



## Lenz Digital Plus DCC

Lenz Digital Plus DCC technology was offered to the NMRA as a basis for the NMRA DCC standard back in 1991. The Lenz technology was opened to all other manufacturers then and it remains the basis for all other systems on the market today.

It was, and remains, one of the best engineered and easiest to use of all DCC systems available. On the outside, the Lenz Digital Plus line has not changed much over the years. Inside, though, it has undergone continuous improvement with repeated upgrades of hardware, software and firmware over the years. Some units produced in the early 1990s are still in use by owners, both with and without upgrades.

The Lenz Digital Plus line of products offers 2 basic sets, the Set 100 and the Set 01, which consist of one controller and one integrated Command Centre/"Booster" unit.

The line also offers a range of very high quality, precision control-capable decoders, and modules that allow hands-on or computer controlled operation on a model railway.

Some of the capabilities of the Lenz System:

- Control of all 28 NMRA standard functions
- Internal stack capable of holding 256 different locomotive decoder addresses
- 5 Amp maximum current draw capacity (Ungradable to 10 Amp for large Scale)
- Up to 12 decoder addresses controllable from a single LH100 controller
- High quality, finely adjustable motive control decoders
- Digital Logic feedback capabilities (for enhanced, reliable automatic train control)
- Uninterruptible Power Supply module (for short-wheelbase locomotives or locomotives with poor power pickup)
- Railcom: Two way communication between decoders and the Command system
- Automatic Train control: Block Occupancy; Train Stop,/Hold /Release modules
- Control of Turnouts and Accessories from Hand-held Controllers and/or from Panels
- Layout extensibility: Extra power and Xpressnet control modules
- Computer/Model Railroad Interface, plus LAN/Layout connection, allowing Smart phones to be used as locomotive, etc. controllers

## **BASE SYSTEM COMPONENTS**

The **SET 100**, consists of one **LH100** handheld controller and one **LZV100** base module. The LH100 offers full operations and programming capabilities and permits control of all 28 NMRA functions on up to 12 different locomotives from the single controller. The LZV100 is an integrated Command and Power (“Booster”) unit that provides full programming and operations control, a power output of up to 5 Amps and a software adjustable range of output voltages from 11 to 22 volts,



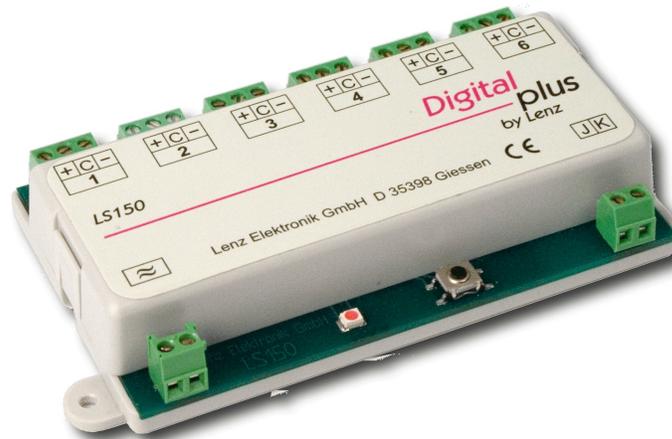
The **SET 01**, consists of an LH01 controller for operations and three function only and the same LZV100 integrated command centre and booster unit



## ACCESSORY/TURNOUT CONTROLS (1)

Two different Turnout Motor or accessory controllers are available:

The **LS150 Accessory Decoder** (p/n 11150) provides control for 6 different turnout motors or accessories.



The **LS100 Accessory Decoder** (p/n 11100) provides control for 4 different turnout motors or accessories, but it also provides feedback to the system's command circuitry and allows fully interactive control flexibility.



The **LA101 Adaptor** (p/n 11010) is available to convert the three terminal output of the LS100 to a two terminal output for decoders/accessories that use only two wire inputs.)

## ACCESSORY/TURNOUT CONTROLS (2)

The **LW150 Decoder** (p/n 25150) allows owners to control 16 Switch Machine/Accessory decoders or other accessories by means of panel switches or pushbuttons and also provides for a LED panel display of the way the turnout(s) accessories are set. (The addresses controlled are set in increments of 16.)



