



DCC Impulses Column

by Bruce Petrarca

A personal tour with Matthew Herman of ESU.

In my October 2013 column, I featured an interview with the folks from SoundTraxx. In that column, I offered equal time to other manufacturers who wanted to get their message out to MRH readers. ESU was the next to take me up on my offer. The offer still stands for other manufacturers.

Matt Herman was in the Southwest in early October, doing dealer training and customer clinics. I caught up with him when he was in the Phoenix area. We had breakfast and chatted. Later, I attended a user clinic he gave at Litchfield Station. Here is a look at the products from ESU with an eye to the future.

ESU (Electronic Solutions Ulm) GmbH & Co. is a Germany-based company who markets everything from locomotives to DCC command stations worldwide. Matt said they are likely the largest sound and DCC manufacturer in the world. In the North American market, they are best known for their decoders: LokSound and LokPilot (non-sound). FYI, LokSound is **not** pronounced LahkSound, but LōkSound with a long ō, like bōat.

Who is Matthew?

Matt's title is General Manager, ESU, LLC. As such, he serves the U. S. A., Canadian and Australian markets. He is, in fact, the spark plug behind the big steps that LokSound has made in North American style sound and operations.

A long-time modeler and rail fan, Matt worked for Bowser after he left the Marine Corps. At Bowser, he was responsible for the super-detailed Executive Line of locomotives, which fit with his nit-picky personality.

Matt introduced sound to Bowser, starting with LokSound. He then changed to SoundTraxx' Tsunami, feeling it was, at the time, a better fit for the super-detailed Executive Line locomotives, given the detail of its sound. His recent improvements in LokSound's sound has prompted Bowser to change back.

When Yvonne and Dennis Gapinski, the prior importers, retired in 2010, ESU approached Matt to take over the North American operations. The detail-oriented Marine and the German company make for an interesting combination. Matt wanted to bring his extreme interest in the minutia to the product line. I believe the modeler is the winner as a result of the give-and-take relationship between Matt and the factory.

