

DCC Impulses - What's Up With LCC?



Model Railroad Hobbyist |

DCC IMPULSES

column

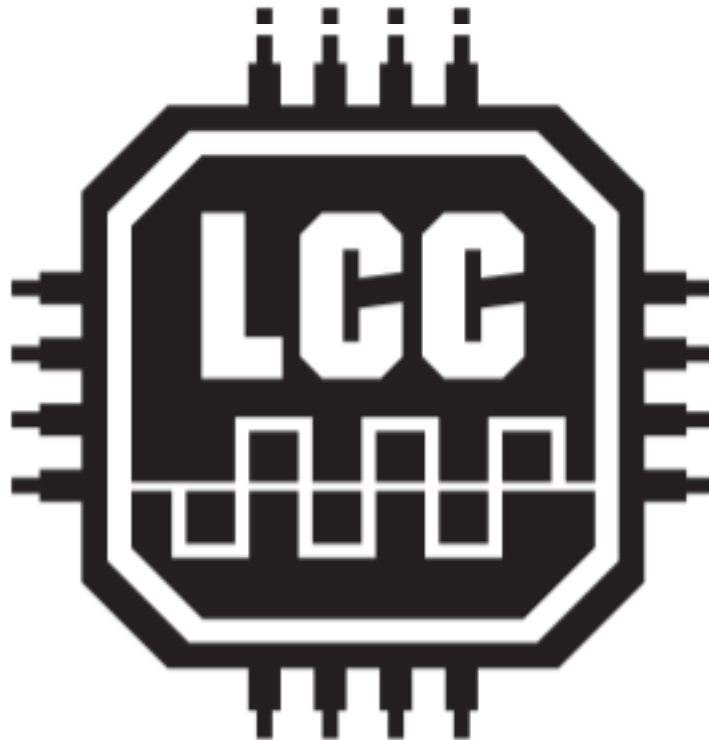
BRUCE PETRARCA



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At the NMRA national convention this August (2015) in Portland a lot of the buzz was about LCC. What is it? When will hardware be available? Software? There were several clinics. I got to a couple of them.

While I don't have all the answers, I'll try to blow away some of the clouds. Many of the answers won't be available for months or years, as things shake themselves out. Okay, let's answer some questions.



What is LCC?

LCC stands for Layout Command Control. It is a new NMRA standard for data flow on a model railroad layout. After many years of work, it was released in February 2015.

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Previously there had been discussion about NMRANet. LCC is the accepted name for that concept and includes the work that had been done under the OpenLCB banner, as well. Anything you have heard about possible new network standards from the NMRA is in this standard.

Note the term "layout" in the name. It is designed to handle all the communication with static items on your layout, leaving your DCC bus for only communication with the (hopefully moving) trains.

What will this do for me?

LCC will work on your layout whatever the track power and control is: AC, DC, DCC, or Dead Rail. In the DCC world, it matters not what brand of DCC system you use.

Whether or not you want LCC on your layout is a different matter.

LCC is designed to control the stationary items on your layout: turnouts, signals, building lights, telephone system, even room lighting. It will even stream realtime HD video. It has lots of what computer guys call bandwidth. That means it is a really big pipe, like a 10 foot high drain culvert, compared to the small water pipe size buses associated with current DCC systems.

In addition to the ability to carry a lot more data than any DCC bus, LCC is fast. Not only can it carry more water, to continue my analogy, it can carry it faster, about ten times faster, than any DCC bus.

I have no need for it on either my HO (mrdccu.com/layouts/SMVRR) or garden (mrdccu.com/layouts/RMP) layouts. Both are small, modeling dark territory with no dispatch and mostly fascia or manually activated turnouts.

