MARK ROBERTS MOTION CONTROL

# TURNTABLE

AUTOMATED PRODUCT PHOTOGRAPHY


## QUICK START GUIDE

QSG Product Code: MRMC-1502-04
Products covered: MRMC-1579-01, MRMC-1566-01, MRMC-1082-00, MRMC-1563-00

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## Turntable Quick Start Guide

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Modification date: 13 November 2023



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|---|---|
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# Contents

# Chapter 1 **Quick Start**

## Important safety instructions

To ensure the best from the product, please read this manual carefully. Keep it in the safe place for future reference.

To reduce the risk of electric shock, do not remove the cover from the unit. No user serviceable parts inside. Refer servicing to qualified personnel.

### General care

- Do not force switches or external connections.
- When moving the unit, disconnect the mains cable.
- Do not attempt to clean the unit with chemical solvents or aerosol cleaners, as this may damage the unit. Use a clean dry cloth.
- Do not use around flammable gas. All electrical equipment can generate sparks that can ignite flammable gas.
- Keep away from pets and children. The head has powerful motors that can pinch, so take care not to get your hands trapped in the head or cabling.
- Keep cables tidy. Use cable ties to keep them out of harm's way. If you have a head with slip rings then make use of them; avoid running any cables between the base and the rotating head or camera.

### Location

Installation of this unit should be away from sources of excessive heat, vibration, and dust.

### Intellectual property

This product includes confidential and/or trade secret property. Therefore, you may not copy, modify, adapt, translate, distribute, reverse engineer, or decompile contents thereof.

## Overview

Thank you for using the Turntable from Mark Roberts Motion Control (MRMC). You can use the Turntable for day in and day out use in product photography. There are three sizes: Small, Medium and Large. There is also a high-speed turntable.

Turntable gives you the following features:

- High speed
- Zero backlash
- Precise movement
- Different size disks can be used depending on your product dimensions
- Medium and Large turntable are centreless so cables or power can be fed through to appliances
- Small turntable can be positioned upside down to hang fashion accessories on such as bags
- Large turntable can take weight of up to 600kg

# Large Turntable (Ethernet)

## Attaching the control box

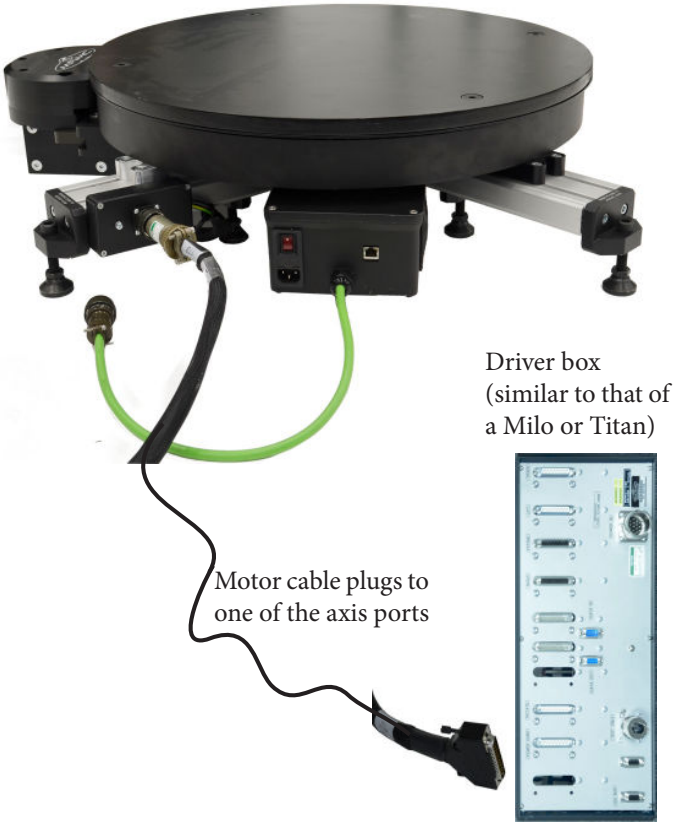
1. Rest the Large Turntable on the side opposite to where the connectors are. Slide the control box into the slot on the Large Turntable until you hear a slight click.

2. Use an allen key to tighten the grub screw to secure the control box to the Large Turntable.

## Connecting the cables

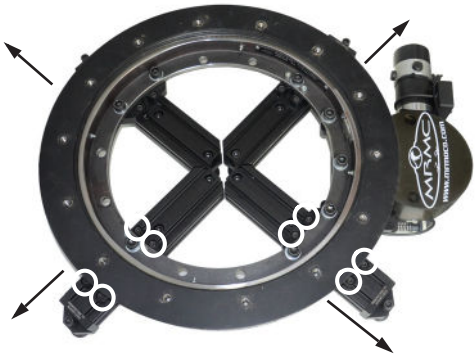

The diagram shows a typical application.

