Carousel USA
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Fontana, CA 92335
626-334-7190

12LD Controller Outline

Contents

1. Introduction

This document is intended to further detail the standard turntable controller equipment described in the contractual agreement. It will cover functionality and provides step-by-step standard operating procedures.

a. Content of Carousel USA Agreement

CUSA Standard Controls, with one (1) remote transmitter.

b. Components

Enclosure:	Custom	Enclosure H6" x W9"x D9"
VFD:	BMUD60-A2	Oriental Motor Single Phase 100-120VAC Drive
Motor Cable	CC020KHBLB	Motor Cable, B-Type Opposite Shaft Outlet, 2M
Circuit Breaker:	BR2D3UC	Weidmuller Circuit breaker, 3A 2-pole
Switches:	DB-14-F	Power Switch 10A 250V AC Rocker Switch 3 Pin SonOff 4ch pro R3 Wi-fi Switch

2. Control Panel

a. Enclosure Specifications

- White Painted Steel, H6" x W12"x D 12"
- Recommended enclosure location: within 10’ of motor

b. Connections

- Incoming Power
  - Voltage: 115-120V/1Φ/60Hz
  - Required Amperage: 3A
- Conduit to motor pit
  - Motor Horsepower: 1/12 HP, 60W

c. Electrical Schematic

See Attachment.

d. Front Panel Layout

3. Standard Operating Procedure

1. Turn on device using switch located on the back of the enclosure.
2. Move the Standby/Run switch on the front of the drive to the Run position.
3. Turntable can now be rotated clockwise or counterclockwise using the buttons on the remote control.
4. Turntable rotation speed can be adjusted using the dial on the front of the drive.

CarouselUSA

12LD Turntable Controller

Troubleshooting Guide

12LD-O

12LD-A

Revised 2/20/2024

Carousel USA

15206 Ceres Ave, Fontana, CA 92335

www.carousel-usa.com

1. Introduction

This manual provides a step-by-step guide to troubleshooting simple issues related to the Carousel-USA 12LD Controller.

2. Inspect Operational Area

Create a clear and free working area around the turntable, ensuring that there is no debris that could cause interference with the turntable while in motion and that no one would be endangered by sudden movement of the turntable at any time while troubleshooting.

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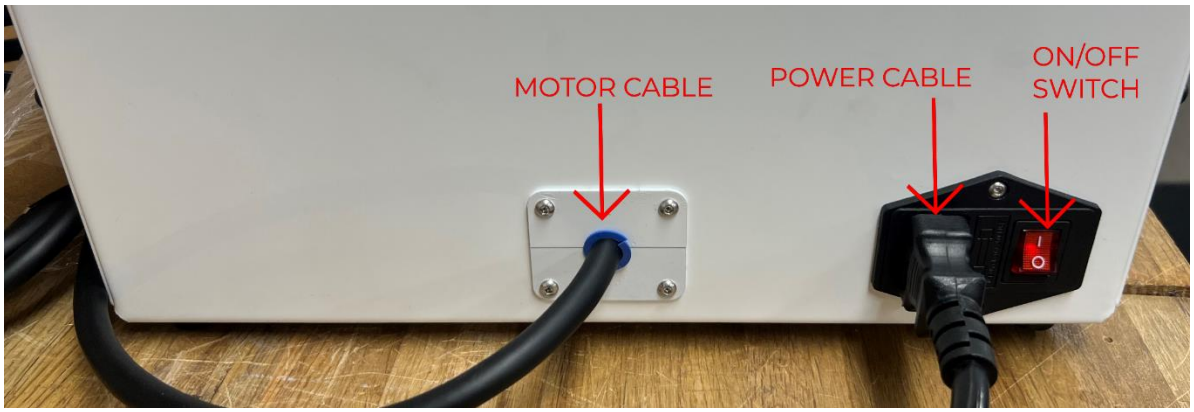
3. External Panel Layout

