NMRA STANDARDS	
ELECTRICAL STANDARDS FOR MODULES, ALL SCALES	
Revised 1-90	MS-1.3

Modules built prior to the acceptance of these Standards will be exempt from these standards. However, if non-conforming modules are to interface with conforming modules, a Transition module will be required to accommodate any difference in trackage, electrical, etc.

(*) denotes change from previous issue.

ELECTRICAL STANDARDS FOR ALL SCALES, (EXCEPT WHERE NOTED IN PARENTHESES)

See notes for S scale.

A. Track power is carried under modules using these minimum figures. O,14 ga.; S,16 ga.; HO and smaller, 18 ga. Two conductor recommended for neatness.

B.* Track feed lines shall be firmly attached to each module and shall terminate at each end in a terminal block. Interconnect lines to track shall be as prescribed above. Terminal blocks will have connection to rail and connection to other module end, and may be a 2 pin Cinch-Jones (TRW#P302 & S302) or Radio Shack plug (#274-201 & 274-202). These connectors will have the wide blade (pin 1) connected to the outside rail terminal and the narrow pin (pin 2) connected to the inside rail terminal. (O scale modules shall use a 4 pin Cinch-Jones (TRW#P304 & S304 or Radio Shack #274-204 & #274-205) plug with pins 1 & 3 connected to the outside rail & pins 2 & 4 connected to the inside rail.

PLEASE NOTE: THESE INSTRUCTIONS APPLY TO EACH TRACK ON THE MODULE.**

When track power connectors are used, the female connector is located at the left Interface (from the public viewing side). The male connector at the right interface (from same viewing side) is wired to the terminal block using an 18" length of flexible 16ga 2 conductor stranded cable. Track power connectors should be paired with color coding as follows: Outside mainline **RED**; center or inside mainline (on 2 track modules) **YELLOW**; inside or 3rd track **BLUE**; counted from outside viewing edge of module. All electrical connections shall be soldered and taped or otherwise insulated. No section of mainlines or passing track shall depend on power being fed through bridge track.

TRACK GAPS (INSULATED)

Insulating material shall be used to fill rail gaps. No air gaps are allowed. Crossovers between mainlines and tracks leading from mainlines to other trackage on the module shall have both rails gapped (insulated). All tracks gapped for block control shall have both rails gapped (insulated).

POWER

Electrical Standard S-9 shall be observed. (Exception for Nn3 & Z scales; Full throttle voltage at the railhead shall not be more than 8 volts.)

(*)NOTE: The use of 110V power is acceptable provided all components carry UL labels and are secured to the underside on the module and measures taken to prohibit any possible connection to the low voltage wires. Local electrical requirements may vary at different locations so it is advisable to contact the local fire inspector for details.

NOTE: Cinch-Jones and Radio Shack Connectors ARE COMPATIBLE.

(*)*S Scale only:

NOTE: S Scale wiring is entirely different. Check NASG module specs for full details.

All electrical connectors should be painted black. See also note at bottom of page. Two mainline and single mainline modules have a male & female 2 pin connector (same type as used for HO or N scales) at each interface. This configuration allows for reversing modules within layouts.

For TWO-MAINLINE modules, the following is the configuration as you look at the end of the module. The male connector is on the right and connected to the wiring for the right mainline. The wide blade is connected to the outside (right-most) rail terminal and the small blade is connected to the inside rail for that mainline. A female connector is connected to the wiring of the second mainline on the left. The wide socket is connected to the left-most rail terminal and the small socket is connected to the inside rail.

For SINGLE MAINLINE modules, a male and female connector is attached to the same terminals. Looking at the end of the module, the wide blade of the male connector is connected to the outside (right) rail terminal and the small blade is connected to the inside (left) rail. The wide socket of the female connector is connected to the inside (left) rail terminal and the small socket is connected to the outside (right) rail terminal. (For single mainline modules, during use. ONLY ONE connector is used per interface. The other will be used only if the module is reversed in the layout).

**** N SCALE ONLY:** A 4th line should be used to carry low voltage DC. This shall consist of a pair of 16 gauge (Zip cord is OK) wires with a Cinch-Jones or Radio Shack connector as outlined above. No connection is made to the track.