The LF100XF is a four-function ultra-thin decoder suitable for all scales from Z-Large Scale. Multiple LF100XFs can be combined with a locomotive decoder to provide support to a wide variety of functions.

- Four on/off function outputs with a current rating of 150 mA each.
- Special lighting effects including directional, independent, dimming, Mars light, Gyro light, single Strobe, double Strobe, adjustable blinking and ditchlights
- Can be configured to support for all 13 NMRA DCC functions
- special electronics for sophisticated direction dependent lighting
- Support for Advanced Consist Control and Extended Addressing
- Support for operations mode programming
- Support for all forms of programming as described in NMRA RP-9.2.3

Size: L 0.95" x W 0.47"x H 0.1" L 24.1mm x W 12mm x H 2.6mm

# LF100XF Function Decoder

Art. No. 10104
Revised 11/01

Digital plus by Lenz TM

Submitted for formal NMRA C&I testing

**Important safety instructions**

The function decoder LF100XF is designed for use with Lenz DIGITAL plus or other standard NMRA DCC conforming systems.

Make sure that the maximum current-load does nor exceed the maximum current-carrying capacity of the decoder outputs. Exceeding these limits will destroy the decoder!

The parts of the locomotive function decoder must not touch the metal components of the chassis or the body of the locomotive. This would cause a short-circuit within the locomotive decoder which would destroy it.

**Never wrap the decoder in insulating tape** as this will prevent the necessary air circulation around the decoder. Instead, put insulating tape or something similar around the metal components in the vehicle. By doing so you can avoid unintentional short-circuits without depriving the decoder of air. The heat-shrink sleeve installed at the factory is to protect components which are sensitive to contact and therefore it is not to be removed. Use double-sided tape to affix the decoder.

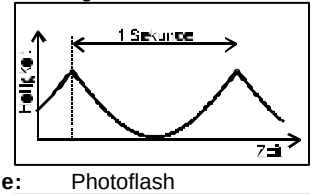
## Features of the function decoder LF100XF

The LF100XF is used to control functions in locomotives or coaches. Typical applications include the switching of lights in coaches; to control the headlight, ditch lights and cab light in the control cab in push pull operations; or as a second decoder for the purpose of controlling more functions. The LF100XF has a special drive for operating cab vehicles which are equipped with diodes. Furthermore, the LF100XF has numerous lighting effects:

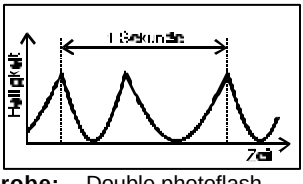
**Dimming:** Setting the brightness of bulbs or luminous diodes.

**Flashing:** Individual outputs or alternating flashing with 2 outputs (Ditch light), the flashing frequency can be set.

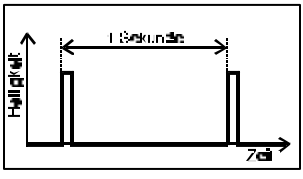
**Marslight:** Rising and fading of light, 1x:



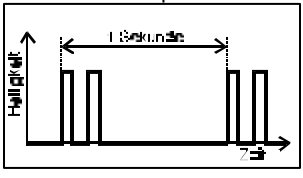

**Gyrolight:** Rising and fading of light, 2x:




**Strobe:** Photoflash




**Double strobe:** Double photoflash



### Allocation of functions:

The individual outputs A, B, C and D can each be configured with a wealth of features to support to the various functions of the Digital System. This configuration is carried out by programming the CVs. Please refer to the section "Programming the function decoder LF100XF." A summary of the features follows:

| | |
|---|---|
| **Output A:** | - direction-dependent function (alternating with output B), dimming, and dimming with a set brightness.<br>- on/off function using F0, dimming, dimming with a set brightness, and 4 additional special lighting effects.<br>- on/off function configured using any function in the range of F4 - F12 |
| **Output B:** | - direction-dependent function (alternating with output A), dimming, and dimming with a set brightness..<br>- on/off function using F1, dimming, dimming with a set brightness, and 4 additional special lighting effects.<br>- on/off function configured using any function in the range of F4 - F12 |
| **Output C, D:** | - on/off function configured using any function in the range of F1 - F8, blinking operation possible with variable flashing frequency, and optional ditch light control |

The settings of the outputs A and B are independent of the settings of the outputs C and D. Therefore, each of the settings for the outputs A and B can be combined with any setting for outputs C and D.

