NYRS

Turntable Indexing That Works

PTC Model 5

Programmable Turntable Controller

Controller and Motor Assembly

P/N 03-200

Installation Instructions and Users Manual

New York Railway Supply (NYRS)
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Contents

Contents 2
Quick Start Guide 5
1. Introduction 6
1.1 Scope of This Manual 6
1.2 Safety and Regulatory Notices 6
2. System Overview 7
2.1 Major Components 7
2.2 How You Interact With the PTC 5 7
3. Motor Installation 7
3.1 Using the NYRS Motor Mount Kit 7
3.2 Designing Your Own Motor Mount 8
4. Controller Installation 8
4.1 Choosing a Location 8
4.2 Fascia Cutout and Mounting 8
4.3 Connecting the Motor Cable 9
4.4 Power Button and Supply 10
4.5 Track Reverser (ATR) Wiring Overview 10
4.6 APR2 Automatic Power Router 10
4.7 Effects Relay Connector 10
5. System Check-Out 11
5.1 Power-Up 11
5.2 Checking Bridge Motion 11
6. Programming the Turntable 11
6.1 Planning Track Numbers 12
6.2 Entering Program Mode 12
6.3 Program Track 1 (Head End) 12
6.4 Program Track 1 (Tail End) 13
6.5 Program the Remaining Tracks 13
6.6 Editing a Track 13
6.7 Deleting a Track 13
6.8 Finishing 13
7. Operating the PTC 5 13
7.1 Home Screen at a Glance 14
7.2 Selecting and Moving to a Track 14
7.3 Stopping a Move (Emergency Stop) 14

7.4 Operating Hints....15
8. Settings....15
8.1 Speed....16
8.2 Momentum....16
8.3 Stall Detection....16
8.4 Start Delay....17
8.5 Polarity Relay Mode....17
8.6 Effects Enable....17
8.7 Beep Enable....17
8.8 Factory Reset....17
8.9 Number Entry Screen....17
8.10 DCC Settings and Load Firmware....18
9. Operating From a DCC Throttle....18
9.1 The DCC Settings Panel....18
9.2 Locomotive Decoder Mode — Set or Check the DCC Address....19
9.3 Select a Track With the Speed Control....19
9.3.1 Throttle Display....19
9.4 Send the Bridge With the Head and Tail Buttons....19
9.5 Stop the Bridge....20
9.6 Example — Send the Bridge Head-First to Track 4....20
9.7 Accessory Decoder Mode....20
10. Automatic Track Power Reversing (ATR)....20
10.1 Standard ATR Operation....20
10.2 Wiring....20
10.3 Using an External Auto-Reverser....20
11. Firmware Update....21
12. Troubleshooting....21
Appendix A — Motor Dimensions....22
A.1 N Scale Motor (NEMA 17)....22
A.2 HO / On3 Motor (NEMA 23)....23
A.3 O Scale Motor (NEMA 34)....24
Appendix B — Panel Cutout....25
Appendix C — Connectors and Wiring....25
C.1 ATR Wiring....26
Appendix D — Firmware Change Log....26
Version 0.9.4....26

Added automatic motor detection, eliminating the need to manually select the motor scale. .26
Improved positioning and stopping accuracy when approaching programmed track locations. 26
Version 0.9.1 26
Version 0.9.0 26
Contact and Support 26

Quick Start Guide

We are constantly trying to make our documentation better; always check for updates on the nyrs.com website.

This checklist gets you up and running with a properly installed and programmed PTC Model 5 turntable controller. For full details, refer to the later sections of this manual.

1. Bench test first. Run the system on the bench, not attached to a turntable, so you understand the touchscreen and programming process before final installation.

2. Install the motor and bracket. Mount the stepper motor using the NYRS Motor Mount Kit or a rigid, well-aligned custom mount. Keep the motor shaft square to the turntable shaft.

3. Check free rotation. Before programming, make sure the bridge turns freely through a full 360 degrees with no binding or sudden increase in drag. Section 5.2 describes the recommended loaded fish-scale test.

4. Mount the controller. Install the controller in the fascia within reach of the turntable. Cut the panel opening to the dimensions in Appendix B and secure the module with the supplied hardware. The display face is glass - handle with care.

5. Wire the system. With power off, connect the motor (MOTOR / DB9), the 24 V power supply (POWER 24V DC), optional ATR track-reversing connections, APR2 if used, and the effects relay as shown in Appendix C. Secure both DB9 connections with their thumbscrews.

6. Configure DCC, if used. Open DCC Settings to select Locomotive Decoder or Accessory Decoder operation and set the applicable address; see Chapter 9.

7. Program the tracks. Tap Program Tracks. Point the bridge head at Track 1 and press HD → 01 → STORE. Rotate the tail to Track 1 and press TL → 01 → STORE. Then point the head at each remaining track and press HD → nn → STORE.

8. Operate and fine-tune. On the home screen, select HD or TL, enter the track number, and press GO. Adjust speed and momentum as desired. If a track is slightly out of alignment, use JOG CW / CCW to position it correctly and re-store that track.

1. Introduction

The NYRS PTC Model 5 is a precision programmable turntable controller designed for model railroaders who want reliable, repeatable alignment of a turntable bridge to multiple lead and service tracks. The PTC 5 replaces the keypad and LED display of earlier models with a 5-inch color touchscreen, and drives a closed-loop stepper motor with an absolute encoder. Because the motor knows its true position at all times, the bridge does not need to be re-indexed after a power loss, and there is no lost-step drift or gear backlash to compensate for.

This manual describes how to install the motor and controller, perform a bench checkout, program head and tail positions for each track, operate the controller from the touchscreen or from a DCC throttle, adjust speed and momentum, use automatic track power reversing (ATR), and troubleshoot any conditions that may occur.

1.1 Scope of This Manual

This document covers the PTC Model 5 with firmware Version 0.9.4. The running firmware version is shown on the splash screen at power-up. Refer to the Firmware Change Log (Appendix D) for version details.

1.2 Safety and Regulatory Notices

Read the following notices before installing or operating the PTC 5. The same warnings are repeated at the relevant steps later in this manual.

WARNING — POWER OFF BEFORE TOUCHING THE MOTOR CONNECTIONS.

Always turn off and unplug the controller and all connected power before plugging in or unplugging the motor. Connecting or disconnecting the motor while power is on can permanently damage the controller and motor.

CAUTION — 24 V, 6 A POWER SUPPLY.

The PTC 5 ships with a 24 V, 6 A power adapter. Use it only with the PTC 5, and power the PTC 5 only from this adapter. Plugging this 24 V supply into other equipment rated for a lower voltage can permanently damage that equipment.

CAUTION — THE DISPLAY IS GLASS.

The touchscreen face is glass and can crack or shatter if dropped, struck, or pressed against a hard edge. Handle the controller carefully during installation, and do not rest tools or weight against the screen.

The PTC 5 contains electronic assemblies soldered with lead-based solder. Avoid inhaling fumes if you solder or rework the internal boards, and wash your hands after handling internal components. Follow all applicable electrical safety practices when wiring your layout, power supplies, and any mains-powered devices.

California Proposition 65 Warning: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm.

