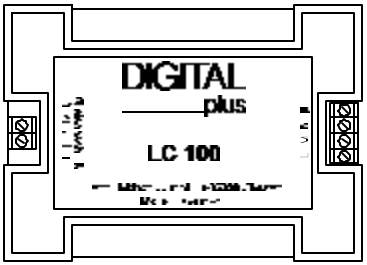

The **X**press**NET** DCC Converter LC100 connects input devices from other manufacturer's NMRA DCC systems with any **X**press**NET** based system. This allows reuse or expansion of other systems with DIGITAL plus.

Any devices that send the standard NMRA DCC format to the track can be connected to the LC100.

LC100
Xpress**NET DCC Converter**

Art. No. 24100
Revised 4/00

Digital plus by Lenz ™

Submitted to the NMRA for C&I testing

The function of the LC100 **X**press**NET** DCC Converter

The LC100 "listens" to the track output of the other digital system. DCC commands that would normally be send over the track to your engines and turnouts are instead sent to the LC100. The LC100 looks for changes in the data received, and sends those to the command station that is conected to the **X**press**NET**. The communication is strictly one way, no information can be send back to the 'foreign' digital system.

The advantage of this set up is that you can use any input device as a Cab on your **X**press**NET** based system as long as it uses the standardized NMRA DCC track signal.

For example, you will be able to use a dispatchers panel built from switchboards to set your turnouts, or you could set complex routings through the interface.

Xpress**NET-address**

The LC100 is fixed to the **X**press**NET**-address 30. Therefore, no other device connected to the **X**press**NET** can use the same address. You might have to change the address on your LH100 or LH200 Handheld, your Tower Cab (LW100) or on the Computer Interface (LI100). The procedure is described in the appropriate manuals.

If you need to use 2 LC100 units, they have to be programmed to different addresses. Please contact LENZ for further advice.

Connecting the LC100 to a "foreign" DCC System

The connections to the LC100 are always according to the same principle, independent of the other digital device:

The terminals that connect the other digital system to the tracks is connected to the screw terminals labeled "Gleisanschluß central unit=" on the LC100, as illistrated in figures 1 and 2.

Please switch off the supply voltage to the digital system before connecting to the LC100. (Disconnect the power lines from the wall plug)!

Connecting the LC100 to **X**press**NET**

The terminal connecting the LC100 to the **X**press**NET** is located on the right hand side of the unit. Please connect the four poles (L, M, A, B) on this screw terminal with the identical terminals on the Command Station LZ100 or LA152, or using an **X**press**NET** **X**press**NET** port on your system

The connection does not need to be directly to the Command Station, but can be done at any point on the **X**press**NET**, for example at a connector plate LA150/151. As always, when wiring an **X**press**NET** extension, the cables L and M and the cables A and B have to be laid out as a twisted pair.

Now you can reconnect the supply voltage to your **X**press**NET** based system and also to the other digital system.

Using ROCO and LGB Digital

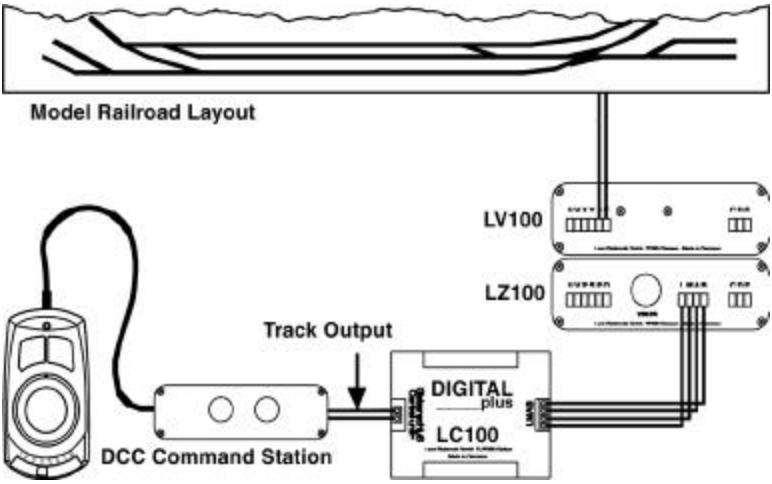

Figure 1 Connecting the LC100 to a ROCO "Digital is Cool" or LGB "Multi Train Control" DCC System

Controlling locomotives

The locomotives using the addresses 1 to 8 can be moved as usual with the 'loco mouse'. If the desired locomotive is not selected by another 'loco mouse', you will have immediate command over the selected locomotive. This might result in sudden changes in speed and direction of travel.

If you select an address that is already selected on a LH100 Handheld, the display on this Handheld will start to blink.

You can control the locomotives at addresses 1 to 8 from the 'loco mouse'.

Please select the modus '8 Digitalloks' on the LGB central unit, since the information for a conventional engine cannot be send from the LC100 to the LZ100.

If you want to control a locomotive with an address higher than 8, you can consist this locomotive to an address between 1 and 8 and then control it from the LGB or ROCO system.

Emergency Stop

Triggering an emergency stop on the 'loco mouse' leads to a shut down of track voltage on the connected DIGITAL plus System. The LED's on the 'loco mouse' will start to blink, and a message is posted on the Handheld LH100.

Pressing the emergency stop on the 'loco mouse' again will release the 'Emergency Stop' condition.

Information about an emergency stop triggered from the DIGITAL plus system, a short circuit on the layout or too high a power draw is not send to the 'loco mouse', therefore the LED's will not start to blink.