1: Matt Herman, General Manager of ESU North America. ESU Photo

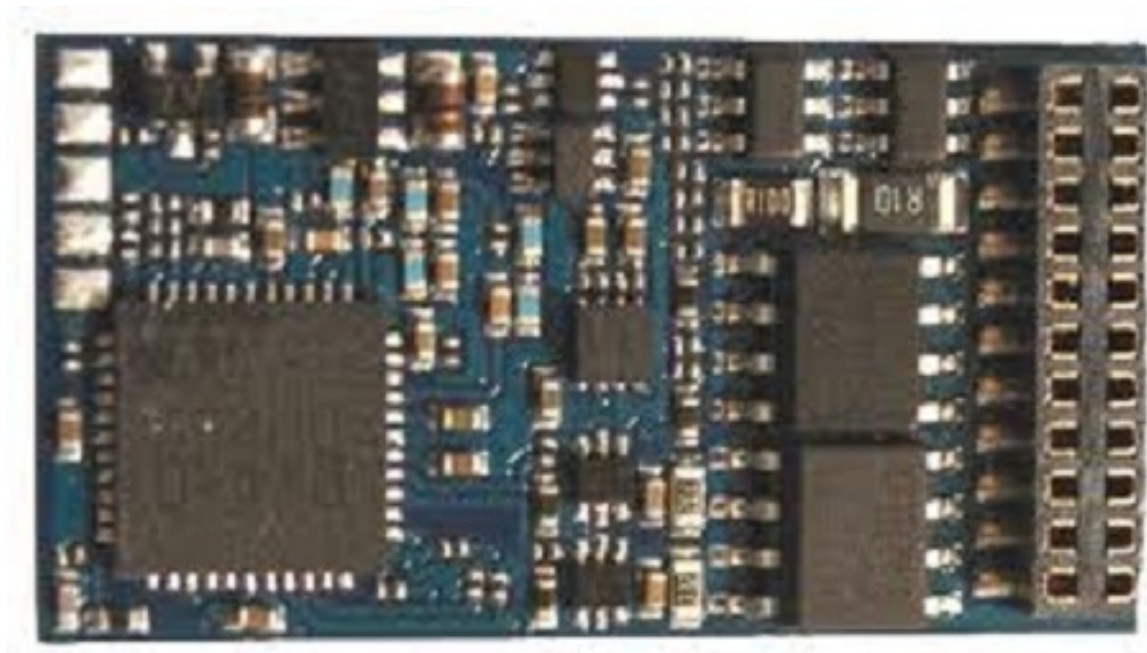


Matt states that his goal was to bring the best of all decoders together. This would provide the modeler a better product and encourage development and enhancement by other manufacturers. He has worked to create a product that has the sound quality of the Tsunami, with the motor control of TCS, and the robust horns of QSI. It is his goal to allow as much flexibility for the modeler as possible and give them the best of all features desired in today's market. ESU has labeled it: "LokSound...Sound Super-Detailed!"

ESU and locomotive manufacturers

You will be seeing LokSound (Select) decoders factory installed in lots of locomotives soon. Part of that shift relates to the improvements that Matt has pushed into the LokSound product (new recordings plus very sophisticated algorithms for sequencing sounds, motor and light operations). The hidden part is that ESU has significantly reduced the supply chain to the plants in China through a local warehouse with programming and repair capabilities.

2: LokSound Select 21MTC 21-pin decoder, used in OEM locos and available for end-users, too. ESU Photo



When Matt explained the details of the process, I realized that ESU is significantly reducing the inventory, shipping and handling costs to the loco manufacturers. Part of this savings relates to JIT (Just-in-time) delivery to loco factories in China. The factory in China can get next-day delivery on production releases and less than a week turnaround on warranty replacements.

One of the cost-saving elements of ESU's distribution method is that every manufacturer uses the exact same hardware. Every HO loco, for example, uses a LokSound Select 21-pin [2] decoder. This decoder just plugs into a mother board installed in the loco, making installation and repair a snap, or a plug actually.

Even though they use the same hardware, each manufacturer selects the sound and features and function mapping that personalize the decoder to their locomotive. ESU's warehouse bulk programs the decoders just before delivery to the loco factory.

Why do you care about who is putting what decoder into their locomotive? The modeler will be able to duplicate the sound and feel of a newly purchased LokSound-equipped locomotive in any LokSound Select decoder-equipped loco in their stable. It doesn't matter if the loco came from a different manufacturer or was originally a non-DCC loco that has had the decoder installed after the fact. All OEM sounds are available for free download on the LokSound website (www.LokSound.com). The end user or dealer can use a LokProgrammer to load the OEM sounds and settings to any LokSound Select decoder, even in a different size. ESU is not offering stripped down decoders to manufacturers to save a dollar or two.

Currently ESU is partnering with the following North American manufacturers.

- Atlas
- Bowser
- Fox Valley Models
- Hornby America (Rivarossi)
- InterMountain Railway
- Kato
- PBL
- Rapido Trains
- True Line Trains

The LokSound product line

LokSound has a decoder for (almost) every scale. They also have two programming types, both in many sizes. Within any programming type, the same program can be loaded in any form-factor decoder. Table [3] compares the different products.

The goal, however, is to have a very few different hardware items, allowing the dealer to customize hardware to the customer's need, rather than stocking tens of different, virtually identical, pieces of hardware with only software differences.

The LokSound Select line is designed for cost conscious users who want the features without the fuss. The sounds and other features are user-installable in the Select series. What this means is that the user or dealer can load a factory-designed file into the Select. If the exact file you want is not available for the Select, then you will want to look at the LokSound V4.0 product, where you can tweak to your heart's desire.

