This document is under formal review of the NMRANET Working Group. It has not been approved by the WG, reviewed by the Manager, S&C Dept., nor approved by the NMRA Board of Directors.

NMRA TECHNICAL NOTES	
NMRAnet	
Use Cases	
All Scales	
21/07/10	

Use Cases

This document discusses various use cases that have been considered during NMRAnet development. Each section describes a single use case, and then discusses the NMRAnet solution for that case.

Entry Level User

A model railroader wants to learn about NMRAnet. He buys two inexpensive boards at his local hobby shop. He connects them on his layout to two pushbuttons and a turnout motor, does a simple configuration, and is able to control the turnout with the pushbutton.

Expanding a Small Layout

A user has four NMRAnet boards working on his layout. He buys one more input board to provide extra pushbuttons to operate his yard ladder from the other end of the layout. He's able to configure the new board and put it into operation.

Mid-size Layout Problem

A user has twelve NMRAnet boards operating. Something changes, and the system is no longer reliable. Certain operations no longer work, and others only work sometimes. The user attempts some debugging steps using features of the existing hardware, but is unable to locate the problem, so buys/borrows diagnostic device(s).

Large Layout Upgrade

A model railroad has 40 NMRAnet boards controlling a large layout. To upgrade a major yard, the user wants to replace 12 boards with new ones that offer new (non-NMRAnet) features. He captures the existing setup, replaces old boards with new ones, configures the equipment and is back in operation.

Distant Control Panel

A model railroad has turnouts and signals controlled via NMRAnet. The owner wants to put a physical control panel in his house, a separate building, and operate it via NMRAnet.

Large Layout Expands

A large model using CAN, but not any attached computers, grows enough that it needs to have another CAN segment. This must be possible without reconfiguring all the existing nodes, event IDs, etc.

Connect Multiple Programs

The user wants to run multiple programs from multiple vendors in his home computer that simultaneously connect to the layout NMRAnet and control/monitor it.

Remote Dispatcher

A model railroad has turnouts and signals controlled via NMRAnet. NMRAnet is used to install a CTC panel at a distant location. The panel could be either a physical panel or on a computer screen.

Modular Layouts

A modular club has fifty modules, each of which as a CAN NMRAnet with two or three nodes controlling the module. These modules are separately built, with no central administration. For example, a new member might be bringing four modules that have never run with the club before, or a member may have just completed a couple new modules. They are brought to a central location for a meet, where they are all connected together in some pre-planned orientation. The NMRAnets are connected in some fashion, and used to operate the entire layout from both central and distributed locations.

The club does not want to expend any effort preallocating numbers, making sure that module configurations don't conflict or anything like that; they just want to plug together the OpenLCB CAN backbone and operate the entire layout from both central and distributed locations. All the modules must still continue to operate without reprogramming or reconfiguration; there's just not enough time for that. Connections between modules need to be added easily, either by multiple manual operations (pushing local buttons) taking place in parallel, or multiple computers attached to the layout with configuration tools.

Remote Diagnostics

A club layout is operated via NMRAnet. There's something not quite right about the signaling, and one of the members wants to check the operation of the signals. He makes a remote connection to the layout and checks the status and configuration of the hardware from his home computer.

Aggregation of Modular Clubs

Dozens of clubs put together dozens of NMRAnet segments and hundreds of modules that have been separately configured. A large FREMO meet would be an example. Collision avoidance must be easily arranged; event and node identifications that are already configured into the modules should already be unique, without any need to reprogram ones that might be duplicates. It must be possible to build automated tools for connecting events between layouts and modules. Conventions and/or tools for connecting across the boundaries are needed so that e.g. signaling systems can work with adjacent

modules they've never met before. It must be possible to build automated tools for health monitoring across the layout.

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