accommodate the cable, but no larger than $\text{Ø}5/16"$. Make certain that the hole is deburred.

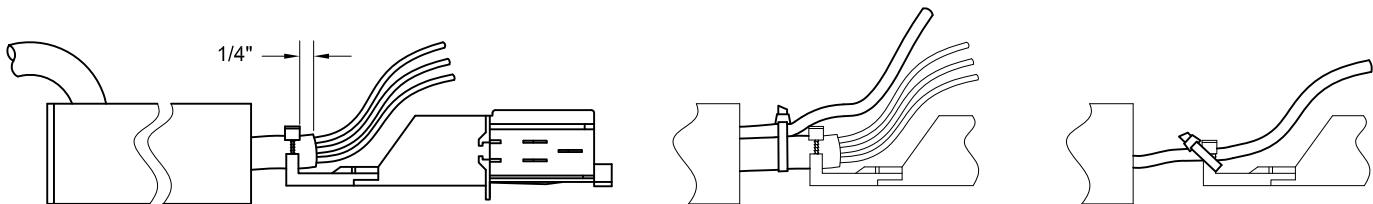
1) Remove the Connector from the Connector cover and set the two screws aside. Remove the cable clamp from the Connector and set the clamp and the two clamp screws aside. It should be noted that Connectors may be used to bring a control signal only to the track system, especially with DMX control runs. If this is the case, ignore the instructions for the power cable feed and follow the instructions for the control signal wiring only.



2) Carefully insert the power cable and/or, if required, the control signal cable into the appropriate opening(s) in the Connector cover.

3) Strip the power cable jacket approximately 2-1/4".

4) Secure the power cable to the connector with the clamp and screws as shown in the diagram below, left. If a control signal cable is used with the power cable, secure it to the power cable with a wire tie (by others) as shown in the diagram below, center. If a control signal cable is used alone without a power cable, secure it to the cable clamp with a wire tie (by others) as shown in the diagram below, right.



5) Trim and strip the system ground wire from the power cable 7/16-1/2" and connect it to the screw terminal indicated for ground: \oplus

6) Trim and strip the hot and neutral feed wires and connect them to the L and N screw terminals respectively using the instructions in Section 1: ELECTRICAL POWER CONNECTIONS. Make certain that the electrical feed matches the track type according to those instructions. Also, see the NOTE and CAUTION in the first paragraph of Section 3: FEEDING THE TRACK AND TRACK LAYOUTS. If control signal wires are present, connect them to the D+ and D- screw terminals according to the chart on the previous page. If a DMX terminating resistor is to be used, then install it as shown in Section 3: FEEDING THE TRACK AND TRACK LAYOUTS, Guidelines for Layouts.

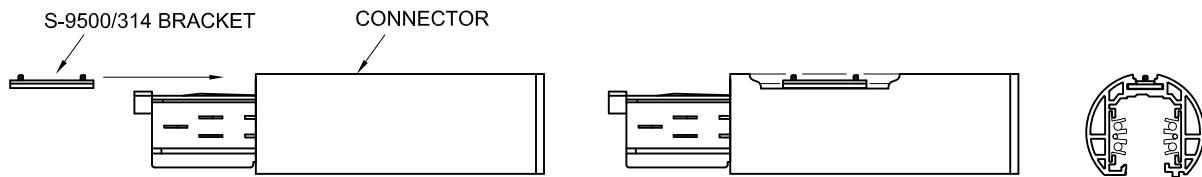
7) Carefully slide the Connector into the cover until it is fully seated, while simultaneously pulling the cables out from the cover. Install the two screws securing the Connector to the cover.

5) INSTALLING CONNECTORS, DEAD ENDS AND JOINERS TO THE TRACK

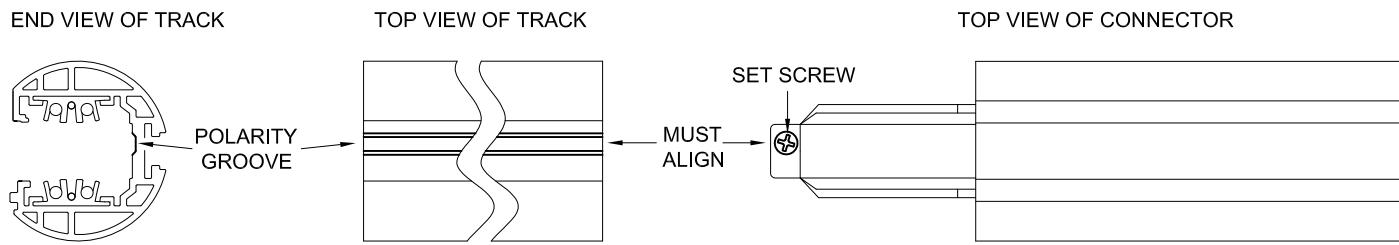
Connectors (Used to create layouts and feed electrical power to the track)

Follow the steps below to install all Connector types to the track. NOTE: Before installing Connectors, make certain that the conductor ends have been properly prepared according to the instructions in Section 2: FIELD CUTTING THE TRACK AND PREPARING THE CONDUCTOR ENDS.

1) Slide one S-9500/314 reinforcing bracket onto the end of the Connector. An L Connector will need two brackets, a T Connector will need three brackets, and an X Connector will require four brackets. NOTE: It is important to coordinate the installation of these brackets with the installation of the S-9000/113-M Pendant Supports discussed later in Section 6. Careful planning is required as to what point in the installation process these components are to be installed.

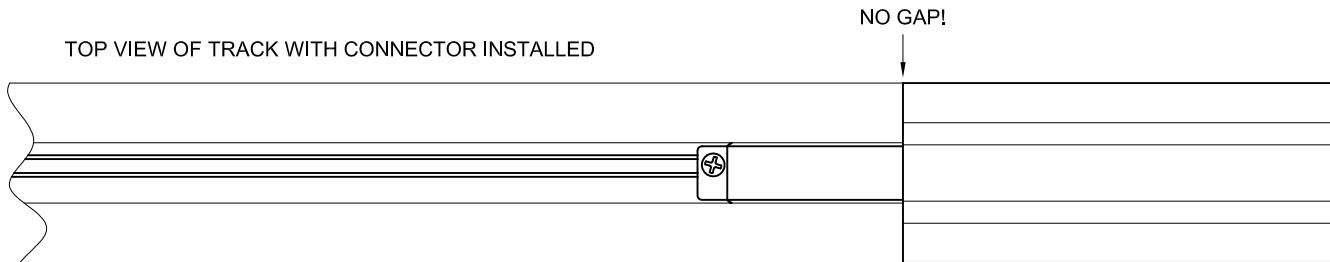


2) Align the set screw of the Connector with the polarity groove on the track.

