

Magnetic Track Power and Wiring

INSTALLATION NOTE

Our magnetic track is a low voltage constant voltage bus. It comes in two profiles, Slim (27.5mm, NT27) and Standard (39mm, NT39), each recessed, surface or pendant mounted. The profile carries the bus, couplers carry it across joints, and the heads take power magnetically anywhere along the run, so the only field wiring is at the supply. Line voltage (120V) only ever lands on the driver input, never on the track. Page 2 covers feeding the track and page 3 covers feed cable size.

Track Builds

BUS	PROFILE	BUS VOLTAGE	CONDUCTORS AT THE FEED	CONTROL	HEADS
Standard	NT27 Slim NT39 Standard	24V DC	2: V+, V–	Triac, 0-10V or 1-10V, at the supply	Standard
DALI (-D)	NT27-...-D Slim NT39-...-D Standard	48V DC	4: V+, V– and the DALI pair	DALI-2, addressable per head	-D only

Standard and DALI heads are not interchangeable on the same profile. Decide the protocol before the rail is specified. All heads are 90+ CRI; specify a single CCT across a run.

Load Limits per Fed Segment, 24V Bus

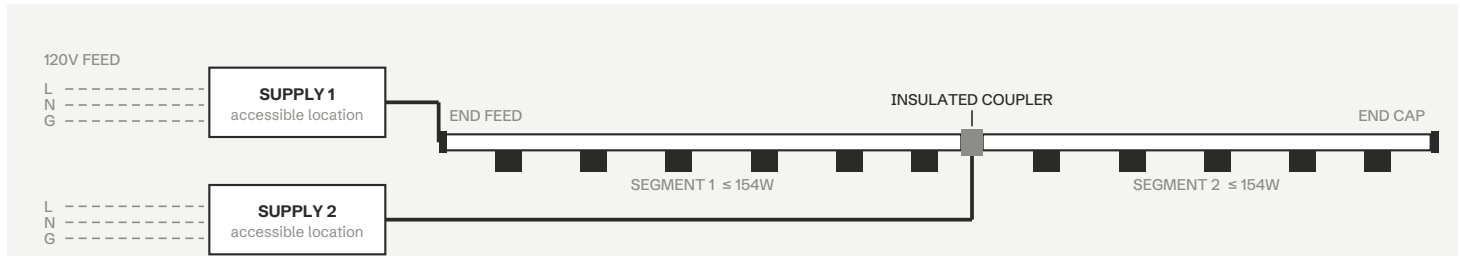
LIMIT	VALUE	WHAT IT MEANS
Maximum current	8 A	Profile conductor limit, per fed segment
Absolute ceiling	192W	24V × 8 A. Never load a segment to this
Design load	154W	80 percent of the ceiling. Specify every segment to this
Class 2 feed	80W	Design load where a Class 2 supply is required (100VA cap per source)
Supply size	125%	Size the supply to at least 125 percent of the connected head load

DALI (48V) builds: the 8 A conductor limit applies per fed segment. Confirm DALI segment loads with us at order.

Before You Install

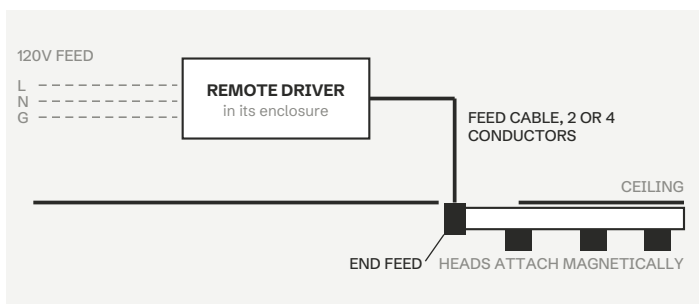
1. Line voltage lands on the driver input only. Track, couplers and heads are low voltage.
2. Confirm the bus (standard or DALI) matches the schedule before installing profile or heads.
3. Observe polarity at the end feed: V+ to V+, V– to V–.
4. Add the wattage of every head on a segment. Keep each segment at or under its design load.
5. Never parallel two supplies on one continuous bus. Fit an insulated coupler between separately fed segments.
6. Use a straight coupler at every joint within a segment and an end cap on every unfed end.
7. Keep Class 2 low voltage conductors separated from line voltage conductors.
8. Size the feed cable from the table on page 3. Track is rated for indoor, dry locations only (IP20).
9. If the run, bus or head count does not match the drawings, stop and call us before energizing.

Feeding the Track



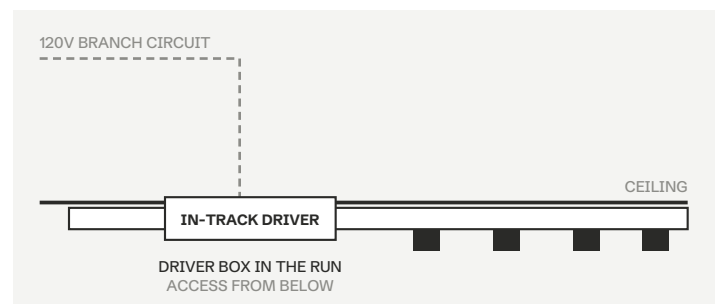
Add the wattage of every head on the run and size the supply to at least 125 percent of that figure. Where the total exceeds 154W, break the run into separately fed segments, each with its own supply and an insulated coupler at the break so the supplies are never paralleled. Within a segment, straight couplers carry the bus across each joint. A split run dims as two zones, one per supply. Every head on a profile must match its bus.

