BXP88

All Scales

LocoNet DCC Occupancy Detector with Transponding and Power Management for 8 Detection Sections, Transponding Zones, and Power Sub-Districts

Features:

- DCC Occupancy Detection supports up to 8 Detection Sections letting you know when equipped rolling stock is in a detection section on your layout.

- One Transponding Zone per Detection Section lets you know the location of transponder-equipped locos or rolling stock.

- Intelligent Automatic short-circuit and over-current power management for each Detection Section, improves reliability by avoiding most booster shutdowns.

- Connects to LocoNet to transmit Detection Section occupancy, Transponding and track power information.

- Detects any powered locomotives in a Detection Section.

- Detects rolling stock equipped with resistor wheel sets.

- Identify where specific rolling stock is on your layout with Digitrax transponder-equipped locos and rolling stock.

- Plug and Play with Digitrax DCC systems with automatic Railsync polarity detection.

- LED output headers for front panel indication of Detection Section occupancy, Transponding, and power status.

- Easy-connect pluggable track wire terminal blocks can plug-in straight or at right angles.

- 3 Amp capacity per Detection Section , 8 Amp total unit capacity.

- Automatically updates status at track power on.

- Operations Mode Read Back allows you to read CV values of decoders equipped with transponders when on track.

- Firmware update capability via IPL over LocoNet.

Parts List

1 BXP88   1 LT5 Tester
1 Instruction Manual

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Please visit www.digitrax.com for the latest version of all manuals.**

1.0 Introduction

The BXP88 is a combination DCC occupancy detector, Transponding detector, and intelligent power manager. It is designed to make transponding implementation easy and provide advanced DCC track management by communicating all state information to LocoNet.

The BXP88 provides DCC occupancy detection that lets you know when any of its 8 connected Detection Sections are occupied by rolling stock that is equipped for detection. Any rolling stock equipped with a decoder or other load that draws current can be detected. This occupancy detection capability is the first step toward prototypical control of your rolling stock, layout signaling, realistic surround sound effects and more realistic modeling on your layout. In addition to detection the BXP88 also enables transponding on your layout. Transponding allows you to track and inform LocoNet of the layout location and identification of rolling stock equipped with transponders. Finally, the BXP88 provides automatic power management for each Detection section. Each Detection section acts as an independent power sub-district with short circuit and over-current power management. This allows for more reliable layout operations by preempting most booster shutdowns.

On your Digitrax system, the BXP88 reports detection section occupancy, transponding and track power status to the system via its LocoNet connection. This makes occupancy and transponding information available for use by any LocoNet device hooked up to LocoNet. For instance, the information can be used by a computer and the SE8c to set signals or by a computer program for dispatch control. Occupancy and transponding information can also be reported via a user installed LED display panel.

The number of BXP88s you use on your layout is determined by how many areas of track you want to monitor and how automated you want your layout to be, more Detection Sections require more BXP88s. Installing the BXP88 on your layout is easy and will make more prototypical and reliable operations possible.

2.0 Terminology

Understanding this terminology will help you best apply the BXP88 to your layout.

Direct home wiring is a DCC layout wiring method where each power district and its booster tracks are electrically isolated. The track within each power district uses a "common return" wiring method for occupancy detection and/or power management. Direct home wiring is the wiring method recommended by Digitrax and required for proper operation of the BXP88

Power district is the power wiring, track, components and equipment attached to that wiring, driven by a single properly isolated booster. The track for a power district is double gapped on both ends of the district. The BXP88 is used to set up detection/transponding sections within one power district.

Power sub-district is the wiring, components and equipment that are controlled from both power bus wires by their own power management device. Each of the 8 Detection/Transponding sections on the BXP88 acts as its own sub-district implementing short circuit and over current protection.

Detection/Transponding Common is the common return used within a properly electrically isolated power district for implementing occupancy detection.

Security element is the plant, including track, associated with any reporting, interlocking and/or signaling for that track section.

Whole layout common rail is a method of wiring layouts where power districts and their boosters are connected electrically by a common rail or common power bus return wire. This method is traditionally used for conventionally controlled layouts. Whole layout common is not compatible with the BXP88.