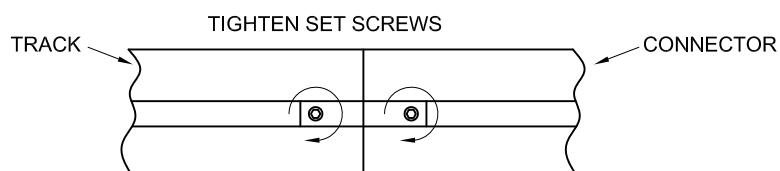


3) Insert the Connector into the end of the track. Make certain that the set screw is aligned the polarity groove in the base of the track. NOTE: If the insertion is too tight, do NOT force it. Loosen the set screw until the Connector slides in easily.

4) Make certain that the Connector is fully inserted and tighten the set screw.



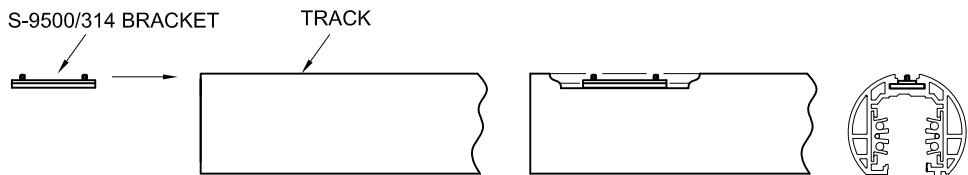
5) Position the S-9500/314 reinforcing bracket(s) such that it straddles the seam between the Connector and the track and tighten the two set screws with a 2mm hex wrench.



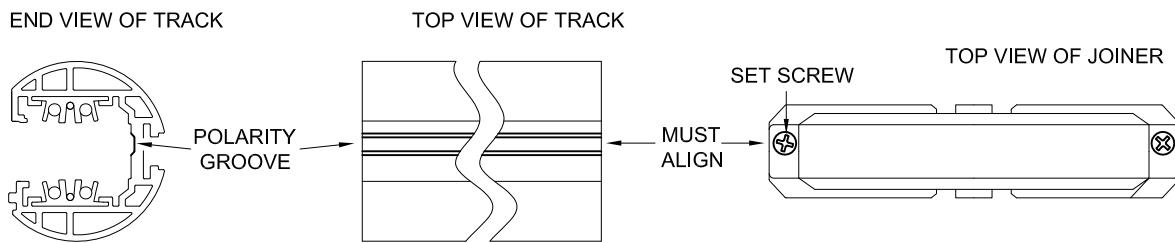
Joiners (Used only to connect track sections together for layouts)

Follow the steps below to install Joiners to the track. NOTE: Before installing Joiners, make certain that the conductor ends have been properly prepared according to the instructions in Section 2: FIELD CUTTING THE TRACK AND PREPARING THE CONDUCTOR ENDS.

- 1) Slide one reinforcing bracket onto *one* of the two tracks ends to be joined together. NOTE: It is important to coordinate the installation of these brackets with the installation of the S-9000/113-M Pendant Supports discussed later in Section 6. Carefull planning is required as to what point in the installation process these components are to be installed.

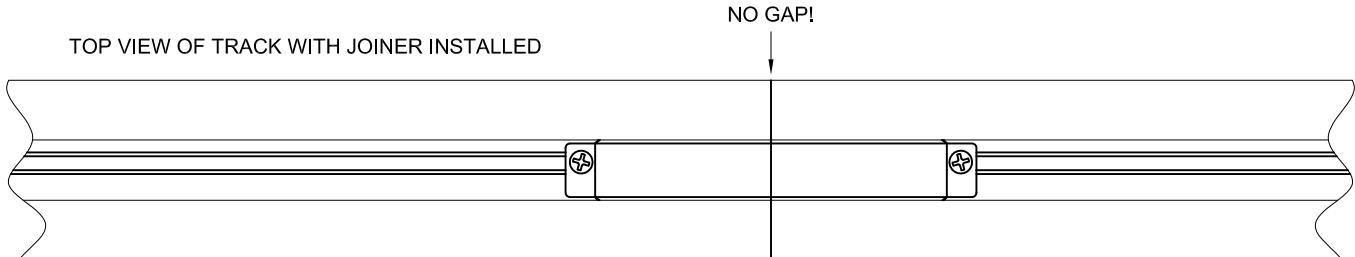


- 2) Align the set screw of the Joiner with the polarity groove on the track.

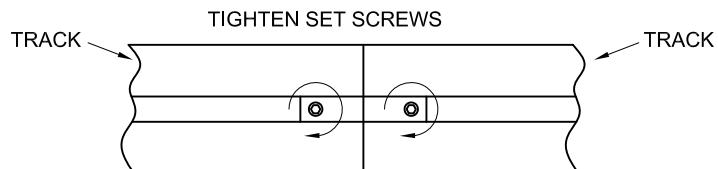


- 3) Insert the Connector into the end of the track. Make certain that the set screw is aligned the polarity groove in the base of the track. NOTE: If the insertion is too tight, do NOT force it. Loosen the set screw until the Connector slides in easily.

- 4) Make certain that the Joiner is fully inserted and tighten the set screw. Repeat Steps 2 through 4 for the other side of the Joiner.



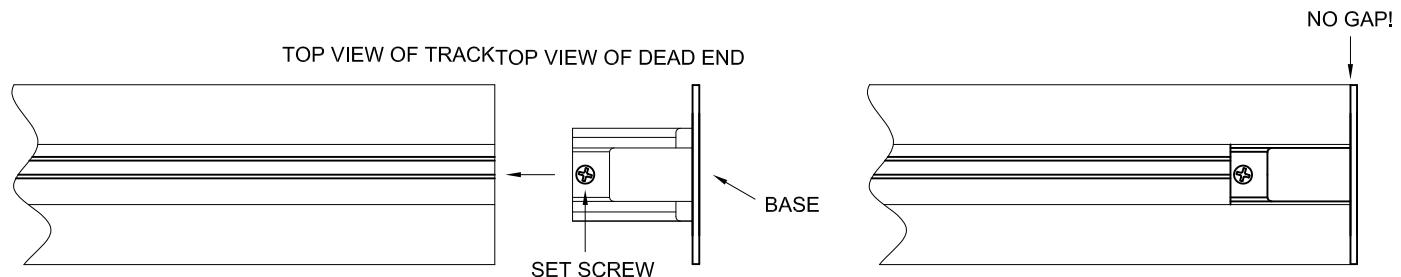
- 5) Position the S-9500/314 reinforcing bracket(s) such that it straddles the seam between the two track sections and and tighten the two set screw with a 2mm hex wrench.



Dead Ends (Used only to cap off track ends without Connectors, Joiners or Current Limiters)

CAUTION: To prevent electrical shock or fire hazard, Dead Ends *must* be used when a track end has no Connector, Joiner or Current Limiter installed. NOTE: Before installing Dead Ends, make certain that the conductor ends have been properly prepared according to the instructions in Section 2: FIELD CUTTING THE TRACK AND PREPARING THE CONDUCTOR ENDS.

To install Dead Ends, insert the Dead End into the end of the track until the base is flush with the end of the track. Tighten the set screw. NOTE: If the insertion is too tight, do NOT force it. Loosen the set screw until the Dead End slides in easily.