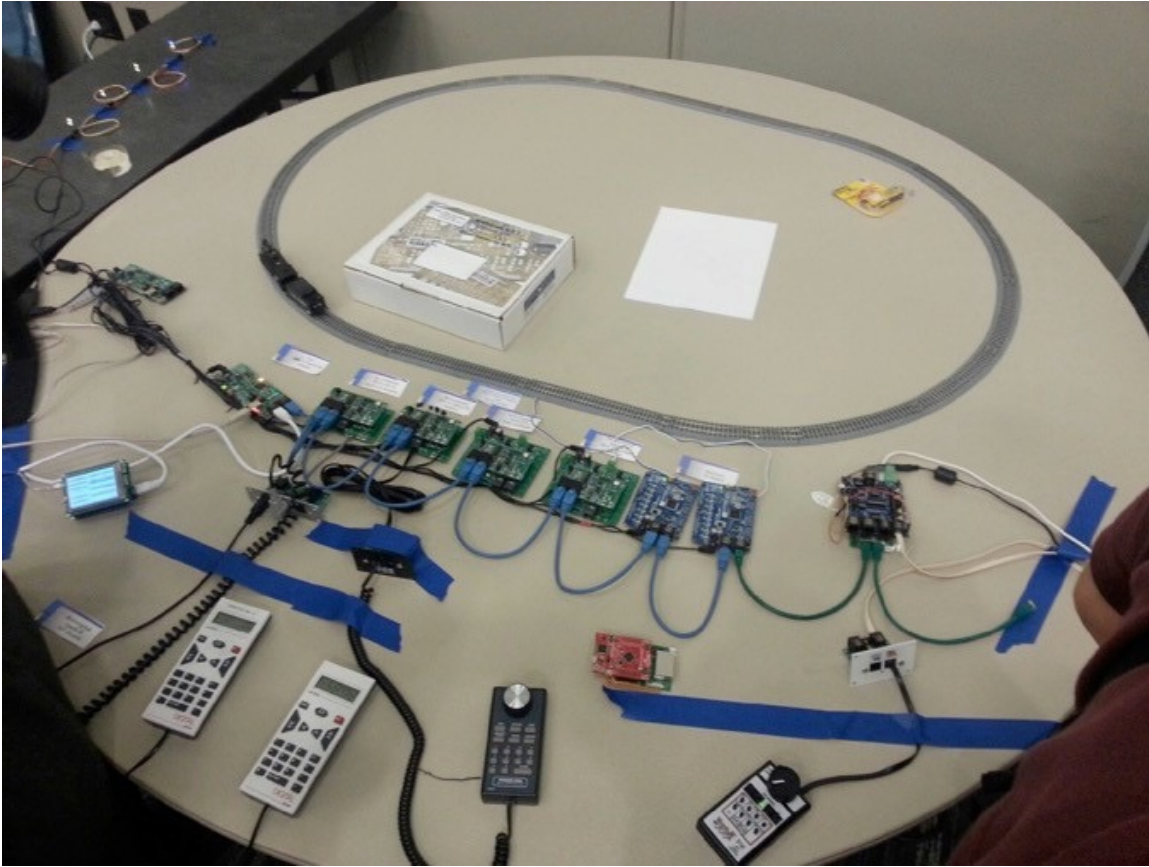
My HO layout will not impact data on the NCE CabBus. There are yard turnouts which are planned to be controlled by stationary decoders and run by a macro on the DCC system. This could be moved to an LCC network, but there is no point in putting in LCC for such a small task. In fact, it probably would be more expensive.

Medium to large tasks seem to be where LCC shines. Tasks that need speed and move large quantities of data. Later, I'll talk about special features for modular clubs.

While LCC is designed for the stationary side of the layout, it may find one, or more, use(s) in the DCC control side. I attended Steven Priest's clinic in Portland. He had a slide [1] that showed DCC throttles connected to nodes on a LCC bus. What was interesting was the three nodes shown: one with a Digitrax throttle, one with two Lenz throttles and one with a NCE throttle. They were all controlling the same layout at the same time. LCC may finally provide the way to use different throttles on your DCC system, just when the major migration is toward smart phones as the universal wireless throttle.

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1. LCC nodes taking data from Lenz, NCE and Digitrax throttles and sending it out on one command station: a universal throttle solution.



What does LCC define?

On the hardware side, the NMRA standard (nmra.org/index-nmra-standards-and-recommended-practices) only defines the connector for the bus.