Detection/Transponding Section is a section of track gapped on one or both rails and connected to an occupancy/transponding detector so that the detector can sense the presence of a loco (or other specially equipped cars) in that section of track and identify transponding equipped locos and rolling stock. Traditionally with BDL168/RX4 combinations Detection sections could be combined inside Transponding Zones. With the BXP88 each of its 8 Detection Sections act as both an occupancy and transponding detector. For simplicity, these sections will be referred to as Detection Sections in this document. Note the BXP88 does not support detection/transponding within an automatic reversing section.

Occupancy detector is a device that senses the presence of a locomotive (or specially equipped cars) in a section of track that is set up for occupancy detection. Occupancy detectors also provide feedback to indicate occupancy. This feedback may be in the form of a lamp on a control panel or it may be a feedback message sent to the system that can be used by other layout devices. Also called a block occupancy detector on conventional layouts. Detectors are not covered by the DCC Standards or Recommended Practices.

Transponder is an electronic device that is installed in rolling stock and can be assigned a unique address. Transponders in rolling stock provide information to transponder detectors installed on the layout tracks. This lets the system determine in which Detections Section or track the transponder is currently located. Transponders are included in all current production Digitrax decoders and many older models as well. TL1 & TF4 function-only decoders with Transponding are available as separate units that can be added to locos with existing decoders or

to other rolling stock without decoders if you want to use them for transponding only and don't need motor control.

Transponder detector is an electronic device as part of a detection section on the layout that receives the information broadcast from a transponder. The transponder detector sends feedback to the system to let it determine the detection section location of any given transponder at any time. The BXP88 incorporates transponding and occupancy detectors in each of its 8 detection sections.

Transponder zone is an area of track that may be single gapped on one rail or double gapped on both ends and equipped with a transponder detector. Traditionally with BDL168/RX4 combinations Detection sections could be combined inside Transponding Zones. With the BXP88 each of its 8 detection sections act as both an occupancy and transponding detector, so transponding zones are incorporated into each detection section.

3.0 Plan Your Feedback System

Before you begin installing BXP88s you should carefully analyze your layout and what you want to achieve with your feedback system. The key to proper wiring for occupancy detection/transponding is planning. Your layout will be divided into Detections sections that can range anywhere from several inches to many feet in length. This process is custom to each unique layout, with the number and length of a detection sections varying depending on your layout, train length and the purpose of the detection/transponding. The BXP88 provides Detection, Transponding, and Power Management in each of its 8 detection sections, you should consider if every section on your layout needs these features. Transponding is often not needed in all detection sections of your layout and other occupancy only detectors could be used. By using transponding and other types of detection technologies in tandem, you will be able to get excellent performance and results at the lowest possible cost.

It is best to plan your detection sections based upon the operations you want to accomplish on your layout before cutting track gaps and installing a BXP88 or other detection devices. For instance, a grade level signal crossing may require from two to four different detection sections with occupancy detection in order to control the lights and gates operating, for trains traveling in either direction. Signal lights will require information from one or more detection sections in front and behind of the signal mast to function like the prototype.

Occupancy detection is not only useful, but critical, if operating a hidden staging area and will let you know which tracks are occupied. In your initial wiring installation, not all sections have to be connected to BXP88s; they can be connected to a terminal strip and then to boosters or power management devices. Additional BXP88s can then be inserted later as needed to further develop your layout.

4.0 BXP88 Installation Notes

The BXP88 is only compatible for use with Direct Home Layout wiring and requires a LocoNet compatible system for Detection/Transponding Reporting. The BXP88 is also not designed for use with Auto Reversing sections.

The BXP88 can be located for convenience and ease of installation. Consider placing these units on swing-down panel(s) at the layout fascia to support a section of close by tracks. This allows easy front access during construction, debug and maintenance, without having to work upside down under the layout.

Ensure that booster and track feeds are sufficient to carry currents and detect short circuits. We recommend at minimum 14AWG bus lines and 22AWG feeder connections up to the rails.

When installing multiple BXP88s or BXP88s in conjunction with other devices ensure that Rail A and Rail B are consistent between all Power Districts so rolling stock can cross the double gaps without short circuits. Rail A and B inputs to the BXP88 can be switched as needed to match existing wiring, the BXP88 automatically sets railsync.