3: LokSound Decoder Features Summary

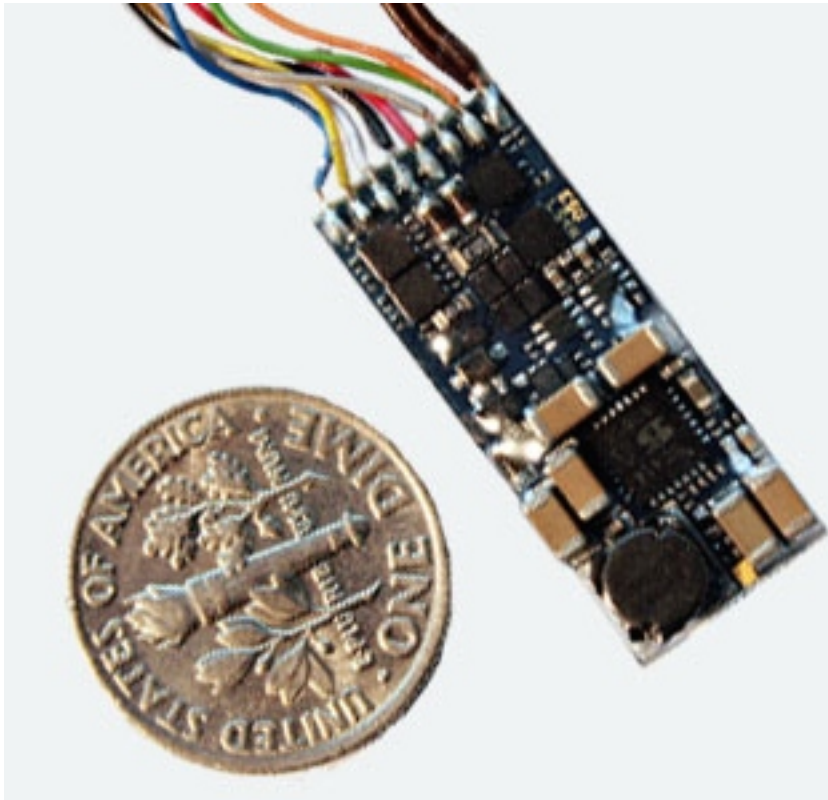
Family	LokSound Select			LokSound V4.0		
Model	Select	Micro	Direct	V4.0	Micro	XL
Target scale	HO	N	HO	HO	N	G
Size inches	1.18 x 0.59	0.98 x 0.42	2.72 x 0.67	1.18 x 0.59	0.98 x 0.42	1.57 x 2.00
Motor Amps	1.1	0.75	1.1	1.1	0.75	4.0
Functions	6 x 250 mA	4 x 150 mA	6 x 250 mA	6 x 250 mA	4 x 150 mA	12 x 500 mA
Speaker ohms	4 - 16	4 - 16	4 - 16	4 - 16	4 - 16	8 - 32 / 2 speakers
Programmability	User or dealer can load factory-defined sound files			Same as Select plus user or dealer can create and load custom files, too		
Connection	NEM-652 8-pin or 21MTC 21-pin	NEM-652 8-pin	wired board	NEM-652 8-pin or NEM-651 6-pin or 21MTC 21-pin or PluX12 12-pin or PluX16 16-pin	NEM-652 8-pin or NEM-651 6-pin or Next18 18-pin or PluZ12 12-pin	Screw terminals or pins
Supplied Speaker		16 x 25 mm with sound chamber		23 mm round	16 x 25 mm with sound chamber	
Format	DCC			DCC or Selectrix or Motorola		all V4.0 + LGB MZS serial

How do the LokSound decoders sound and operate?

All of the previous is meaningless unless you like the results. I've been away from the LokSound product for over 4 years, since I sold Litchfield Station. I'll admit that the LokSound was not my first choice back then. With the newer products coming out, it is time for me to rebook and rethink my position.

I was very favorably impressed with what Matt demonstrated in his clinic. The sounds in HO-scale locos are crisp and clear and well defined. Without getting into specifics of bits and sample rates, I will say that I was more than satisfied with all sounds, and I'm a picky person, sound wise.

