

Fast Clock Repeater - NCE User Guide



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TECHNOLOGIES

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1. Introduction

Thank you for purchasing a *Logic Rail Technologies* product. The Fast Clock Repeater – NCE (FCR-N) provides remote fast clock display capability and works in conjunction with the network fast clock found on North Coast Engineering (NCE) cabs. The FCR-N has the following features:

- Large (0.8”), easy-to-read, red LED digits
- 12 or 24 hour time format (selected on NCE cab)
- PM indicator
- Flashing colon capability
- Two Cab Bus jacks for connecting the FCR-N to other FCR-Ns or any other Cab Bus devices
- Pre-mounted fascia plate ready for easy installation; can be installed in a standard Radio Shack project box

1.1 Package Contents

This product consists of the following items:

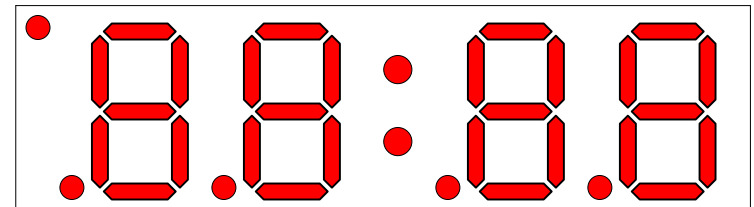
- Fast clock module with pre-mounted fascia plate
- 3 ft. Cab Bus cable
- User Guide

1.2 Power Requirements

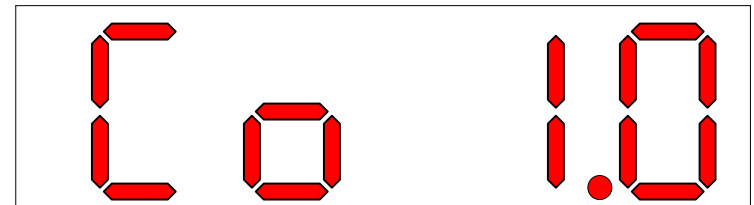
The FCR-N will operate from 12-13.5VAC or DC and draws a maximum current of 200mA (0.2A). It can be powered from the Cab Bus or from a suitable wall transformer such as our WT1A or NCE’s P114. The plug end of the wall transformer must be female with dimensions 2.1mm ID and 5.5mm OD.

1.3 Operation

When power is first applied the FCR-N will illuminate all LED segments for two seconds. This is illustrated below.



The FCR-N will then display its current code revision. For example:

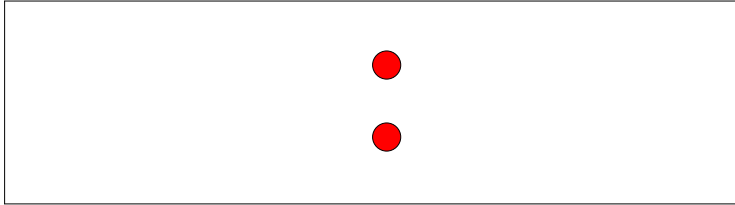


The FCR-N has two configuration dipswitches located on the back of the module. They are defined below.

Switch	Name	Meaning
1	FLC	On: Flash the colon when the time is displayed Off: Colon is always on when the time is displayed
2	OPT	Reserved for future use

2. Display Modes

The FCR-N display can be in one of two modes: *current time* or *idle*. Most of the time the display will show the current time. The *idle* mode is entered when the FCR-N detects that the Cab Bus has become idle; the display will look like this:



The FCR-N will exit the idle mode when the Cab Bus is active again and a fast clock message has been received.

3. Quick Start Guide

The FCR-N is ready for installation. You should be able to have it up and running on the Cab Bus in a matter of seconds (*real* time seconds, not *fast* time seconds!). Follow these simple steps:

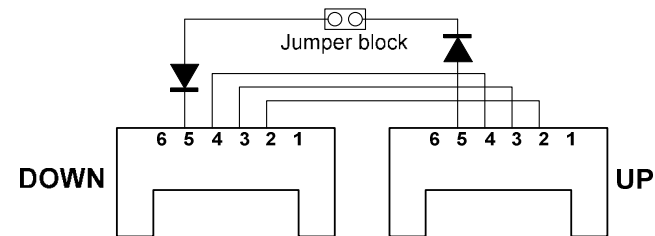
1. Make sure that power to your NCE system is OFF.
2. Plug either end of the enclosed Cab Bus cable into the jack labeled “UP” on the back of the FCR-N. Make sure you hear the connector “click.”
3. Plug the remaining end of the enclosed Cab Bus cable into any available Cab Bus jack on your layout. **Use NCE’s recommended practices on Cab Bus wiring! Limit stub branches to less than 10 feet!**
4. If you do not have a wall transformer to power the FCR-N then make sure that the blue shorting plug

near the top of the jacks is covering BOTH of the two pins. This allows the FCR-N to draw power from the Cab Bus. Skip to Step 7.