The communication protocols and interfaces are the nuts and bolts and the majority of the LCC specifications.

When will hardware be available?

While the standard only covers the connector, nodes are needed to get things running.

Some hardware was shown in Portland. All I saw were prototypes, but they were close to production quality. I expect to see announcements soon.

RR-CirKits had many of the nodes and interfaces to show. Based on the photograph [2], they are investing time and money in this project. A good sign.

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2. RR-CirKits setting up their factory to build the first run of LCC hardware.



One thing that will drive manufacturers to build products for LCC, or incorporate LCC interoperability into current products, is for all of you to ask them. Nothing drives ingenuity like demand.

What is the hardware?

LCC connects between nodes [3] and [4]. Nodes are the stand-alone interfaces between the LCC bus and the external world.

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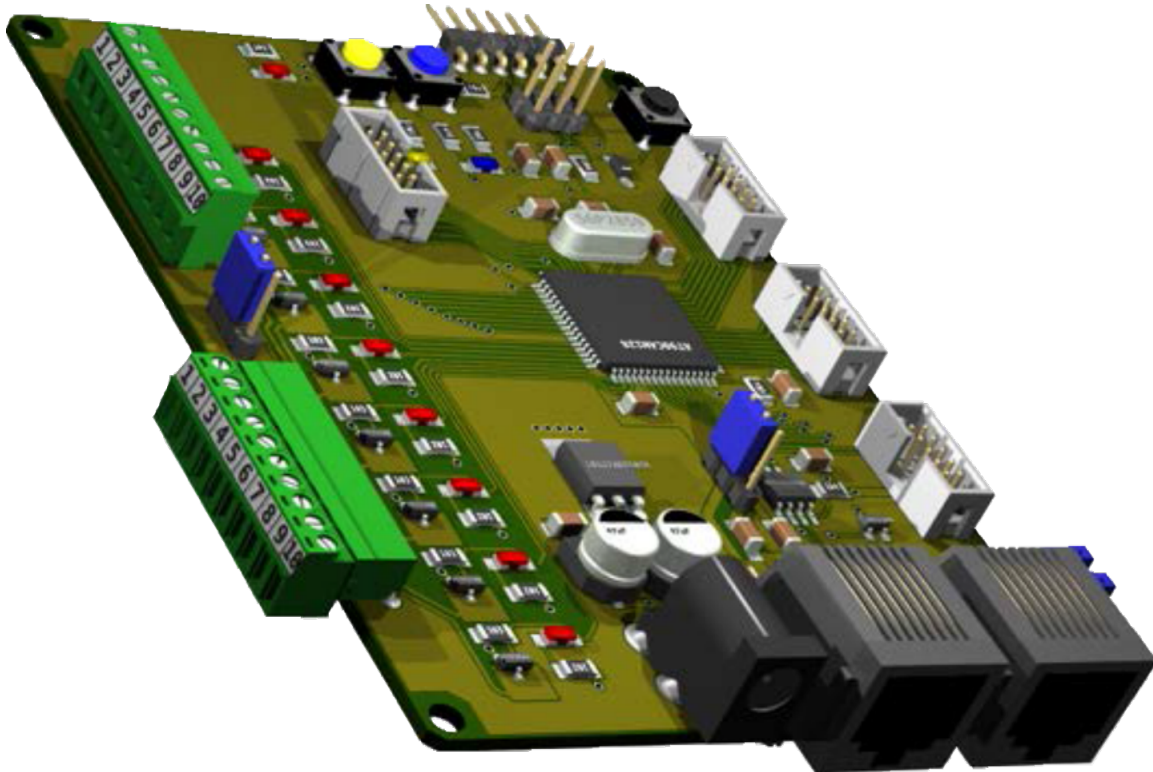
3. A basic LCC node: bus connections on the left and external hardware connection on the right.



Configuring a network is as simple as connecting the necessary nodes (via Ethernet cable) and teaching them how to work and play well together. This teaching can be done without a computer by pressing buttons and such, but a computer makes it so much easier.

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4. A more complex LCC node board.



How about software?

JMRI will embrace LCC and provide at least some of the configuration and operating software.