4: LokSound Select Micro decoder, as was installed in the S2 that was demoed. ESU Photo



One loco he showed was an Atlas S2, which is one of my favorite sounding locos. I've installed Tsunamis in at least a dozen of them and run some of those on two layouts where I operate at least monthly.

His after-market installation of a LokSound Select Micro was measurably better in sound, motor control and ease of use than the units with Micro Tsunamis that I've used. That's a lot to

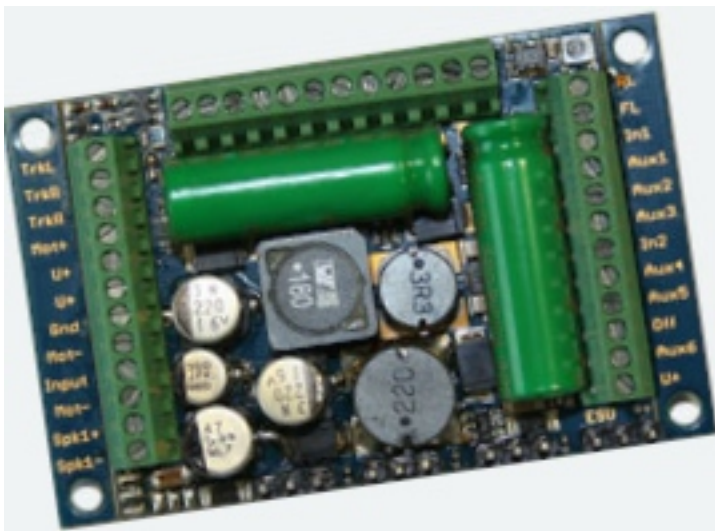
say. Matt explained the continuous nature of the throttle (Air Throttle) in the ALCO S-series locos and demonstrated the lack of notching in that sound file. This is important as not all locos have notched throttles. LokSound is working hard to make the sound files correct for specific locos in this regard.

Another loco that he demonstrated was an F40PH with accurate Head End Power sounds available when used in passenger service. With the HEP enabled, the motor ran at notch 6 (HEP Standby) or notch 8 (HEP Run) regardless of loco speed, as the prototype does.

While the specific examples that Matt demoed were interesting, it was his experience as a rail fan and comments about specific locomotive operation that seemed to impress the attendees most. For example, areas that we discussed included:

There are three basic types of bell (manual, air and electronic) with various sounds within the types. While the electronic version can sound like either of the other, depending upon what was recorded, there is one sonic difference. When you shut down an electronic bell it stops immediately, even in mid clang. The other two will fade out when either the air supply is interrupted or the operator stops pulling the cord. Matt reinforced that the appropriate type and sound would be included in any LokSound prefabbed sound file (for the Select) and all would be available to the tinkerer who "rolls his own" for the V4.0 decoders. He also showed how, for the first time, LokSound has made it possible for the E-Bell to play automatically when the horn was blown as is prototypical in many modern diesels.

5: LokSound V4.0 XL decoder for large-scale locos. ESU Photo



Another sonic aspect of prototype locos that is supported by LokSound is "smart start". Since I reside in the warm southwest, I was not aware of this operation. To save fuel (and, of course, reduce pollution and noise), modern locos will shut down after an extended period of idling. In cold climates, they will then automatically restart when they get too cool and run for a bit to heat things up. Changing a CV will allow a LokSound decoder to

emulate this feature or not, without having to put your model in the freezer. This feature is available in many of the current sound files, where appropriate.

