Model Railroad Hobbyist |

DCC IMPULSES

column

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RailPro makes things easy

This summer I was in Utah and had the opportunity to meet Lee Nicholas and run some trains on his Utah Colorado Western HO layout [1]. This layout has been featured in many magazine spreads over the years and is a true collection of eye-candy.

1. Operating signals on Lee Nicholas' Utah Colorado Western HO layout. ***Bruce Petrarca photo***

Lee and I spent several hours together one Saturday afternoon, discussing lots of things, ranging from sugar beets to his operating methodology to the Golden Spike National Historic Site, which is just a few miles west of Lee's place.

When the discussion turned to command control systems, Lee expressed his disinterest in DCC. He has become a strong advocate of the RailPro system and he was happy to show me why. After spending some time running and consisting locos on Lee's layout, I was impressed enough to consider devoting a column or two to the concept.

After witnessing Lee's enthusiasm and seeing some folks operate on his layout, I decided to dig deeper into the RailPro system. So, I spent a fair amount of time on the phone and via email with Tim Ring (of MRH advertiser Ring Engineering), the inventor and manufacturer of RailPro.

2. RailPro HC-2 hand controller puts your loco's functions at your fingers, with lots of graphics to make operations easier. *Ring Engineering photo*

Prior to these discussions, I had seen the RailPro system advertised and had obliquely noted its existence. I had chalked it up as another option in the simplistic toy trains world. What I saw at Lee's showed me I had seriously under-estimated the product.

Here's what I've learned so far. Understand, I'm gathering a lot of information and know that I don't have all the answers now. But I'm working on it.

What is RailPro?

Tim Ring conceived of RailPro after spending many hours trying to speed match two DCC-equipped locos. In frustration, he said, "There has to be a better way."

RailPro is a complete control system with handheld cabs [2] where everything in the system communicates with everything else by radio. Since the communication is wireless, the track may be used for power or power can come from a battery, making the loco independent from whatever is on the track.

I'm going to perpetuate the terminology that has evolved in this column: the handheld units simulate the functions within a loco cab, so it I'll call them cabs.

So, I followed my own advice and worked on running a few locos and setting up some consists to start getting a feel for the cab and its ergonomics.

How does the system control your locos and layout?

Let's first look at how it works.

All units connect to each other by a duplex (bi-directional) radio link. So, the module in a loco can know what is happening anywhere on the system. The communication protocol is not DCC, even though the cab looks and feels as if it were.

RailPro develops a radio-based network between all the devices registered on the system and lets them talk amongst themselves. This radio link is in the 2.4 GHz band. Ring Engineering developed their own radio system so as not to be tethered to the protocols, delays, and uniqueness of the pre-existing radio systems. Because RailPro developed their radio system from the

ground up, Tim reports that there has never been a documented case of interference with their systems.

So, in the simplest system, a command starts from the cab and gets delivered to the loco module. There, the loco module [3] will activate the lights, motion, and sound.

3. Each loco will need a module to control the motor and lights. If the module has a "S" suffix, it also includes sound. Here is the LM-3S sound loco module. *Ring Engineering photo*

What modifications must be made to the loco?

A "RailPro loco module" (Ring Engineering's term) needs to be installed into the loco to control the motor and lights and create the desired sounds. To facilitate the installation, the RailPro loco modules have a 9-pin JST connector on them wired the same way that many DCC decoders are. The sound version, as shown in [3], has a separate connector on the other end (right in the photo) for speaker connection and other items. The LM3-S is about the same size as DCC decoders designed with the 9-pin JST connector, mostly aimed at HO gauge locos.

Anybody who has installed a DCC decoder will be immediately familiar with the process.

A DCC-style adapter harness will allow the LM-3S to plug into many locos that don't have the 9-pin connector installed. DCC manufacturers have harnesses available that will go from the 9-pin to 8-pin NMRA standard or

the 21-pin plug that is becoming popular. For hardwired installations, I recommend installing a 9-pin receptacle in the locomotive and plugging the module into that.

What is the radio range?

The range from the cab to the loco is about 100 feet (30 meters). However, this is not terribly important, as the system is designed for walk-around control of smaller scale locos, where you are close to your loco.

The PWR-56 [4] power supplies can be configured as a repeater to assure full coverage for system-wide commands throughout your entire layout.

How do locos run on track power?

That depends upon how you connect the loco module [3].

If you connect the input (red and black leads) to the track pick-ups, the loco can be powered by power from the track: DC or DCC. For the locos to operate properly, the track needs to be at full voltage at all times. The RailPro system includes a power module [4] that supplies enough power for a dozen or so HO gauge locos: 4 amps (56 watts). The track voltage from this module is about 14 volts.A member of a DCC club could have a RailPro system for their home layout and take their RailPro equipped loco and RailPro cab to their club and run. When configured to run via RailPro radio, the loco would be drawing power from the DCC track, but not responding to, nor interfering with, the DCC operation for the other locos.

Address conflicts wouldn’t matter, because the address information is being carried by each RailPro system for their assigned locos. Even if two members showed up with two RailPro locos running on the exact same number but on different systems, there would be no issue. The RailPro system is smart enough to keep them separate.