5. If you are using a wall transformer with the FCR-N then insert the small round plug end of the wall transformer into the mating connector on the back of the FCR-N. Make sure that the blue shorting plug near the top of the jacks is only covering ONE of the two pins. This prevents the FCR-N from using power from the Cab Bus.
6. Plug the wall transformer into any available AC outlet. **Caution:** children should not be allowed to do this without adult supervision! Electrocutation and death could occur! Skip to Step 8.
7. Turn on the power to the NCE system.
8. The FCR-N display will light up for approximately two seconds. The FCR-N will then display its code revision for at least two seconds and until it receives a fast clock message.

4. Cab Bus and Power Connections

The two Cab Bus jacks on the FCR-N board are wired as shown in the following diagram.



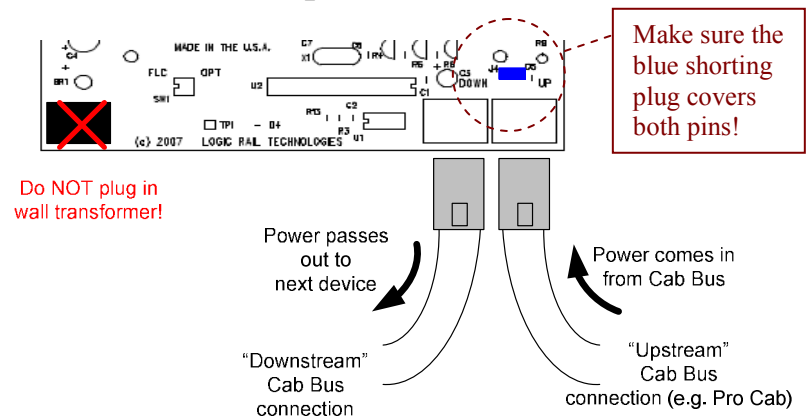
The 6-pin Cab Bus cable included with the FCR-N is wired in a “pass-through” style. That is, pin 1 on one end of the cable is connected to pin 1 on the other end.

This should be contrasted with the “telco” style that has pin 1 on one end connected to pin 6 on the other end. **Do NOT use telco style cables for the Cab Bus!**

If the enclosed cable is not long enough for your application you can replace it with one available from a variety of sources (e.g. Radio Shack #279-422) but make sure it’s wired pass-through style!

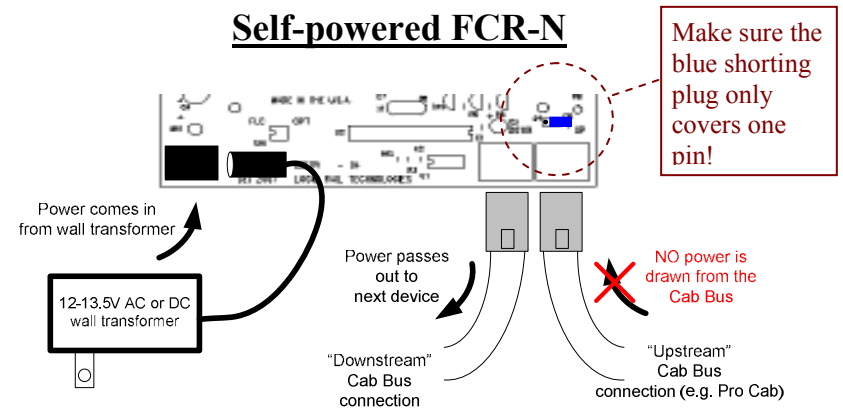
The two Cab Bus jacks on the FCR-N are labeled “UP” and “DOWN”. The “UP” jack is closest to the left hand edge of the FCR-N when looking at the front of the FCR-N. The “UP” jack **MUST** be used to connect the FCR-N “Upstream” to the Cab Bus network where the Power Pro or Power Cab is plugged in. The FCR-N can be powered from the Cab Bus (hereafter referred to as “bus-powered”) or from a wall transformer (hereafter referred to as “self-powered”). There is a two-pin jumper block on the back of the FCR-N near the Cab Bus jacks. The position of the blue shorting plug on this header determines whether the FCR-N will be bus-powered or self-powered. If the blue shorting plug is covering both pins then the FCR-N will be bus-powered and you **MUST** not attach the wall transformer to the FCR-N; although doing so shouldn’t cause any damage please avoid it! If the blue shorting plug is only covering one pin of the header then the FCR-N will be self-powered and the wall transformer **MUST** be attached. These options are illustrated on the next page. The “DOWN” jack is used to connect other Cab Bus devices (throttles, other FCR-Ns, etc) to the FCR-N. Power is provided to this jack (also shown in the following figures).

Bus-powered FCR-N



NOTE: Make sure you don't exceed the power supply capacity when drawing power from the Cab Bus.