2. System Overview

A complete PTC Model 5 installation consists of the controller/touchscreen assembly, a closed-loop stepper motor and bracket, the 24 V power supply, optional ATR wiring for bridge track power, an optional APR2 Automatic Power Router for roundhouse track power, and any accessories tied to the effects relay. See the APR2 manual at www.nyrs.com for details on that accessory.

2.1 Major Components

- PTC Model 5 controller with a 5-inch color touchscreen and an illuminated power button.
- Closed-loop stepper motor with absolute encoder — a NEMA 17 frame motor for N scale, a NEMA 23 frame motor for HO and On3, or a NEMA 34 frame motor for O scale (see Appendix A).
- 24 V, 6 A power supply (NYRS-supplied or equivalent).
- Optional track reversing (ATR) connection to the bridge rails.
- Optional APR2 Automatic Power Router for switching power to roundhouse and stall tracks.
- Effects relay output for auxiliary accessories such as lamps, sound modules, or indicators.

2.2 How You Interact With the PTC 5

All operation is through the touchscreen. From the splash screen you reach the home (operating) screen, and from there you can open Settings, the DCC settings panel, or the Program Tracks screen. There is no separate index mode: the absolute encoder establishes bridge position automatically, and if the bridge is moved while power is off, the controller corrects its position the next time it is powered up.

3. Motor Installation

Proper motor installation is critical to accurate and repeatable turntable performance. Any misalignment, flex, or binding between the motor and the turntable bridge will show up as inconsistent track alignment. Take your time on this step — good mechanics make everything else easy. The PTC 5 closed-loop drive has no gear backlash, so the bridge approaches every track the same way from either direction. To keep the bridge from being pushed out of alignment, make sure locomotives come onto the bridge straight; we recommend at least one engine length of straight track leading onto the bridge.

3.1 Using the NYRS Motor Mount Kit

If you are using the optional NYRS Motor Mount Kit, refer to the separate NYRS Motor Mounting Manual, available at www.nyrs.com, for detailed mounting instructions. Install and test the motor mount before proceeding with the rest of this manual. The kit is designed to provide proper alignment and rigidity for most common turntable installations.

3.2 Designing Your Own Motor Mount

If you are designing your own mount for a scratch-built turntable or special installation, keep these guidelines in mind:

- Do not suspend the motor from the turntable shaft. The motor should be firmly supported by the pit, benchwork, or a rigid bracket — not by the bridge.
- The mount must be rigid. There should be no noticeable flex or twist when you apply moderate hand force to the motor.
- Maintain alignment. The motor shaft must remain coaxial with the turntable shaft to avoid binding.
- Use a common reference surface. The turntable and motor should be mounted to the same structural reference rather than opposite sides of flexible benchwork.

Motor mounting patterns differ by scale. N scale uses the NEMA 17 motor with four tapped M3 holes on a 31 mm square pattern. HO and On3 use the NEMA 23 motor with four Ø5 mm through-holes on a 47.14 mm square pattern. O scale uses the NEMA 34 motor with four Ø5.5 mm through-holes on a 69.6 mm square pattern. The O scale motor uses the NYRS BRA-MM-NEMA34 motor mount. See Appendix A for full mounting-hole patterns and shaft dimensions, and the NYRS Motor Mounting Manual for step-by-step mounting guidance.

WARNING — POWER OFF BEFORE TOUCHING THE MOTOR CONNECTIONS.

Always turn off and unplug the controller and all connected power before plugging in or unplugging the motor. Connecting or disconnecting the motor while power is on can permanently damage the controller and motor.

4. Controller Installation

The PTC 5 controller is designed for fascia mounting, where the operator has a clear view of the touchscreen and easy access to it. Choose a location that is comfortable to reach and close enough to the turntable for the motor cable and wiring to reach.

4.1 Choosing a Location

- Mount within reach of the turntable using the standard motor cable; extension cables are available for longer runs.
- Treat the turntable like a cluster of turnouts — place the controller where the operator can easily see and reach it.
- Ensure sufficient clearance behind the fascia for the controller, connectors, and cabling.

4.2 Fascia Cutout and Mounting

Refer to Appendix B for the panel cutout dimensions. The opening is 5.6 in. wide by 3.5 in. tall with chamfered corners and a semicircular relief on the right edge for the illuminated button. Cut and de-burr the opening, test-fit the controller, and secure it with the supplied hardware. Do not oversize the opening so far that the bezel cannot fully cover it.

CAUTION — THE DISPLAY IS GLASS.

The touchscreen face is glass and can crack or shatter if dropped, struck, or pressed against a hard edge. Handle the controller carefully during installation, and do not rest tools or weight against the screen.

4.3 Connecting the Motor Cable

The motor connects to the PTC 5 through two cables: a short cable permanently attached to the motor, ending in a keyed connector at the motor and an HD-LINK (DB9) connector, and a 3-ft DB9 cable supplied with the PTC 5 that extends the reach between the motor and the controller. With all power off, make the connections in this order:

1. Align the cable's keyed connector with the mating connector on the motor. The motor connector is marked with Red, Black, White, and Green legends that match the wire colors visible entering the cable connector — use them to confirm orientation. The connector fits only one way; push it straight on until it clicks.

Figure 4-1. The keyed motor connector seated on the motor (wire colors aligned to the connector legends).

2. Connect one end of the supplied 3-ft DB9 cable to the motor cable's HD-LINK connector, and the other end to the MOTOR port on the controller's rear panel.
3. Tighten the thumbscrews at both DB9 connections to lock them in place.

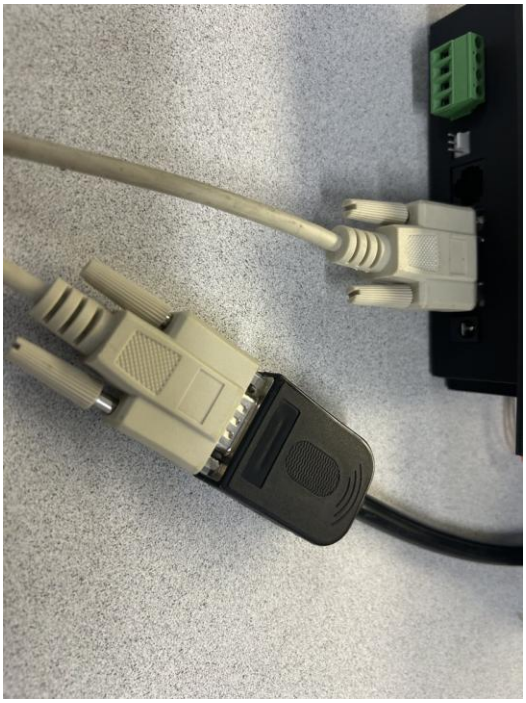

Figure 4-2. The supplied 3-ft DB9 cable connects the motor cable to the MOTOR port; secure the thumbscrews at both ends.

CAUTION — SECURE BOTH DB9 CONNECTIONS WITH THEIR THUMBSCREWS.

Do not operate the PTC 5 unless both ends of the motor cabling are fully seated and held by their thumbscrews. A loose connector can cause intermittent power and may damage the controller or motor.

4.4 Power Button and Supply

The PTC 5 uses an illuminated push button mounted on the right side of the controller. Connect the supplied 24 V, 6 A power adapter to the POWER 24V DC jack on the rear panel (see Appendix C).