The **LY145 "Completion" set** (p/n 80145) provides 32 LEDs and an interface cable to connect the LW150 to a panel display or displays.



## **COMPUTER/MODEL RAILROAD INTERFACE**

The **LI-USB/LAN Computer interface** (p/n 23151) provides a USB interface for control of layout operation or decoder programming via a computer AND it allows owners to connect their layout to either their home LAN or a layout-dedicated LAN so that Smart phones and iPads and even some iPods may be used to control locomotives and other operation on the layout.



## **LAYOUT FEEDBACK (1)**

The **LR101 Feedback Encoder Module** (p/n 11201) allows information from a layout to be fed back to the command circuitry of the system, permitting fully or partially computerized operations as well as making specific layout information available to owners/operators in real time. The LR101 will handle inputs from 8 discrete devices, e.g., an LS100 or the LB101 Block Occupancy Detector.



## LAYOUT FEEDBACK (2)

The **LB101 Block Occupancy Detector** (p/n 11210) provides solid state detection of occupancy for 2 discrete layout blocks. It feeds information to the system command circuitry via the LR101.



## AUTOMATIC BRAKING AT BLOCK BOUNDARIES

The **BM 1 Braking Module** (p/n 22600) allows owners to set up a layout so that trains will STOP automatically at a block boundary when the block ahead is occupied, are HELD there until the block ahead becomes unoccupied and are then RELEASED automatically to proceed into the block ahead.

The **BM 2 Braking Module** (p/n 22610) does the same thing, but also will actuate block signals and/or panel display LEDs.

The **BM 3 Braking Module** (p/n 22620) does the same thing, but also will actuate block signals and/or panel display LEDs, and provide digital feedback to the Command system.

The **BM3K Braking Module** (p/n 22621) does the same thing as the BM3 but is specifically for use in reverse loop situations.



## FOR LARGER LAYOUTS AND LARGE SCALE LAYOUTS

The **LV102 Power Module** (p/n 22102) “Booster” provides extra power output for a large layout or for layouts running a large number of locomotives and regularly drawing over 5 Amps. It allows layouts to be divided into separate, discrete, power districts and to distribute current use more evenly. Each has a power output of up to 5 Amps and a software adjustable range of output voltages from 11 to 22 volts.



For large scale layouts that routinely draw over 5 Amps, using an LV102 wired in series with an LZV100 or another LV102 allows provision of up to 10 Amps in any given power district.

## LAYOUT CONTROL EXTENSIONS - THE XPRESSNET

For Layouts with more than one operator, the Xpressnet allows many controllers to feed into the Command system and control locomotives virtually simultaneously.

The LA152 Faceplate/Adapter (p/n 80152) extends the Xpressnet bus (layout control conduit) and allows owners to place connections to the Xpressnet at strategic locations around the layout. It comes with the adapter, a fascia mountable faceplate, and a 5 metre cable with RJ connectors for easy connection/expansion from one location to the next.



For really long Xpressnet busses, modules are available to boost power and signal transmission.

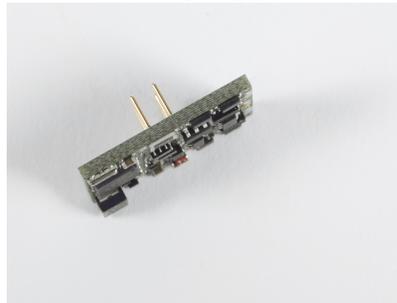
## **DECODERS (1)**

Lenz has produced three lines of decoders since the late 1990s: The Standard, the Silver and the Gold series. All provide the finest possible Motor control as well as having built in Railcom and ABC (Automatic Braking Control) technology.

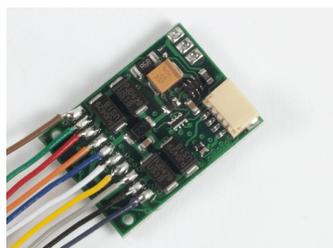
The **Standard+ Decoder** (p/n 10231) is a base decoder, providing 1.0 A current handling capability, four function outputs, and a wide range of lighting modes (Headlight, flashing, Mars, ditch, etc.) in a package size of 25,0 x 15,0 x 3,8 mm, with a fitted NMRA 8 pin plug..