## Connecting the cables (Large Turntable that runs off Milo driver box)



## Fitting the disc

## Adjusting the legs

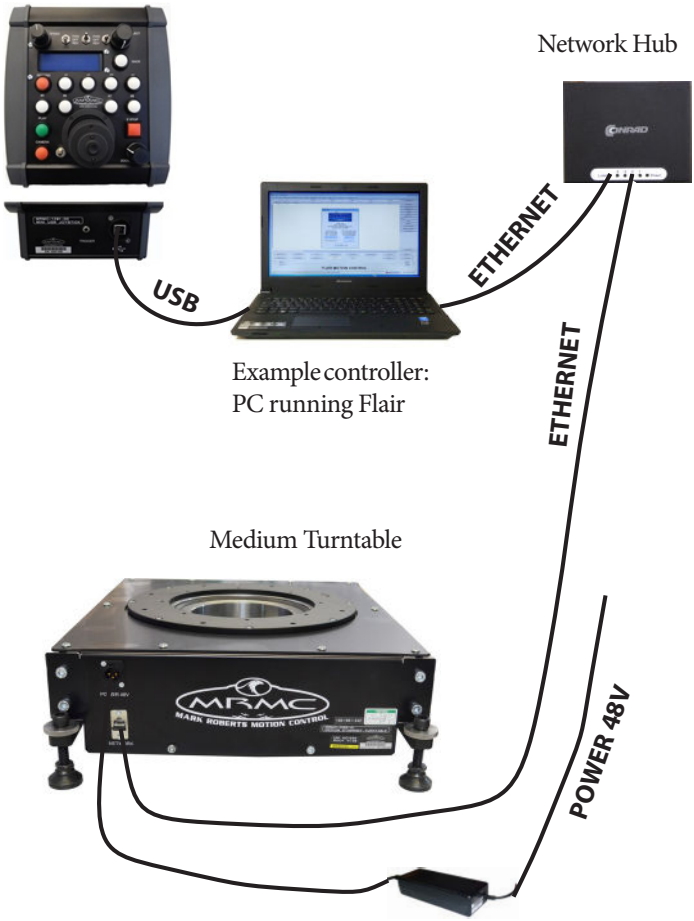


1. Loosen the four screws on each leg to adjust the leg for supporting larger objects on the turntable.
2. Use a tape measure to ensure that all the legs are pulled by the same length so the turntable is balanced properly.
3. After you have adjusted the legs, tighten the screws.

# Medium Turntable

## Connecting the cables

MRMC Controller

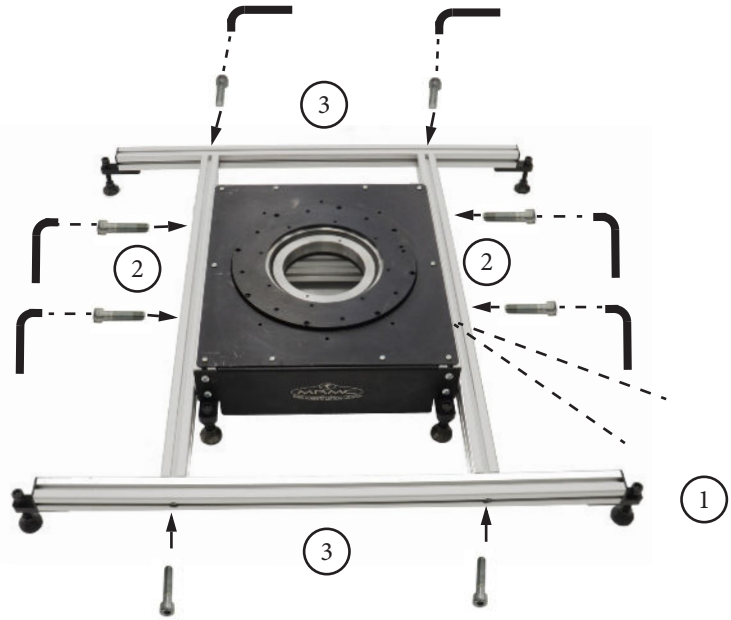



The diagram shows a typical application. Attach the power cables last. The controller can be any MRMC controller such as a PC running Flair Motion Control Software or one of the MSA-based controllers such the Large Flat Panel (LFP), MSA-21 Handwheels, Joystick Controller, or Mini

MSA. After doing this, to add the turntable in Flair, refer to *Adding Ethernet Turntables in Flair* on page 15.

The Medium Turntable can also be run with a Simple Stepper Motor Controller once an upgrade panel is added to it. For more instructions, refer to Appendix 3 *Medium Turntable Upgrade*.