### Technical data:

| | |
|---|---|
| Total current-carrying capacity: | 0.4 A (400mA) |
| Current-carrying capacity of the outputs: | |
| Output A, B | 150 mA |
| Output C, D | 300 mA |
| Locomotive addresses which can be set: | 1 - 9999 |

Each function output can be connected to external low cost relays. Connected relays do not need free-wheel diodes as they are integrated in the LF100XF.

## Installing the LF100XF

The LF100XF has a total of 7 connecting wires:

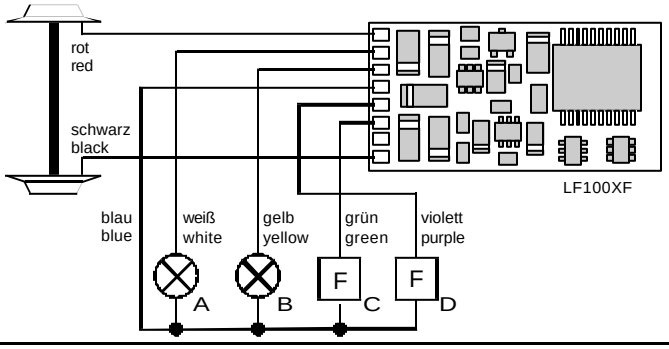
| Wire color | Function |
|---|---|
| Red | Track connection 1 |
| Black | Track connection 2 |
| Blue | Common positive connection for the functions |

| Wire color | Function |
|---|---|
| White | Function output A |
| Yellow | Function output B |
| Green | Function output C |
| Purple | Function output D |

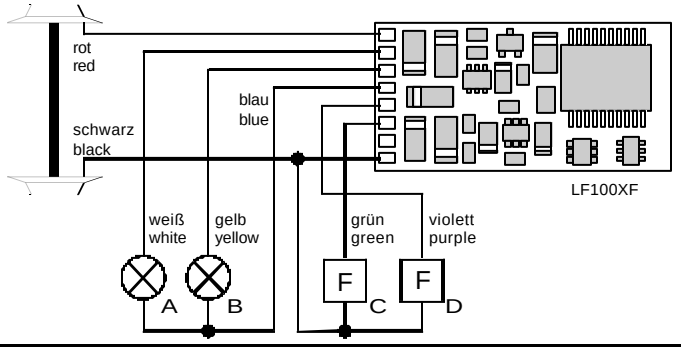
## Optional wiring techniques

Each individual function is connected using the same principle: connect the desired function output to one pole of the function, connect the other pole to the decoder's blue wire. Functions C and D can alternatively be connected to one of the track connections (red / black). If a function is polarity sensitive (such as a LED), please make sure that the function output is connected to the negative pole and that the blue cable is connected to the positive pole.

You can install several LF100XFs in the same locomotive to work in combination with the locomotive decoder or install the LF100FX by itself in a piece of rolling stock that does not need motor control. If you install multiple decoders in the same locomotive, you will have to make sure that you can program the decoders independently and you might have to carry out the programming before installation. This figure shows the basic connection of the functions to the LF100XF. Here, all functions are connected to the blue cable:




In this figure the functions at the outputs D and C are connected to a track connection. **Outputs A and B must use the blue common.**



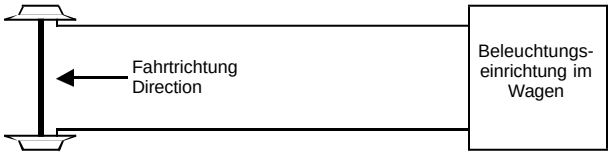

## Controlling sophisticated direction-dependent functions

Some models have sophisticated direction-dependent lighting which are designed so that the direction-dependent switchover of the lighting (white/ red) in analogue mode is performed automatically via the respect to the applied track polarity. For example, depending on the polarity, the white or red marker light is switched on: When the positive pole is located on the right rail (forward direction), the white light is switched on, if the negative pole is located on the right rail (reverse direction) the red light is switched on.