Currently, the RailPro loco modules will not respond to DCC. That will change soon, perhaps before this column gets published. Soon, the user will be able to select whether the loco module responds to RailPro radio signals or DCC and, if DCC, what address (1 to 9999).

RailPro locos getting their power from the track can suffer from intermittent operation due to power dropouts from things like dirty track, dead frogs, etc.

There is nothing magical about the system that will overcome these weaknesses in track work and wiring.

4. RailPro PWR-56 Power Supply module supplies track power (with short circuit protection) and a radio repeater. ***Ring Engineering photo***

How about battery power?

A secondary method of providing power to run the loco and the loco module is to use battery power (10 to 18 volts), applied to the red and black leads. Now the loco can be 100% dead rail or can run on active rails with any sort of power on them, if the track pickups are not connected to the motor or the

loco module. If the rail pickups are not connected, neither system cares what is running the other.

What about computer control?

Computer control is the thing that makes the RailPro system perk. New software and sounds are downloaded from their site to your system. Computer control makes the setup a breeze. An on-screen cab can control a RailPro loco.

To have computer control, your computer needs to speak RailPro radio.

This is accomplished with a module [5] that plugs into a USB port on your computer and talks to the RailPro radio network.

5. RailPro CI-1 computer interface module plugs into a computer USB port and talks to the network, allowing control or updates from the computer. ***Ring Engineering photo***

The RailPro software was written to be operating system independent. However, the current version available is designed for Windows machines. From what I learned, there might be an Apple OS X or iOS version in the future.

How about consisting?

Consisting, breaking up consists, hostling. Those are all part of operations. This is where RailPro really shines, much to my surprise. And they don't require any fancy, special cab to happen. The HC-2 or a computer will suffice.

Considering that speed matching under DCC is what drove Tim to create the system, one might expect it to be the center-point of operations.

For locos to run well in a consist, their throttle response needs to be pretty closely matched. At least that's the theory. Well, with RailPro, throw that theory out the window. There is a video on their web site (**ringengineering.com/RailProVideosPage.htm**) which shows two diesel locos running together. One is an Athearn FP series (120 + SMPH) loco and the other a Kato SD90 (80 SMPH) loco. The consist has the faster loco in the rear of the normal direction of operation. Except for a few seconds of motor calibration (done automatically), which should be done for any loco while being established on the system, nothing special was done before consisting. Following the steps detailed on the video, the locos ran just fine together.

How? Why?

The RailPro radio system is the reason. When the "go" command was issued from the cab, both locos began to move. Since the rear loco was starting to push the front loco, the front loco could tell the trailing loco to slow down until they were running well together.

RailPro allows the lead loco to use the radio network to throttle all the following locos independently so that the consist runs smoothly. Just like the prototypes do.

Finally, someone is offering an easy-to-consist system that allows virtually any loco to consist with any another without special speed matching.

Will the components become obsolete?

Yes, all electronics do. But . . . the RailPro is engineered to keep that wolf away from the door for as long as possible. As long as the hardware in a specific RailPro unit is capable of a new task, the software can be downloaded to adapt the hardware to it.

All software is downloadable from the Ring Engineering site to the various modules comprising the system. So, the end user can keep his RailPro products working with the latest software. And there is no programming track needed. The updates are all done by radio.

Since sounds are downloaded similarly, a loco module can have its “voice” changed at will, too. And much less expensively than the hardware for “loadable” DCC decoders.

How do I get started?

Ring Engineering has a starter kit [6], which includes a cab and a power supply with a power adapter and cord. This kit plus a loco module [3] (LM-3 - silent - or LM-3S - sound) will get you started with power on the rails, a cab, and a loco controller.

More economically, one can purchase a loco module [3] and the computer interface [5] and run trains from existing track power (DCC or DC at full voltage), using a cab on the screen of your computer. Yes, the computer can be a Windows tablet, as long as it has a USB port.

6. The RailPro starter kit. ***Ring Engineering photo***

Many folks who are in a DCC club, get an HC-2 [2] cab and a LM-3 or LM-3S [3], allowing them to run a loco on the club’s layout.

How sophisticated can it get?

The RailPro system has AM-1 series stationary decoders. These little guys have inputs for switches and outputs to control lights, LEDs, or motors. There is even an AM-1S [7] unit with sound. So, it would be possible to control the spout on a water tower with a motor and have the AM-1S match the motion with the sounds of filling a tender. You can even use your own photos for screen icons.

7. AM-1S auxiliary decoder with sound for sophisticated scenes. *Ring Engineering photo*

Advanced modelers with electronics talent might run their RailPro locos from a battery that is being charged from the track while the train is running.

As I discussed in my May 2017 column (**model-railroad-hobbyist.com/magazine/mrh2017-05/dcc-impulses**), an advanced installation might include a switch to select between track power and battery power. When married with the forthcoming RailPro or DCC choice in the decoder, the loco could run on:

- Track DCC
- Track DC with RailPro control
- Battery power with RailPro control

If folks are interested, I'll look at spending some time with the system and report from personal experience in a future column. Hopefully, this introduction will stir some creative juices amongst some of you.

Please share your ideas with us all. 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.

Until next month, I wish you green boards in all your endeavors.