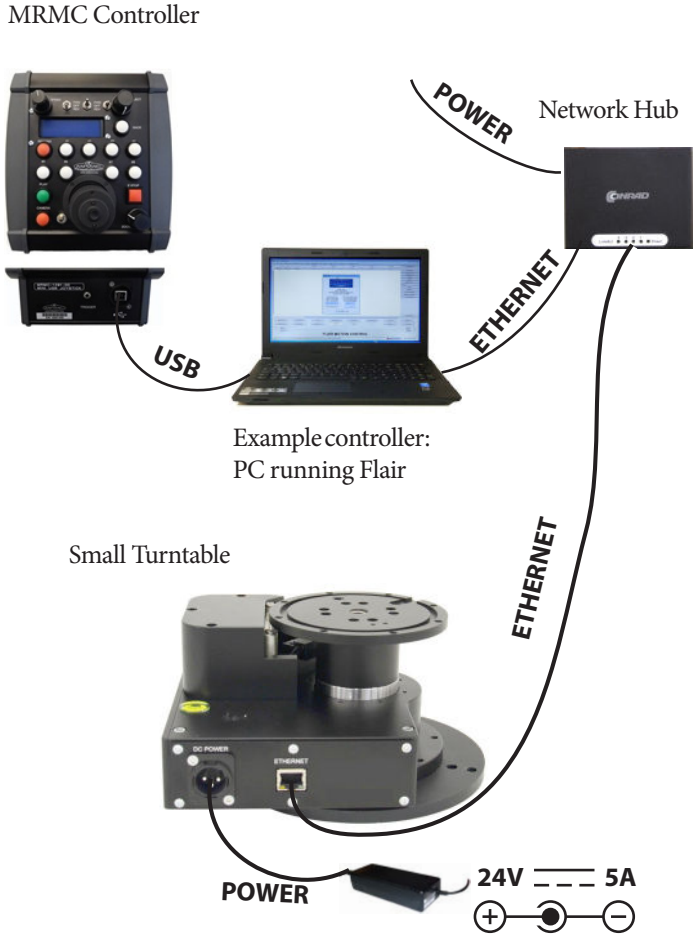
## Adding the outriggers




1. Insert the four slide nuts into the sides of the medium turntable carefully aligning them with the screw slots on the sides of the turntable.
2. Add the two sidebars of the outriggers and screw them while lining the slider nuts.
3. Screw the main bars in the outriggers and adjust the legs to seat the outriggers on the floor.

# Small Turntable (with Ethernet connectivity)

## Connecting the cables




The diagram shows a typical application. Attach the power cables last. After this, to add the turntable in Flair, refer to *Adding Ethernet Turntables in Flair* on page 15. The controller can be any MRMC controller such as a PC running Flair Motion Control Software or one of the MSA-based controllers such the Large Flat Panel (LFP), MSA-20 Handwheels, Joystick Controller, or Mini MSA.

# Small Turntable (with External Quad Box)

## Connecting the cables

MRMC Controller


The diagram shows a typical application. Attach the power cables last.

The controller can be any MRMC controller such as a PC running Flair Motion Control Software or one of the MSA-based controllers such the Large Flat Panel (LFP), MSA-20 Handwheels, Joystick Controller, or Mini MSA.

# High-speed Turntable

The High-speed Turntable is a medium turntable with a servo motor and can run at a maximum speed of 400 degrees per second. It uses an ultibox as the motor driver and has the power requirement of 48V. The ultibox is connected with a 48V in power supply unit, which has two 3-pin XLR 48V out connectors.

## Connecting the Cables

The diagram shows a typical application. Attach the power cables last.

> Note
>
> The ulti-box is not part of the High-speed Turntable and is procured separately.

The controller can be any MRMC controller such as a PC running Flair Motion Control Software or one of the MSA-based controllers such the Large Flat Panel (LFP), MSA-21 Handwheels, Joystick Controller, or Mini MSA.

USB Joystick

POWER

Network Hub



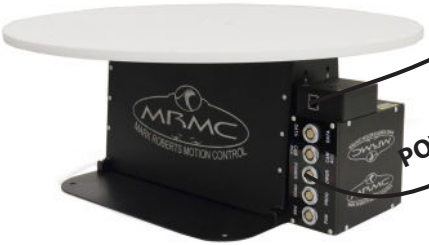
USB

ETHERNET

ETHERNET

Example controller:
PC running Flair

High-speed Turntable (front)




Mains

POWER 48V

High-speed Turntable (rear)

SERVO MOTOR MOVER

## Adding Ethernet Turntables in Flair

Before you start using the Ethernet Turntable first time, once you have cabled the Turntable with the Ethernet hub and powered it up, it needs to be added to the Flair software so Flair can communicate with it.

1. In Windows Explorer, navigate to the Flair folder, and open the Flair.ini file.
2. Change the following in the Flair.ini file:
   - Add 1 to the value of **`*NetworkBoards`** and **`*LoadNetworkBoards`**.
   - Add an axis to the existing number in **`*Axes`** and **`*ShownAxes`** fields, if a model mover axis is not already added in Flair
   - Add a line with **`Node Program`** field with the number of node you are adding and set it to **`Uni6Ether_II.btl`**.
   - Set **`*Autorecalibrate`** to **`False`** and **`*LoadFromHC`** to **`True`**

For example, if you are adding an Ethernet Turntable as a third network board and a 10th axis (9 axis already added in Flair), then in Flair.ini file change the following settings:

```
*NetworkBoards:          3
*LoadNetworkBoards:      3
*Axes:                   10
*ShownAxes:              10
```

And add the following lines:

```
*NodeProgram3:           Uni6Ether_II.btl
*Autorecalibrate:        False
*LoadFromHC:             True
```

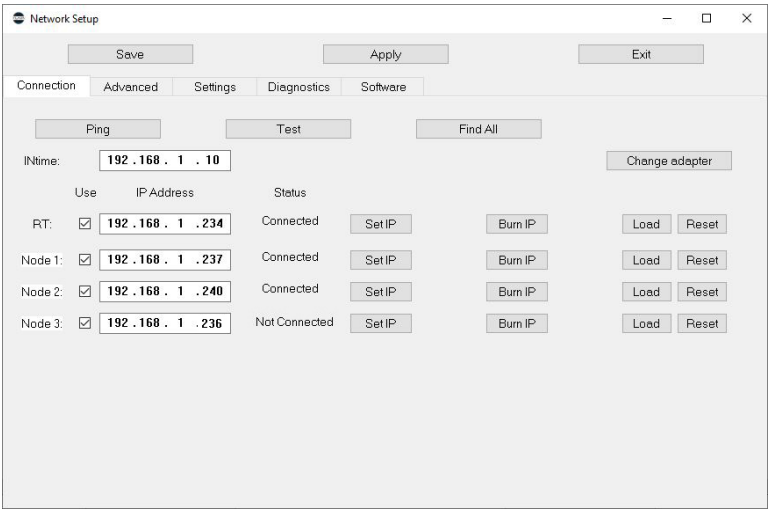
> Note
>
> The '3' on the NodeProgram field corresponds to the node for the turntable.