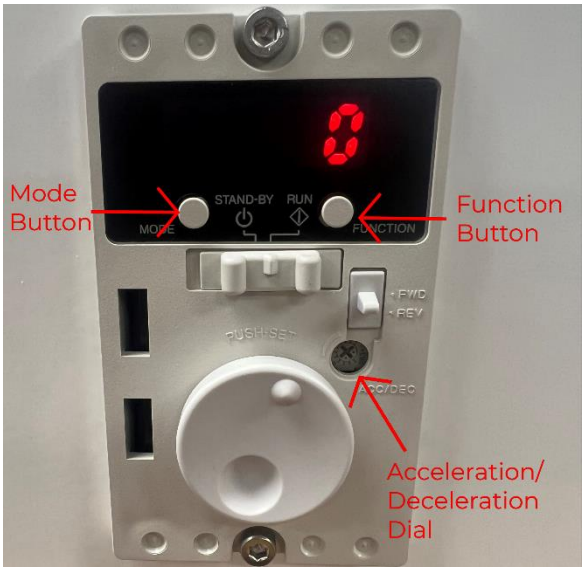
A. *Back Panel Layout*



Before troubleshooting, check the back of the control panel and ensure there are no loose connections or damaged cabling. Additionally, ensure that the On/Off Switch is in the “on” position and that the red light inside the switch is on. If it is in the “on” position and the light is not on, this indicates a problem with either the power cable, or incoming power from the wall outlet.

B. *Front Panel Layout (12LD-O)*

Motor Driver with Cover On



Motor Driver with Cover Off

Once power is on, check the Red LED Display on the motor driver shown above. This will usually give the most information about why a fault has occurred. The next section will describe common motor driver alarms and next steps should any of these alarms be present.

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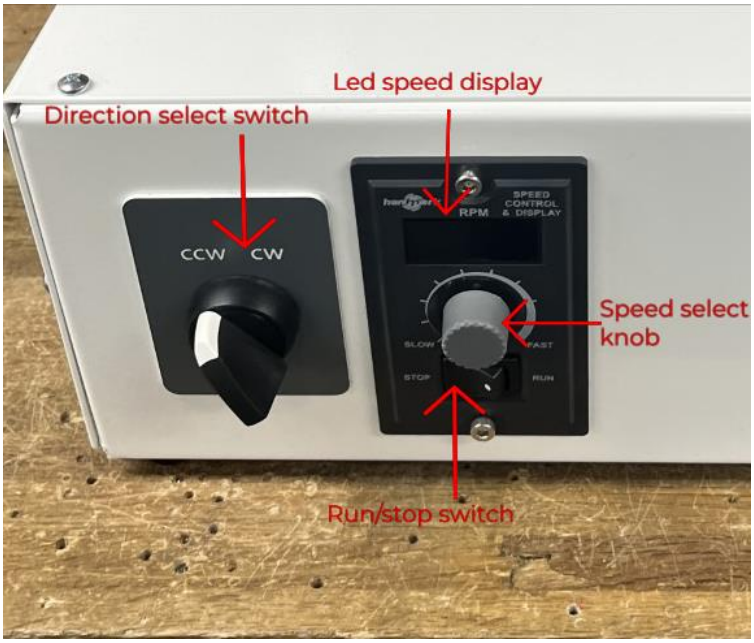
C. Front Panel Layout (12LD-A)



12LD-A Motor Driver

Unlike the 12LD-O, the motor driver for the 12LD-A model does not include alarms or navigation to change parameters, meaning it does not give troubleshooting information aside from a confirmation that incoming power is ok via the LED speed display. If you have a 12LD-O model, skip ahead to Section 7, General Troubleshooting.