An LT5 tester is included with the BXP88, and optional fascia LED panels can be constructed following the instructions in section 10.3 .

The BXP88 does not need to be externally powered. An optional auxiliary 9V 150ma DC power supply may be used to allow the BXP88 to remain on when track power is lost. Multiple BXP88s can be powered from the same supply as long as 150ma is available for each unit. The optional 9V DC supply should not be shared with any other non-BXP88 devices.

The primary advantage to additional auxiliary powering of the BXP88 is the BXP88 can default to report Detection Sections as occupied when track power is lost. This allows for signal or computer logic to respond appropriately. Additionally, if the BXP88 is auxiliary powered it can report other track and LocoNet faults via its LED indicator connectors.

When a BXP88 is powered up on a Digitrax Layout it will automatically disable analog stretching, by setting OPSW 20= Closed in the Command Station. The BXP88 is not compatible with analog mode stretching, and you will not be able to run conventional DC locomotives at address 00. All locomotives will need a DCC decoder to operate.

5.0 BXP88 Installation

1. Power down your Digitrax LocoNet System.
2. Determine an appropriate mounting location for your BXP88.
3. Mount the BXP88 in the appropriate location. The BXP88 is equipped with removable screw terminals for easy wiring once the unit is mounted.
4. Connect the "BGND" terminal to the General Return bus that connects all your boosters. This should be a heavy gauge wire.
5. Connect "RA" to the Rail A terminal on the booster that will be powering the 8 sections.
6. Connect "RB" to the Rail B terminal on the booster that will be powering the 8 Sections.

Note: Rail A and Rail B should consistent between all Power Districts, you may need to switch the Rail A and Rail B connections in the above steps.

7. Connect "RAX" to the common Rail A for all 8 detection sections.
8. Connect "DS1"-"DS8" to each isolated Rail B detection sections.
9. Connect to LocoNet via the LocoNet port using a known good LocoNet Cable.
10. Connect optional auxiliary 9V 150ma DC power supply using the power barrel plug connector.
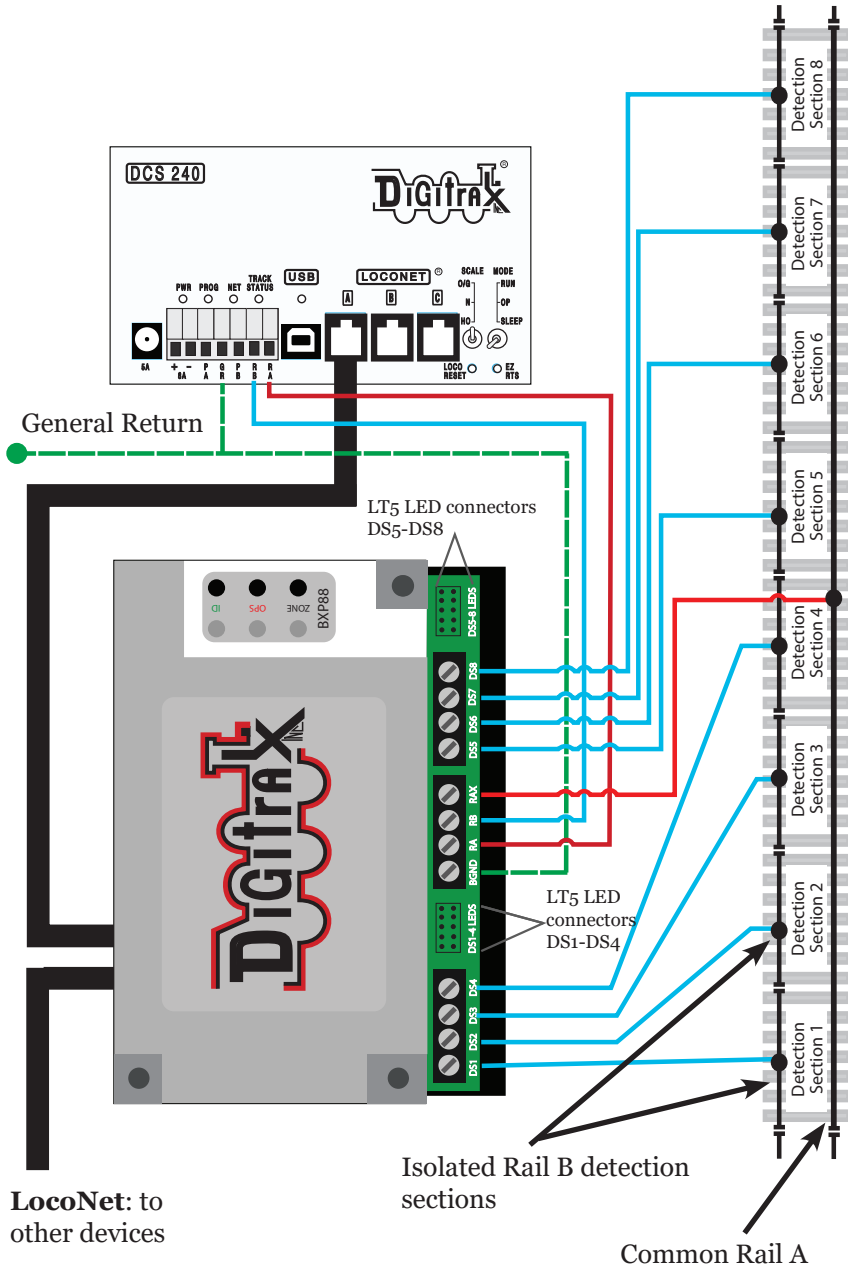
See Figure 1: BXP88 Installation Example for a typical installation.