CAUTION — 24 V, 6 A POWER SUPPLY.

The PTC 5 ships with a 24 V, 6 A power adapter. Use it only with the PTC 5, and power the PTC 5 only from this adapter. Plugging this 24 V supply into other equipment rated for a lower voltage can permanently damage that equipment.

4.5 Track Reverser (ATR) Wiring Overview

The PTC 5 includes onboard automatic track power reversing (ATR) that keeps locomotive direction consistent as the bridge turns, eliminating the need for a split-ring rail or manual polarity switch. Connect your track (layout) power to terminals A and B, and take bridge power from terminals C and D. Terminals A and B are internally fused. If you are using DCC, connect the DCC bus to A and B; C and D supply the bridge rails only. At the Track 1 home position, A connects to C and B to D; the polarity reverses automatically as the bridge passes ±90° from Track 1. See Chapter 10 and Appendix C for details.

For DCC users, NYRS recommends a dedicated DCC auto-reverser such as the PSX-AR, which adds circuit-breaker protection. The PTC 5's own ATR works well; the added protection of a DCC reverser can help protect wiring and boosters in the event of a major short.

4.6 APR2 Automatic Power Router

The optional APR2 is a separate accessory board that switches power to roundhouse and stall tracks. It is a distinct function from ATR — ATR handles bridge-rail polarity, while the APR2 controls power to the surrounding tracks. Connect the APR2 to the rear-panel APR2 jack and refer to the APR2 manual at www.nyrs.com for its own installation and configuration.

4.7 Effects Relay Connector

The effects relay provides a switched contact for auxiliary accessories such as lamps, sound modules, or indicators. The relay contacts are brought out to the EFFECTS connector, which provides both normally-open and normally-closed contacts, so you choose the behavior by which terminal you wire to rather than by a software setting. The effects relay is enabled on the Settings screen. See Appendix C for the connector pinout.

5. System Check-Out

Before committing to a permanent installation, verify basic operation on the workbench or with the turntable temporarily in place. This confirms that wiring, motor connections, and the controller are correct before you program track locations.

5.1 Power-Up

Apply power. The display shows the blue PTC 5 splash screen with the running firmware version in the lower-left corner. Tap the screen to continue to the home screen.

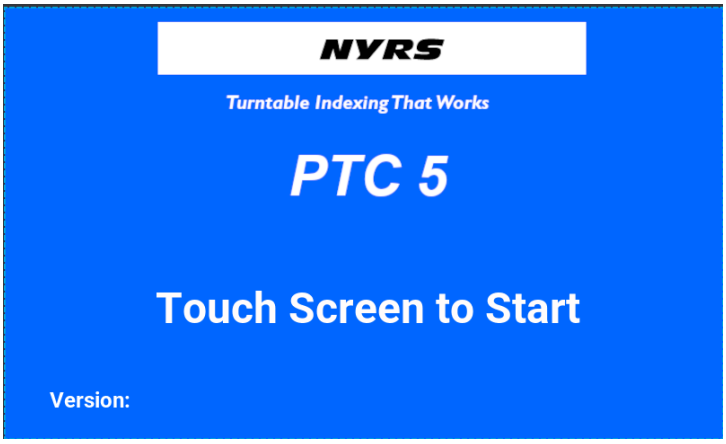

Figure 5-1. Power-up splash screen — tap to start.

If the bridge was moved while power was off, the status line reads CORRECTING POSITION and the bridge drives itself back to its known position before returning to READY. This is normal — the absolute encoder always knows where the bridge is, so no manual re-indexing is required.

5.2 Checking Bridge Motion

Use the Program Tracks screen (Chapter 6) to verify the bridge turns smoothly before programming. In programming the motor is released and the bridge turns freely; the Advance button rotates the bridge continuously and the CW / CCW buttons jog it one step at a time. Rotate the bridge through a full revolution and watch for binding, stiff spots, stuttering, or unusual noises. If you find any, turn off power, correct the mechanical problem, and re-check before programming.

Free-rotation load check: Before programming, place your heaviest locomotive on the bridge. An inexpensive digital fish scale (typically less than $10) can be used to check the force required to rotate the loaded bridge. Attach the scale near the end of the bridge and slowly pull the bridge through a complete 360° rotation while watching the reading. The force should remain reasonably consistent. A sudden increase at any point indicates a stiff spot, binding, interference, or another mechanical problem that should be corrected before programming the turntable.

6. Programming the Turntable

Programming teaches the PTC 5 the angular position of every track. Thanks to the absolute encoder, you program the head end of each track plus the head-to-tail offset just once, and the

controller derives every tail position automatically. Programming is normally done once after installation, and again only if major mechanical changes occur.

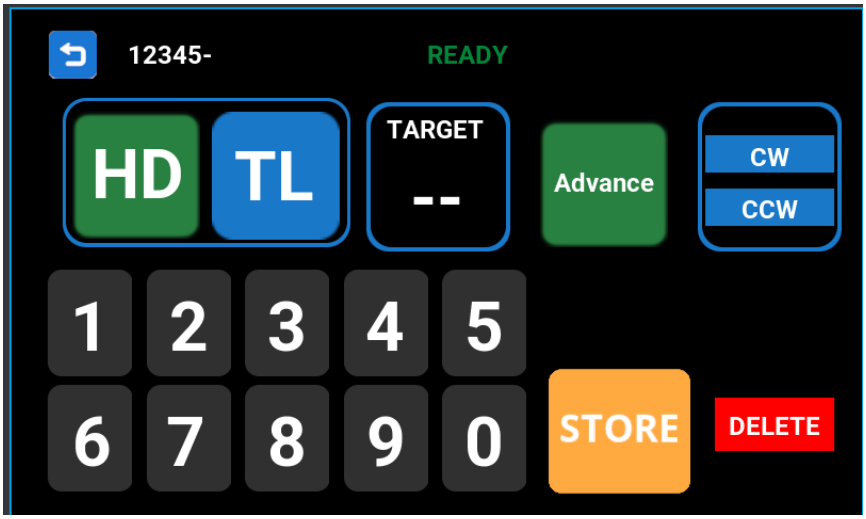

Figure 6-1. The Program Tracks screen.

6.1 Planning Track Numbers

Track 1 is your primary lead track and serves as the angular reference for ATR and for the head-to-tail offset. The remaining tracks may use any numbers from 2 to 99 in any pattern. Many users group numbers logically — for example, 1–3 for lead tracks, 11–15 for roundhouse stalls, and 20–29 for outside storage. Sketch your turntable and write the chosen numbers next to each track, then check them off as you program.

6.2 Entering Program Mode

Tap Program Tracks. This button is available from both the home (run) screen and the Settings screen. In programming mode the motor releases and the bridge free-wheels, so you position it by hand. The Advance and CW / CCW buttons are not required for programming; they are provided to test that the bridge rotates smoothly.

6.3 Program Track 1 (Head End)

Choose one end of the bridge as the head end. It is helpful to mark this end, or to model an operator's shack on it, so you can tell the two ends apart. Then:

1. By hand, point the head end of the bridge at Track 1.
2. Select **HD**, enter **01**, and press **STORE**.
3. The status line confirms **HEAD TRACK 01 SAVED**.