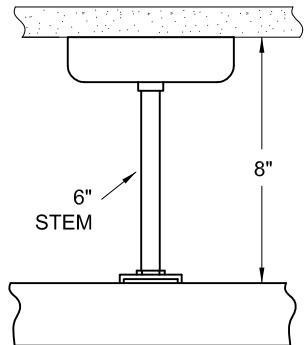
NOTE: Dead Ends are rarely used with track layouts requiring DMX control signals. Live Ends and Mirror Live Ends are generally used in combination. This is because: 1) A terminating resistor is required at the opposite end of the layout from where the DMX control signal is introduced, and 2) The DMX control signal must be run in a daisy chain fashion when more than one run of track needs to be interconnected. See Page 10 for more details.

6) INSTALLING THE TRACK

Drama track is always pendant mounted, and there are two phases to the installation process. In all cases, pendants use 3/8" NPT stems. The first phase encompasses mounting the pendant suspension hardware, canopies and pendants to the electrical boxes or the building support structure above. The second phase encompasses mounting the track to the pendants using S-9000/113-M Supports.

NOTE: All Suspension components, when installed, will measure approximately 2" plus the length of the stem from the mounting surface to the top of the track. For example, a 6" stem with its associated suspension components would yield 8" total. See diagram, right.

CAUTION: A single track section that is 4 feet or less in length must have one Pendant Support spaced a maximum of 6 inches from each end of the track section. A single track section that is greater than 4 feet in length must have one Pendant Support spaced a maximum of 24 inches from each end of the track section with additional Pendant Supports provided a maximum of every 4 feet along the length of the track section.



Pendant stems are supplied with both ends threaded. In many cases, the stems need to be cut to a specific length, and therefore one end will end up with the threads removed. In all cases, a hole will need to be added to the cut end of such stems. The procedure for adding these holes will be discussed later in this Section.

For the first phase, there are two methods shown. The first method is for installing pendants to perfectly level surfaces. This method uses SPUS suspension kits and requires stems with threaded ends. The second method is for installing pendants to sloped, i.e., tilted or non-level surfaces, or where the stem may need to swivel. This method uses SPUS-ADJ suspension kits which require a hole to be added to the end of the stem. In all cases, it must be determined how long the stems need to be and whether or not threads are required to the upper end of each stem. Read through and understand the following pages on Pendant Mounting entirely before cutting the stems.

PENDANT SUSPENSION DETAIL (Using SPUS Suspension Kits)

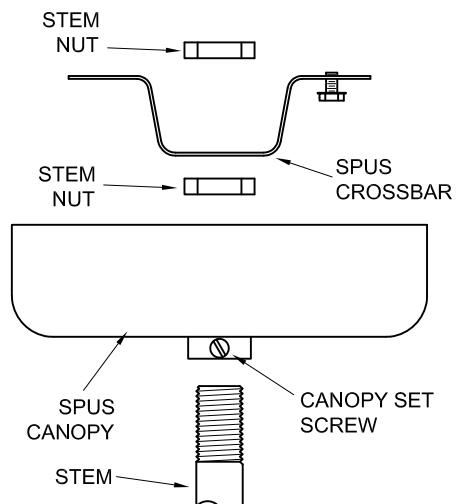
NOTE: These Kits require stems with threaded upper ends)

Use the diagram to the right as a guide along with the instructions below.

1) Using the factory provided mounting holes, secure the SPUS Crossbar directly to the ceiling, standard outlet box, or other allowed flat surface using toggle bolts or appropriate screws (by others). **CAUTION:** When using screws (other than for a standard outlet box), make certain that there is adequate support blocking.

2) If mounting to a standard outlet box, connect the crossbar to system ground using the green screw provided.

3) Attach a stem nut to the stem approximately 1/2" from the upper end.



4) Add a second stem nut to the end of the stem. Do not tighten the nuts together, leave a gap of approximately 3/8".

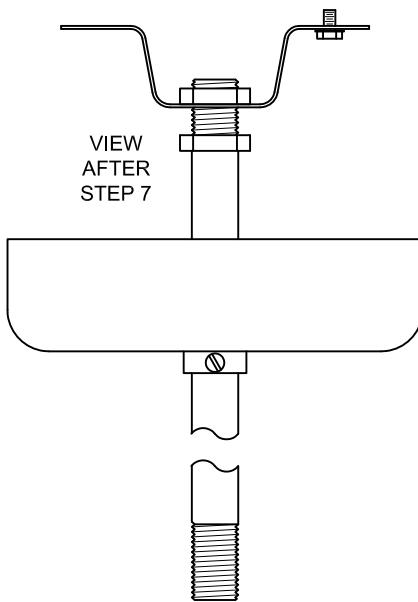
5) Loosen the set screw on the SPUS Canopy and carefully slide the canopy approximately half way onto the stem. Take care not to scratch the finished surface of the stem with the canopy. Lightly tighten the set screw to temporarily hold the canopy in place.

Continued on next page

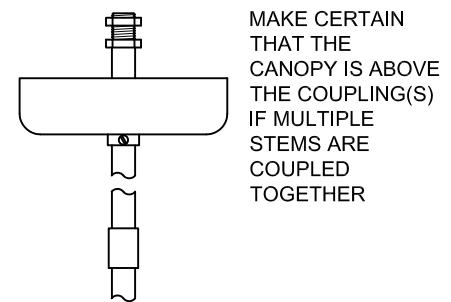
PENDANT SUSPENSION DETAIL (Using SPUS Suspension Kits) (Continued)

6) If more than one stem section is to be coupled together, do so now. Make certain that all threads are fully engaged within the coupling(s).

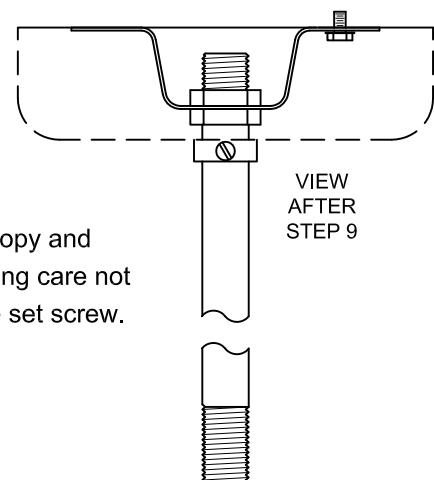
7) Slip the stem(s) onto the SPUS Crossbar such that the upper stem nut sits directly onto the crossbar and is centered within the crossbar. See diagram below, left.



8) Tighten the upper stem nut to the crossbar such that the crossbar is sandwiched tightly between the two nuts. Note: If there are multiple pendant supports on a particular layout, it may be beneficial to skip this and the next step until *all* of the track has been hung for that layout.



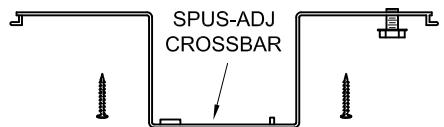
9) Loosen the set screw on the SPUS Canopy and carefully slide the canopy up the stem, taking care not to scratch the finished surface. Tighten the set screw. See diagram, right.