Individual node designs may need some specific software. I would expect that to be supplied by the hardware vendors.

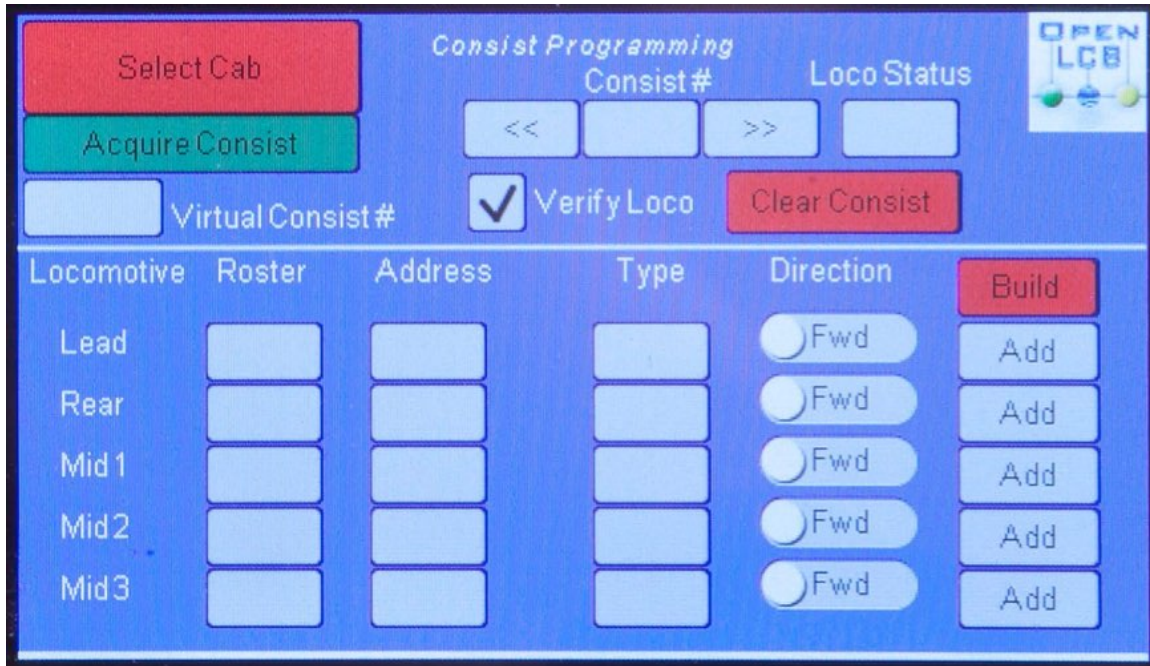
There may be some software packages for layout control, similar to the current Railroad & Co. product.

Anything else?

The OpenLCB work, which has been folded into LCC, included some special ideas, like a "hostler" board [5]. This touchscreen allows the hostler to set up trains (build consists) without knowing the details of the DCC system involved. All that is needed is just to punch some buttons and enter a few numbers.

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5. A touchscreen hostler board to set up loco consists



Is there something special for modular clubs?

LCC was designed with modular or sectional layouts in mind. For example, when layouts using LCC are joined, any turnouts having the same ID number can be automatically renumbered, temporarily. That's right, the ID numbers can be restored automatically, once they are separated. Implementation of this will be the responsibility of the manufacturer of the nodes to control the turnouts.

What are the grimy details?

LCC is based on the rugged CAN bus used in automobiles. Development on that bus began over 30 years ago by Robert Bosch GmbH. It was released in 1986. So, this is not new ground that the NMRA is plowing, but technology that has been around the block (literally) many millions of times.

This basic technology has been used many places, including transportation, industrial automation and, recently, entertainment devices. The components for the interface are readily available and inexpensive.

It is interesting to watch evolution. That's what we are seeing with LCC. Whether you jump into the melee or not, it will be fun to watch the ride. I'm looking forward to viewing my first DCC / LCC layout.

Folks always seem to have additional ideas to share. Just click on the Reader Feedback icon at the beginning or the end of the column. While you are there, I encourage you to rate the column. "Awesome" is always appreciated. Thanks.