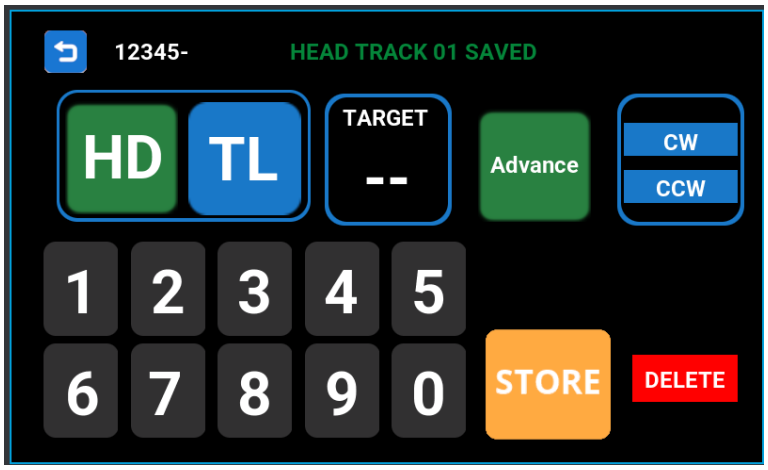

Figure 6-2. A head position has been stored.

6.4 Program Track 1 (Tail End)

Next, capture the head-to-tail offset by programming the tail end of Track 1:

1. By hand, rotate the bridge so the tail end points at Track 1.
2. Select **TL**, enter **01**, and press **STORE**.

The controller stores the offset between the head and tail ends from this single move and applies it to every other track. You do not need to program the tail end of any other track.

6.5 Program the Remaining Tracks

For each remaining track, point the head end of the bridge at the track and press HD → the track number → STORE. Repeat for all tracks you intend to use.

> **Optional:** If a particular track ever needs its own tail position, you can program it the same way with TL → the track number → STORE. This is rarely necessary because the Track 1 offset already covers the whole table.

6.6 Editing a Track

Editing works exactly like programming. Enter Program Tracks, position the bridge at the corrected location, and press HD → the track number → STORE. The new position overwrites the old one. There is no separate track-edit mode.

6.7 Deleting a Track

To remove a stored track, enter its track number and press DELETE.

6.8 Finishing

Use the back arrow to leave the Program Tracks screen and return to normal operation. No separate indexing step is required — the absolute encoder already knows the bridge position.

7. Operating the PTC 5

Once programmed, normal operation is done entirely from the home (operating) screen.

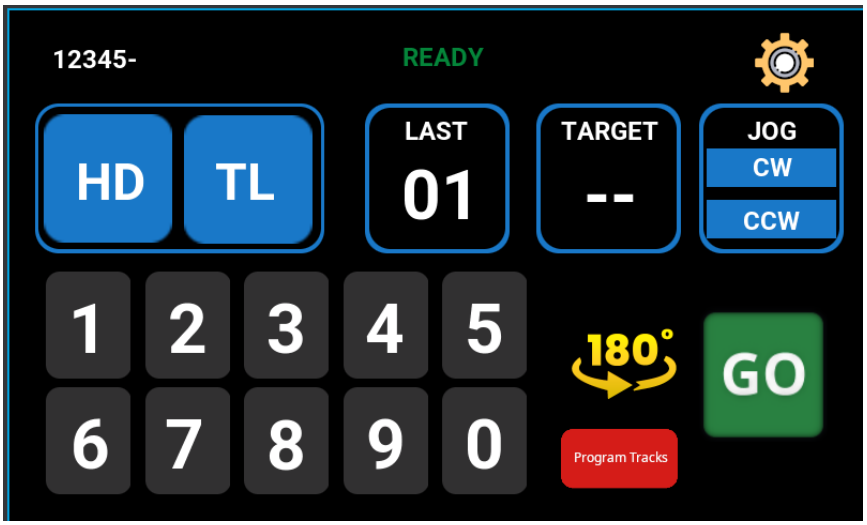

Figure 7-1. The home (operating) screen.

7.1 Home Screen at a Glance

- **Status line** (top center) shows READY when the controller is idle, or a message such as MOVING HEAD TO TRACK 11 during a move.
- **Gear icon** (top right) opens the Settings screen.
- **HD / TL** select whether a move aligns the head end or the tail end of the bridge.
- **LAST** shows the last track reached; **TARGET** shows the track number you are entering.
- **Number keypad** enters the track number.
- **GO** starts the move; **JOG CW / CCW** nudge the bridge one step per press; **180°** turns the bridge a half-revolution to swap a locomotive end-for-end.
- **Program Tracks** opens the programming screen (Chapter 6).

7.2 Selecting and Moving to a Track

1. Press **HD** or **TL** to choose the head or tail end.
2. Enter the track number on the keypad. It appears in the **TARGET** box.
3. Press **GO**. The status line shows the move in progress, and the bridge ramps to the track using the current speed and momentum.

7.3 Stopping a Move (Emergency Stop)

While the bridge is moving, the GO button turns red and reads STOP. Press STOP to halt the bridge immediately. After stopping, press GO to continue to the same target, or enter a new track number to redirect the bridge to a different location.

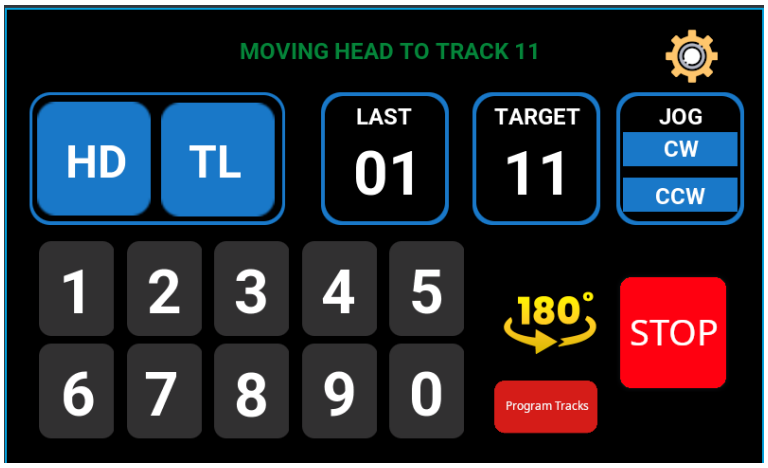

Figure 7-2. During a move, GO becomes a red STOP button.

7.4 Operating Hints

- The 180° button is handy for turning a locomotive without selecting a specific track.
- JOG CW / CCW move the bridge a single small step per press, useful for spotting equipment precisely.
- If the bridge was moved with power off, the controller corrects its position automatically at the next power-up; no re-indexing is needed.
- If a track consistently stops slightly out of alignment, use JOG CW / CCW to position the bridge correctly. Then open Program Tracks, select HD or TL as appropriate, enter the track number, and press STORE. The corrected position is saved immediately. Return to the Run screen and resume normal operation.

8. Settings

The Settings screen, reached from the gear icon, collects the controller's adjustable options on a single page. Changes do not take effect until you press SAVE; CANCEL discards them.

