Model Railroad Hobbyist |

DCC IMPULSES

column

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First look at the Digitrax Evolution DCC system

Well, I'm back. After losing my father in October, family issues took priority over my column, so I missed writing for the November issue. Here we are heading into December and I'm back at the keyboard.

This year Digitrax made some fundamental changes in its flagship cabs and its DCC systems.

I reviewed the new top-of-the-line (DCS240) system box briefly in my September 2016 (**Tiny URL for** **model-railroad-hobbyist.com/magazine/mrh2016-09-sep/dcc-impulses**) column. This pricey box has a lot for big layouts: 400 cab capacity and a built-in computer USB interface.

In October,Digitrax announced a realignment of the Digitrax systems. The Zephyr Xtra (DCS51) system remains unchanged. The Empire Builder series of systems is discontinued, an event that I've been championing for about 15 years. Digitrax announced a new entry level 5-amp system, the Evolution [1], with a new DT500 cab [2], and a new DCS210 system box for it [3].

The Evolution has an amazing price of MSRP of $450 with a wired cab, or $660 for the duplex radio version. These are currently translating to street prices of $350 and $500, respectively.

The series of new high-end DT500 cabs will replace the DT400 series. The latest versions of the DT402 (rev 2) can be upgraded in your own home to the functionality of the DT500.

1. Digitrax Evolution starter system announced in October 2016. *Digitrax photo*

These new products have newer microprocessors and other updated components compared to their predecessors. In addition to allowing new features and controlling prices, updated components help with the availability of repair parts.

Simplex radio items are gone from the new Digitrax sales brochure. Digitrax systems are now only available with duplex radio. Infrared wireless is offered for countries where the duplex radio format is not authorized.

Digitrax supplied a new Evolution system for my evaluation. This column will be a quick look at the system. The hardware will then migrate to the Great Lakes Western (**Tiny URL for model-railroad-hobbyist.com/magazine/mrh2016-10-oct/great-lakes-western**) club layout for an extended evaluation, fodder for a future column.

2. The DT500 cab is part of the new Digitrax Evolution system.

Opening the box

At first look, the major difference between the Evolution and the predecessor Super Chief Xtra is the inclusion of a power supply. This makes the Evolution a complete “out of the box” 5-amp system.

3. The new DCS210 system box is the basis of Digitrax' Evolution system.

The included parts and pieces will be familiar to Digitrax users:

- DCS210 system box (command station / booster)
- PS615 DC power supply
- DT500 cab
- UP5 LocoNet universal panel
- 2-foot LocoNet cable
- LT1 LocoNet test kit
- Evolution manual
- Digitrax Decoder manual
- Digitrax system sales brochure

The DCS210 resembles historical Digitrax system boxes. The new box is sleek at 5.4 (w) x 4.6 (d) x 2.9 (h) inches. The unit is shorter and wider [4]

than the predecessor products, like the DCS100, which was 4.4 (w) x 4.6 (d) x 3.3 (h) inches.

The only readily apparent external difference between the DT400 series and the DT500 [2] series cabs is the number between the knobs. The keyboard is labeled identically on both.

4. The new DCS210 beside the predecessor DCS100.

The PS615 power supply, only available as a part of the Evolution system, has a detachable line cord. The one supplied with my system was for the North American standard socket. The input requirements for the PS615 are 100 to 240 volts AC, 50 to 60 Hz, making it compatible with power mains around the world with at most a change of line cord to support the local sockets.

With the PS615, the DCS210 in the HO mode will put about 14.7 volts DCC on the track. The PS615 plugs into the barrel connector on the front of the DCS210, for a quick plug-and-play 5-amp N or HO system.

What's new in the DCS210?

Let's look at the new or changed features.

Manual - The manual has been rewritten and is easier to understand than the Super Chief manual. It is not yet "Digitrax for Dummies," though. A lot of items that I believe should be indexed are not covered in the back of the manual.

Track voltage adjustment - The three-position track voltage switch is still on the front panel. The voltage selected by each of the three positions is adjustable, giving a complete range of track voltages from 9 to 24 volts. For track voltages above 15 volts or currents above 5 amps, the user must provide a separate DC power supply. The ideal voltage for this supply is about a volt above the desired track voltage. Default track voltages are: N = 12.4 V; HO = 14.7 V; O/G = 20.4 V.

8-amp system - No longer must we buy a different product to get the higher current booster. To unleash the 8-amp rating, rather than using the PS615 supply, just connect an appropriately sized DC power supply to the “8 A” connections on the 7-pin gray plug (observing polarity). Digitrax recommends their PS2012. See page 37 of the DCS210 manual for details.

Slots - The DCS210 will handle 100 cabs of any Digitrax vintage, controlling 100 locos. For comparison, the Super Chief series could work with a maximum of 120 if you changed an OpSw setting and the Empire Builder could only support 22.