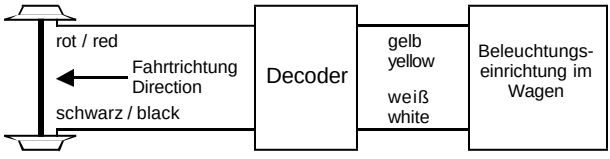
In order to make the conversion of these types of functions particularly easy, outputs A and B of the LF100XF were designed so that you can control the

polarity of functions connected to their outputs. The direction sensitive electronics use outputs A and B using the wiring illustrated in the following diagrams. Outputs C and D are then available for further functions, e.g. the internal lighting of the coach.

Elementary circuit of the direction sensitive electronics before conversion:




Elementary circuit of the of the direction sensitive electronics after conversion:




# Programming the function decoder LF100XF

The LF100XF supports all NMRA DCC programming modes and can be programmed by any NMRA DCC programmer. With some entry level systems only a few CVs (such as CV #1, the locomotive address) can be set unless you use a separate programmer. Specific details for reading and writing the decoder's configuration variables can be found in the manuals of the appropriate equipment used for programming.

If the power consumption of the connected functions is very low, some programmers will have difficulty detecting the acknowledgement of the decoder. If this is the case, you will receive an error message from the system (e.g.: "Err 02" on the LH100 display). You can ignore this error message for individual write operations as individual write operations will still take place.

## The configuration variables and their meaning

The following table lists the various CVs supported in the LF100XF decoder. Both the NMRA DCC CV numbers and the older Register numbers are provided for cross reference.

*Please note: Some CVs (such as CV29) have specific meanings for each bit. The bit assignments in this table use a bit numbering scheme of 0-7 to correspond the NMRA convention for universal bit numbering. Many handhelds (such as the DIGITAL plus LH100 handheld) use a scheme of 1-8 to refer to the individual bits rather than 0-7. (Bit 0 in this table is displayed as a"1" on LH100 handheld, Bit 1 is identified as "2".) The bit numbers in* ***()*** *within these tables contain the LH100 bit numbers.*

**Table 1: LF100XF Configuration Variables**

| CV | Reg | Description | Range | Factory setting |
|---|---|---|---|---|
| **1** | **1** | **Function decoder address:**<br>This is the number with which you select a locomotive (or rolling stock with decoder) in the DIGITAL plus system. Setting the address from #1 to #3 using register mode will reset the decoder to utilize 14 speed step operation. | 1-127 | 3 |
| - | **5** | **Contains CV29 (see CV29 below)** | 0-55 | 6 |
| - | **6** | **Page/Pointer Register:**<br>Normally this CV is not modified directly by a user. For correct operation, this CV should be set to have a value of 1 after any use. | 0-127 | 1 |
| **7** | **7** | **Version Number:**<br>This location stores the version number of the decoder. This location is read only. | - | 10 |
| **8** | **8** | **Manufacturers Identification:**<br>Contains the manufacturer ID of the decoder, (Lenz =99). Writing a value of 33 using Register mode resets all CVs to their factory condition | - | 99 |
| **17** | - | **Extended Address High Byte** | 192-231 | 0 |
| **18** | - | **Extended Address Low Byte**<br>The two byte address if used is contained in CV17+18 | 0-255 | 0 |
| **19** | - | **Consist Address**<br>The advanced consist address if used is stored in CV19 | 0-255 | 0 |
| **29** | **5** | **Decoder Configuration, Byte 1:**<br>Several decoder properties are set with this byte. The detailed properties are: | 0-63 | 2 |
| | | bit 0 (1) **Function decoder direction:**<br>Locomotive's relative direction: Sets the direction for the forward directional headlight<br>0 = locomotive's direction is normal<br>1 = locomotive's direction is reversed | 0,1 | 0 [1] |
| | | bit 1 (2) **Headlight mode:**<br>0 = Directional headlights work with 14 or 27 speed step modes. If the headlights turn on and off as the speed is increased, the command station is configured for 28 speed step mode, and the decoder is in 14 speed step mode.<br>1 = Directional headlights work with 28, 55 or 128 speed steps modes. | 0,1 | 1 [2] |