PENDANT SUSPENSION DETAIL (Using Adjustable SPUS-ADJ Suspension Kits)

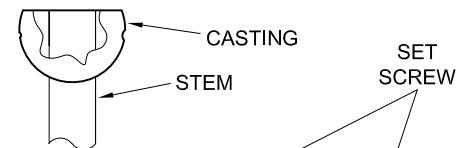
NOTE: These Kits do NOT require stems with threaded upper ends

1) Using the factory provided mounting holes, secure the SPUS-ADJ crossbar directly to the ceiling, standard outlet box, or other allowed flat surface using toggle bolts or appropriate screws (by others). **CAUTION:** When using screws (other than for a standard outlet box), make certain that there is adequate support blocking.

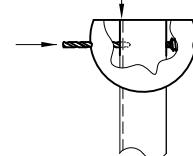


2) If mounting to a standard outlet box, connect the crossbar to system ground using the green screw provided.

3) Insert the upper end of the stem into the round end of the SPUS-ADJ Casting such that the end of the stem is flush with the flat side of the casting. See diagram, near right.



4) Install the set screw into the SPUS-ADJ Casting such that the pin of the set screw is pressing tightly against the stem, thereby holding the stem in place. See diagram, far right.

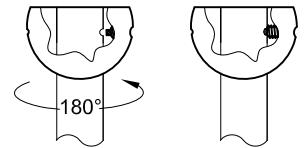


5) Using the hole on the casting opposite the set screw as a guide, drill through the stem wall using a 1/8" drill bit. Make certain that the drill bit stays perpendicular to the stem, and drill through the first stem wall only. See diagram, near right.

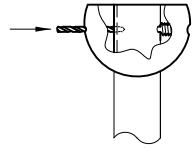
Continued on next page

PENDANT SUSPENSION DETAIL (Using Adjustable SPUS-ADJ Suspension Kits (Continued))

6) Loosen the set screw several turns and rotate the stem exactly 180° keeping the end of the stem flush with the flat side of the casting. Retighten the set screw such that the pin of the set screw is now engaged into the hole drilled in the previous step.



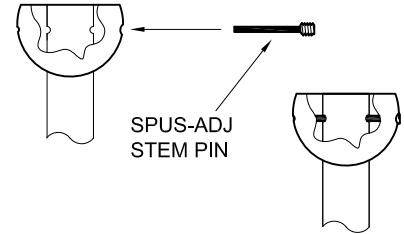
7) Using the hole on the casting opposite the set screw as a guide, drill through the stem wall using the same 1/8" drill bit. Make certain that the drill bit stays perpendicular to the stem, and drill through the first stem wall only. NOTE: There should now be two 1/8" holes in the end of the stem opposite one another.



8 Remove and discard the set screw.

9) Remove the stem from the casting and remove any burrs from the inside of the two drilled holes.

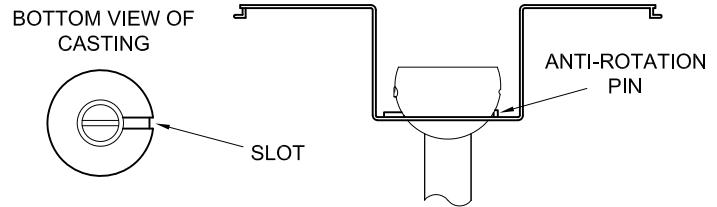
10) Reinsert the stem into the round end of the SPUS-ADJ Casting such that the casting holes and newly drilled stem holes are aligned. See diagram, near right.



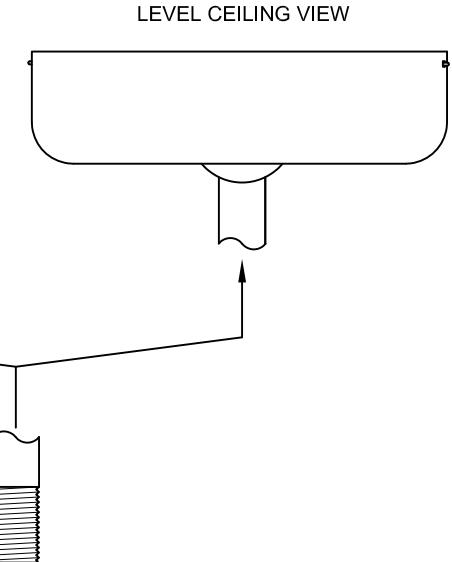
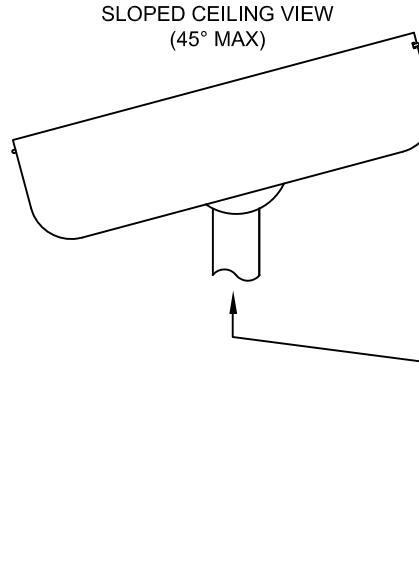
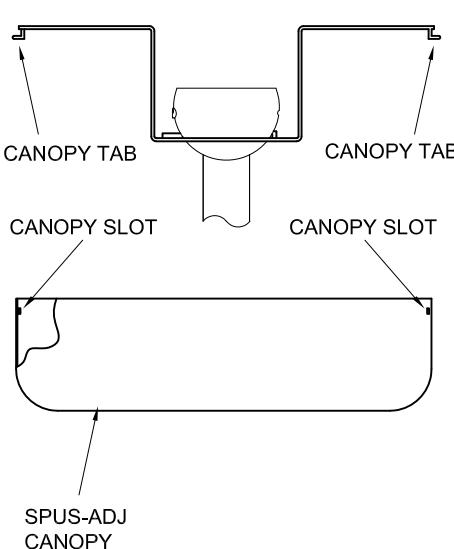
11) Install the SPUS-ADJ Stem Pin into the casting such that the end of the pin extends through both holes of the stem and into the opposite side of the casting. See diagram, far right.

12) If more than one stem section is to be coupled together, do so now. Make certain that all threads are fully engaged within the coupling(s).

13) Slip the SPUS-ADJ Casting onto the SPUS-ADJ Crossbar such that anti-rotation pin of the crossbar rests within the slot in the casting.



14) Carefully slide the SPUS-ADJ Canopy up the stem, lightly squeeze the canopy between the two tab slots, and snap it in place such that both canopy tabs are fully engaged with the two canopy slots. NOTE: Take care not to scratch the finished surface of the stem with the canopy.