6.0 Turning on your system and configuring the BXP88

Once you have installed your BXP88, you may turn on your system. There are several tests you can perform to ensure that the BXP88 is properly functioning.

1. Power on your Digitrax System and the sections of your layout where the BXP88 is connected.
2. Using a small piece of wire or some other conductor short the "RA" and "RB" terminals together the booster connected to the BXP88 should reliably shut down.
3. Test each detection sections 1-8 by shorting across the tracks they are connected too. Using the LT5 tester included plugged into the "DS1-4 LEDS" and "DS5-8 LEDS" header you should see each corresponding Detection section LED blink fast when the short is present.
4. If the Booster powering the BXP88 shuts down during these tests you will need to lower the resistance of your wiring.
5. For additional Detection and Transponding Testing please refer to sections 12 and 13.

Figure 1: BXP88 Installation Example

General Return

LT5 LED connectors DS5-DS8

LT5 LED connectors DS1-DS4

LocoNet: to other devices

Isolated Rail B detection sections

Common Rail A

7.0 Setting BXP88 Board ID and corresponding Transponding Zone IDs

Setting up your Board ID for your BXP88s should be carefully considered. Each BXP88 automatically assigns Detection Sections and Transponding Zones based off the BXP88's Board ID. For example, a BXP88 with a board ID of 001 (factory default) will report for detection sections 01-08 and transponding zones 00-07. A BXP88 with a board ID of 002 will report for detection sections 09-16 and transponding zones 08-17. Each subsequent ID will generate corresponding IDs. The BXP88 supports board addresses 001-256. When planning your layout it is important that these section and zone IDs do not overlap. Additional considerations should be taken with incorporating the BXP88s into systems using other detection or transponding products such as the BDL168 and RX4. Please see the Digitrax Tech Support Depot for additional information on configuring device Board IDs.

To set your BXP88 Board ID:
1. Ensure that your BXP88 is properly connected and powered on.
2. Press and hold the ID button for approximately 4 seconds until the ID LED flashes red, then release it. The ID LED will flash alternating red and green. This let's you know that you are in board address set up mode.
3. Connect a Digitrax throttle to the BXP88s LocoNet port. (This can only be done with a Digitrax LocoNet throttle or equivalent software).
4. Go into SWITCH mode on the throttle. Select the switch number that corresponds to the board address you want to set and issue a closed "c" command to set the board address. The board address is changed as soon as you issue the SWITCH command.
5. Once the Board ID is set the ID LED will go back to solid green.

