RT EX-Turntable
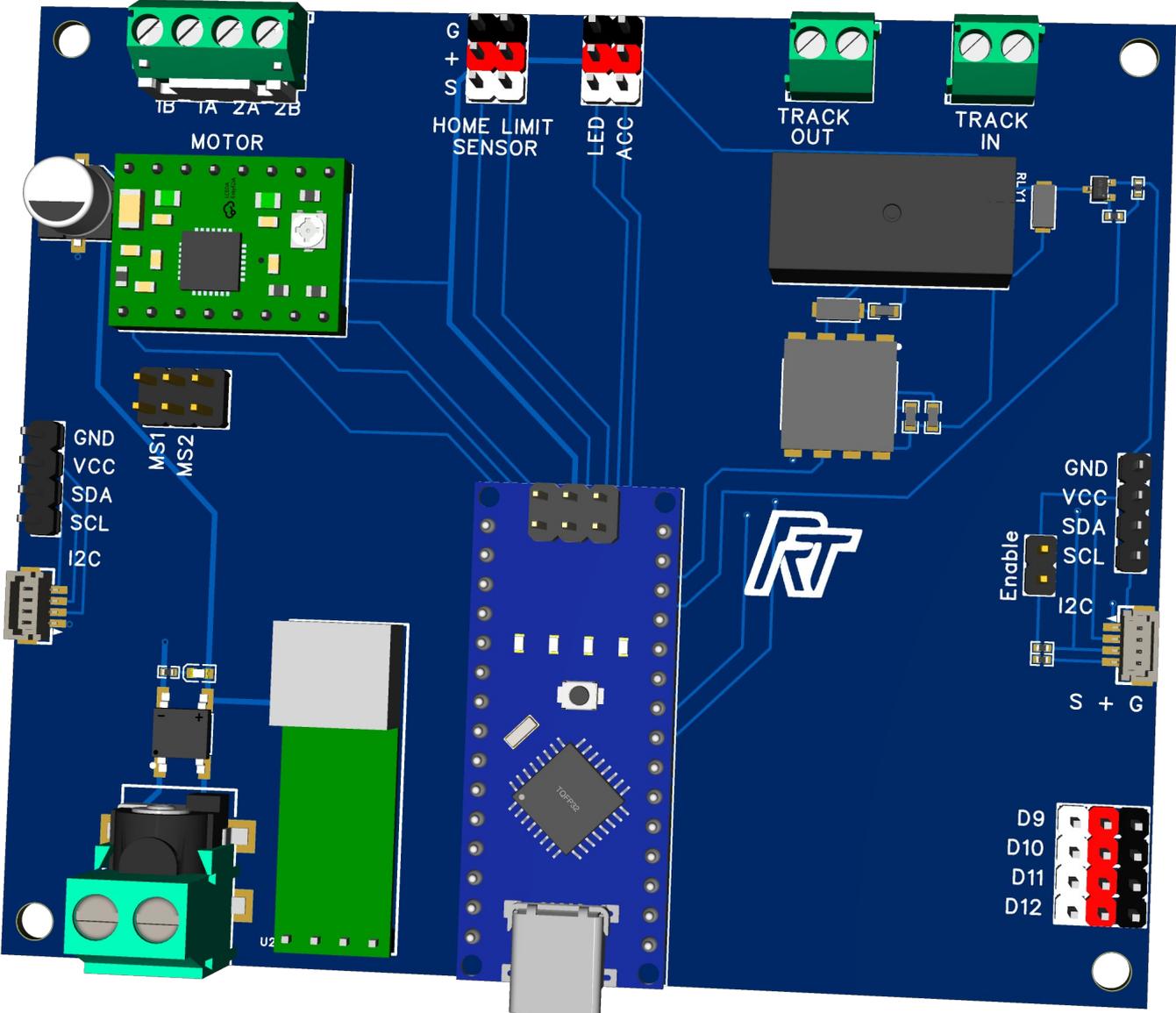

This is an all in one solution for a stepper motor driver turntable using EX-Turntable from here:

https://dcc-ex.com/ex-turntable/index.html#gsc.tab=0

In use.

The board will provide most of the hardware that you need to have a stepper motor driven turntable.

Other than the board you need:

1. Stepper motor - NEMA17 recommended however a will work with modification

2. Home sensor - this is normally a hall effect which has active low output but can be a reflective IR sensor or break beam IR sensor.

3. Power supply - recommended 15VDC if using a NEMA17 stepper, or 6VDC if using the 28BYJ-48.

4. Limit sensor - only if using this for a traverser.

Optional.

1. Led with current limiting resistor connected to the LED output.

2. Device that may be connected to the ACC output.

BEFORE YOU START

Please ensure that the heatsink on the motor driver has not been dislodged in transit.

Do not operate the board without a heatsink on the motor driver.

Do not have the motor connected when only connected to USB.