**Note: in the factory setting field the numbers in the [ ] are decimal.

| CV | Description | | Range | Setting |
|---|---|---|---|---|
| **29** | **CV29 Continued** | | | |
| | bit 2 (3) | **DC mode Conversion**<br>If enabled the functions that are on it digital mode will remain on in analog mode as long as power is maintained. | 01 | 0 |
| | bits 3-4 (4-5) | **not used** | 0,1 | 0 |
| | bit 5<br>(6) | **Extended Addressing**<br>0= Normal addressing<br>1= Four digit extended addressing | 0-1 | 0<br>[32] |
| | bit 6,7 (7,8) | **not used always 0** | 0 | 0 |
| **38 to 46** | **Allocation of outputs A and B to the functions F4 to F12**. The allocation is carried out in accordance with the following table: | | | 0 |

| | F 4 | F 5 | F 6 | F 7 | F 8 | F 9 | F 10 | F 11 | F 12 |
|---|---|---|---|---|---|---|---|---|---|
| Output **A** | **38**/5(6)<br>32 | **39**/5(6)<br>32 | **40**/5(6)<br>32 | **41**/5(6)<br>32 | **42**/5(6)<br>32 | **43**/2(3)<br>4 | **44**/2(3)<br>4 | **45**/2(3)<br>4 | **46**/2(3)<br>4 |
| Output **B** | **38**/6(7)<br>64 | **39**/6(7)<br>64 | **40**/6(7)<br>64 | **41**/6(7)<br>64 | **42**/6(7)<br>64 | **43**/3(4)<br>8 | **44**/3(4)<br>8 | **45**/3(4)<br>8 | **46**/3(4)<br>8 |

The number in bold preceding the slash indicated the CV, the number after the slash states the bit number {0-7} or (1-8) which is to be set in the CV. The number on the second line is the decimal equivalent for that bit. If multiple bits need to be set add the decimal equivalents together. For example:

Output A is set to react to F8: Bit 5 (6) should be set in CV41.
Output B is set to react to F12: Bit 3 (4) should be set in CV46.

If a bit is set in any of these CVs, the other settings for both outputs A and B (using CV51-CV52 and CV57-CV58) are ignored.

| | | | | |
|---|---|---|---|---|
| **51** | **Lighting Special Effects for Outputs A** | | 0-255 | 0 |
| | bit 0<br>(1) | 0 = the headlights (A&B) are directional.<br>1 = the lights (A&B) are independent per Rule 17. F0 controls the front headlight and F1 the rear headlight or a separate function. | 0,1 | 0<br>[1] |
| | bit 1<br>(2) | Only active if dimming (bit 2 (3)) is set to a value of 1. The value in CV52 is used for dimming.<br>0 = function A output is always dimmed<br>1 = If directional F1 is used for dimming, if independent F4 is used for dimming | 0,1 | 0<br>[2] |
| | bit 2 (3) | Output A can be dimmed | 0,1 | 0 [4] |
| Bits 3-7 are only active for independent lighting. If more than one bit is set, only the higher bit is active. If a bit is set dimming is inactive. | | | | |
| | bit 3(4) | Not used | 0,1 | 0 [8] |
| | bit 4 (5) | Output A is a Gyrolight | | 0 [16] |
| | bit 5 (6) | Output A is a Mars light | | 0 [32] |
| | bit 6 (7) | Output A is a Single Strobe | | 0 [64] |
| | bit 7 (8) | Output A is a Double Strobe | | 0 [128] |