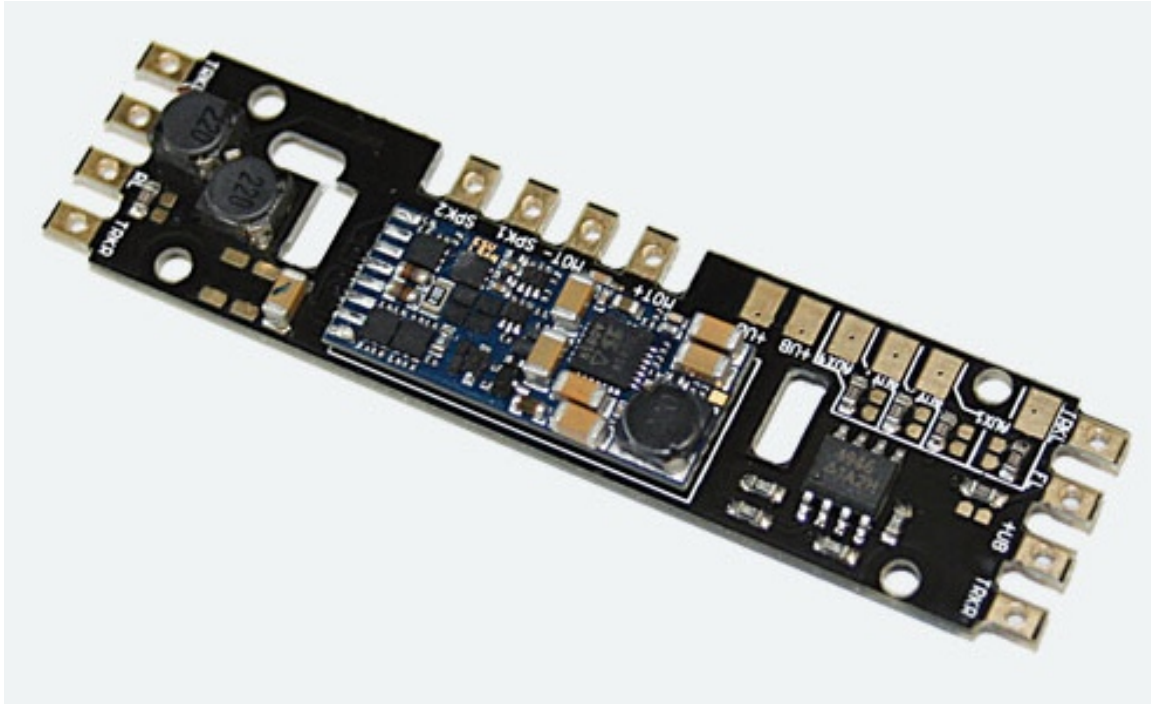
Matt pointed out that some locos don't change motor speed from the idle setting when going into run 1. In many cases notch 1 in a loco only engages the traction motors. He discussed and demonstrated locos programmed to start to run without increasing RPM and another that did. All this is user adjustable.

Another place where LokSound is working hard to emulate prototype performance is "coast mode". When you have been pulling hard and throttle back, the motor may drop to an idle, then bump up a few notches for a bit and then drop back to an idle, when running on the flat or downgrade.

Matt expressed his displeasure with decoders that do things on such a tight time schedule that you can predict when a sound is going to occur. He is justifiably proud of, for example, LokSound's "spitter" sound. There is a valve in the bottom of the air reservoir that pops off to vent condensed water from the tank. This distinctive sound

is pretty random on prototype locomotives. Recent LokSound decoders have as many as 13 different spitting sounds with random spacing between the sounds. The results, being totally unpredictable, are fun.

6: LokSound Select Direct HO-scale light board replacement decoder. ESU Photo



On the topic of energy storage, Matt was asked about ESU's response to TCS' Keep-Alive product. Matt explained that programming LokSound decoders with an attached energy storage device ran the gamut from problematic to impossible, depending upon what is being programmed and what hardware is doing it. ESU offers their "Power Pack" which is an intelligent energy storage device that, amongst other things, disconnects itself when the decoder is being programmed. To use a conventional unit, the installer should provide a method of disconnecting it (with a small switch) during programming.