Please see your specific throttle manual for details on how to issue SWITCH commands.

8.0 Customizing Your BXP88 – Setting up Option Switches

A BXP88 with Factory-default settings will generally work on Digitrax DCC layouts with no modifications, and only the Board ID needs to be set uniquely for each BXP88 to report allocated Detection section and Transponding Zone numbers correctly onto LocoNet.

The implemented option switches and settings you can use to customize your BXP88 are indicated in Table 1: BXP88 Option Switches. These option switches on your BXP88 are set up using a Digitrax throttle's SWITCH commands.

SWITCH mode is normally used for operating turnouts by issuing closed ("c") or thrown ("t") commands. In the case of your BXP88, each switch address is a BXP88 option switch when it is in OPSW setup mode.

How to read back and change BXP88 Option Switches (OpSw):

1. Power up your BXP88 and connect it to LocoNet.
2. Connect a Digitrax throttle to one of the BXP88's LocoNet connectors.
3. Press the OPS button for about 2 seconds, then release it. The red OPS and green ID LEDs will flash alternately to let you know that you are in option switch setup mode.
4. Go into SWITCH mode on your throttle. Dial up the switch number that corresponds to the OpSw you want to change and issue a closed "c" or thrown "t" command to set the OpSw to the desired setting. The OpSw is changed as soon as you issue the SWITCH command.
5. When BXP88 OpSws are set up as desired, press the OPS button for about 2 seconds and release it, the BXP88 will exit option switch set up mode.

Option Switch #	Function	Default
OpSw 04	c=slower short circuit detection t=normal short circuit detection	t
Opsw 05	c=transponding enabled t=transponding disabled	c
OpSw 07	c=disable fast find t=enable fast find	t
OpSw 10	c=enable power manager t=disable power manager	c
Opsw 11	c=enable power manager reporting to LocoNet t=disable power manager reporting to LocoNet	c
Opsw 14	c= high detection sensitivity t= regular detection sensitivity	t
Opsw 15	c=do not send occupied message on LocoNet when faulted t=send occupied message on LocoNet when faulted	t
Opsw 33	c= Disable Operations Mode Readback t=enable Operations Mode Readback	t
Opsw 40	c=set factory default	t
Opsw 41	c=disable occupancy reporting for Detection Section 1 t=enable occupancy reporting for Detections Section 1	t
Opsw 42	c=disable occupancy reporting for Detection Section 2 t=enable occupancy reporting for Detections Section 2	t

Table 1: BXP88 Option Switches

Option Switch #	Function	Default
Opsw 43	c=disable occupancy reporting for Detection Section 3 t=enable occupancy reporting for Detections Section 3	**t**
Opsw 44	c=disable occupancy reporting for Detection Section 4 t=enable occupancy reporting for Detections Section 4	**t**
Opsw 45	c=disable occupancy reporting for Detection Section 5 t=enable occupancy reporting for Detections Section 5	**t**
Opsw 46	c=disable occupancy reporting for Detection Section 6 t=enable occupancy reporting for Detections Section 6	**t**
Opsw 47	c=disable occupancy reporting for Detection Section 7 t=enable occupancy reporting for Detections Section 7	**t**
Opsw 48	c=disable occupancy reporting for Detection Section 8 t=enable occupancy reporting for Detections Section 8	**t**
Opsw 50	c=do not allow selective transponding disabling by Opsw 51-58 t=allow selective transponding disabling by Opsw 51-58	**t**
Opsw 51	c=disable transponding reporting for Detection Section 1 t=enable transponding reporting for Detections Section 1	**t**
Opsw 52	c=disable transponding reporting for Detection Section 2 t=enable transponding reporting for Detections Section 2	**t**
Opsw 53	c=disable transponding reporting for Detection Section 3 t=enable transponding reporting for Detections Section 3	**t**
Opsw 54	c=disable transponding reporting for Detection Section 4 t=enable transponding reporting for Detections Section 4	**t**
Opsw 55	c=disable transponding reporting for Detection Section 5 t=enable transponding reporting for Detections Section 5	**t**
Opsw 56	c=disable transponding reporting for Detection Section 6 t=enable transponding reporting for Detections Section 6	**t**
Opsw 57	c=disable transponding reporting for Detection Section 7 t=enable transponding reporting for Detections Section 7	**t**
Opsw 58	c=disable transponding reporting for Detection Section 8 t=enable transponding reporting for Detections Section 8	**t**