A Remote Driver to End Feed



1. Mount the driver (supplied with its enclosure) where the drawings show it, with permanent access. Land the 120V feed and any 0-10V control on the driver input.
2. Run the feed cable from the driver output to the end feed. Two conductors for a standard bus; four for DALI, the power pair plus the DALI pair.
3. Terminate at the end feed, V+ to V+ and V- to V-. On DALI builds, land the DALI pair as marked on the end feed.
4. Join profiles with straight couplers, close every unfed end with an end cap, then fit the heads.

B In-Track Driver



1. The in-track driver is a 24V supply in 60W, 100W or 150W, 100 to 277V input, with Triac, 0-10V, 1-10V and potentiometer dimming. It serves standard bus track only.
2. Bring the 120V branch circuit, and 0-10V conductors if used, to the driver box location shown on the drawings.
3. Land line, neutral and ground on the driver input. Connect the output to the track per the driver box instructions, observing polarity.
4. Seat the driver box in the run, close the cover, then fit the heads. Size the driver for the segment it feeds.

Sizing the Feed Cable

With a remote driver, the cable from the driver to the end feed is the one conductor sized in the field. The profile, couplers and heads are fixed. Measure along the cable route from the driver to the end feed, including drops and rises, and choose the smallest gauge whose length equals or exceeds the run. An in-track driver sits in the run and needs no feed cable.

BUS	LOAD	CURRENT	18 AWG	16 AWG	14 AWG	12 AWG
24V	36W	1.5 A	35 ft (11 m)	55 ft (18 m)	90 ft (28 m)	150 ft (46 m)
24V	60W	2.5 A	20 ft (6 m)	35 ft (10 m)	55 ft (17 m)	90 ft (27 m)
24V	80W	3.3 A	15 ft (5 m)	25 ft (8 m)	40 ft (13 m)	65 ft (20 m)
24V	100W	4.2 A	10 ft (4 m)	20 ft (6 m)	30 ft (10 m)	50 ft (16 m)
24V	154W	6.4 A	5 ft (2 m)	10 ft (4 m)	20 ft (6 m)	35 ft (10 m)
48V	48W	1.0 A	110 ft (34 m)	175 ft (54 m)	280 ft (86 m)	450 ft (138 m)
48V	96W	2.0 A	55 ft (17 m)	85 ft (27 m)	140 ft (43 m)	225 ft (69 m)

Maximum run, driver to end feed. Basis: 3 percent drop (0.72V at 24V, 1.44V at 48V), copper at 68°F (20°C), rounded down to the nearest 5 ft. At the 154W design load a 24V feed carries 6.4 A, so keep the driver close to the end feed. In attics and other hot spaces, take about 20 percent off these lengths.

Dimming and Control

Triac: phase-cut at the supply. One dimmer per supply; every head on that segment dims together.

0-10V and 1-10V: analog control at the supply, on standard bus track. No control pair in the rail. 18 AWG is typical; install to the circuit class the driver requires.

DALI-2: addressable per head on -D track and -D heads. Size the DALI pair to the bus: 18 AWG to 500 ft (150 m) from the bus power supply, 16 AWG to the DALI maximum of 984 ft (300 m).

Split runs: each separately fed segment is its own dimming zone.

Cable Type and Rating

Every feed from a Class 2 supply is a Class 2 circuit. Use cable listed for the space it passes through: CL2 for walls and ceilings, CL2R for vertical runs between floors, and CL2P in plenum (air handling) spaces. CL3 types may substitute for the matching CL2 type. A supply above 100W is not Class 2; wire its output to the method local code requires. Keep low voltage separated from line voltage, and use connectors listed for the conductor size.

Working It Out

$$\text{Maximum run (ft)} = \text{allowed drop (V)} \times 1000 \div (2 \times \text{current (A)} \times \text{conductor resistance } (\Omega \text{ per } 1000 \text{ ft}))$$

The 2 accounts for the conductor out and the conductor back. Copper resistance at 68°F (20°C):

18 AWG 6.39 Ω 16 AWG 4.02 Ω 14 AWG 2.53 Ω 12 AWG 1.59 Ω per 1000 ft

Example. Six 18W heads on a 24V segment load 108W, so specify a 150W supply. The feed carries $108 \div 24 = 4.5$ A. On 14 AWG at 3 percent (0.72V): $0.72 \times 1000 \div (2 \times 4.5 \times 2.53) = 31.6$ ft. If the driver sits farther than that from the end feed, step up to 12 AWG or move the driver closer.