The LokSound decoders have a playable horn. Not in the sense of the Digitrax version where you modulate your pressure on the F2 key to change the horn. No, this is not quite as exotic as that, but also doesn't require any specialized hardware. Varying how long you hold down the F2 key(or whatever key you have assigned to your horn), will give many different lengths of horn with a few different exit sounds. Thus, with a bit of experimentation, you can make some very interesting sounds. It is especially notable that LokSound decoders have eliminated the need for a short horn button as their method has this all built into the main horn button. As many throttles only give you easy access to about 10 buttons, this frees up one button for another use.

Function mapping can frustrate modelers. Multiple versions of what functions-are-where throughout a stable is no fun. LokSound allows any function to be mapped to any button. If you establish a standard set of sounds or effects for specific buttons throughout your stable, LokSound will be able to comply. This does lead to a lot of CVs needing to be programmed, but more on that later.

The myth of the LokProgrammer.

One of the biggest myths is that one must have a LokProgrammer to work with LokSound decoders. Nothing could be further from the truth.

7: LokProgrammer - you "get to" use it to change the sound or internal logic or upgrade the decoder. ESU Photo



You do not need a LokProgrammer to do any of the adjustments you can do normally with other decoders. If you want to change the sounds in your locomotive or tweak the logic that runs the sounds, or update your decoder firmware, you will need access to a LokProgrammer. Many dealers offer this service for free or for a small fee.

One can set up all the CVs, literally numbering in the thousands, with most any current DCC systems. ESU Decoders DO NOT need a programming booster. They use a more efficient power management system than other manufacturers. It does not require the sound amplifier to be powered during programming.

With the large quantity of CVs, it is nice to have someone else keeping track of things for you. The latest version of JMRI will seriously simplify keeping track of your CVs.

If you are going to do lot of fiddling or install a lot of LokSound decoders, then the programmer is a valuable addition. For example, with the LokProgrammer, all the CVs in a LokSound decoder can be read in less than a minute. With JMRI, it will take closer to 30 minutes.

Other ESU products

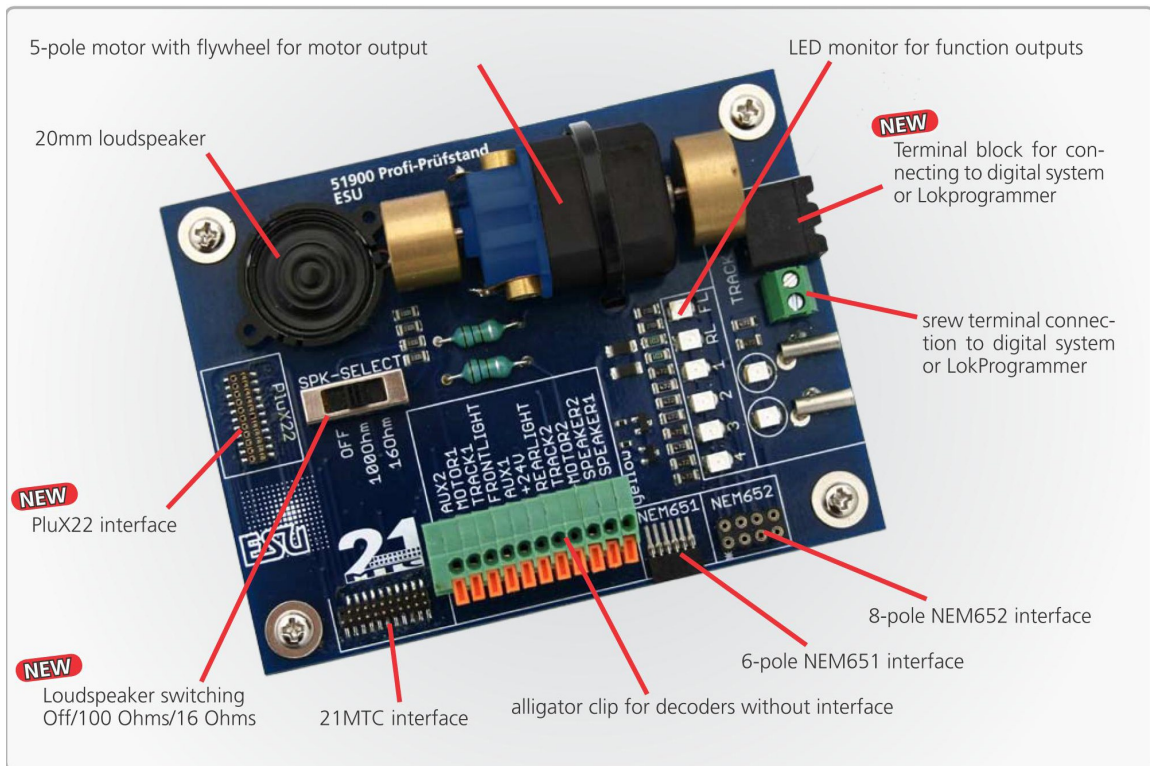
While they are known for decoders in the American market, ESU makes lots of things in the world of DCC. Most are sold in the USA.