Table 1: BXP88 Option Switches

9.0 Auto-Reversing

The power management timing used by the BXP88 may not be compatible with some auto-reverser control items connected upstream on the RA and RB input connections. A downstream auto-reverser on a DS will show that Detection Section as occupied at all times, but Transponding will work. An upstream auto-reverser will reverse all of a BXP88's detection sections tracks, so these 8 detection sections can only be used within the same single reverse area or power district.

10.0 Occupancy/Transponding Indication

The BXP88 can report occupancy and Transponding information via the LocoNet connection or via direct output to a user created LED panel.

10.1 LocoNet Devices

The BXP88 provides occupancy and transponding messages to LocoNet that can be used by computer software for a visual display of occupancy and transponding status on the layout or to other devices on the layout. For instance layout control software can use these messages to control signals on the layout via a Digitrax SE8c. See the operating manual of your computer software or the SE8C for details on installation and operation.

10.2 LT5 Tester

The BXP88 provides two LT5 LED compatible outputs labeled "DS1-4 LEDS" and "DS5-8 LEDS" and the supplied LT5 tester can be plugged in here to provide visible detection section, power state and fault information for setup, debug and running. This will help you with layout wiring and troubleshooting for transponding & detection.

LT5 Indications	Meaning
Detection Section LED on Solid	Detection Section is Occupied
Detection Section LED is Blinking Slow	Detection Section is Occupied and Transponding
Detection Section LED is Blinking Fast	Detection Section is in Short Circuit
Zone LED is on Solid	Normal Operation, no faults
Zone LED off blinking on once repeating every 2 seconds	Track Power is off, RailSync not detected
Zone LED off blinking on twice repeating every 2 seconds	Rail A or Rail B unpowered
Zone LED off blinking on 3 times repeating every 2 seconds	Internal Voltage Problem
Zone LED off blinking on 4 times repeating every 2 seconds	LocoNet Error or Disconnected

Table 2: LT5 LED Indications

Note: When a fault is detected a detection sections will show and report as Occupied and detection section LEDS will be lit. This is the default fail-safe logic, reporting can be changed with OpSw 15.

Figure 2: LT5 Tester

LED for DS2 or DS6   LED for DS3 or DS7

LED for DS1 or DS5   LED for DS4 or DS8

Zone Power LED
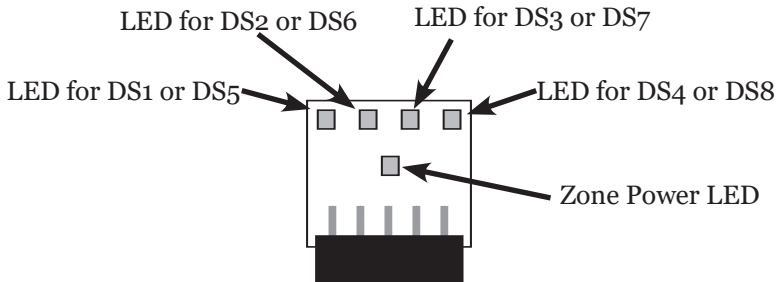
10.3 Panel Indicator Wiring

You can build a display panel with a track schematic and LEDs to indicate track occupancy by connecting LEDs to the LT5 compatible output connectors on the BXP88. For a panel display of occupancy status made up with user supplied LEDs, connect to the four 0.1" 2x5 headers, and wire up high brightness LEDs as shown in Figure 3: LED Panel Indicators Wiring. The plugs and ribbon cable included in the Digitrax SDCK Signal Driver Cable Kit can be used.

