

National Model Railroad Association, Inc., an Ohio corporation  
OpenLCB, an unincorporated association

**MEMORANDUM OF UNDERSTANDING**  
Development of Layout Command Control (LCC<sup>®</sup>)

**History of Layout Command Control (LCC<sup>®</sup>)**

September 27, 2007, the goals of the NMRANet Working Group are laid out.

June 4, 2010, Dr. Bob Jacobsen issues a list of Goals and Mandate of the NMRANet Technical Working Group.

June 6, 2010, An NMRA Technical Note listed as S-9.6/OpenLCB NMRANet Proposal, Goals and Mandates Reply is circulated for review. Copyright 2010, by J. Day, D. Harris, B. Jacobsen, A. Robinson, and A. Shepherd.

July 11, 2011, A Memorandum of Understanding was issued by the NMRA to develop a layout accessories control bus to be called NMRANET<sup>®</sup>. Two approaches were listed in the MOU, Bruce Chubb's C/MRI and OpenLCB (Open Layout Control Bus).

July 2012, The Board of Directors adopted OpenLCB Standard S-9.7.1 for NMRANET<sup>®</sup>.

July 16, 2014, A Memorandum of Understanding was signed by Charlie Getz, NMRA President, and Tony Koester, Officer Selection Committee, stating that OpenLCB was the only sanctioned Layout Control System (LCS), rejecting C/MRI (Dr. Chubb), Signals by Spreadsheet (Dr. Gerry Albers) and TCSnet© by Train Control Systems (TCS). This MOU authorized OpenLCB to use NMRANET<sup>®</sup>. It is noted in handwriting on the MOU that NMRANET<sup>®</sup> was too specific and that a more generic term such as Layout Control Systems (LCS) should be used. The note at the bottom of the MOU indicated that LCS would later be changed to LCC<sup>®</sup>.

February 2015, The Board of Directors changed the name of NMRANET<sup>®</sup> to Layout Command Control (LCC<sup>®</sup>). After a lengthy discussion, the Board of Directors determined that there should only be one Standard for LCC<sup>®</sup> and that Bruce Chubb's C/MRI would not be accepted, giving the design of LCC<sup>®</sup> to the open-source group known as OpenLCB Group.

February 20, 2016, OpenLCB presented a total of 22 Standards and Technical Notes for adoption by the Board of Directors covering Unique Identifiers, Event Identifiers, Physical Layer, Data Link Layer, Network & Transport Layer, and Session Layer for LCC<sup>®</sup>. The Board of Directors adopted all 22 documents.

**Organizations and Interface**

National Model Railroading Association, Inc. (NMRA) is a 501(c)(3) non-profit corporation organized under the laws of the State of Ohio and having headquarters at P.O. Box 1328, Soddy Daisy, TN 37384-1328.

Handwritten signatures in black ink, appearing to be initials or names, located at the bottom right of the page.

Open Layout Control Bus (OpenLCB) is an unincorporated association of persons which formed in 2010 independent of NMRA for the purpose of developing technical details of LCC.

The NMRA LCC® Advisory Group is a group of NMRA members and OpenLCB members (who are also members of the NMRA) appointed by the NMRA President, managed by NMRA, and tasked with supporting and reviewing OpenLCB documents and their compliance with NMRA stated goals and mandates for Layout Command Control (LCC®). The NMRA LCC® Advisory Group will periodically report on OpenLCB progress to the NMRA Board of Directors.

### **Technical Document Discussion**

The NMRA will not independently change the technical content of OpenLCB documents.

The purpose of this restriction is to ensure that there is no conflicting forward or backward compatibility issues between existing and/or new OpenLCB and LCC® Standards, as well as to ensure that the robust document review and adoption processes of both the OpenLCB Group and NMRA are observed.

The OpenLCB Group is taking great care to ensure the highest technical quality in the solutions and documentation that it publishes. This is achieved through careful deliberation, a multi-faceted peer review and a mandatory prototyping process that involves a variety of highly skilled individuals with diverse backgrounds. The OpenLCB Group also ensures the integrity of the Standards in their evolution to maintain backwards compatibility with past versions and seamless upgrade paths where mandated.