8: ESU ECoS DCC System. ESU Photo



The ECoS DCC system, and its accessories, is one of the more inventive units out there with user definable loco names and even the ability to have a color photo of your loco when you select it. But that could be a column in itself.

9: ESU Decoder Tester. ESU Photo



The ESU decoder tester has been one of my favorites for years. Initially it had a motor, a 100-ohm speaker and LEDs on the board for decoder testing and set up. Now that LokSound decoders no longer use 100-ohm speakers, the tester allows switch selection between 100 and 16 ohms for compatibility with all decoders. There are 6 LEDs to show what's going on with all functions. There are connectors for every imaginable decoder and clip terminals for decoders with wires.

10: ESU BR151 German electric locomotive



In Europe, ESU sells their own line of locomotives. Matt demonstrated a German electric with amazing features. A few are:

- Pantographs that react to the loco direction and even bounce as they come out and contact the catenary.
- Amazing lighting effects including cab lights, dash lights, sparks from the drive motor and off the brakes when they are applied quickly.
- Flange squeal sounds that react to track conditions, like going through S-curves, and even frog thump in turnouts.

Space limitations prevent me from waxing poetic any longer on these items.

Coming soon

In the next few months, ESU will be unveiling some new products. Here are a few.

O-scale decoders

ESU will be providing OEM decoders to the Atlas O-scale locomotives soon. It is not hard to figure out that there is an end-user product here, capable of O-scale currents and yet easier to fit into an O-scale loco than the XL series is.

Adapter board

Matt saw a need to help customers use the 6 available outputs of the LokSound decoders in engines with the 9 Pin JST connectors. The Adaptor Board will be an interface to go between the 21MTC Select decoder and the 9 Pin JST connector. This board can take advantage of pre-supplied resistance for bulbs. Also, there is a 1.5 volt regulator on the board, for those folks who want to use these low-voltage bubs. There will be soldering pads on the adaptor boards for the functions beyond the four that come through the 9-pin JST connector.

Android throttle

Part of ESU's ECoS system is their Mobile Control throttle. A forthcoming update to their system will move that throttle into the Android realm, as the Mobile Control II.

I am excited about this event. This hardware plus some Android software, perhaps Engine Driver, will allow this throttle to operate any DCC system that will interface with JMRI.

This throttle features a motorized knob for the “feel” of a real throttle while supporting the features we have come to expect with smart phone throttles.

11: ESU Mobile Control II Android throttle. ESU photo



So there you have a walk down the path of where ESU has been and a look to where it is going. I hope you enjoyed the journey and will share your experiences on the MRH web site. Just click on the "Reader Feedback" logo at either the beginning or end of this column to go there. While you are there, feel free to register an "awesome" vote for this column if you found it helpful. Thanks.