External LED Connector

GND — Zone Power
GND — DS1 or DS5
GND — DS2 or DS6
GND — DS3 or DS7
GND — DS4 or DS8

Edge of PC Board

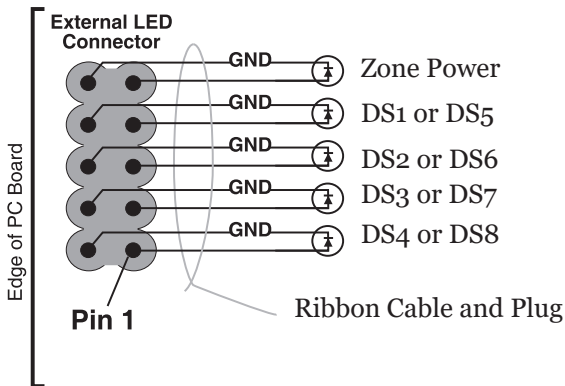Pin 1   Ribbon Cable and Plug

Figure 3: LED Panel Indicators Wiring

The BXP88 incorporates current setting resistors to set the LT5 LED current typically to about 1~3mA. If you need higher LED drive currents you can use external transistors etc. to amplify the LED current.

The LT5 header drive from the BXP88 is active high at about +3.5 volts, via a 1 Kohm resistor. Note that the ribbon cable includes separate ground return conductors for each LED that allow a 10 conductor ribbon cable to be split into 5 pairs to conveniently routed to individual LEDS. Be sure to connect the +ve active detection section output wires to the LED anodes. Do not connect any LT5 wiring to other voltages as this may cause damage and void the warranty.

11.0 Setting Up Locos & Other Rolling Stock for Transponding

1. Your locomotives or other rolling stock that you want to use for transponding must be equipped with either a transponder device or a decoder with Digitrax transponder capability included. Transponder devices such as the TD1 & TL1 can be added to non-transponding decoder installations. These devices are very small and easy to install. If you have not put decoders in your locos, it is easy to use a transponder equipped decoder and then you won't have to add a second board inside the loco. All Digitrax current production decoders support Digitrax Transponding.

2. When you install a wired transponder equipped decoder, you should also install a load resistor of between 270 ohms & 470 ohms between the blue and white decoder leads. If you are using a board replacement, and some other decoders the resistor may already be installed on the decoder. Digitrax compatible transponder current pulse generation uses the F0F decoder function or white lead that is also used for the forward light function. Transponding will not affect the operation of the forward light but you may see a slight glow when the light is turned off because of the way transponding works.
    Notes: If the resistor is not connected between the blue & white/F0F leads, then the locomotive will transpond in only one orientation on the track. If you are using a DH126D, DH166D, TD-1 or TL-1 to equip your loco or rolling stock for transponding, you won't need to install the resistor because it is already included in the decoder.

3. Enable transponding in the transponder equipped decoder by programming CV61 to a value of 02.

4. Place the loco on the track, select it and run it back & forth. Verify that transponding is working in that orientation. If transponding is not working, be certain if required that the resistor described in step 2 above is installed properly between the white and blue leads of the decoder.

5. Pick up the loco and turn it around on the track, select it and run it back and forth again. Verify that transponding is working in that orientation. If transponding is not working, be certain that the resistor described in step 2 above is installed properly between the white and blue leads of the decoder. NOTE: Locos must be selected in the system for transponding to work.

12.0 Occupancy Debug

Use the LT5 provided or attached LED indicator panel with your BXP88 as described in Sections 10.2 & 10.3. The LT5 tester or and attached LED indicator panel allows you to easily check the zone sensitivity (typically 22 Kohms to give detection). This also aids in the determination of detection number and activi-

ty for a track detection section. Many detection problems are related to wiring problems or poor connections to the detection section rather than to the actual BXP88. By using the display array, you can eliminate the wiring issues from the equation and be sure that the BXP88 is set up correctly.

Remember, if the zone power is OFF, the occupancy LEDs should be set up so that they will be on to be sure that signaling systems or a CTC/dispatcher will see the detection section in its most restricted aspect.

12.1 LocoNet Debug

The BXP88 reports information to LocoNet, so be sure that the connection is working. In normal operations the red "OPS" LED will blink ON briefly when valid incoming LocoNet messages are seen, confirming a good LocoNet network connection. The BXP88 will blink the ZONE led green when a state message is sent by the BXP88 to LocoNet.