Mr. DCC's Workshop

Digitrax' "Slots" and DecoderPro

Alas, this is not Las Vegas or your local casino. "Slots full" is not good.

There is more than one way to skin a cat. That applies to DCC system design, too.

Digitrax has chosen a method that requires "dispatching" locomotives in order to remove the relationship between an individual throttle and a specific locomotive or consist.

"Dispatching" involves a couple of button presses for the DT series throttles. With the UT4 series, it is a bit more cumbersome: disconnect the throttle from the layout (unplug from fascia), press the DISP button and insert the cable into the UP5 panel.

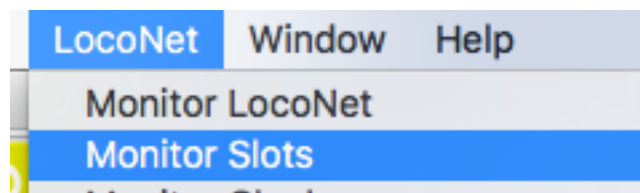
Not that any of this is terribly complicated, but it is one more thing for operators to remember. It is especially easy to forget if their normal system is not Digitrax.

What happens if you don't DISPATCH your loco? Most times things go along for days, weeks, months or years until the command station maxes out. This situation is indicated by a SLOTS FULL display.

Then comes the laborious task of clearing the slots. This can be done through acquiring, one-by-one, locos and dispatching them. Or using the complicated OpSW configuration switches to clear all slots. If you are not careful, you can clear all your consists, too.

However, if you have DecoderPro there is an easy way to clear the slots. Open DecoderPro with your Digitrax system connected, open Monitor Slots [6]. Your screens may look a bit different, depending upon your preferences settings, computer system and version of DecoderPro, but the functions are the same.

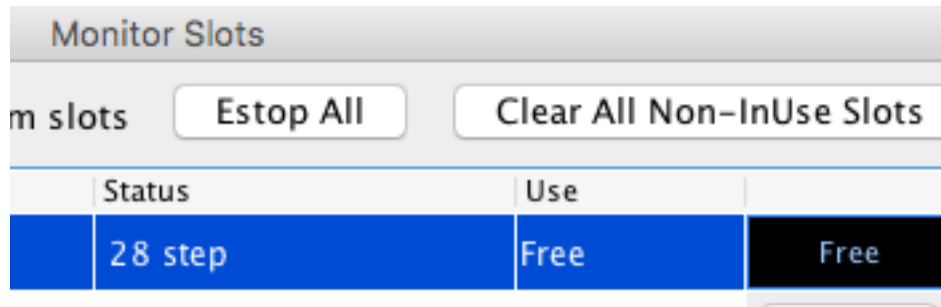
6. Open Slot Monitor in DecoderPro



Depending upon your version, there may be two ways to proceed. The one that always works, is to press the "Free" button after every active slot [7].

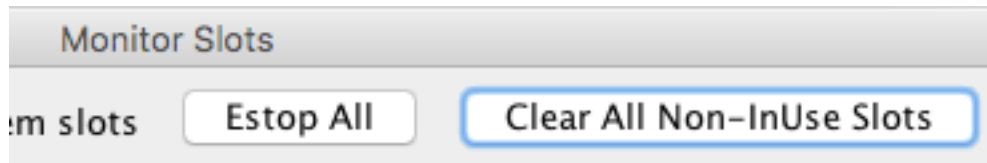
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7. Depress the "Free" button for every throttle registered in the Monitor Slots window - the black button in the screen shot.



Your version of Decoder Pro may have the option, as seen in [7] to "Clear all Non-InUse Slots." If so, pressing it will clear all slots that are not currently in use [8]. This is not as clean as pressing the "Free" button for every throttle, but it is quick.

8. A quick answer is to press "Clear All Non-InUse Slots". This will clear slots that have no throttle assigned to them currently.



After every club operating session, I do the "Free" button for every throttle, leaving an empty sheet in the Monitor Slots window [9].

9. Clean "Monitor Slots" screen after pressing "Free" for every throttle.