The **Silver+** series of decoders, provides all the superlative motor control, ABC and Railcom capability of the Standard series and the same function and light modes, as well as the Uninterruptible Signal Processing technology (with the Power 1 module). It comes in various sizes, with a range of bespoke connection versions, from wires/NMRA 8 pin plug, to the NEM 21 pin plug, etc. The Silver Direct (p/n 10330-01) has the 8 pins of the NMRA-standard plug mounted right on its circuit board. The Silver + Mini (p/n 1-310-02 and 10311-02) is one of the smallest decoders available and will fit into virtually any small locomotive space available.



The Gold+ is the premier line of decoders, with all of the feature of the Silver and Standard, as well as having the capability of having a SUSI sound-only decoder connected directly to it. The Gold+ (p/n 10433-01) comes with wires and the NMRA 8-pin plugs . The Gold+ Mini (p/n 10410-01 and p/n 10411-01) is the smallest decoder available on the market.



## **DECODERS (2) - USP - Uninterruptible Signal Processing**

Lenz has had USP available since the late 1990s. The Power 1 module (p/n 10490), when connected to a Gold+ or Silver+ decoder, allows short wheelbase locomotives to continue to operate normally over dead spots in rail, dirty track, etc., without stopping, stuttering or needing a helping hand to get going again.



## **DECODERS (3) - “RAILCOM” Technology**

Railcom technology allows two-way communications between decoders and the command system. The applications of Railcom are limitless, depending only on the ingenuity and inventiveness of owners and programmers or application developers. These can be as simple as displaying the address of a locomotive/decoder occupying a block, to assigning maximum fuel or water levels in locomotives and stopping locomotives from operating when “empty”, to activating accessories when a specific locomotive approaches a location.

Lenz offers two Railcom modules.

The LRC100 (p/n 15205) allows the retrofitting of non-Railcom-capable decoders.



And:



The LRC120 (p/n 15106) is a digital display module that will show the decoder address of any locomotive occupying the block to which it is connected..

### **DECODERS (3) - Specific Decoder Listing**

10231-02	Standard+ Decoder V2, 1,0A, with NEM 652 plug (8-Pin NMRA Std.) Size: 25,0 x 15,0 x 3,8 mm
10310-02	Silver+ mini Decoder 0.5 / 0.8A, with wires Size: 11,5 x 7,5 x 2,6 mm
10311-02	Silver+ mini Decoder 0.5 / 0.8A, with NEM 651 plug (6-Pin NMRA Std.) Size: 13 x 7,5 x 2,6 mm
10312-01	Silver+ PluX-12, Decoder NEM 653 interface Size: 11 x 20 x 4 mm.
10318-01	Silver + Next18, Decoder NEM 662 interface Size: 15 x 9,5 x 2,9 mm.
10321-01	Silver+ 21+ Decoder 1.0 / 1.8A, with 21-pin socket Size: 20,5 x 15,5 x 3,92 mm
10322-01	Silver+PluX22, Decoder NEM658 interface Size: 22 x 15 x 6 mm.
10330-01	Silver+ Direct+ Decoder 1.0 / 1.8A, with NEM 652 plug (8-Pin NMRA Std.) Mounted directly on the decoder's pcboard Size: 19 x 13 x 3,35 mm
10410-01	Gold+ mini Decoder 0.5 / 0.8A, with wires only Size: 19 x 13 x 3,35 mm
10411-01	Gold+ mini Decoder 0.5 / 0.8A, with NEM 651 plug (6-Pin NMRA Std.) Size: 19 x 13 x 3,35 mm
10433-01	Gold+ Decoder 1.0 / 1.8A. with NEM 652 plug (8-Pin NMRA Std.) Size: 19 x 13 x 3,35 mm
10490	POWER 1, USP Power module for Gold decoder Size: 22 x 13,3 x 9,4 mm

(Photos on Page 8 above are approximate size)