3. Save and close the Flair.ini file. Launch Flair.
4. If you get any error messages, click on **OK** to close them.

5. When you get a message about network failure, click on the **Network Setup** button in the message:


or...

If the Flair installation already has a valid Ethernet connection on a network then you might not get the network failure message. In this case, start the Network Setup facility manually by choosing the **Setups > Network Setup** menu option in Flair.

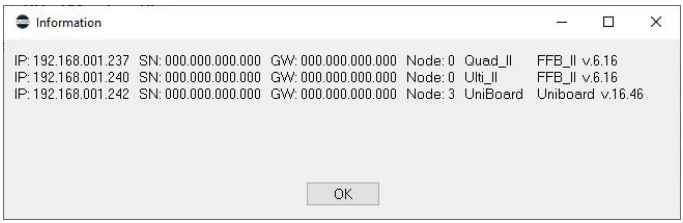



The Network Setup window, Connection tab, lists the Nodes (board and head connections) that Flair is looking for, as defined in the NetworkDirect.ini file. Any changes that you make and **Save** in the Network Setup window are saved in the NetworkDirect.ini file. You can also edit this file by using the menu option **Help > View**

**Network.ini File**. If Flair cannot find the Turntable on the network at the IP address shown then the node's status is **Not connected**.

6. In the Network Setup window click on **Find All**, then on **OK** in the pop-up to confirm.

7. An Information pop-up displays information about the devices that Flair has found on the network:

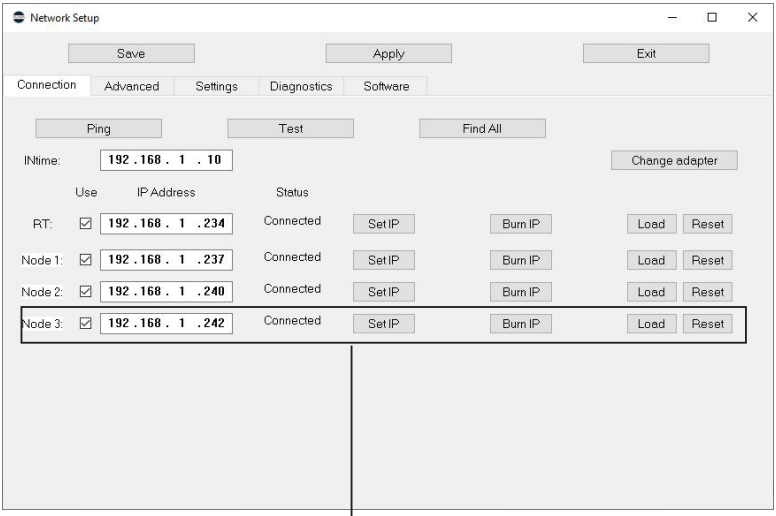



Make a note of the Turntable's IP address that is displayed in the pop-up; for example 192.168.1.242. Note that the two other IP addresses are of devices that appear connected in the Network Setup dialog box before.

8. Change the IP address of the Turntable node to the one noted above (in this case, 192.168.1.242).

9. Click **Set IP**, click **Save** and then click **Apply**.

10. Click on **Load** for the node belonging to the Turntable to reset and load it. It should now appear connected




Turntable connected

11. Close the Network Setup window by clicking on **Exit**.

## Resolving IP Address Conflict

It is possible that the IP address of the turntable is same as that of one of the existing network devices already connected with the Flair PC resulting in an IP address conflict. In such a case, you will need to change the IP address stored in the board of the turntable using Flair. Such a conflict can be detected when you add the turntable on the PC network with existing connected node(s) and click **Find All** in the Network Setup dialog box, an additional node fails to appear in list of nodes in the Information pop up or Network Setup dialog box.

To resolve this type of conflict:

1. Unplug the network hub from the PC.
2. Connect the PC directly to the turntable via Ethernet.
3. Start Flair. In the Network Setup dialog box, click **Find All**. In the appearing Information popup, you might see the additional board. If you do not then restart the PC and relaunch Flair. You should now

see the additional board after clicking Find All in the Network Setup dialog box.

