

Proposed Additions to RP-9.1.1.

Proposed for better fit of decoders in rolling stock by Reinhard Müller
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Reasoning

General Remarks

- 10 Between a mobile digital decoder and the rolling stock it shall control there are three interfaces:
Electrical, electromechanical and mechanical. While the electrical and electromechanical
interface is clearly defined in the RP, the mechanical interface is not defined at all. But does it
make sense to have two devices which should work together with only two of three aspects
fitting? Like a car radio not fitting into the dashboard due to size mismatch. Or an odd shaped
battery or battery compartment not matching?
- 15 Clearly such an RP can not change existing designs. But we should not allow to diverge even
more where de-facto standards exist. Each scale and connector type as described in section "C"
has a different history, possibilities and needs. Therefore the level of definitions will be different.
The proposal is written in a way each manufacturer should be able to live with, while giving the
modeler the needed information what will fit and what not. All numbers are to be confirmed, i.e.
20 they may change to some degree.

The Different Connector Sizes

The Small Connector

- 25 The small connector was invented by Trix for their Selectrix decoder 66830 sized 14 x 9 x 2.5
mm³ (0.55" x 0.35" x 0.1"). To save space in the small N scale locomotives the decoder is
directly plugged into the socket without any wiring. The space for the decoder is in front of the
socket. For several years Trix were the only ones to use this connector type. No other decoder
fitted in the space for the 66830 and the other manufacturers had their own digital system, so
they would not support the easy installation for just the Selectrix decoder.
- 30 When the DCC decoders became small enough to fit at least the footprint of 14 x 9 mm², they
got also the small connector to fit into the Trix N scale locomotives. Other manufacturers of
rolling stock started to implement the small socket, allowing the space of the "original" decoder
in front of the socket.
- 35 But one manufacturer offers also decoders which did not fit into this footprint. They decided to
add wiring between the plug and the decoder. In their rolling stock there is no space left for a
decoder in front of the socket. This results in a loss of compatibility between decoders and
rolling stock with the small connector implemented. It is actually the main reason for this
proposal to regain some level of compatibility or at least to tell the user, which combinations do
not fit to avoid frustration. Any type of frustration does help neither the modeler nor the
40 manufacturer and currently frustration level is high concerning the evolution of the small
connector standard.

The Medium Connector

For decoders using the medium connector there has never been something like a standard size. But the decoder has to find its space. Therefore its needed to mark clearly the size of the decoder and of the space in the rolling stock. Furthermore the space for the harness has to be there and
45 the length of the harness needs to be defined. Neither a too short cable does work nor a too long cable without the needed space to store it.

The Large Connector

As I have no experience with larger scales the large NMRA Connector will not be addressed in this proposal. However there may be some need to define some standard way of mounting the
50 decoder, as a piece of sticky tape does not do the job for the larger decoders.

Additional Comments

The main aim of this proposal is to let the user find out in the shop, whether a decoder will fit in his (new) locomotive without opening the locomotive. If it leads to a better fit between decoders and rolling stock, it is even better. But there is no requirement to change current designs. Just
55 some more labeling like "Decoder size ### x ### x ###" or "Space for decoder ### x ### x ###" will be sufficient to meet the new requirements.

The below stated maximum measurement should not prevent manufacturers from designing even smaller decoders. Also special form factors may be used to fit some locomotives where there is no space for the standard set-up with an NMRA socket. But if the socket is used, it should
60 provide maximum compatibility. Where this can not be achieved, it should be clearly labeled. This is necessary not to confuse and frustrate the modelers and should be therefore in everyone's interest.

This proposal was written to actually prevent further "conforming but not compatible" issues.

The Proposal

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Text to be added to section

A. General Interface Requirements

of the existing RP-9.1.1

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Any work to be done to prepare the rolling stock for use with NMRA DCC in access of removing the dummy plug and inserting the digital decoder shall be clearly labeled. This includes but is not restricted to

- the change of bulbs for a higher voltage
- removal of components (diodes etc.)
- replacement of motor parts
- ...

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If a special decoder is available which makes any additional work unnecessary, this may be noted, but the needed work for other decoders still needs to be labeled. If the amount of work is not easily put on a label, an instruction sheet with all necessary steps is required.

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Note concerning this section: I know that this is some work for the manufacturer but they know best what to do to insert a decoder especially into older designs.

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Text to be added to section

C. Locomotive Interface Electromechanical Specifications

of the existing RP-9.1.1 in the paragraph addressing the
Small Connector

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Rolling stock with the small socket and marked with the corresponding logo shown below should leave the following minimum space in front of the socket:

- A length in direction of plug insertion of 18 mm = 0.710". This allows a 14 mm = 0.550" long decoder to be inserted.
- A width of 9.5 mm = 0,375" centered to the connector.
- Perpendicular to the above area a height of 2.3 mm = 0.090" in both directions, resulting in a 4.6 mm = 0.180" high space with the connector at half height.

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Decoder with the small plug and marked with the corresponding logo on the right should not extend the following maximum space:

- A length in direction of plug insertion of 14 mm = 0.550" measured from the base of the pins.
- A width of 9 mm = 0.355" centered to the connector.
- Perpendicular to the above area a height of 2.3 mm = 0.090" in both directions, resulting in a 4.6 mm = 0.180" mm height with the connector at half height.

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Rolling stock with the small socket where the above stated space in front of the socket can not be provided and where some wire harness needs to be used, should be marked with the logo for the small connector with the word "wire" added as shown below. Within a wiring distance of 80 mm there should be the following minimum space for the decoder:

- A length of 19 mm = 0.75" allowing to use a 14 mm = 0.550" long decoder together with a socket for an added wiring harness.
- A width of 9.5 mm = 0,375".
- A height of 4.6 mm = 0,180".

If more space is available it should be noted.

A decoder not fitting in the space of 14 x 9 x 4.6 mm³ needs a wire harness and should be marked with the same new logo. The size should be clearly marked on the package of the decoder.



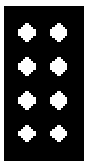
Note: A decoder with the logo to the right does not necessarily fit into rolling stock with the same logo as the size of the decoder may be larger than the space in the loco. Therefore sizes have to be checked by the user.

Text to be added to section

125 **C. Locomotive Interface Electromechanical Specifications**

of the existing RP-9.1.1 in the paragraph addressing the **Medium Connector**

130 Rolling stock with the medium socket and marked with the logo shown below should have some defined space for the decoder. The dimensions of this space need to be specified. Also the wiring distance between the socket and this space should be no more than 80 mm = 3,15". In case of longer distance a special note needs to be added. In case the distance is much shorter there should be enough space for the cable length not needed.



135 There shall be space for the cables from the plug on that side of the socket, where the pins 1 to 4 are located. There should be a space for the plug itself of 0.500" x 0.300" x 0.180", with the height measured from the top of the socket and the other measurements centered to the socket.

140 The size of a decoder with the medium plug and marked with the logo on the right, should be clearly marked on the package of the decoder. The wiring between the decoder and the plug should have a minimum length of 85 mm = 3.35". If a shorter wiring is supplied e.g. for better fit in rolling stock with the decoder space close to the socket, this needs to be clearly labeled on the package.

145 Cables should leave the plug on that side of the plug, where the pins 1 to 4 are located. The plug shall not be larger than 0.480" x 0.280" x 0.180" excluding the pins. The first two dimensions should be centered to the pins.