No need to open the box - There is no internal battery for the user to replace. There is no need to open the box to change the internal computer code; it can be updated through the LocoNet.

Cab capabilities - The new DT500 series cabs will be needed to take full advantage of the DCS210 or DCS240 system boxes. Digitrax has stated that some of the new features will be accessible using older cabs, but haven’t elaborated as to what and how.

Loco Reset button - The DCS210 and DCS240 both have a “Loco Reset” button. As delivered, the button clears loco data, routes and consists out of the database, similarly to closing OpSw 39. A change of OpSw (OpSw 38 = c) will change the function of this button to setting the speed of the cleared locos to zero and shutting off all functions.

Easy Route (EZ RTS) button - This button makes it easy to set up the 64 internal routes (each with up to 16 turnouts).

All NMRA functions are refreshed - The DCS210 and DCS240 will refresh all 30 functions periodically. Older Digitrax systems only refreshed F0 through F8. "Refresh" means resending the status, for example "F12 on." Without refreshing, it is possible for something to get turned off while

running, necessitating manually turning a function off and then back on just to have it on.

"StealZap" feature - With the newer cabs (DT402 R2 or DT500) there is no need to dispatch locos to move them from one cab to another. When they are selected on a second cab, they are automatically removed from the first.

What's new in the DT500 cab?

The DT500 has an on / off switch capability built into the keyboard. Users don't need to flip batteries around anymore.

The DT500 has a longer battery life than the DT4xx series, due to an "advanced power save mode."

The DT500 series cabs can talk to the DCS240 system box on up to 400 slots when connected by cable or duplex radio.

While some things change, others remain the same.

Short addresses are in the range of 01 to 127. Long addresses are limited to 128 through 9983, with a caveat. Page 113 of the manual says: “Not all 4 digit addresses in this range are actually available for use.”

Support for non-decoder equipped locos is still available, where allowed by patent agreements. The DCS210 ships in the USA with this feature enabled. If desired, the user can disable the feature by setting OpSw 20 to “c.”

I still disagree on the wiring diagram for the programming track in the manual (on page 30) -- there is no isolation section. I discussed how I believe the programming track should be wired in my May 2014 column.

How does it play?

I spent a few hours with the Evolution before I wrote this missive. Here’s what I found.

The default settings bring the system box up with the power on and ready to run a loco, unlike prior units. Thank you, Digitrax.

The command beeps are quieter and less obnoxious than previously. Be aware that there are now short and long beeps and the messages being communicated may be different than what you are used to with prior Digitrax systems. You may want to copy the table on page 41 from the manual and post it in a conspicuous place near the command station until you become more familiar with the sounds coming out of it.

The colorful lights on the front of the DCS210 will tell you a lot about what's going on inside. The video I shot this summer [5] will help you understand. The table on page 42 defines their functions.

5. The DCS240 system box has the same lights as the DCS210, except that the DCS210 doesn't have the USB connector or (blue) light. Here is a video I shot of the lights on the DCS240. It is equally descriptive for the Evolution, just ignore the blue USB light. (https://youtu.be/TXRD0JwCSXY)

If you want to interface a computer with the DCS210, you will need an interface module, such as the Digitrax PR3 or a third-party box, like the RR-CirKits LocoBuffer-USB.

With a limited selection of resistors, I tested the power delivery capabilities of the DCS210 and the PS615. There was a slight drop in voltage as the current increased. I didn’t have the capability of pushing

the DCS210 any closer to its limit to see how the shutdown works. The HO setting is closer to the maximum voltage of the PS615. Thus, the voltage drop is larger than with the N setting, as would be expected.

6. Table of track voltage drop as current delivered increases. DCS210 with PS615 power supply.

DCS210 + PS615 Voltage vs. Current

HO setting			N setting	
Volts	Amps		Volts	Amps
14.6	0.00		12.4	0.00
14.4	0.68		12.4	0.58
13.6	3.31		12.1	2.93
13.5	3.90		12.0	3.47

Who should buy an Evolution system?

The Evolution system is stylish and has nice features. If you have a functional Super Chief system I see no reason to change unless you just gotta have the latest and greatest. However, if you are moving up to a 5-amp system or starting out in the Digitrax realm, the Evolution is a price-competitive system in the bulls-eye of the 5-amp system space.

If you are needing the full 8-amp capability or track voltages above 14.7 volts, then you will need an external DC power supply. In these cases, you may want to consider purchasing a DCS240 separately, rather than buying the Evolution set which includes a PS615 power supply that you won't be using. This is especially true if you will be using the computer USB interface functionality that is built into the DCS240.

What now?

The Evolution will take the place of the DCS100 that we are using on the PebbleCreek club layout. I'll report back along the way on what we see as we get to be better friends.

Please share your experiences and ideas. 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.