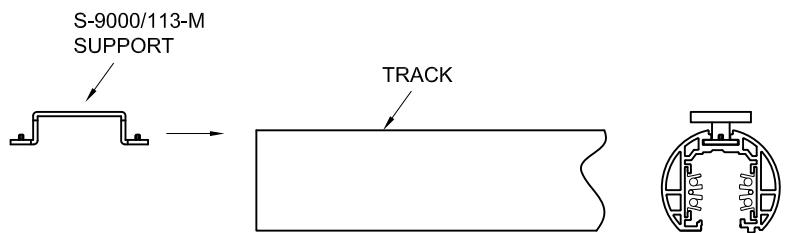


PENDANT MECHANICAL SUPPORT DETAIL (Using S-9000/113-M Pendant Supports)

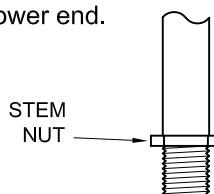
NOTE: These Supports require stems with threaded lower ends

1) The S-9000/113-M Pendant Support is supplied with two stem nuts. For now, set the two nuts aside.

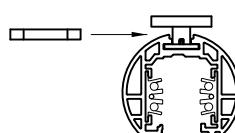
2) Slide the S-9000/113-M Pendant Support onto the track and place it as close as possible to its eventual location.



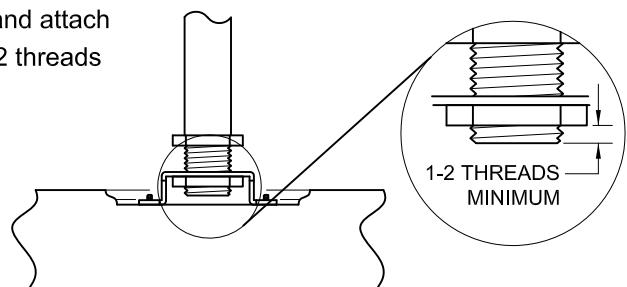
3) Attach a stem nut to the stem approximately 1/2" from the lower end.



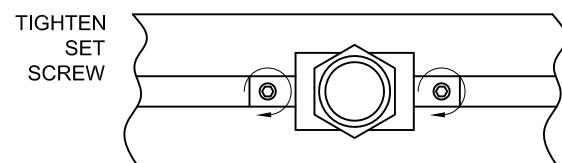
4) Slip the second stem nut into the narrow gap between the Support and the track.



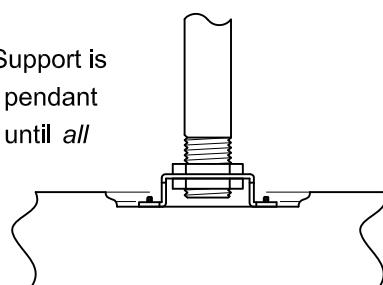
5) Carefully lift and insert the corresponding stem into the Support and attach the second stem nut onto the stem. **CAUTION:** There should be 1-2 threads of the stem extending beyond the second nut.



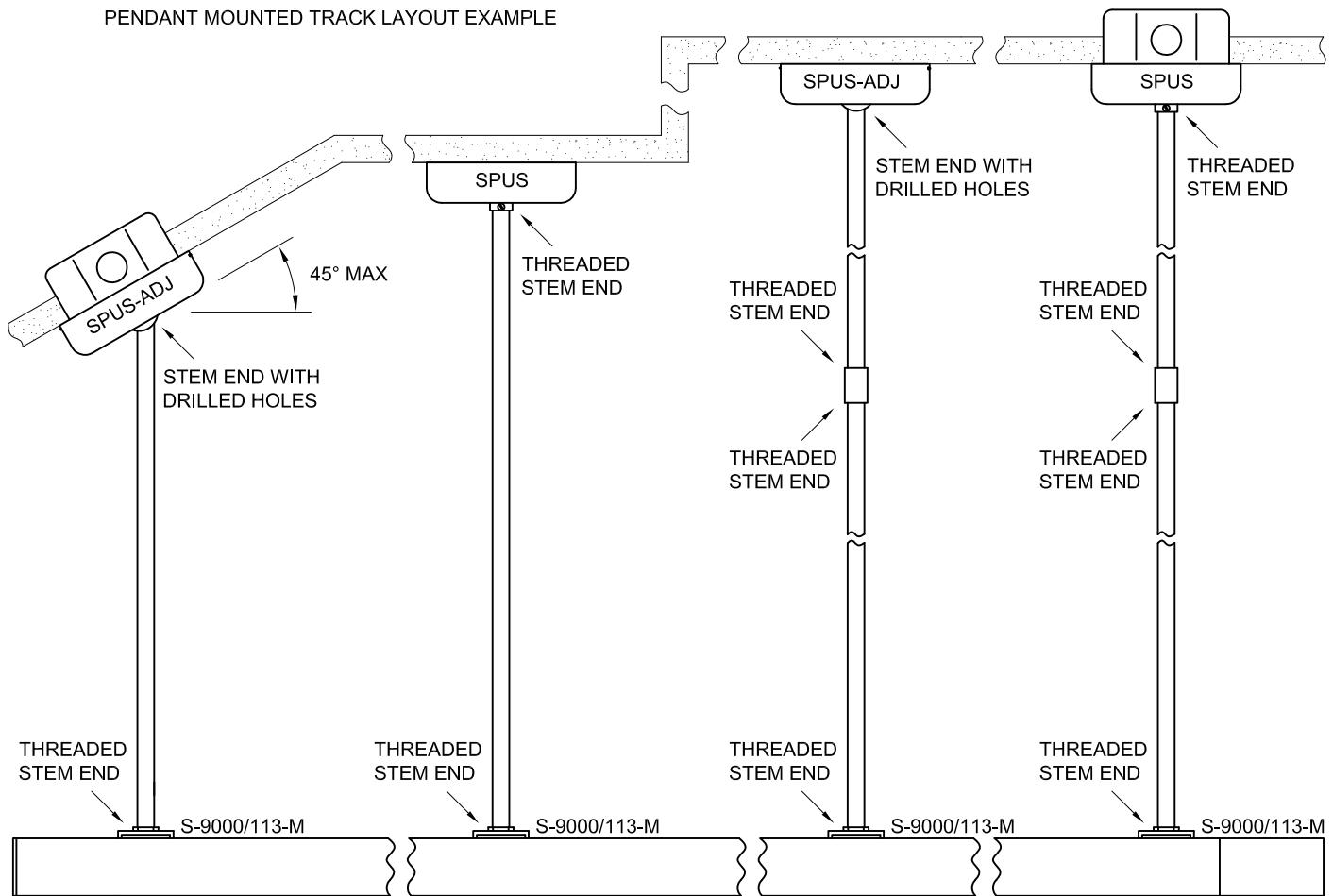
6) Using a level, make certain that the stem is plumb and tighten the two set screws on ends of the Support with a 2mm hex wrench.