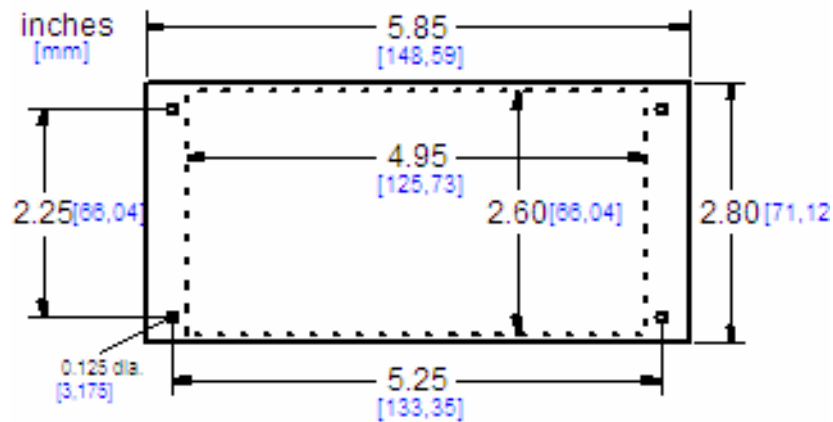
Self-powered FCR-N



We STRONGLY recommend that the FCR-N or FCR-NL closest "upstream" uses the self-powered configuration. Additional "downstream" FCR-Ns or FCR-NLs can then use the bus-powered configuration.

5. Mounting the FCR-N

The FCR-N fascia plate is predrilled in four places for 4-40 mounting screws or bolts. Do NOT enlarge the holes – you may damage the module! You can mount the FCR-N in the fascia of your layout or control panel by cutting out a hole that is 4.95” x 2.6”. You’ll need a depth clearance of 1.5”. This is illustrated in the diagram below.



The fascia plate was designed to allow you to mount the FCR-N inside a Radio Shack project box (p/n 270-1805). Discard the covers that come with the project box. Be sure to drill holes in the box to allow the Cab Bus cable(s) and power connector to pass through. We also recommend that you drill additional holes so that air may flow through the box. The FCR-N contains a voltage regulator with a heatsink to help dissipate heat. For reliable operation this heatsink must receive some airflow.

6. Warranty and Repair

6.1 Warranty

This product is warranted to be free from defects in materials or workmanship for a period of one year from the date of purchase. The product must be returned to Logic Rail Technologies in satisfactory condition. This warranty covers all defects incurred during normal use of this product. This warranty is void under the following conditions:

1. If damage to the product results from mishandling or abuse.
2. If the product has been altered in any way not previously authorized or approved by Logic Rail Technologies.
3. If the input voltage limit (16V AC or DC) of the product has been exceeded.

Requests for warranty service must include a dated proof of purchase, a written description of the problem, and return shipping and handling (\$6.00 inside U.S./\$8.00 outside U.S. - U.S. funds only). Except as written above, no other warranty or guarantee, either expressed or implied by any other person, firm or corporation, applies to this product.

Logic Rail Technologies reserves the right to make changes in design and specifications, and/or to make additions or improvements in its products without imposing any obligations upon itself to install these changes, additions or improvements on products previously manufactured.

6.2 Repair

The FCR-N contains no end-user serviceable parts. If you believe your FCR-N needs repair please contact Logic Rail Technologies prior to returning it. Logic Rail Technologies reserves the right to repair or replace a defective product. Products that have voided the warranty or are out of warranty will be repaired at fair and reasonable rates.

7. Technical Support and Troubleshooting

7.1 Technical Support

If you purchased your FCR-N from a dealer please try to contact them first for technical support. If you purchased the FCR-N directly from Logic Rail Technologies or your dealer cannot resolve your problem/question please contact:

Logic Rail Technologies
PMB #287
21175 Tomball Parkway
Houston, TX 77070
Voice/Fax: (281) 251-5813
Email: info@logicrailtech.com

7.2 Troubleshooting

Before contacting your dealer or Logic Rail Technologies for technical support please read the following common “problems” and solutions.

1. **After the FCR-N powers-up it only shows the colon.** This indicates that the FCR-N has not detected any activity on the Cab Bus for 60 seconds. Verify that your cables are connected correctly. You may wish to try a different cable to see if the problem is the cable itself. If this does not resolve the problem, and you are confident that the Cab Bus is functioning properly then please contact Logic Rail Technologies directly for assistance.

8. Frequently Asked Questions (FAQ)

Q: Can the FCR-N be connected to the Cab Bus as a “stub branch”?

A: Although this SHOULD work, you’ll need to limit the length of the stub wiring (NCE recommends less than 10 feet). We strongly recommend that you connect the FCR-N in a “daisy-chain” fashion like all other Cab Bus devices.

Q: How many Cab Bus devices can be powered when connected “downstream” from a self-powered FCR-N?

A: If you’re using our WT1A or NCE’s P114 wall transformer then you have approximately 1 amp of current capacity. You’ll need to subtract 200mA (0.2A) for the self-powered FCR-N which leaves you with 800mA (0.8A). You’ll need to know the maximum power consumption for the connected Cab Bus devices and add up those numbers. As an example, you could power up to four more FCR-Ns/FCR-NLs (configured for bus power).