| CV | Description | | Range | Setting |
|---|---|---|---|---|
| **52** | **Dimming CV for Output A** - contains the value used for dimming. 0 is dark 255 is max brightness | | 0-255 | 64 |
| **53** | **Lighting Special Effects for Outputs C and D** | | 0-7 | 0 |
| | bit 0 (1) | 1 = Output C blinks with the frequency set in CV56 | 0,1 | 0 [1] |
| | bit 1 (2) | 1 = Output D blinks with the frequency set in CV56 | 0,1 | 0 [2] |
| | bit 2 (3) | 1= Outputs C and D act as Ditch Lights. CV55 controls which function turns on both ditch lights and CV54 controls which function activates the alternating blinking. | 0,1 | 0 [4] |
| **54** | **Function assignment for Output C** | | 0-255 | 1 |
| | bit 0 (1) | 1 = Output C is controlled By F1 | 0,1 | 1 [1] |
| | bit 1 (2) | 1 = Output C is controlled By F2 | 0,1 | 0 [2] |
| | bit 2 (3) | 1 = Output C is controlled By F3 | 0,1 | 0 [4] |
| | bit 3 (4) | 1 = Output C is controlled By F4 | 0,1 | 0 [8] |
| | bit 4 (5) | 1 = Output C is controlled By F5 | 0,1 | 0 [16] |
| | bit 5 (6) | 1 = Output C is controlled By F6 | 0,1 | 0 [32] |
| | bit 6 (7) | 1 = Output C is controlled By F7 | 0,1 | 0 [64] |
| | bit 7 (8) | 1 = Output C is controlled By F8 | 0,1 | 0 [128] |
| **55** | **Function assignment for Output D** | | 0-255 | 2 |
| | bit 0 (1) | 1 = Output D is controlled By F1 | 0,1 | 1 [1] |
| | bit 1 (2) | 1 = Output D is controlled By F2 | 0,1 | 0 [2] |
| | bit 2 (3) | 1 = Output D is controlled By F3 | 0,1 | 0 [4] |
| | bit 3 (4) | 1 = Output D is controlled By F4 | 0,1 | 0 [8] |
| **55** | **Function assignment for Output D (Cont)** | | | |
| | bit 4 (5) | 1 = Output D is controlled By F5 | 0,1 | 0 [16] |
| | bit 5 (6) | 1 = Output D is controlled By F6 | 0,1 | 0 [32] |
| | bit 6 (7) | 1 = Output D is controlled By F7 | 0,1 | 0 [64] |
| | bit 7 (8) | 1 = Output D is controlled By F8 | 0,1 | 0 [128] |
| **56** | **Blinking Rate for Outputs C and D.** Frequency in Hz = 1/0.016*(1+CV56) | | 0-255 | 15 |
| **57** | **Lighting Special Effects for Outputs B** | | 0 | 0 |
| | bit 0 (1) | Not Used: CV51 Bit 0 (1) applies to both output A and output B | 0,1 | 0 [1] |
| | bit 1 (2) | Only active if dimming (bit 2 (3)) is set to a value of 1. The value in CV58 is used for dimming.<br>0 = function B output is always dimmed<br>1 = If directional F1 is used for dimming, if independent F4 is used for dimming | 0,1 | 0 [2] |
| | bit 2 (3) | Output B can be dimmed | 0,1 | 0 [4] |

| CV | Description | | Range | Setting |
|---|---|---|---|---|
| **57** | **CV57 Continued** | | | |
| Bits 3-7 are only active for independent lighting. If more than one bit is set, only the higher bit is active. If a bit is set dimming is inactive. | | | | |
| | bit 3(4) | Not used | 0,1 | 0 [8] |
| | bit 4 (5) | Output B is a Gyrolight | | 0 [16] |
| | bit 5 (6) | Output B is a Mars light | | 0 [32] |
| | bit 6 (7) | Output B is a Single Strobe | | 0 [64] |
| | bit 7 (8) | Output B is a Double Strobe | | 0 [128] |
| **58** | **Dimming CV for Output B** - contains the value used for dimming. 0 is dark 255 is max brightness | | 0-255 | 64 |
| **105** | **User Identification #1** | | 0-255 | 255 |
| **106** | **User Identification #2** | | 0-255 | 255 |
| **128** | **Decoder Software Version** – read only | | | 0 |

