Layout Command and Control – LCC
Documentation Package
February 2016

This package of Standards and Technical Notes
are submitted to the NMRA Board
for Ratification as the
First Official Release
of
Layout Command and Control – LCC

This set of Standards and Technical Notes documents forms the basis and infrastructure for an extensible and flexible layout control bus system for Model Railroads. It is designed for both the novice and experienced modeler, and both small personal and large modular group layout.

It was developed in public by the OpenLCB Development Team with the input from many people but especially the members of the OpenLCB egroup on Yahoogroups. It is the accumulation of years of work, following the NMRA Board mandated Goals and Mandate, and the self-determined Goals and Measures documents.

These documents have been open to review for more than six months. The comments and errors were collected, considered and applied to the documents. Material changes are documented in each document's cover sheet.

In addition, two sets of documents are being submitted for acceptance as Drafts, to be published for a six-month comment period. These are:

- *CAN Physical Standard and Technical Note*: Three manufacturers have requested changes to allow them to provide one connection on their LCC command stations. The updated documents allow a low-current DCC signal to be optionally carried on the two unassigned wires in the CAN Physical cable, in accordance with the pre-existing NMRA S-9.1.2 DCC Power Station Interface standard.
- *Firmware Upgrade Standard and Technical Note*: This allows nodes to update their firmware over LCC. This was requested by manufacturers, and in use by one in their products.

The OpenLCB Development Team: Stuart Baker USA, Balazs Racz Switzerland, Alex Shepherd New Zealand, David Harris Canada, Brian Barnst USA, Dick Bronson USA, Ken Cameron USA, Don Goodman-Wilson USA, Tim Hatch USA, Bob Jacobsen USA, Jim Kueneman USA, and others who have contributed their knowledge and inspiration.

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