4. Add a unique IP address to the node line of the board that has the same IP address as that of the turntable. **DO NOT** click Save and Apply yet.
5. Click **Set IP** for the changed IP address board and click **Apply**.
6. Now, change the IP address for the Turntable node to the one that was conflicting.
7. Click **Set IP** and then click **Load** for the turntable node.
8. Once it is loaded, you can change the IP Address of the turntable to a unique value. This should be different from all connected nodes.
9. Click **Set IP**, then click **Burn IP** to permanently change the IP address on the turntable board. The turntable might appear disconnected temporarily before appearing connected again.
10. To test that this is all done correctly, power down the turntable by unplugging power to it. (Do not exit Flair.) After a few seconds, turn it back on and click Find All in the Network Setup dialog box in Flair to see if the turntable node has the new unique IP address that you assigned. If it does not, then start again from Step 6.
11. If the IP address of the turntable is now changed to the desired value, you will need to revert the IP address of the conflicting node to its original value. To do this:

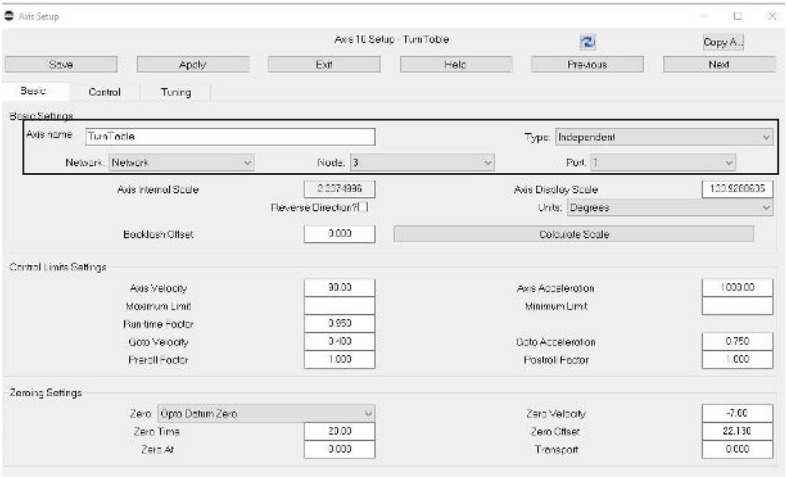
    11.1 Change the IP address of the node to the original one.

    11.2 Click **Set IP**, click **Save** and then click **Apply**. Exit Network Setup.

## Setting up the Axis

1. Note that an additional axis appears in the Flair Numeric screen.
2. Right-click the new axis and select **Axis Setup**.
3. Specify a name in the **Axis name** box.

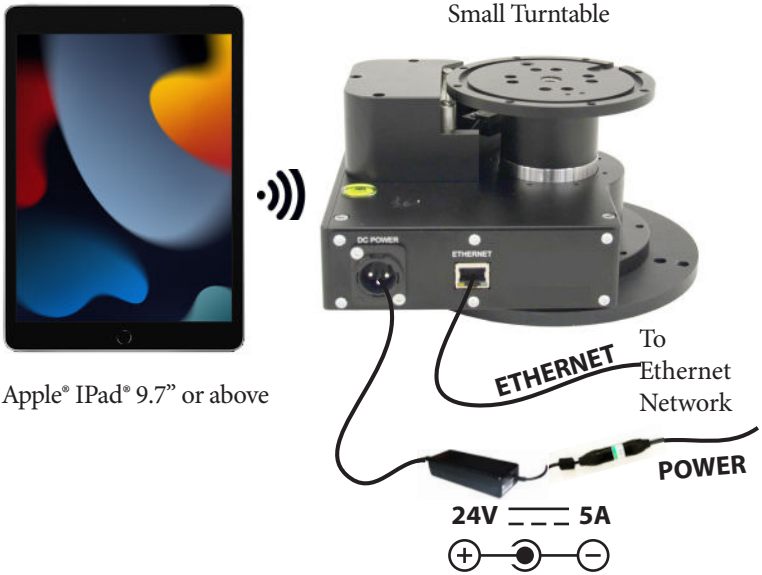
4. In the **Node** box, select **3** (same as the number above) and in the **Port** box, select **1**.