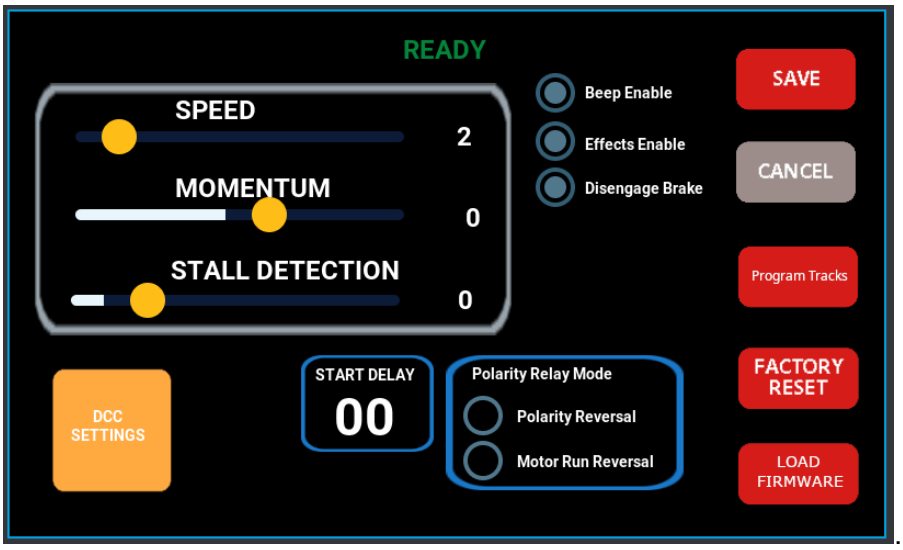

Figure 8-1. The Settings screen.

8.1 Speed

The SPEED slider sets the maximum rotational rate of the bridge. Lower values turn the bridge more slowly and smoothly; higher values are faster. Very large bridges generally look best at lower speeds.

8.2 Momentum

The MOMENTUM slider controls how gradually the bridge accelerates and decelerates, simulating the inertia of a heavy prototype turntable. A setting of zero starts and stops abruptly; higher settings produce longer, smoother ramps. Momentum is scaled to the selected speed.

8.3 Stall Detection

The motor's built-in encoder continuously tracks the true position of the bridge. Stall detection uses this to confirm that the bridge is actually reaching — and holding — the position it was told to move to. If anything prevents the bridge from turning freely, the controller can sense it, stop the move, and keep the motor and drive from forcing against the obstruction.

What a stall is

A stall is any condition that keeps the bridge from following its commanded movement. Common causes include:

- Debris or a stray object fouling the turntable pit.
- A derailed or overhanging locomotive catching on nearby scenery or rail.
- A mechanical bind in the drive, bearing, or gearing.
- The bridge being physically held or stopped by hand.

When the bridge falls behind its commanded position by more than the allowed amount, the controller registers a stall and stops the move.

The Stall Detection slider

On the Settings screen, the STALL DETECTION slider sets how sensitive this protection is, on a scale of 1 to 10. A setting of 1 is the most sensitive — the controller reacts to the smallest deviation from the commanded position. A setting of 10 is the least sensitive — the bridge can drift much further before a stall is declared. The default is 3, which suits most installations and bridge weights; most layouts will not need to change it.

When to adjust it

If the turntable stops with a false stall during normal operation — on a heavier bridge, during quicker moves, or with no obvious obstruction — the setting may be too sensitive. Raise it one step at a time until normal moves complete reliably.

If a genuine obstruction is not being caught — the bridge strains or grinds against something before stopping, or does not stop at all — the setting may be too forgiving. Lower it so the controller reacts sooner.

Make changes one step at a time and run a few full rotations after each adjustment. A good setting ignores the small, harmless lag of everyday moves while still catching a real jam quickly.

Recovering from a stall

When a stall is detected, the turntable stops and will not move again until it is reset. To recover:

1. Switch off power to the controller.
2. Clear whatever was blocking the bridge.

3. Switch power back on.

The turntable knows its true position when it powers up, so it is ready to use again as soon as the obstruction is removed and power has been cycled.

> **Note:** Stall detection is a protective feature, not a substitute for keeping the pit and bridge clear. Always make sure the turntable is free of obstructions and that locomotives are properly seated on the bridge before commanding a move.

8.4 Start Delay

START DELAY inserts a pause between the moment a move is commanded and the moment the bridge begins to turn, which is useful for triggering pre-move sound or lighting through the effects relay. The range is 00 to 03 seconds. Tap the field to open the Number Entry screen (Section 8.10), enter the value, and SAVE.

8.5 Polarity Relay Mode

Polarity Relay Mode selects how the onboard relay behaves:

- **Polarity Reversal** — standard ATR operation. The relay reverses bridge-rail polarity automatically as the bridge passes ±90° from Track 1 (see Chapter 10).
- **Motor Run Reversal** — the relay energizes whenever the motor is running. This mode supports a two-wire servo or other device used as a bridge lock or auxiliary mechanism. The Start Delay applies to this output as well.

8.6 Effects Enable

Effects Enable turns the effects relay function on or off. Whether an accessory acts when the relay is open or closed is determined by which EFFECTS terminal you wire to (Appendix C), not by a software setting.

8.7 Beep Enable

Beep Enable turns the touchscreen feedback beep on or off.

8.8 Factory Reset

Factory Reset restores the controller's settings to their defaults. Use it only when you want to start fresh.

8.9 Number Entry Screen

Whenever a numeric value is required away from the home screen — for example, a Start Delay or a DCC address — the controller shows a shared Number Entry screen. Enter the value on the keypad and press SAVE, or press CANCEL to leave it unchanged.

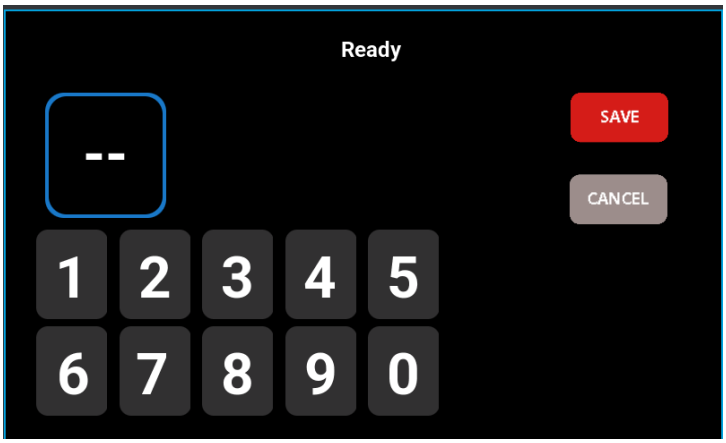

Figure 8-2. The shared Number Entry screen.

8.10 DCC Settings and Load Firmware

The DCC SETTINGS button opens the DCC settings panel (Chapter 9). The LOAD FIRMWARE button begins a firmware update (Chapter 11).

9. Operating From a DCC Throttle

The PTC 5 can be operated from a DCC system in either Locomotive Decoder mode or Accessory Decoder mode. Locomotive Decoder mode uses a locomotive address, the throttle speed setting to select a track, and function buttons to select the Head or Tail end of the bridge. Accessory Decoder mode uses standard turnout commands, with one accessory address assigned to each track.