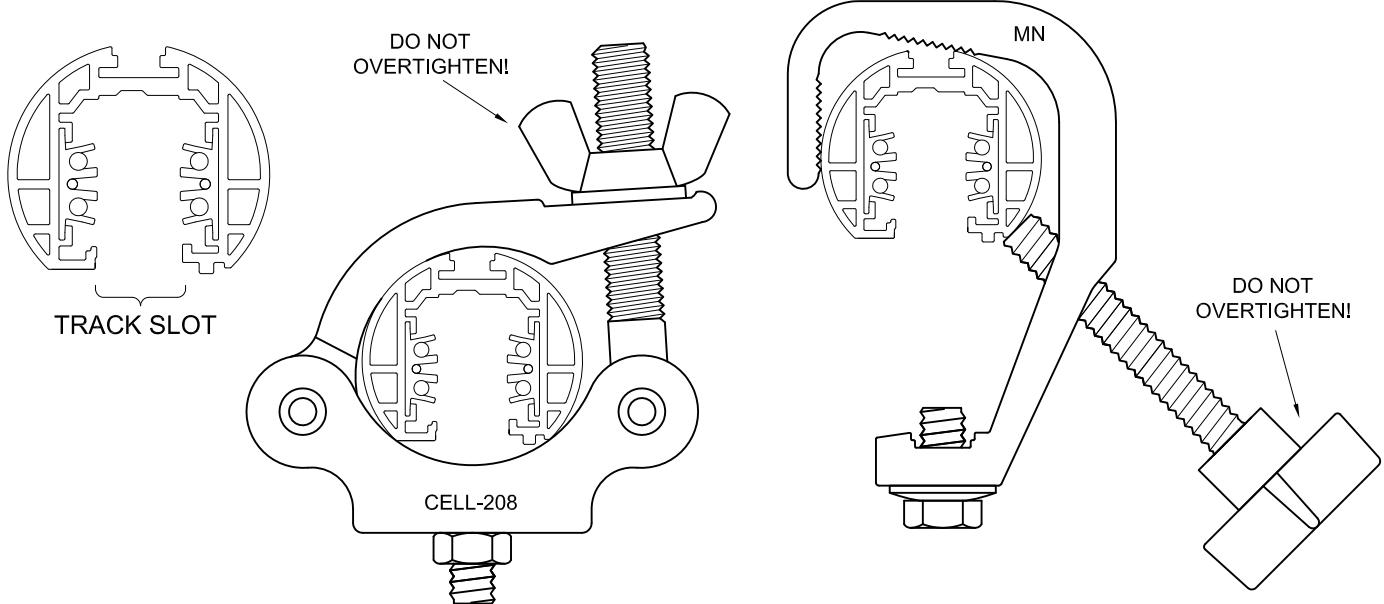
7) Tighten the first stem nut to the top of the Support such that the Support is sandwiched tightly between the two nuts. Note: If there are multiple pendant supports on a particular layout, it may be beneficial to skip this step until *all* of the track has been hung for that layout.



PENDANT MOUNTED TRACK LAYOUT EXAMPLE



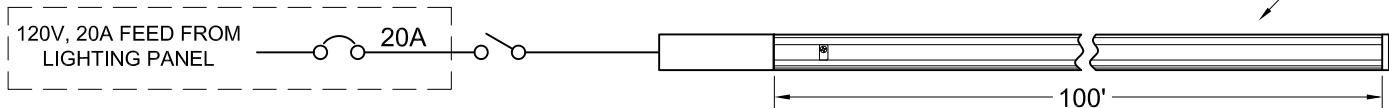
CAUTION: Although a typical layout using Drama Series Track has the *appearance* of a truss system, it is not as robust as truss, and should never be used as a truss system. Use only Times Square approved Lighting Fixtures and components (clamps, safety cables, etc.). Never exceed the 11lb/ft Maximum track loading. When installing Times Square approved clamps and safety cables to the outer surface of the track, make certain that no portion of the clamp, bolt, screw, safety cable, power cable or the like encroach into the track slot. See diagram below, left. If a clamp is used, make certain that the clamp or any portion thereof does not deform the track. See diagrams below, center and right. For fixtures over 3lbs., CELL-208 clamps are recommended.



7) CURRENT LIMITERS

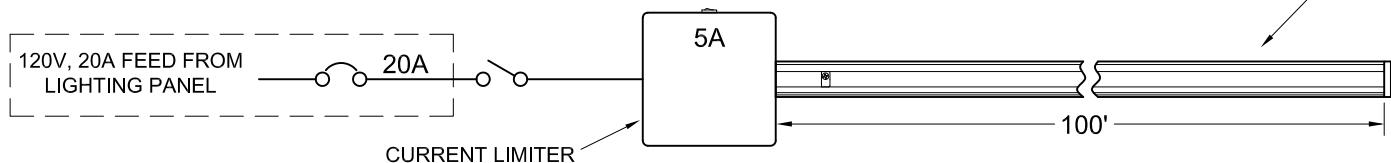
Current Limiters are designed to provide an answer to energy limitations on wattage per foot requirements for track lighting installations. Some newer energy codes set a rating of up to 45 watts per linear foot of track irrespective of the actual wattage that is meant to be used on the track, unless a current limiting device is permanently installed between the track and the branch circuit feeding it. The diagrams below illustrate the difference in wattage calculations based on a hypothetical 100' layout with and without a Current Limiter installed. Note: Neutral conductors not shown for clarity.

TRACK LIGHTING WATTAGE WITHOUT CURRENT LIMITER:
Track Length Determines Wattage Calculation



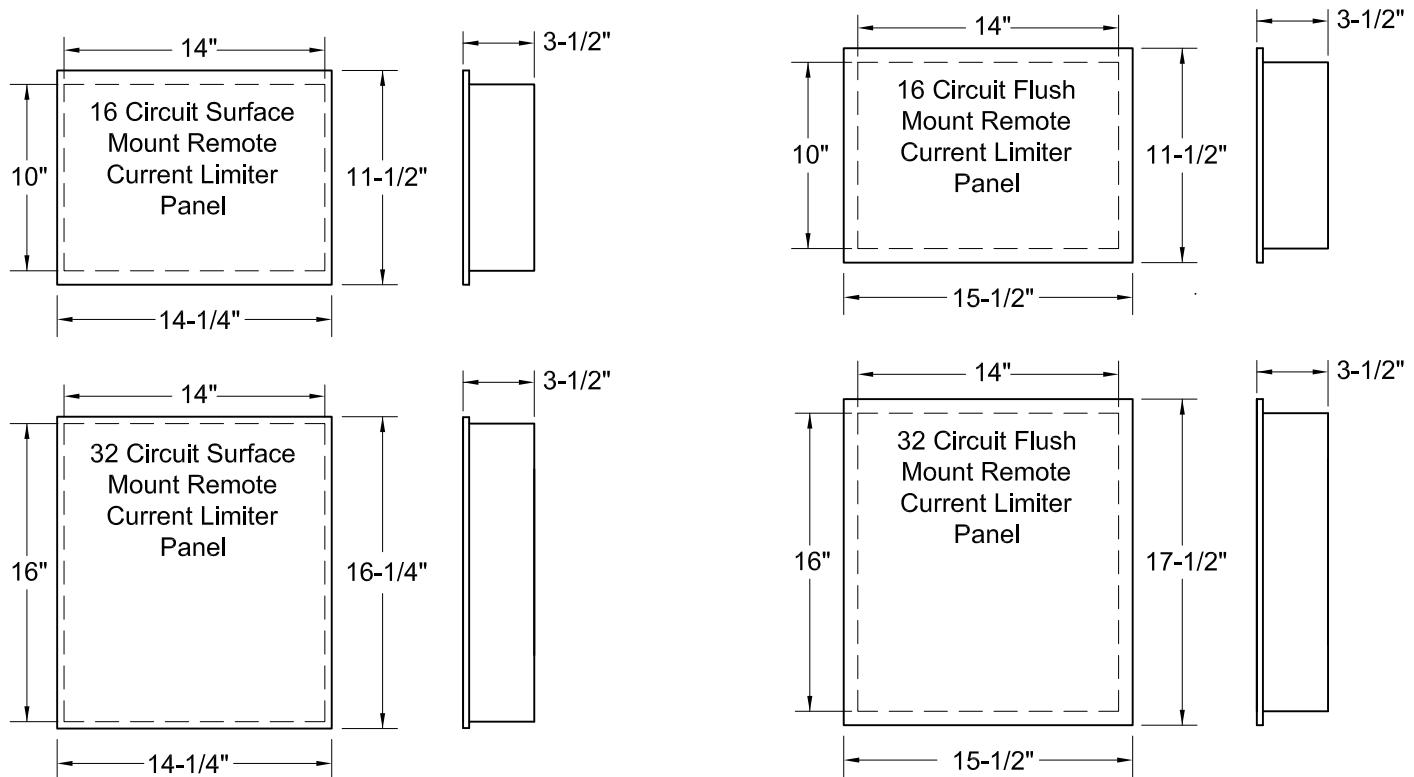
100 ft of Track Lighting @ 45 watts/ft = 4500W