## Examples for programming:

The following examples describe the CV configuration for several popular settings. Decimal values for the values of the key CVs are provided. The values of the bits within the CVs are also provided to provide more guidance on how the actual configuration was set up. As in the CV tables the first value uses bit numbering 0-7 while the numbers in () use bit numbering 1-8.

Outputs A and B are directional and react depending on the direction of motion for the decoder's address. The output that is on can be dimmed to reduced brightness using Function F1:

| CV | CV Value | Bits | Bit Value | Explanation |
|---|---|---|---|---|
| **38 - 46** | 0 | | | Outputs A and B are not allocated to F4 to F12 |
| **51** | 6 | | | |
| | | 0, (1) | 0 | Outputs A and B are directional and react depending on the direction of motion |
| | | 1, (2) | 1 | Output A is dimmed with F1 |
| | | 2, (3) | 1 | Output A dimming is activated |
| | | 3-7, (4-8) | 0 | No special functions |
| **52** | 64 | | | Dimming value for output A |
| **57** | 6 | | | |
| | | 0, (1) | 0 | Not used |
| | | 1, (2) | 1 | Output B id dimmed with F1 |
| | | 2, (3) | 1 | Output B dimming is activated |
| | | 3-7, (4-8) | 0 | No lighting effects |
| **58** | 64 | | | Dimming value for output B |

Outputs A and B are directional and react depending on the direction of motion.
When on the output is always dimmed to reduced brightness.

| CV | CV Value | Bits | Bit Value | Explanation |
|---|---|---|---|---|
| **38 - 46** | 0 | | | Outputs A and B are not allocated to F4 to F12 |
| **51** | 4 | | | |
| | | 0, (1) | 0 | Outputs A and B are directional and react depending on the direction of motion |
| | | 1, (2) | 0 | Output A is always dimmed |
| | | 2, (3 | 1 | Output A dimming is activated |
| | | 3-7, (4-8) | 0 | Output A has no additional lighting functions |
| **52** | 128 | | | Dimming value for output A |
| **57** | 4 | | | |
| | | 0, (1) | 0 | Not used |
| | | 1, (2) | 0 | Output B is always dimmed |
| | | 2, (3) | 1 | Output B dimming is activated |
| | | 3-7, (4-8) | 0 | No lighting effects |
| **58** | 128 | | | Dimming value for output B |

Output A is a Marslight and is switched on and off with F0.
Output B is a double strobe light and is switched on and off with function 1.

| CV | CV Value | Bits | Bit Value | Explanation |
|---|---|---|---|---|
| **38 - 46** | 0 | | | Outputs A and B are not allocated to F4 to F12 |
| **51** | 17 | | | |
| | | 0, (1) | 1 | Output A reacts to F0, output B to F1 |
| | | 1-2, (2-3) | 0 | Output A no dimming |
| | | 3, (4) | 0 | not used |
| | | 4, (5) | 1 | Output A is a Marslight on |
| | | 5-7, (6-8) | 0 | No further lighting effects |
| **57** | 128 | | | |
| | | 0, (1) | 0 | Not used |
| | | 1-2, (2-3) | 0 | Output B no dimming |
| | | 3, (4) | 0 | Not used |
| | | 4, (5) | 0 | No Marslight |
| | | 5, (6) | 0 | No Gyrolight |
| | | 6, (7) | 0 | No strobe (flash) |
| | | 7, (8) | 1 | Output B is a Double strobe (double flash) |

Function F7 turns Output A on and off. Function F12 turns output B on and off.