Using Arnold and Märklin Digital=

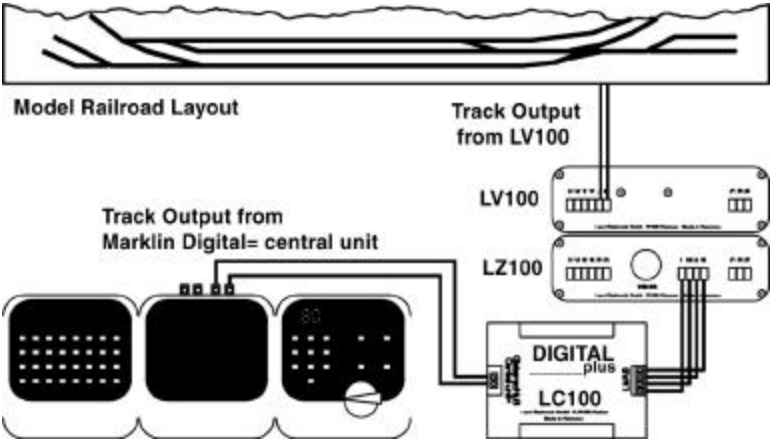

Figure 2 Connecting the Arnold or Marklin Digital= system to the LC100

Controlling locomotives

As usual, the desired locomotive address is entered on the control 80(f). Control of the engine is transferred immediately, therefore the speed and direction information is send instantaneously to the engine. This may lead to sudden changes

in speed and direction, as the settings for speed and direction are stored in the central unit=. A change in direction on a LH100 Handheld is not send to the central unit=. Similarly, none of the auxiliary function settings are send from the LH100 Handheld to the central unit=. Therefore, the headlights on an engine might shut off when the engine is called up from the control 80(f).

If desired unit is already under control of another control 80(f), the display panel will be blinking. There is no information send to a control 80(f) if the locomotive address is already dialed in on a Handheld LH100. Instead, the display on the LH100 Handheld starts blinking.

A control 80 can control locomotive addresses from 01 to 80, a control 80(f) from 01 to 99.

Please use the mode "analog off", since control information for a conventional engine cannot be transferred from the LC100 to the LZ100.

Setting turnouts:

Turnouts are set as usual either by pressing the push button on the keyboard or, for a route, on the memory unit. The LED on the keyboard is switched on or off, but the indication might not be the same as the real setting of the turnout. The turnout might have been set from a DIGITAL plus Handheld or the LW100, and this information is not fed back to the central unit=.

STOP and GO:

Pressing the red control button on the control 80(f) switches off the power to the entire layout, and the red LED on the central unit goes off. This is equivalent to the emergency off "NOTAUS" or off "AUS" states in the DIGITAL plus system. This modus will be indicated on the LH100 Handheld (depending on the software revision of the Handheld as "NOTAUS' or "AUS").

Pressing the "GO" button switches the power back on, and the indication is erased from the Handheld. The emergency off condition can also be annulled from the Handheld LH100 (see the manual for the LH100).

The central unit= will not know if a NOTAUS or NOTHALT is triggered in the DIGITAL plus system. The LED on the central unit= stays on. If you want to remove the emergency condition from the control 80(f), you have to press first the 'stop' and then the 'go' button on the control 80(f).

Connecting the LC100 to other NMRA DCC systems

The LC100 can be used to connect any NMRA DCC system to the DIGITAL plus **X**press**NET**. Simply connect the track output of the remote DCC system to the input for the LC100 as shown in figures 1 and 2.

One word of caution. The LC100 currently can only translate speed and direction commands, function commands, and switch machine commands. It can not translate programming commands or advanced commands such as consist setup, or 128 speed step commands.

NMRA DCC Commands Supported

The following NMRA DCC commands are currently supported by the LC100.

Locomotive Addresses	1-99
14 Speed Step Speed and Direction Commands	14 speed step on of "foreign" system will be converted to the current locomotive speed step setting on the **X**press**Net** system
Function Group 1	1-4
Accessory Addresses	1-64
Emergency Stop	If the "foreign" system stops sending packets the LC100 will consider this an emergency stop indication.

Warranty

Lenz GmbH does everything it can do to ensure that its products are free from defects and will operate for the life of your model railroad equipment. From time to time even the best-engineered products fail either due to a faulty part or from accidental mistakes in installation. To protect your investment in Digital Plus products. Lenz GmbH offers a very aggressive 10 year Limited Warranty.

This warranty is not valid if the user has altered, intentionally misused the Digital Plus product, or removed the product's protection, for example the heat shrink from decoders and other devices. In this case a service charge will be applied for all repairs or replacements. Should the user desire to alter a Digital Plus Product, they should contact Lenz GmbH for prior authorization.

Year One: A full repair or replacement will be provided to the original purchaser for any item that that has failed due to manufacturer defects or failures caused by accidental user installation problems. Should the item no longer be produced and the item is not repairable, a similar item will be substituted at the manufacturers discretion. The user must pay for shipping to an authorized Lenz GmbH warranty center.

Year 2 and 3: A full replacement for any item will be provided that has failed due to manufacturer defects. If accidental user installation or use caused the failure, a minimal service charge may be imposed. Should the item no longer be produced and the item is not repairable, a similar item will be substituted at the manufacturers discretion. The user must pay shipping to and from the authorized Lenz GmbH warranty center during this portion of the warranty period.

Year 4-10: A minimal service charge will be placed on each item that has failed due to manufacturer defects and/or accidental user installation problems. Should the item no longer be produced and the item is not repairable, a similar item will be substituted at the manufacturers discretion. The user must pay shipping to and from the authorized Lenz GmbH warranty center during this portion of the warranty period.

Please contact your dealer or authorized Lenz GmbH warranty center for specific instructions and current service charges prior to returning any equipment for repair

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This equipment complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CE Please save this manual for future reference!