5. Click **Apply** and then click **Save**.

# Chapter 2 **Turntable iPad App**

## Connecting the Cables



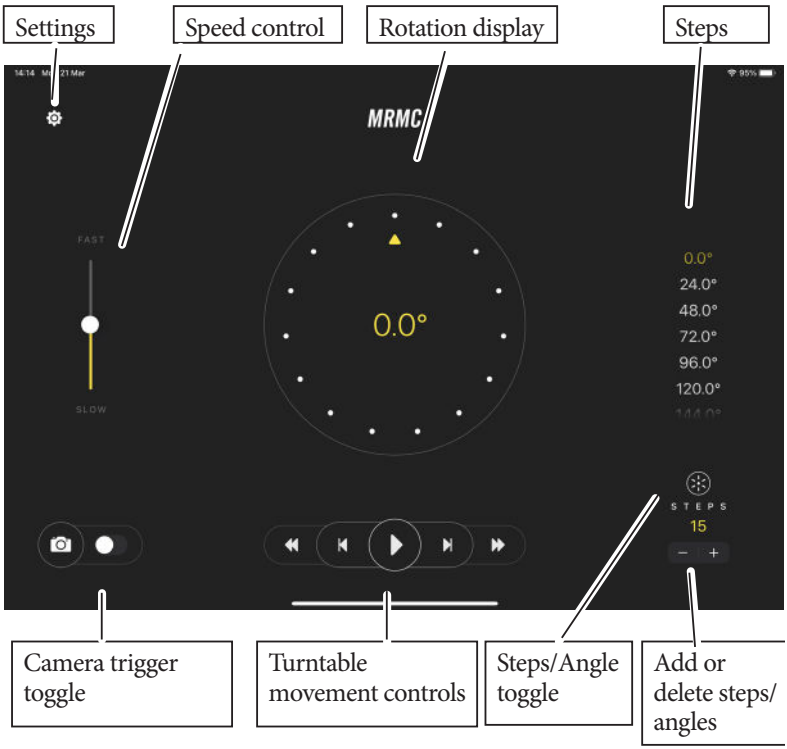

Apple® IPad® 9.7" or above

1. Ensure that your Wifi network is on the range 192.168.1.xxx. The IP address set at the factory for the Turntable is printed on it. If IP address of the turntable has changed then the Wifi network range should match that of the turntable.
2. Also, ensure that no other device already has the IP of the turntable. If it does, if possible, change its IP address or disconnect it from the network for the duration of using the Turntable App.
3. Download the **MRMC Turntable App** from App Store and install it on your Apple iPad.
4. Power up the Turntable and start the MRMC Turntable App.
5. Tap  and enter the IP address of the Turntable.

**Important**

When using the App, if the reconnecting fails (after the iPad was switched to sleep), restart the App. You can also modify the sleep setting in iPad to avoid restarting the app frequently.

# Using the Turntable iPad App




## Settings button

Tapping  displays a dialog box where you can specify the Turntable settings. The IP address of the Turntable is entered here. Normally, once specified, you will not need to change this IP Address. Specify here, how

long do you want the Turntable to pause before moving to the next step. You can also reverse the direction of movement of the Turntable and also Home the Turntable here.

> Note
>
> If the turntable is at 45 degrees position, it will fail to Home. To avoid this, change the position to another value and Home it again.


## Rotation display

Rotation displays shows the graphical representation of the rotation points.

## Steps

Lists the steps in degrees at which the Turntable will pause. There are 4 steps or angles by default. The step at which the Turntable is due next is highlighted.

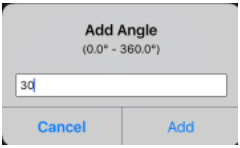
## Steps/Angle toggle button

This button allows you to specify whether the stops in the rotation will be at equidistant steps or at specific user-defined angles.

## Add or delete angles or steps

When in the Steps mode, pressing the '+' button will add steps and make the steps equidistant. You can use the '-' button to delete steps.

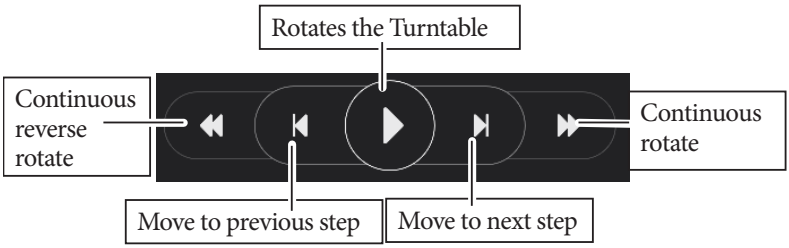
When in Angle mode, the App allows you to add a custom angle by clicking '+'. .




You can delete one of the added angles by tapping the appearing  and tapping the angle to be deleted.


## Turntable movement controls

The Play button is used to starting the system stepping through the rotation steps at the defined speed.Other buttons are step controls to move to next or previous steps and fast forward or fast reverse buttons, which when clicked will rotate the Turntable at a higher speed.




The Continuous Rotate buttons can be used for product video shoot. When a move is playing, this bar replaces the Play button with the Stop button that can be used to stop the Turntable at any point.

## Camera trigger button

The trigger button can be used to manually capture a photograph when a camera is connected to the board trigger output. This button is non-operational with the current version on Small Turntable.

## Camera toggle

When this toggle is 'On', the Turntable App will trigger the camera automatically to click a photograph at every step. The turntable will pause for the duration specified in the Settings dialog box for the camera to click a photograph. When using with the Continuous Rotate buttons, it would continuously trigger the camera without pausing.

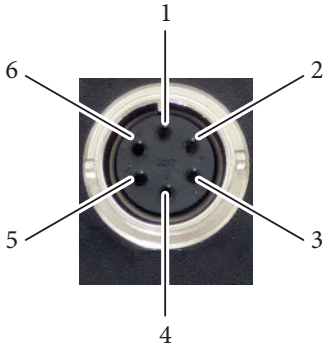
Notes

# Appendix 1 **Back panel**

## Connector summary

### Stepper motor connector

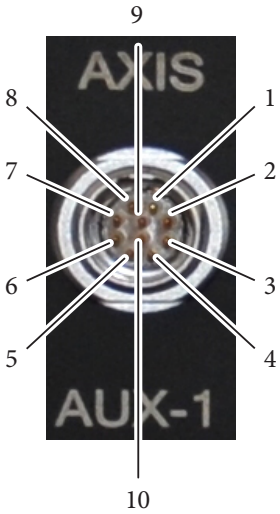
This connector connects the model mover motor cable to the stepper motor connector on the quad box. The cable can also be a split to provide 48V power to the quad box.




1. GND
2. 24V
3. 5V
4. Homing Datum
5. Step
6. Direction

### Servo motor connector

The lemo connector on the high-speed turntable connects to the AUX-1 connector on the ulti-box.




