



Fig. 1

DALI BUS WIRING GUIDELINES

The DALI standard requires that the voltage drop between the power supply and any DALI device be no more than 2 volts. These tables use published wire resistance to compute the maximum cable length for a variety of network wiring situations. Connector resistance has not been considered.

Table 1 computes cable lengths for 18-gauge bus wire with various home-run wire gauges. Table 2 gives the maximum bus length for a range of wire gauges.

Example 1: Bus Length – Using Table 1 below, a homerun length of 100 feet with 12-gauge wire allows 18-gauge branch wire to be up to 602 feet long.

Branch Wiring – A DALI bus can be fed at any point on the bus including the end or middle. Any number of branches may be used as long as any one of them does not exceed 1,000 feet or the maximum cable length listed in these tables. Fig. 1 shows a center feed DALI bus with 2 branches extending from a home-run feeder. In example 1 above, a second branch can be added that allows an additional 602 feet of bus wire.

Maximum Load – Available DALI bus power is determined by the DALI power supply up to a maximum of 250 mA per bus. The bus connected load should not exceed 80% of this rating in order to provide sufficient charging current.

Table 1 – Maximum Bus Cable Length

Home Wire Gauge	18	16	14	12
Bus Wire Gauge	18	18	18	18
L Home (ft.)	L Bus (ft.)			
0	627	627	627	627
25	602	611	617	621
50	577	596	607	614
75	552	580	597	608
100	527	564	587	602
125	502	548	577	596
150	477	533	567	590
175	452	517	558	583
200	427	501	548	577

Example 2: Load – Given 50 ballasts at 2mA each, a 250mA power supply, and 6mA per control, 16 controls may be used on the bus in addition to the ballasts.

$$(250 \cdot 8 - 50 \cdot 2) / 6 = 16 \text{ controls/bus}$$

Bus Testing – DALI network buses should receive the same type of tests normally performed on power wiring to detect opens, line-to-line and line-to-ground shorts.

Start up

1. Start up and test the lighting fixtures and lamps before energizing the controls. All digital ballast lamps should come on at full bright when power is applied.
2. Conventional ballasted fixtures controlled by digital relays can be checked by shorting the power pack power and signal wires.
3. Allow lamps to burn in for 100 hours at full bright or as directed by lamp manufacturer.
4. Before energizing the DALI network, check wiring for voltage line-to-line shorts, and line-to-grounds shorts using a VOM. Voltage should be zero and both shorts open.
5. Energize the **RT03** Router and verify that all indicator lights are on.
6. Connect DALI bus wires to the **RT03** router and verify that the DALI bus indicator lights stay on. If Fault light turns off there is a short in the bus. Remove the short and retest.

Table 2 – Alternate Bus Wire Gauges

Wire Gauge	ohm/ft.	Cable Length (ft.)	Jumpers Per Bus
22	0.0161	248	15
20	0.0102	392	24
18	0.00638	627	39
16	0.00401	998	
14	0.00253	1000	
12	0.00159	1000	