| CV | CV Value | Bits | Bit Value | Explanation |
|---|---|---|---|---|
| **38-40** | 0 | | | No allocation to functions 4 to 6 |
| **41** | 32 | | | |
| | | 0-4, (1-5) | 0 | |
| | | 5, (6) | 1 | Output A is assigned to function 7 |
| | | 6-7, (7-8) | 0 | |
| **42-45** | 0 | | | No allocation to functions 8 to 11 |
| **46** | 8 | | | |
| | | 0-2, (1-3) | 0 | |
| | | 3, (4) | 1 | Output B is assigned to function 12 |
| | | 4-7, (5-8) | 0 | |

Output A is switched on and off with both functions F9 and F12. Function F12 switches on and off output B.

| CV | CV Value | Bits | Bit Value | Explanation |
|---|---|---|---|---|
| **38-42** | 0 | | | No allocation to functions 4 to 8 |
| **43** | 4 | | | |
| | | 0-1, (1-2) | 0 | |
| | | 2, (3) | 1 | Output A is assigned to function 9 |
| | | 6-7, (7-8) | 0 | |
| **44-45** | 0 | | | No allocation to functions 10 and 11 |
| **46** | 12 | | | |
| | | 0-1, (1-2) | 0 | |
| | | 2, (3) | 1 | Output A is assigned to function 12 |
| | | 3, (4) | 1 | Output B is assigned to function 12 |
| | | 4-7, (5-8) | 0 | |

Output C is switched on and off with function F3. Output D is switched on and off with function F8 and when on flashes with a frequency of 2 Hz

| CV | CV Value | Bits | Bit Value | Explanation |
|---|---|---|---|---|
| **53** | 2 | | | |
| | | 0, (1) | 0 | Output C is an on/off function |
| | | 1, (2) | 1 | Output D is a flashing function |
| | | 2, (3) | 0 | Ditch light control is not active |
| | | 3-7, (4-8) | 0 | Not used |
| **54** | 4 | | | |
| | | 0-1, (1-2) | 0 | |
| | | 2, (3) | 1 | Output C is switched with F3 |
| | | 3-7, (4-8) | 0 | |
| **55** | 128 | | | |
| | | 0-6, (1-7) | 0 | |
| | | 7, (8) | 1 | Output D is switched with F8 |
| **56** | 8 | | | Flashing frequency 2 Hz |

Ditch light using outputs C and D. F4 activates both ditch lights (C and D), Ditch light flashing is activated with F2, frequency 2 Hz.

| CV | CV Value | Bits | Bit Value | Explanation |
|---|---|---|---|---|
| **53** | 4 | | | |
| | | 0-1, (1-2) | 0 | flashing is not activated |
| | | 2, (3) | 1 | Ditch light control is activated |
| | | 3-7, (4-8) | 0 | Not used |
| **54** | 2 | | | |
| | | 0, (1) | 0 | |
| | | 1, (2) | 1 | F2 causes the Ditch lights alternately flash |
| | | 2-7, (3-8) | 0 | |
| **55** | 8 | | | |
| | | 0-2, (1-3) | 0 | |
| | | 3, (4) | 1 | F4 causes both ditch lights to be on |
| | | 4-7, (5-8) | 0 | |
| **56** | 8 | | | Flashing frequency 2 Hz |

## North American 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. A minimal service charge for shipping and handling costs will be imposed. Should the item no longer be produced and the item is not repairable, a similar item will be substituted at the manufacturer's discretion.

**Year 4-10:** A service charge to include repair, shipping and handling 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.

A return authorization number is necessary for warranty service. Please contact a Lenz Service Center to receive this number and give the required information.

Hüttenbergstraße 29
35398 Gießen, Germany
Hotline: 06403 900 133
Fax: 06403 900155
info@digital-plus.de

Lenz ELEKTRONIK GMBH
**http://www.lenz.com**

Lenz Agency of North America
PO Box 143
Chelmsford, MA 01824
ph: 978 250 1494
fax: 978 455 LENZ
support@lenz.com

FC 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!