4. Motor Driver Alarms Table (12LD-O)

__NOTE:__ Driver alarms, navigation, and parameters only available for model 12LD-O

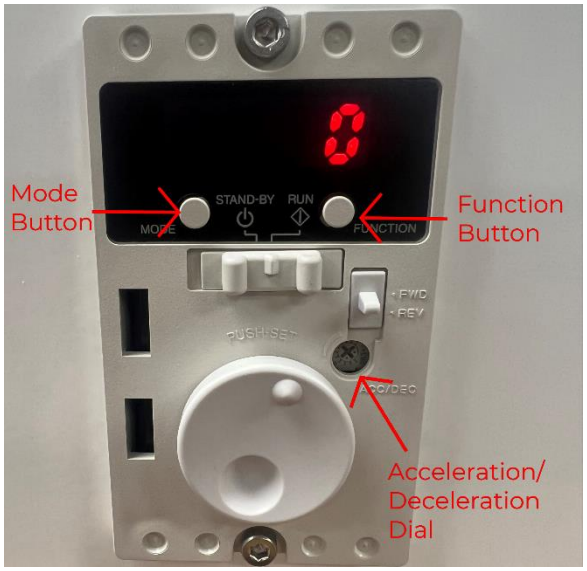
Alarm Code	Alarm Type	Cause	Next Steps
AL20	Overcurrent	Excessive current has flown through the driver due to ground fault, etc.	Check the Motor Cable coming out of the back of the control panel for damage
AL21	Main Circuit Overheat	The temperature inside the driver exceeded the alarm detection temperature	Check ambient temperature and ensure there is decent ventilation near the control panel
AL22	Overvoltage	The power supply voltage exceeded 120% of the rated voltage OR a load exceeding the permissible load inertia was driven	Check power supply voltage. If alarm occurs during operation, reduce load on the turntable, or make acceleration/deceleration time longer
AL25	Undervoltage	The power supply voltage became lower than 60% of the rated voltage	Check power supply voltage and Power Cable coming out of the back of the control panel for damage
AL28	Sensor Error	During operation, the sensor signal line of the motor cable was disconnected OR the sensor connector came off	Check the Motor Cable for damage

AL30	Overload	A load exceeding the continuous duty region was applied to the motor	Reduce load on the turntable, or increase acceleration/deceleration time using the knob on the front of the driver
AL31	Overspeed	The rotation speed of the motor output shaft exceeded 4800 rpm	Reduce load on the turntable, or increase acceleration/deceleration time using the knob on the front of the driver
AL41	EEPROM Error	The stored data was damaged or is otherwise non-writable or non-readable	Initialize parameters (Parameters Listed in “Motor Driver Parameters” Section)
AL42	Sensor Error at Power-On	Before the power supply is turned on, the sensor signal line of the motor cable was disconnected	Check the Motor Cable coming out of the back of the control panel for damage
AL46	Prevention of Operation at Power-On	Power was turned on while the Forward or Reverse Run Signals were active	Turn off the Forward or Reverse Run Signal that was on and attempt operation again

5. Motor Driver Navigation (12LD-O)

__NOTE:__ Driver alarms, navigation, and parameters only available for model 12LD-O

Motor Driver with Cover On



Motor Driver with Cover Off

1. Upon initial power up, the motor driver will display zero, indicating that the motor is not in motion.
2. From here, pressing the Mode Button will cycle through the different menus available. To enter a menu, press the Function Button when the LED display reads the menu you want to access. The list of menus available is as follows: non= Monitor Mode, dAtA = Data Mode, and PAr = Parameter Mode.
3. Once in the menu, pressing the Function Button again will cycle through the available options in the menu selected, pressing the Mode Button will return you to menu selection, and pressing in on the Acceleration/Deceleration dial will choose the option displayed, allowing you to change the setting if in the parameter menu by turning the dial in either direction.
4. To return to the speed display, simply press the Mode Button until you return to menu selection, and the display reads non for Monitor Mode, and press the Function Button once.

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6. Motor Driver Parameters (12LD-O)

NOTE:** Driver alarms, navigation, and parameters only available for model 12LD-O