1. DATUM
2. A+
3. B+
4. Z+
5. N/C
6. MOTOR_B
7. MOTOR_A
8. LIMIT
9. +5V
10. GND

Notes

# Appendix 2 **Specifications**

## Large Turntable

Weight: 73kg including the disc

Power requirements: 5 amps from 140V from Milo power supply or 240V AC from Mains

Temperature range: -10 to +45 °C
Humidity tolerance: 0% to 90% relative humidity, non-condensing

Rotation speed: 100°/s

Load capacity: 600kg

Dimensions are shown as follows. All measurements are in mm.


89.2mm
83.3mm


19.8mm

## Medium Turntable

Weight: 20kg

Power requirements: 48 Volts DC

Temperature range: -10 to +45 °C
Humidity tolerance: 0% to 90% relative humidity, non-condensing

Rotation speed: 90°/s

Load capacity: 200kg

Dimensions are shown as follows. All measurements are in mm.


Medium Turntable

## Small Turntable

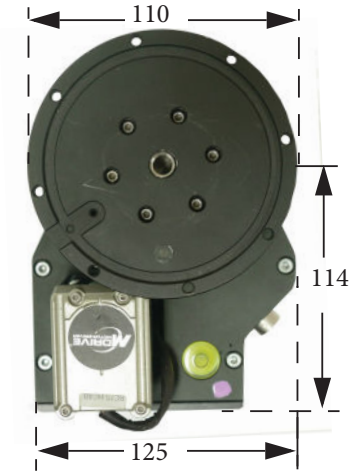
Weight: 2.8Kg

Power requirements: 24 Volts DC

Temperature range: -10 to +45 °C
Humidity tolerance: 0% to 90% relative humidity, non-condensing