12.2 Analog Locomotives

Analog Locomotive are not compatible with the BXP88, all locomotives must be equipped with a DCC decoder.

13.0 Using a Test Transponder for debugging

You can use a Test Transponder as follows:

1. Use transponder capable decoder set up with a 470 ohm resistor between the blue and white leads. This removes any lamp issues from initial transponding tests. The motor leads can be left unconnected/insulated and all other leads except the red/black track connections should be insulated. Set CV61 to a value of 02 to enable transponding.
2. Ensure the BXP88 is properly connected to your Command Station/Booster via Rail A and Rail B connections. Connect the BXP88 to your Command Station/Booster using a Known good LocoNet cable. Connect an LT5 to the "DS1-4 LED" header.
3. Use the first Detection Section (DS1), hook RAX to the decoder RED lead and DS1 to the decoder BLACK lead.
4. Power up the System and the BXP88 connected to the test decoder. Turn on Track Power and select the decoder's address in a throttle. (Decoder factory defaults are Address 03).
5. DS 1 LED will blink steadily indicating that a valid transponder with that address is being detected in that transponding zone.

14.0 FCC Information

Radio or TV Interference: (this information is MANDATED by the FCC) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment

is operated in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: Any modifications to the equipment not expressly approved by Digitrax voids the user's warranty and compliance with CFR 47 rules, as administered by the Federal Communication Commission. Digitrax believes any properly installed equipment following guidelines in this manual is unlikely to experience RFI problems.

15.0 Warranty & Repair

Digitrax gives a one year *"No Worries" Warranty* against manufacturing defects and accidental customer damage on all Digitrax command stations, boosters, throttles, decoders, power supplies and layout control devices.

That's it! A simple, straightforward warranty with no tricky language! Visit www.digitrax.com for complete warranty details and instructions for returning items for repair.

Please return warranty items directly to Digitrax - DO NOT return items to place of purchase.

BXP88
LocoNet DCC Occupancy Detector with Transponding and Power Management

Go Beyond DCC With Digitrax®
Complete **T**rain **C**ontrol
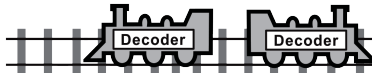
Main Station
Starter Sets
LocoNet®
Power Supplies

DUPLEX EQUIPPED
Available

Your Digitrax LocoNet® Starter Set is just the beginning of an exciting trip! Pick the one that's right for you!
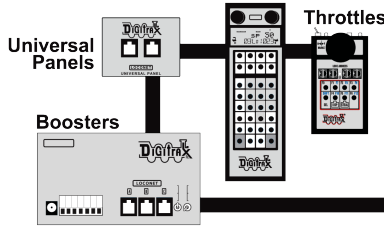
EVOLUTION xpress

ZEPHYR xtra™

LocoNet®
The Digitrax Difference

Locomotive Shops
Mobile Decoders
Function Decoders
SoundFX™ Decoders
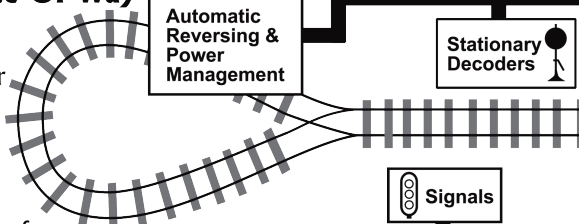
Decoder   Decoder

More Fun For Everyone
Add More Boosters,
Advanced & Simple Throttles,
Power Supplies,
Universal Panels,
IR and/or Radio
for more trains and operators.

Universal Panels

Boosters

Throttles

Maintenance Of Way
Make your layout more fun & simpler to operate!

Automatic Reversing & Power Management

Stationary Decoders

Computer Controls
Computer Interface
Decoder Programmer
Sound Programmer

Signals

It All Adds Up To Complete Train Control

Detection

Transponding
87   8427   4123
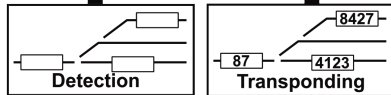
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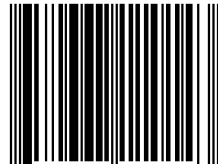
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