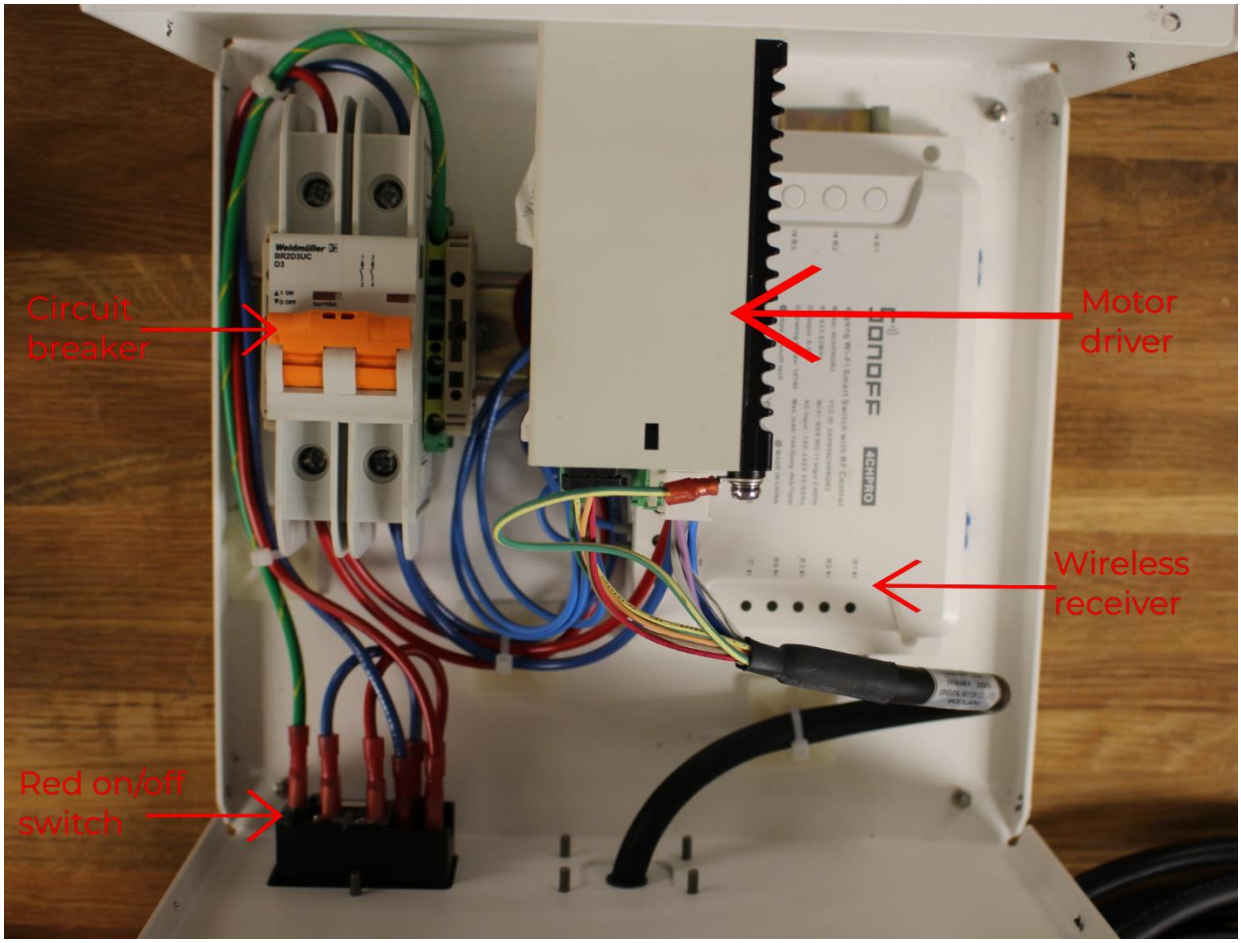
Item	Display	Description	Factory Setting
Speed Reduction Ratio	Gr-r	Sets ratio of rotational speed of the turntable vs rotational speed of the motor shaft	1.00
Speed Increasing Ratio	SP-r	Sets ratio of rotational speed of the turntable vs rotational speed of the motor shaft	1.00
Panel Initial View	PdSP	Sets what will be displayed upon power-on	SPd (Drive Speed)
Prevention of Operation at Power-On Alarm	oPAL	Sets whether to enable or disable the AL46 alarm	on
Reset Method Selection for the Prevention of Operation at Power-On Alarm	oArS	Selects how to reset the AL46 alarm after it has been triggered	doFF (Resets by setting drive to standby)
Analog Acceleration/Deceleration Time	tAtd	Changes the setting method of acceleration/deceleration time	An (Analog: uses accel/decel knob on front of drive)
Speed Upper and Lower Limit	SPLn-Hi SPLn-Lo	Sets upper and lower limit of speed drive is allowed to achieve	4000 (High) 50 (Low)
Slight Position-Keeping Selection	HoLd	The load position can be kept at motor standstill	oFF