These assurances of technical quality can only be given and maintained if the integrity of the published text is maintained during the adoption process. This is why the OpenLCB Group requires that any feedback, proposals, and changes be integrated at the source, undergoing the same rigorous evaluation and review process, and requires that only unmodified text stemming from the OpenLCB Group be published with the markings of "OpenLCB Standard" and "OpenLCB Technical Note".

There are also pragmatic reasons for this process. Having subsequent changes applied to the OpenLCB text could lead to multiple, potentially incompatible or conflicting versions of the same Standard being published. This could be confusing for manufacturers, and be a source of incompatibilities in the market, which would undermine the goals of standardization, and eventually hurt the development community and the consumer.

The OpenLCB Group is open to contributions, ideas, and feedback from all sources, including the NMRA, but all contributions, whether internal or external, shall undergo the same consideration, evaluation, and review process. Since the OpenLCB Group is interested in collaboration, all suggestions and proposals from the NMRA will be considered in good faith for their technical merits and feasibility. Alternatives that the NMRA may choose to pursue at any point in the future are described in the Termination section below.

### Adoption Process

The NMRA and the OpenLCB Group representatives have agreed that the OpenLCB Group is responsible for the ongoing design and preparation of the protocol Standard and Technical Note documents, and working with the NMRA to adopt OpenLCB Standards and Technical Notes as NMRA LCC® Standards. The process is as follows:

- At appropriate times, milestone release versions of OpenLCB documents will be submitted to the NMRA LCC® Advisory Group, each such document stating, at the time of submission, that OpenLCB and its individual author members are granting a license to NMRA under the “Creative Commons Attribution-ShareAlike 4.0 International” license.
- The NMRA LCC® Advisory Group will prepend a cover-sheet that clearly shows the version history and the official adoption dates, etc.
- The NMRA LCC® Advisory Group will append a legal disclaimer.
- The NMRA LCC® Advisory Group will insert a header on each page to clearly identify each page as being adopted as an LCC® Standard or Technical Note.
- The NMRA agrees that it will not modify or alter the content of the OpenLCB document(s) in any way except to prepend the cover-sheet and, append the legal disclaimer, and add the page headers.
- The NMRA agrees that it will not develop its own LCC® branded Standards without the collaboration of the OpenLCB group unless the Termination section below is exercised.
- The document(s) will be assigned numbers in the S-9.7 range.
- Draft versions will be made available on the OpenLCB’s Layout Command Control (LCC®) page for interested parties to review and comment on. The NMRA may also publish the draft versions for review and comment at their discretion. Any changes or suggestions from the reviews will be directed back to the OpenLCB Group for consideration. After an appropriate amount of time elapses, the documents will be finalized and presented to the NMRA Board for formal adoption.
- The NMRA LCC® Advisory Group will coordinate the publication of changes and other information to the NMRA members via its publication channels.

The OpenLCB Group acknowledges and prioritizes mandates for developing Standards for additional use-cases laid out by the NMRA Board of Directors and the NMRA LCC® Advisory Group.

At the optional request of the NMRA, the OpenLCB Group may assist the NMRA in the technical execution of prepending the cover-sheet, appending the legal disclaimer, and adding the page header to OpenLCB documents. The content of the prepended cover-sheet, appended legal disclaimer, and page header are owned for copyright purposes and maintained by the NMRA.

The contents of OpenLCB documents submitted to the NMRA are owned for copyright purposes by the individual authors of said documents. The OpenLCB Group licenses OpenLCB documents to others under the “Creative Commons Attribution-ShareAlike 4.0 International” license.

The OpenLCB Group will not use any NMRA trademarks, including, but not limited to, the LCC® logo and NMRA Conformance related trademarks, except with permission from the NMRA and under terms that the NMRA defines.

Because the OpenLCB and LCC® standards are developed under the “Creative Commons Attribution-ShareAlike 4.0 International” license, equal access is available to any party wishing to develop compatible products using the standards. The license grants permission in perpetuity and without a fee.