9.1 The DCC Settings Panel

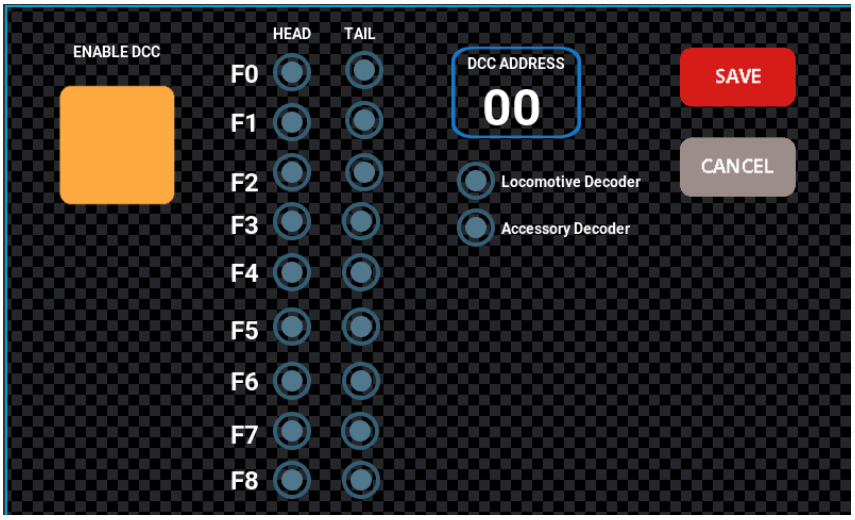

Figure 9-1. The DCC settings panel (DCC enabled).

- **ENABLE DCC** turns DCC operation on or off. The button is green when enabled, which is the default.
- DECODER TYPE selects Locomotive Decoder or Accessory Decoder operation.

- DCC ADDRESS is used in Locomotive Decoder mode and sets the locomotive address the controller answers to, in the range 1–99. Tap the field to enter it on the Number Entry screen.
- BASE ADDRESS is used in Accessory Decoder mode. It is a two-digit value from 01–99 and forms the first two digits of each track's accessory address.
- **Head / Tail function assignment** — the F0–F8 grid selects which function button sends the bridge head-end leading and which sends it tail-end leading. The defaults are F0 for Head and F1 for Tail. Reassign these only if F0 or F1 conflict with other equipment.

9.2 Locomotive Decoder Mode — Set or Check the DCC Address

Acquire the controller's address on your throttle exactly as you would select a locomotive. Set your throttle to 128 speed steps for access to the full range of tracks; in 28-step mode you can still reach tracks 1 through 28.

9.3 Select a Track With the Speed Control

The throttle's speed setting chooses the destination track — it does not set how fast the bridge turns. Bridge speed and momentum are configured separately on the Settings screen. The speed step matches the track number: speed step 1 selects Track 1, speed step 2 selects Track 2, and so on.

Destination track	Speed step
1	1
2	2
3	3
…	…
N	N

Set the speed to the step that matches your target track before sending the bridge.

9.3.1 Throttle Display

Some DCC throttles compress the displayed speed-step values when operating in 128-speed-step mode. As a result, the number shown on the throttle may not always match the actual DCC speed step being transmitted.
The PTC Model 5 always responds to the DCC speed step received from the command station, regardless of how the throttle displays that value. This may result in the throttle displaying repeated numbers even though the PTC correctly selects consecutive tracks.
This is normal behavior and is determined by the DCC throttle's user interface.

9.4 Send the Bridge With the Head and Tail Buttons

Two function buttons decide which end of the bridge is sent to the selected track:

- **Head** — default function F0
- **Tail** — default function F1

Press Head to drive the bridge to the selected track head-end leading, or Tail to send it tail-end leading. The move begins as soon as you press the button.

9.5 Stop the Bridge

To halt a move already in progress, press any function button.

9.6 Example — Send the Bridge Head-First to Track 4

1. Acquire the controller's DCC address on your throttle.
2. Set the speed to step 4.
3. Press F0 (Head).

The bridge turns to Track 4 with its head end aligned. To stop it before it arrives, press any function button.

9.7 Accessory Decoder Mode

In Accessory Decoder mode, the PTC 5 responds to standard DCC accessory (turnout) commands. Each programmed turntable track uses one accessory address. The two turnout states select which end of the bridge is aligned with that track.
The two-digit BASE ADDRESS forms the first two digits of the accessory address, and the track number forms the last two digits. For example, with BASE ADDRESS set to 01, Track 1 is accessory address 0101, Track 2 is 0102, Track 12 is 0112, and Track 24 is 0124.
Thrown / Diverging / On — moves the Head end of the bridge to the selected track.
Closed / Straight / Off — moves the Tail end of the bridge to the selected track.
DCC systems use different terminology for the two turnout states, but the operation is the same. Only the activation command moves the bridge; the release/deactivation command does not cause another move.
The 180° turn function is not available from a DCC command station in Accessory Decoder mode. Use the PTC 5 touchscreen when a 180° turn is required.

10. Automatic Track Power Reversing (ATR)

Automatic Track Power Reversing eliminates the need for a split-ring rail or manual polarity switch to keep locomotive direction consistent as the bridge turns. When ATR is enabled (Polarity Relay Mode set to Polarity Reversal), the PTC 5 monitors the head-end angle relative to Track 1 and reverses bridge-rail polarity when necessary.

10.1 Standard ATR Operation

The controller treats Track 1 as the reference. ATR behaves as though a split-ring commutator were used, with the splits located 90° to either side of Track 1: when the head end is within ±90° of Track 1 one polarity is applied to the bridge rails, and beyond ±90° the polarity is automatically reversed. As the bridge continues around, the polarity toggles again at the next ±90° crossing.

10.2 Wiring

Connect your track (layout) power to terminals A and B, and take bridge power from terminals C and D. Terminals A and B are internally fused. For DCC, connect the DCC bus to A and B; C and D feed the bridge rails only. In the Track 1 home position, A connects to C and B to D. See Appendix C for the full wiring reference.

10.3 Using an External Auto-Reverser

If you prefer to use a separate DCC auto-reverser, simply leave the ATR terminals unconnected. For DCC installations NYRS recommends a dedicated auto-reverser such as the

PSX-AR for added short-circuit protection, although the internal ATR works well and most boosters provide their own short-circuit protection.

11. Firmware Update

Firmware updates for the PTC 5 are handled through NYRS. To obtain an update or arrange to have one installed, contact NYRS support at support@nyrs.com. The LOAD FIRMWARE button on the Settings screen begins the update and displays the warning shown below before anything is changed.

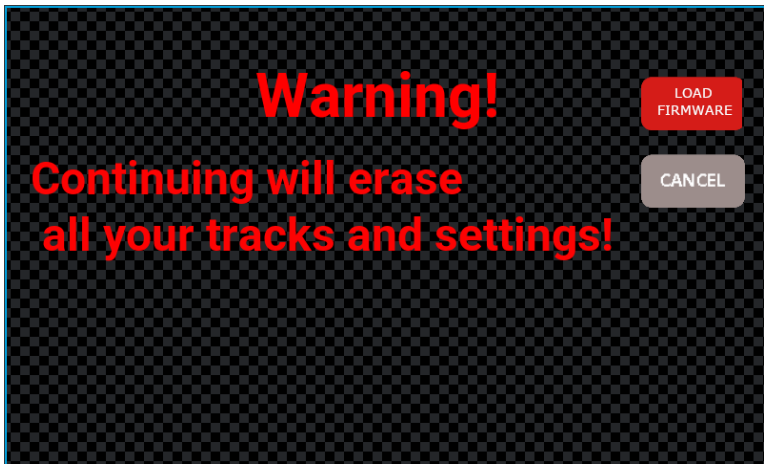

Figure 11-1. The firmware update warning.