External Operation Signal Input	ioEn	Sets whether external inputs can be used to start or stop the motor	rE (Allows external operation)***
X0 Input Function Selection	in-0	Assigns input signals to each of the external input terminals	FYD (Forward)
X1 Input Function Selection	in-1		rEu (Reverse)
X2 Input Function Selection	in-2		n0 (M0)
Y0 Output Function Selection	oUT0	Assigns output signals to each of the external output terminals	SP (Speed-Out)
Y1 Output Function Selection	oUT1		AL-1 (Alarm-Out1)
Overload Alarm Detection Time	oLtn	Sets the time to output the alarm after detecting overload condition	30.0 (Seconds)
Overload Warning Level	oL-L	Sets the detection level for the overload warning function	120 (%)
Rotation Speed Attainment Band	uA	Sets the band within which the rotation speed of the motor is deemed to have reached the set value	200 (rpm)
Initialize the Parameter Mode	ini	Restores the value set in the parameter mode to the factory setting	***NOTE: MUST SET ioEN to rE AFTER INITIALIZING***

7. General Troubleshooting

A. Check For Power

Ensure that the control box is plugged into an electrical outlet and the switch is in the ON position with the internal red light lit. If the internal red light is not lit, this indicates a problem with either the power cord, or the electrical outlet it is plugged into. If the internal red light is lit, but the motor driver display is not, open the control box by unscrewing each of the fasteners on the Carousel-USA Logo plate and lifting it apart from the rest of the control box.



12LD Internal Layout (Wireless Receiver Only in 12LD-O Model)

*****DISCLAIMER*****

Before performing any work involving removing wire from terminals, ensure that power is turned off and proper precautions are taken to avoid electrical shock. If ever unsure about how to proceed, please email Carousel-USA at support@carousel-usa.com and provide a brief description of the issue as well as pictures inside the control box or call Carousel-USA at (626)334-7190 and request electrical troubleshooting assistance for a live diagnostic.

B. Check Circuit Breaker

If the internal red light in the on/off switch is lit and the motor driver display is not, check the circuit breaker inside the control box for a tripped condition. If the breaker is tripped, reset it and observe its behavior. If the breaker trips immediately trips again, leave it alone and call Carousel-USA at (626)334-7190 with pictures and a brief description of the issue ready.

C. Check Wiring/Connections

If you still are not receiving power after checking/resetting the circuit breaker, **turn off power**, and inspect the wiring between the circuit breaker and the motor driver for any obvious damage or loose connections, either in the circuit breaker or the motor driver. If there is a loose connection, you will need to place it back in its original terminal. If there is obvious damage in any of the wires, you will need to replace them. Check the electrical schematics at the end of this guide to determine which wires connect to each terminal and if replacing wiring, make special note of the wire sizes listed in the schematic.

D. Controls Testing

If the motor driver has power, begin by testing each control method available to you.

i. 12LD-A

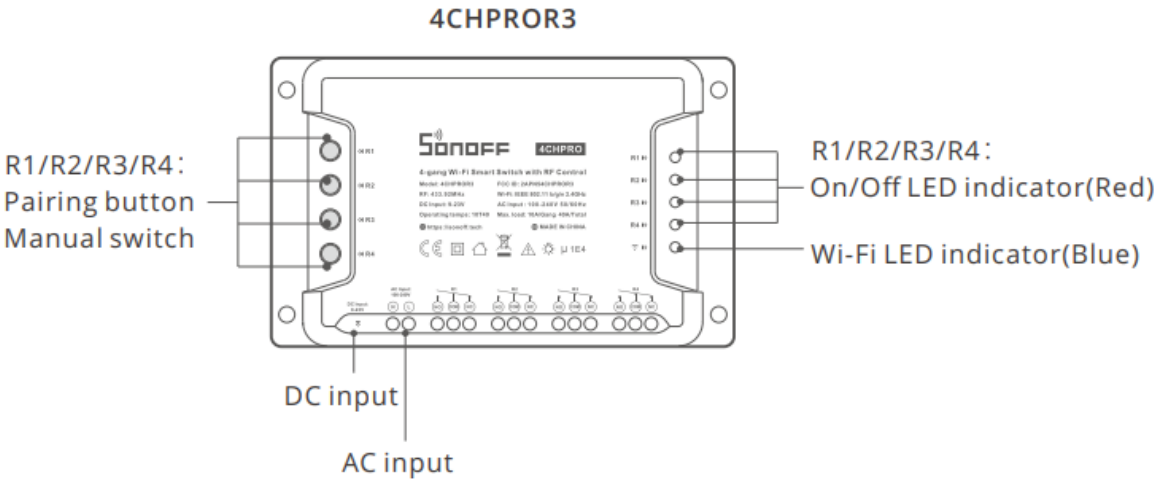
Using the motor driver, attempt to run the table in both directions and using different speeds. Record which of these moves the table, as well as if there are any concerning mechanical sounds while running or attempting to run the table. If nothing runs the table, inspect the motor cable coming out of the back of the control box for loose connections or obvious damage. If the table still is not running, call Carousel-USA at (626)334-7190 with pictures and a brief description for additional troubleshooting assistance.