### **Conformance Testing**

The NMRA has the sole responsibility for product conformance testing and retains all rights to the NMRA Conformance Warrant logo, branding, and endorsement. The OpenLCB Group agrees to work with the NMRA, in good faith, in the development of conformance test software and hardware. The NMRA is not required to accept the OpenLCB Group’s assistance in the development of conformance test software and hardware. The NMRA may also reject test software and hardware for use in conformance testing, in part or in full, developed by the OpenLCB Group. The OpenLCB Group agrees to make any conformance test software it develops for the NMRA available under either the “BSD 3-clause” and/or “GPL version 2.0 or successor” licenses.

The OpenLCB Group does not have any right or responsibility to issue NMRA Conformance Warrants.

### **OpenLCB Group Internal Governance**

The NMRA agrees not to interfere, in any way, with the internal governance of the OpenLCB organization. This includes, and is not necessarily limited to:

- The NMRA will not require the OpenLCB Group to disclose any personal information about any of its members.
- The NMRA will not interfere with how the OpenLCB Group manages its membership.
- The NMRA will not interfere with the OpenLCB Group document development process.

The OpenLCB Group is committed to being an open and inclusive organization that welcomes participation from both NMRA and non-NMRA member volunteers alike, as well as model railroad product manufacturers and their representatives.

The OpenLCB Group is not an NMRA Working Group. The NMRA may choose to establish its own LCC Working Group under its own jurisdiction. Should such a Working Group be created, the OpenLCB Group is committed to working in cooperation with said Working Group in good faith.

### **Termination of Memorandum of Understanding**

The relationship between the OpenLCB Group and the NMRA is based on good faith in the spirit of collaboration and this MOU is not legally binding. The OpenLCB Group generally publishes materials under appropriate Open Source and Open Documentation licenses. If either party wants

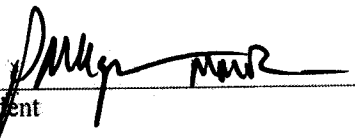
to terminate the collaboration, then the trademark and copyright laws define the legal usage of the materials created before, during, and/or after the period of collaboration of the parties. The understanding of the parties is as follows:

- The OpenLCB Group published all past documentation under the license of Creative Commons CC-by-SA, and is expected to continue during so in the future. This gives anyone, including the NMRA, the irrevocable right to take the material and reuse it as-is or with modification.
- The NMRA is in control of the LCC logo trademark, the NMRA trademark, and what Standards, specifications, or documents are published under these marks. The NMRA may choose to publish the OpenLCB documents as-is, publish different documents by modifying them, extending them, or creating documents from scratch, including the ability to make incompatible changes or a complete re-engineering. If the NMRA bases the LCC Standard on text published by the OpenLCB Group under CC-by-SA, then the only requirement is that the Source Attribution must be present.
- If the NMRA modifies the OpenLCB documents, the NMRA may no longer label them as "OpenLCB Standard" and "OpenLCB Technical Note" when publishing.
- The OpenLCB Group may not at any point in time, during or after the collaboration, publish documents labelled as LCC Standard or NMRA Standard.
- Software that the OpenLCB Group provided (e.g., for conformance testing) may continue to be used according to its license, which for the above-mentioned licenses typically means the NMRA has the right to use or modify it according to the terms without needing to involve the OpenLCB Group, or pay any license fees.

The parties acknowledge that such a termination of collaboration is not in the interest of either party and that both parties will work on resolving any future issues in good faith and collaboration. The statement of consequences as above does not constitute legal advice.

To indicate agreement to this Memorandum of Understanding, the parties have executed this document as set forth below.

NATIONAL MODEL RAILROAD  
ASSOCIATION, INC., an Ohio  
corporation

By   
President

Date: 28-Jan-2021

OPENLCB, an unincorporated association

By   
Authorized Representative

Date: 28-JAN-2021



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### Translations

NMRA's development of NMRA Standards documents involves the review of documents in English only. In the event that an NMRA Standards document is translated, only the English version published by NMRA is the approved NMRA Standards document.

### Official Statements

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### Comments on Standards

Comments for revision of NMRA Standards documents are welcome from any interested party, regardless of membership. However, NMRA does not provide interpretations, consulting information, or advice pertaining to NMRA Standards documents.

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