Installation Tips To Avoid Interference Issues

Flash Technology High Intensity Tower Lighting

Electromagnetic interference (EMI) issues involving tower lighting systems on broadcast structures are hard to pinpoint and diagnose so it is best to avoid problems by following good practices at time of system installation. These include equipment location, shielding, grounding, and filtering as outlined below.

Equipment Location

- If possible, avoid locating tower lighting equipment (especially split systems) in the RF field.

Shielding and Grounding

The goal of shielding and grounding is to block EMI by surrounding all conductors and electronics of the lighting system with a continuous metal shield which is grounded to the tower structure. This shield must have no gaps since RF Energy can pass through very tiny openings in metal enclosures or conduit.

- Ensure that all enclosures, junction boxes, and conduit are mounted on the tower structure with a clean, tight, metal-to-metal mounting (not through paint or rust).
- Verify that all enclosure and junction box doors and covers fit tightly and latch securely.
- Plug all unused enclosure holes with metal fittings or plugs.
- Run all cables and conductors within metal conduit or metallic flex, especially
    - All power & communication wiring (3360 cable or individual conductors and shielded communication cable) between Controller and Beacons,
    - On tier five and above, wiring between the PC302 and the FH308, as well as wiring between the PC204 and FH204. If the AOL cable is not run in metallic seal-tight, ensure that the conduit running within the AOL antenna is rigid steel.
- Ensure that all conduit and flex are in good condition so that metal completely surrounds all conductors including at junction of conduit/flex fittings and enclosure.
- Ensure that all conduit and flex fittings are correct type and size, and properly installed so that they make a tight metal to metal connection at each enclosure entry.
- Inside enclosures, install Grounding Bushings on all conduit entries.
- Take care with shielded cables (communication, Flashhead) that the shield is continuous and undamaged.
- Connect drain wires of shielded cable on both ends of the cable. In Power Converter and Flashhead, connect to the Grounding Bushing at its conduit entry, making the drain wires as short as practical.
- Ground both ends of any unused conductor of the 3360 cable within the Power Converter and Junction box. This includes the yellow, violet, and unused phase wire.
  WARNING!! These must be disconnected within both the Power Converter and the Junction box, made as short as possible, and grounded to the enclosure. Failure to do this in BOTH enclosures could result in a dangerous electrical surge.
- Consider grounding the conduit at the base of the tower directly to the ground ring using #2 solid.
- If RF issues persist, install a flat bonding/grounding strap or braid (not wire) from each equipment enclosure to the tower.
- If RF issues persist, (after other work is complete) install copper tape at least 1” wide over the gap on enclosure or junction box between door and box. Install tape around entire perimeter of the box. Check that the tape makes a tight metal to metal fit with no gaps.

Filtering

- Install EMI ferrites (split core are acceptable) inside each Power Converter on each communication conductor pair (white, black) and incoming power conductor pair as near as possible to where the conductors enter the enclosure. Multiple conductor passes through the ferrite core is best.
- Keep communication and power wiring as far apart as possible within the enclosures.

Other

- Consider adjusting enclosures to direct door openings away from the RF path or relocating.
- To ensure no erroneous alarms are encountered, strip all wires properly to allow solid metal-to-metal contact with termination points. Make sure all screw electrical connections are hand tight and that plug on connectors and terminals are snug and secure on PCB’s, capacitors, power transformers, relays, etc.
- In Junction boxes, point all wire splices up to reduce potential for connection degradation due to moisture.
- Ensure all electrical wiring connections meet factory recommended guidelines, NEC codes, and local and state requirements.

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