If you are wanting to connect to the board with USB while the motor is connected ensure that the main power supply to the board is on and connected before connecting the USB cable.

Connection to the layout.

Most of the information in regards to how you build your turntable is included here:

https://dcc-ex.com/ex-turntable/index.html#gsc.tab=0

I suggest reading through the whole of the EX-Turntable section.

What this board does is remove most of the wiring for an EX-Turntable.

Things to note with this board.

It uses a TMC2209 stepper motor controller. This can control stepper motors from 5V-29V DC.

I recommend using servo extension cables for connection to the sensor(s), led and accessory. The board is setup for this.

Connecting the DCC signal to this board it is important that the TRACK IN and TRACK OUT are connected appropriately.

TRACK IN is connected to the command station, either directly or to the track feed outside the turntable.

TRACK OUT is connected to the turntable bridge track. This is usually through a slip ring.

Configuration

The firmware supplied will be from here:

https://github.com/Rosscoetrain/EX-Turntable

the current (20 Feb 2026) version from DCC-EX doesn't have the updates for this board.

The board will be supplied with the following configuration.

MS1 - open
MS2 - open

This gives 3200 steps per revolution which is 0.1125º per step. More than enough to provide accurate track positioning.

I2C address = 0x60

This is the default for EX-Turntable.

EX-Turntable mode = Turntable

This is the default for EX-Turntable

Stepper maximum speed = 200
Stepper maximum acceleration = 25

These are the default for EX-Turntable

Home sensor active state = LOW

This means that your home sensor must output low signal when activated.

Limit sensor active state = LOW

This means that your limit sensor must output low signal when activated.

Sanity Steps = 30000

This allows you to calibrate with up to 1/128 micosteps. If you really need to.

Everything else is as per EX-Turntable. See here:

https://dcc-ex.com/ex-turntable/index.html#gsc.tab=0

Serial Commands

These can be accessed by the serial monitor in platformio, EX-Installer, Arduino IDE or a serial terminal (Putty, Minicom).

<C> - Initiate the calibration sequence

<D> - Enable/disable debug output to the serial console

<E> - Erase the EEPROM contents, which will force calibration to occur at next startup

<H> - Initiate homing

<M steps activity> - Initiate a move to the provided step count with the specified activity

<R> - Initiate a reboot (note with the old bootloader Nano this will not function correctly)

<T> - Enter/exit sensor testing mode, and requires a restart if exiting

<V> - Display the startup information in the serial console

WARNING

Do not have the motor connected when only connected to USB.

If you are wanting to connect to the board with USB while the motor is connected ensure that the main power supply to the board is on and connected before connecting the USB cable.

Board Headers

Configuration

The following headers are included on the board for configuration.

Enable - closed enables the I2C pullups, open disables the I2C pullups. Default closed.

MS1 MS2 - determines the microstep resolution.

MS1	MS2	Microstep	
OPEN	OPEN	1/16	Default
OPEN	CLOSED	1/64	
CLOSED	OPEN	1/128	
CLOSED	CLOSED	1/32	

Connection

Where the pins are White, Red, Black.

White = signal
Red = +5V
Black = ground

Home Sensor - connection to home sensor.

Limit Sensor - connection to limit sensor.

Led - connection to led via current limiting resistor (maximum 15mA).

Acc - connection to accessory (maximum 15mA).

D9, D10, D11, D12 - these are controlled outputs similar to Acc (see page 8).

Initial Setup

Once you have sorted how your are mechanically building your turntable then it's time to setup the controller.

Connect the stepper motor to the MOTOR connector.

Connect the home sensor to the HOME SENSOR.

Connect your power supply to the power input barrel connector.

Turn the power supply on.

The turntable will now go into automatic calibration mode. This will involve up to 2 complete revolutions depending on where the turntable started in respect to your home sensor.

Setting tracks in myAutomation.h

Full details for this are available here:

https://dcc-ex.com/exrail/exrail-command-reference.html#turntable-traverser-objects-definition-and-control

Controlling D9, D10, D11, D12

These can be controlled by EX-RAIL or DCC-EX command station turntable commands.

Output	DCC-EX command	EX-RAIL
D9 on	<I id 0 10>	PARSE("<I id 0 10>")
D9 off	<I id 0 11>	PARSE("<I id 0 11>")
D10 on	<I id 0 12>	PARSE("<I id 0 12>")
D10 off	<I id 0 13>	PARSE("<I id 0 13>")
D11 on	<I id 0 14>	PARSE("<I id 0 14>")
D11 off	<I id 0 15>	PARSE("<I id 0 15>")
D12 on	<I id 0 16>	PARSE("<I id 0 16>")
D12 off	<I id 0 17>	PARSE("<I id 0 17>")

in all cases id is your turntable id as set by the EX-RAIL command or DCC-EX command.

Addendum

References.