TRACK LIGHTING WATTAGE WITH CURRENT LIMITER:
Current Limiter Rating Determines Wattage Calculation

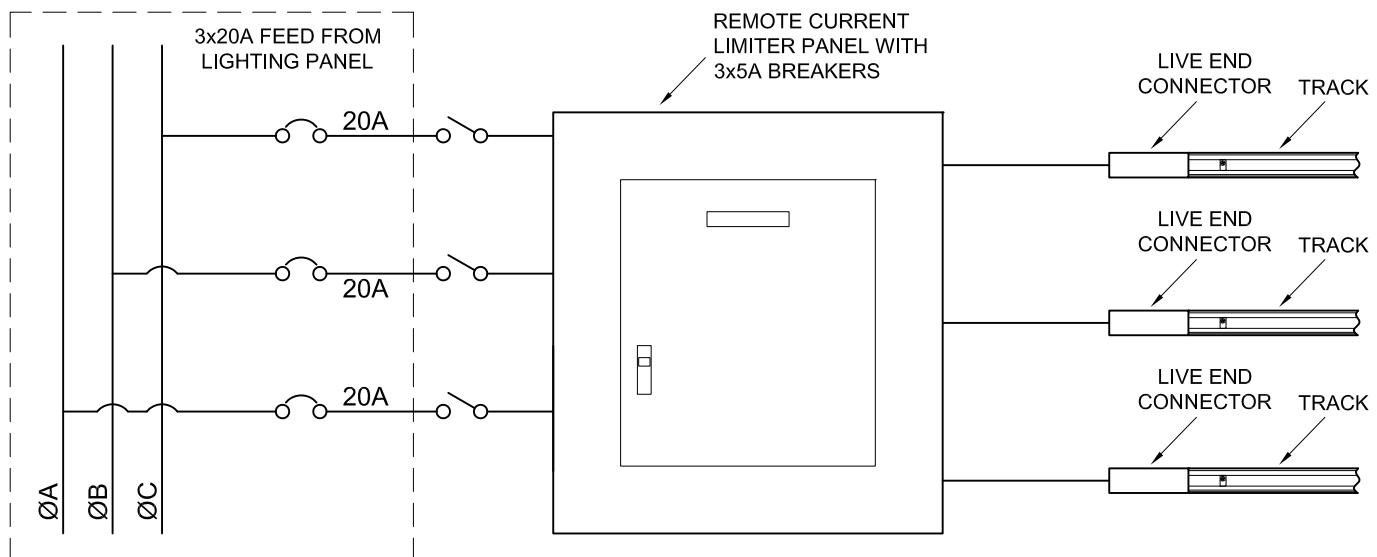
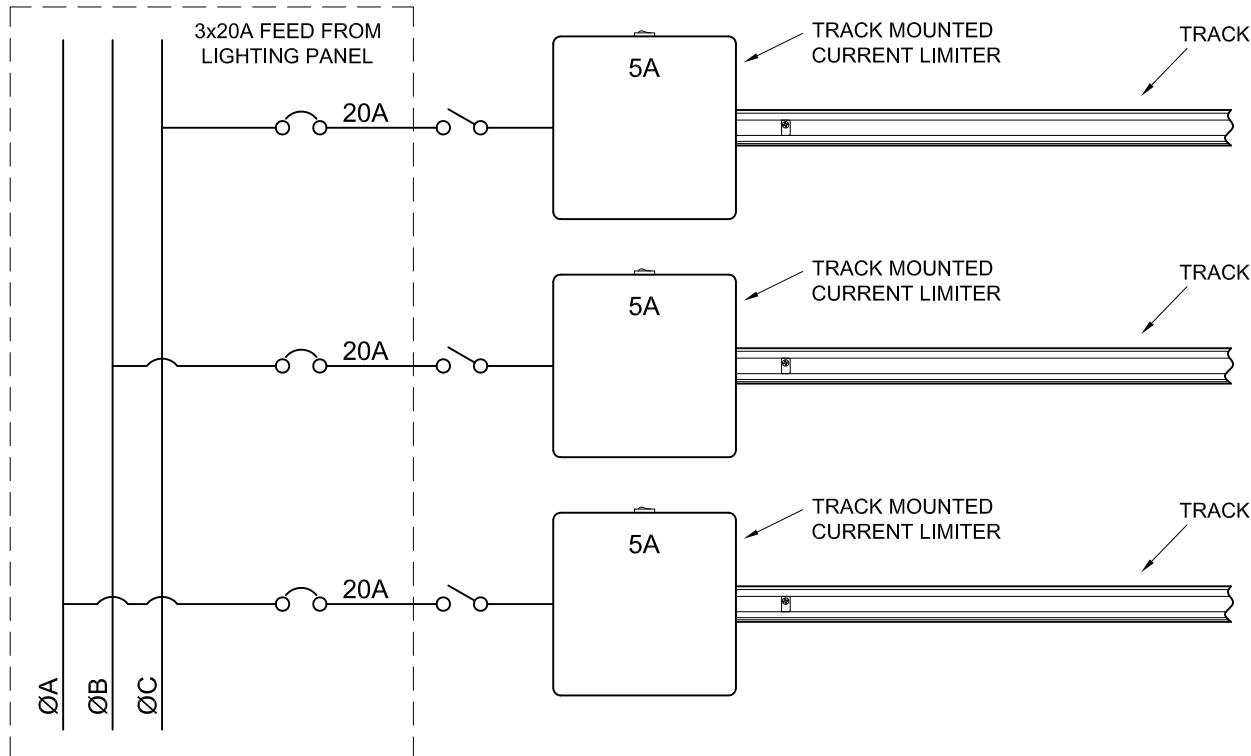