WARNING — UPDATING FIRMWARE ERASES ALL TRACKS AND SETTINGS.

Loading new firmware clears every stored track position and all settings. Only perform an update with guidance from NYRS support, and be prepared to re-program your tracks and settings afterward.

Because an update clears all stored tracks and settings, only proceed with guidance from NYRS support, and re-program your tracks and settings after the update is complete (Chapters 6 and 8).

12. Troubleshooting

The PTC 5 shows plain-language status messages on the touchscreen. Below are some common symptoms and actions.

Symptom	Possible cause / action
Status reads CORRECTING POSITION at power-up.	Normal if the bridge was moved with power off. The controller drives the bridge back to its known position, then shows READY. No action needed.
Bridge does not move when a track is selected.	Confirm the 24 V supply is connected, the motor (DB9) is plugged in, and the controller is on the home screen (not in Program Tracks). Check that the track has been programmed.
Bridge stops short of or overshoots a track.	Verify the bridge turns smoothly with no binding, then re-store that track from the Program Tracks screen (HD → nn → STORE).

Symptom	Possible cause / action
Motor is weak, stalls, or runs hot.	The PTC 5 selects the proper motor configuration automatically. Check for mechanical binding, obstruction, or a loose motor connection. If the problem persists, contact NYRS support.
Shorts when leaving certain tracks.	Check ATR wiring and track gapping at the turntable entrance, and your DCC auto-reverser setup. If a track sits very near 90° or 270° you may need to reverse the polarity of that track's feeders. If using a DCC auto-reverser you should not be taking bridge power off of the PTC5.
Selected track will not store / nothing happens.	Make sure Track 1 has been programmed first, then store the remaining tracks. Track 1 is the reference for the whole table.

Appendix A — Motor Dimensions

Appendix A — Motor Dimensions

Motor selection by scale:
N/HO scale — NEMA 17 motor.
HO/Sn3/On3 — NEMA 23 motor, (If you are turning brass Bigboys in HO you might want this motor).
O scale — NEMA 34 motor with BRA-MM-NEMA34 motor mount.

Turntable shaft sizes vary by manufacturer and model. Contact NYRS for the correct coupling for your installation.

A.1 N/HO Scale Motor (NEMA 17)

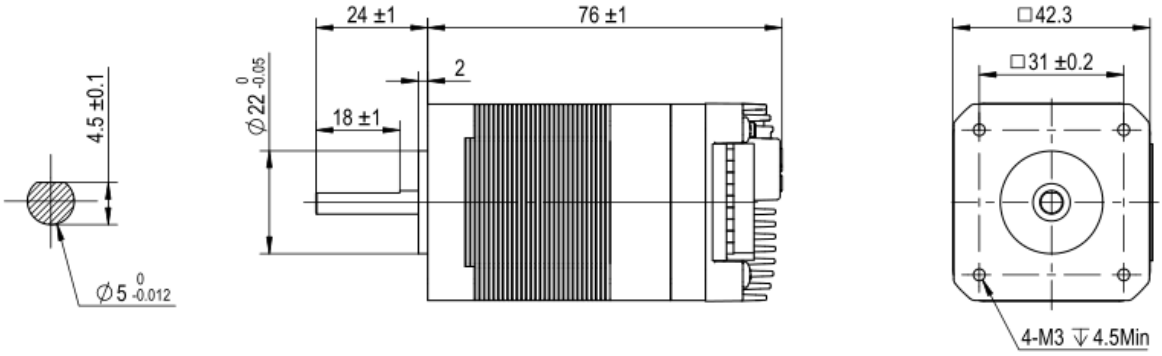

Figure A-1. N scale motor mounting dimensions (mm).

Dimension	Value
Frame	42.3 mm square (NEMA 17)
Mounting holes	4 × M3, 31 mm square pattern, 4.5 mm min. depth
Pilot boss	Ø22 mm (0 / −0.05)
Shaft	Ø5 mm (0 / −0.012), 4.5 mm flat (D-cut)

Dimension	Value
Overall length	76 mm (±1)
Integrated drive	UIM4247CA (internal UIM342 controller)

A.2 HO/S/ On3 Motor (NEMA 23)

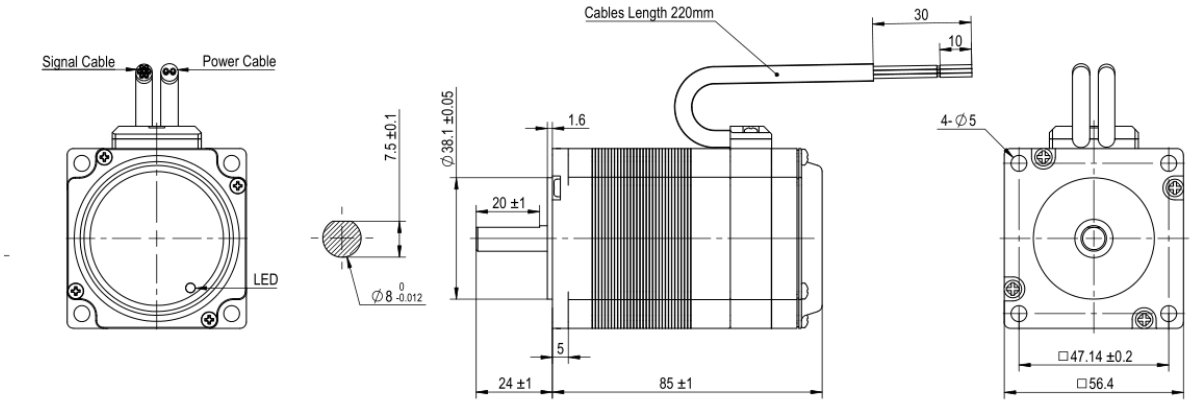

Figure A-2. HO/On3 motor mounting dimensions (mm).