ii. 12LD-O

Attempt to run the table in both directions and using different speeds with the motor driver, the wireless remote, and the phone app, if applicable. Record which of these moves the table, as well as if there are any concerning mechanical sounds while running or attempting to run the table.

8. Sonoff Wireless Receiver (12LD-O Model Only)

If the motor driver runs the table, but the wireless remotes and/or phone app do not, inspect the Sonoff Wireless Receiver inside the control box for loose connections and/or obviously damaged wiring. If any wiring is damaged or no longer connected, use the schematic at the end of this guide to determine which wire matches each terminal and reconnect them if necessary. If wiring needs to be replaced make sure to use the same wire sizes listed in the electrical schematic.



Sonoff Wireless Receiver Labeled

Looking at the Sonoff Wireless Receiver, we can determine which inputs are being registered and which are not.

1. On your wireless remote, press button A for about 2 seconds, and you should see the R1 On/Off LED indicator light up RED if that input is registered. Additionally, this should turn off R2 if it was lit previously.
2. Likewise, pressing button B on the remote should light up R2 and turn off R1 if it was previously lit.
3. If there is no response from pressing the buttons on the remote, move on to Section 9, Pairing the Remote.
4. If the On/Off LED lights up upon remote button press but does not turn off the other LED, move on to Section 10, Phone App Configuration.

9. Pairing the Remote

1. To pair the remote to the receiver, press and hold the R1 pairing button on the receiver for about 3 seconds, until the Wi-Fi LED indicator turns red and quickly flashes once, then release R1 and briefly press the A button on the remote. The Wi-Fi LED indicator will turn red and quickly flash once to confirm that the button has been paired to R1.
2. Then, repeat this process, holding down R2 until the Wi-Fi LED turns red and quickly flashes once, releasing R2, and briefly pressing the B button on the remote.
3. Once done, test that both buttons are paired by checking that each A button press on the remote turns on or off R1 and that each B button press on the remote turns on or off R2.
4. At this point, turning on R1 will not turn off R2, and turning on R2 will not turn off R1; this will be addressed in Section 10, Phone App Configuration.
5. If at any point you deem it necessary to unpair any remotes paired to the receiver, press and hold the pairing button you wish to unpair for about 5 seconds, until the Wi-Fi LED indicator turns red and quickly flashes twice, then release. Then, briefly press the button on the remote you wish to unpair and the Wi-Fi LED indicator will turn red and quickly flash once, indicating that the button has been unpaired.

10. Phone App Configuration

1. Download the eWeLink app on your smartphone from the App Store for iOS or Google Play for Android.
2. Next, press any of the pairing buttons R1-R4 for about 7 seconds until the Wi-Fi LED indicator quickly blinks three times repeatedly.
3. On the eWeLink app, tap the “+” icon at the bottom of the screen to search for a new device, then click “Quick Pairing” and “Add one device”. Ensure that your phone is connected to Wi-Fi and click “Next”.
4. The app will automatically search for the device and it will be added to your account in 1-3 minutes.
5. Name the device and registration will be complete. You should now be able to turn on/off each of the R1-R4 using your smartphone and the eWeLink app.
6. For our purposes, we must ensure that R1 and R2 are not on simultaneously. To do this, click on the newly added receiver in the eWeLink app, then click the “…” symbol at the top of the screen to open “Device Settings”. Then, click on “Interlock” and “Enable”. This will ensure that only one output can be active at a time, and activating any of them will turn off any others that were on.