5 Amp @ 120V = 600W (for any length of track)

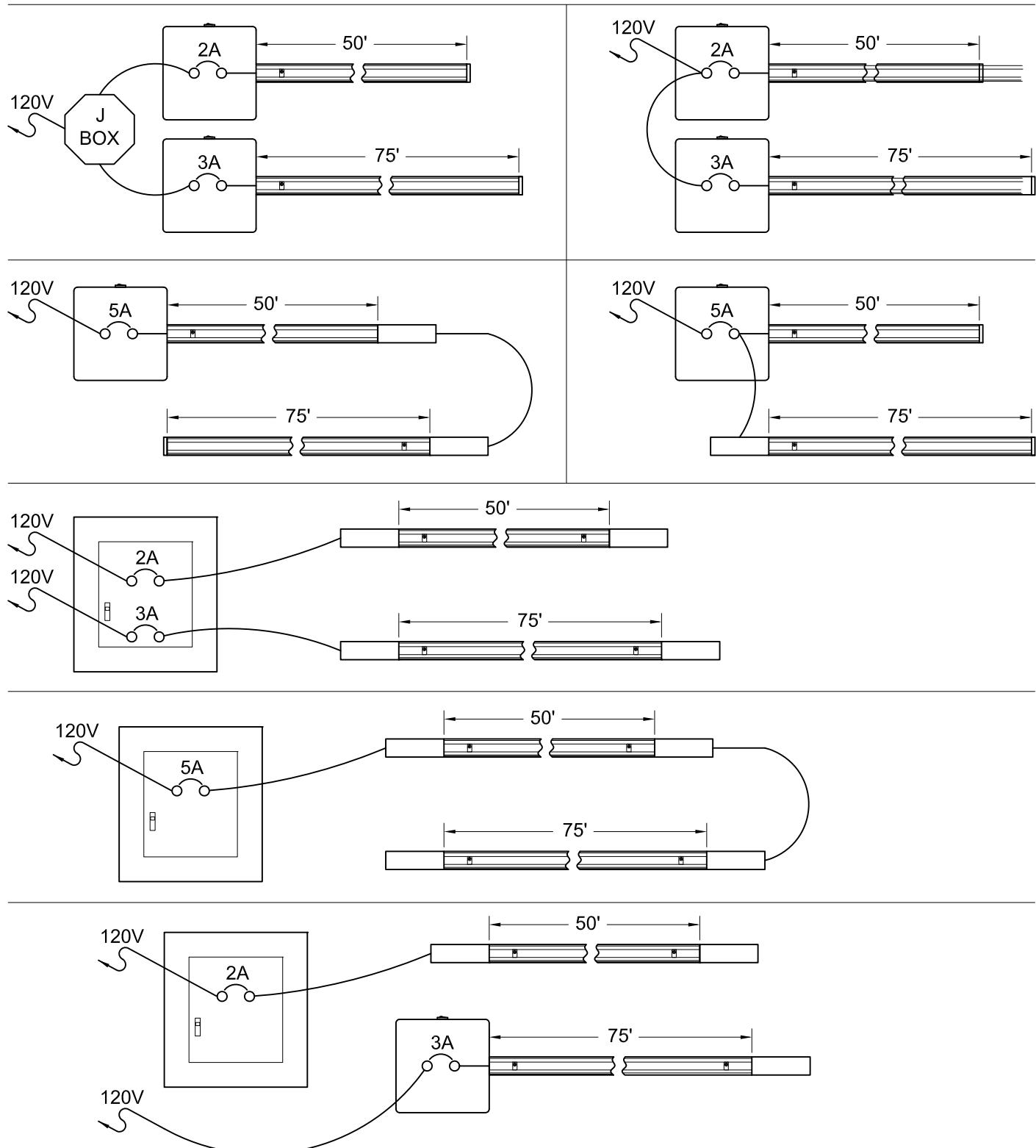
Current Limiters are available in two types: Track and Remote. Track mounted Current Limiters attach to the track the same way Connectors do. Remote Current Limiters are in the form of circuit breaker panels. Each circuit breaker within a panel has its own input and output - there is no common bus on the line side, keeping all circuits discrete. These panels come in two sizes and two mounting styles: Surface and Flush Mount. NOTE: Current Limiter Panels should be installed after the lighting branch circuit panel(s) and before any other lighting control equipment. Current Limiter Panels are generally mounted in close proximity to the lighting branch circuit panel(s). NOTE: All Current Limiter Panels have a plurality of concentric knock-outs on top and bottom surfaces.



The diagrams below illustrate an example of both Current Limiter types. Each example has 3 track layouts connected to individual 5 Amp current limiters all fed from individual 20A branch circuits. In all cases, the Neutral conductors (not shown for clarity) pass through the Current Limiters. Both types serve the same function, but each has its own particular advantages. The factory can offer some guidance as to which type might be more suited to a particular layout.



The diagrams below illustrate just seven out of *many* ways that a hypothetical 4.8 watts per linear foot can be achieved on a sample layout of two individual track runs of 50' and 75'. In all cases, the Neutral conductors (not shown for clarity) pass through the Current Limiters. Switches, dimmers, and the like are not shown for clarity, but they can be interposed anywhere in the line feeding the track itself. With the exception of Linear Current Limiters, all other types can be rewired in the field to allow for switches, dimmers, and the like to be added as well as having circuits spliced within the Current Limiter housings. **CAUTION:** The integral circuit breakers within the housing are never to be tampered with, replaced with a higher value or bypassed.



CURRENT LIMITER INSTALLATION

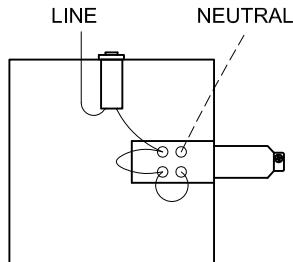
Every Current Limiter is supplied with its own unique mounting and power wiring instructions. Make certain that the electrical feed matches the track type according to the instructions in Section 1: ELECTRICAL POWER CONNECTIONS. If control signal wires are present, connect them to the D+ and D- screw terminals according to the chart below. If a DMX terminating resistor is to be used, then install it as shown in Section 3: FEEDING THE TRACK AND TRACK LAYOUTS, Guidelines for Layouts.

Data Track Connector	DMX Shielded Twisted Pair	DMX Unshielded Twisted Pair (Cat5 or Cat6)	0-10V	DALI
D+	Data + [Any Color]	Orange / White	Signal + (Violet)	No Polarity [Any Color]
D-	Data - [Any Color]	Orange	Signal - (Pink or Grey*)	No Polarity [Any Color]

* The NEC no longer allows Grey to be used for 0-10V dimming. Grey may still be present in older installations.

CURRENT LIMITER WIRING ILLUSTRATIONS

TSC-Q-E (End Feed, 1 Circuit Breaker for All Circuits)



TSC-Q-E (End Feed, 1 Circuit Breaker for Each Circuit)