Dimension	Value
Frame	56.4 mm square (NEMA 23)
Mounting holes	4 × Ø5 mm through-holes, 47.14 mm square pattern
Pilot boss	Ø38.1 mm (±0.05)
Shaft	Ø8 mm (0 / −0.012), 7.5 mm flat (D-cut)
Overall length	85 mm (±1)
Cables	Signal and power, 220 mm; status LED on rear
Integrated drive	UIM5756CA (internal UIM342 controller)

A.3 O Scale Motor (NEMA 34)

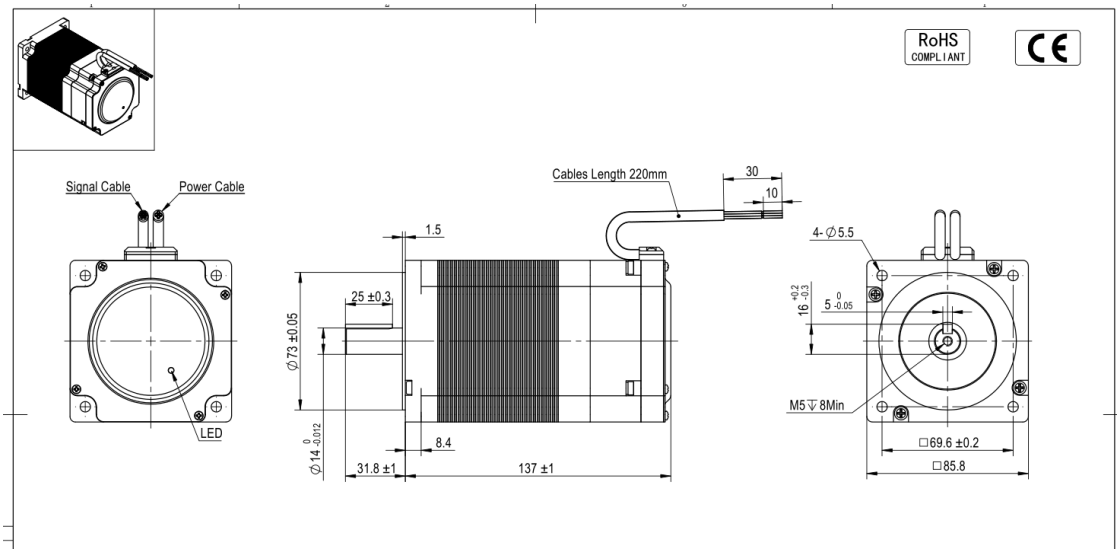

Figure A-3. O scale NEMA 34 motor mounting dimensions (mm).

Dimension	Value
Frame	85.8 mm square (NEMA 34)
Mounting holes	4 × Ø5.5 mm through-holes, 69.6 mm square pattern (±0.2 mm)
Pilot boss	Ø73 mm (±0.05)
Shaft	Ø14 mm, 5 mm flat
Shaft extension	25 mm (±0.3)
Overall length	137 mm (±1)
Cables	Signal and power, 220 mm; status LED on rear

Appendix B — Panel Cutout

Cut the fascia opening to the dimensions below. The opening is 5.6 in. wide by 3.5 in. tall with chamfered corners. The semicircular relief on the right edge clears the illuminated button and is located 0.9 in. from the top edge and 1.9 in. from the bottom edge. Dimensions are in inches.

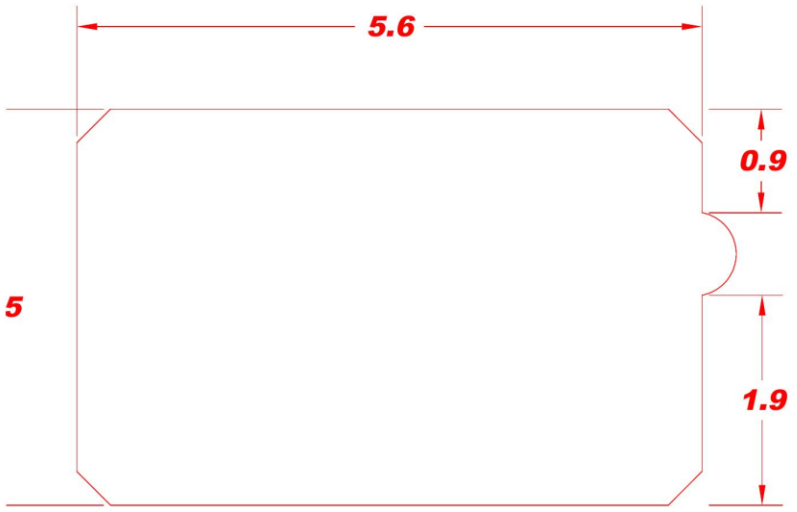

Figure B-1. PTC 5 panel cutout (inches).

Appendix C — Connectors and Wiring

The rear panel connectors are shown below, left to right.

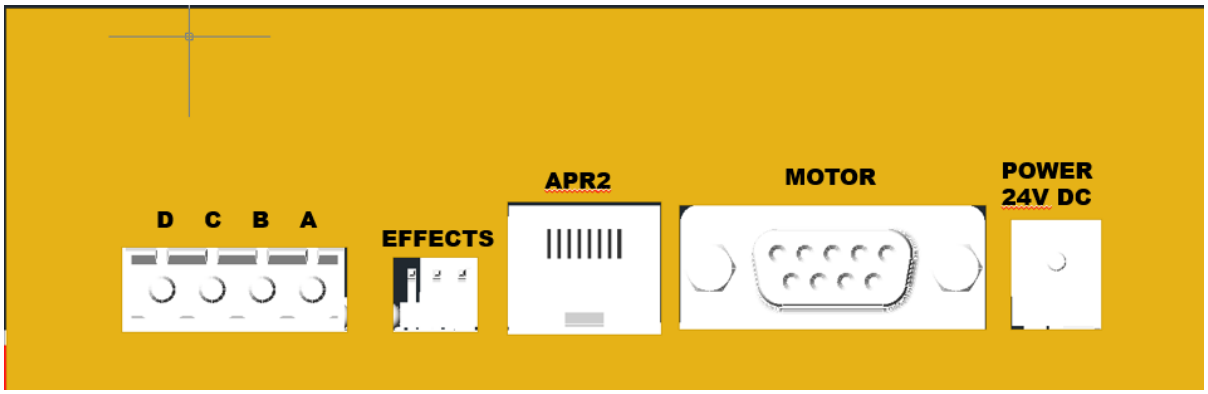

Figure C-1. Rear-panel connectors.

Connector	Function
D · C · B · A	Track reversing (ATR). Track (layout) power connects to A and B (internally fused); bridge power comes from C and D. For DCC, connect the bus to A and B.
EFFECTS	Effects relay output. Pins left to right are C (common), NC (normally closed), NO (normally open) — wire to the contact you need.

Connector	Function
APR2	Connection to the optional APR2 Automatic Power Router (roundhouse / stall-track power).
MOTOR	Motor connection (DB9) to the closed-loop stepper.
POWER 24V DC	24 V, 6 A power input (barrel jack).

C.1 ATR Wiring

Track (layout) power connects to terminals A and B, which are internally fused; bridge power comes from terminals C and D to the bridge rails. If you are using DCC, connect the DCC bus to A and B — C and D supply the bridge only. In the Track 1 home position, A connects to C and B to D; polarity reverses automatically as the bridge passes ±90° from Track 1. Always use adequately sized wire and follow your booster or power-pack manufacturer's instructions.

Appendix D — Firmware Change Log

Version 0.9.4

Added automatic motor detection, eliminating the need to manually select the motor scale.

Improved positioning and stopping accuracy when approaching programmed track locations.

Version 0.9.1

Added support for optional motor brake release (maintenance mode).
Added DCC Decoder Type selection to the DCC Settings screen (Locomotive Decoder currently active; Accessory Decoder reserved for a future software release).
Updated the DCC address display to reflect the selected decoder type.
General user interface improvements and bug fixes.

Version 0.9.0

Initial public beta release.

Contact and Support

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