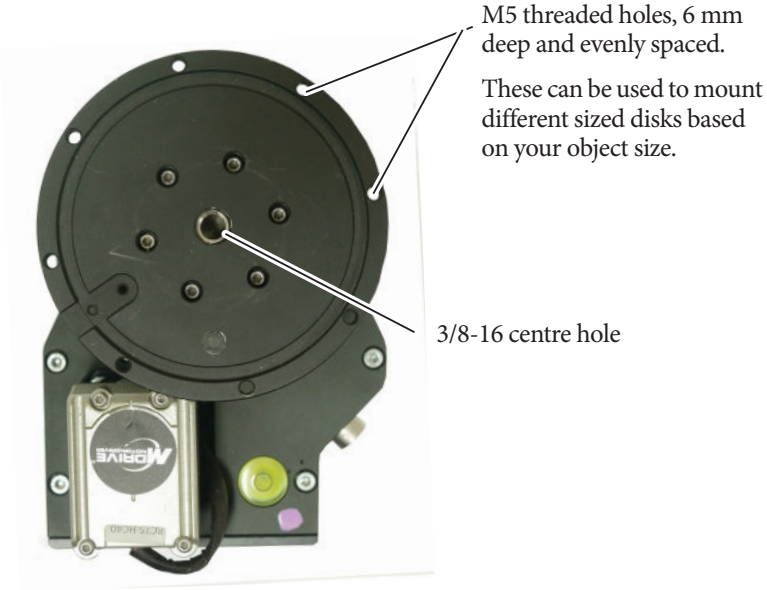
Rotation speed: 100°/s

Load capacity: 20kg

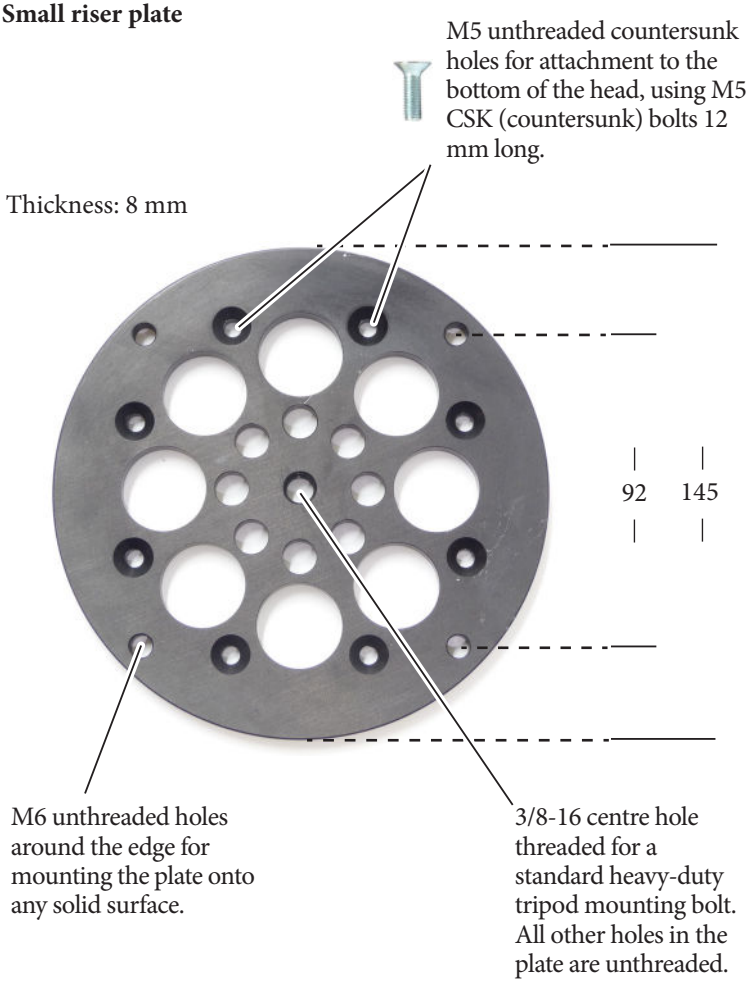

110
114
125


109

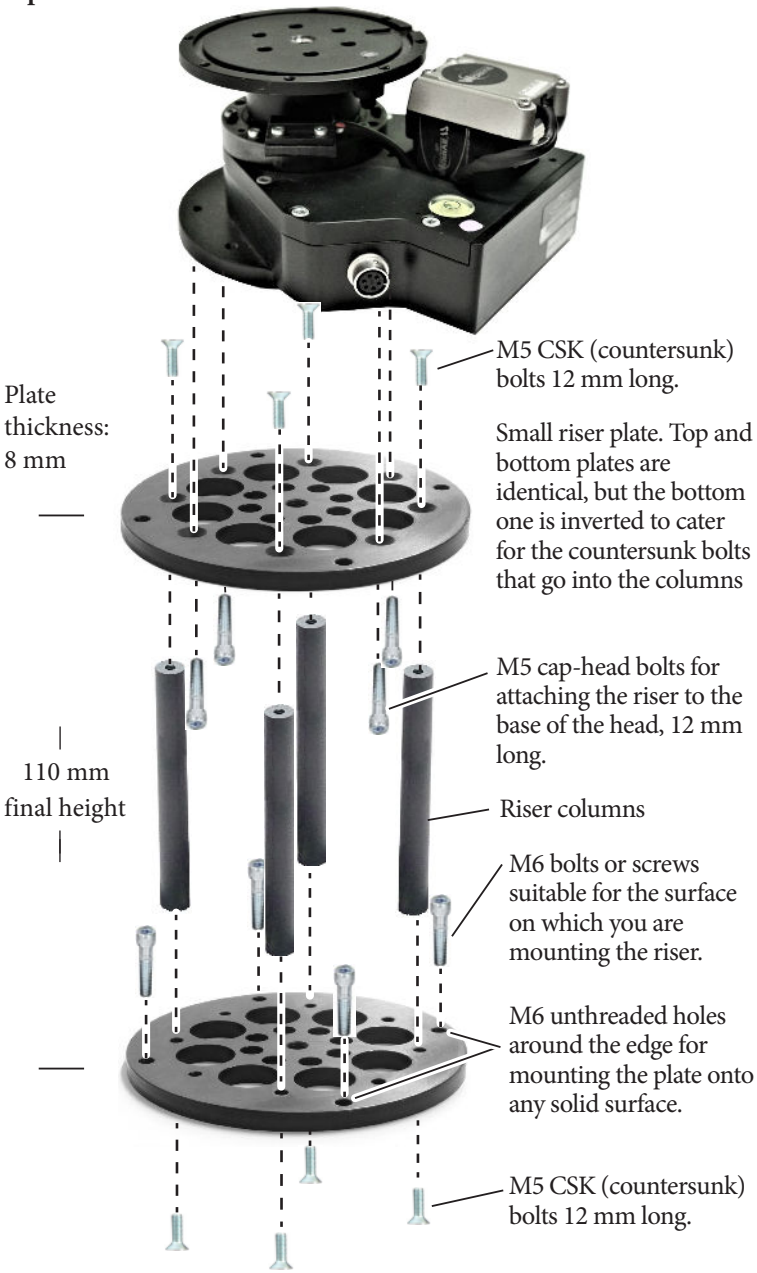
**Small Turntable mounting holes**



**Small riser plate**



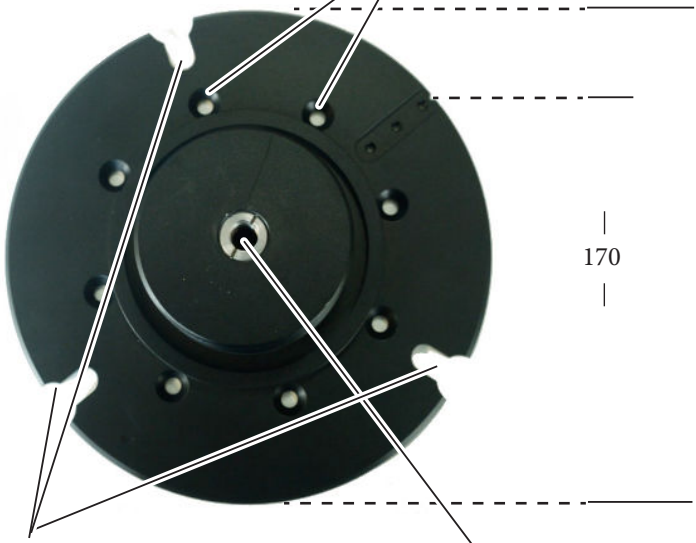
**Optional riser**



**Mitchell Mounting adaptor plate**

M5 unthreaded countersunk holes for attachment to the bottom of the head, using M5 CSK (countersunk) bolts 12 mm long.

Thickness: 8 mm



170

M8 mounting slots

3/8-16 centre hole threaded for a standard heavy-duty tripod mounting bolt. All other holes in the plate are unthreaded.

Small turntable - Underslung

Mitchell mounting adapter plate can be used to mount small Turntable in an underslung or overslung position

## High-speed Turntable

Weight: 2.8Kg

Power requirements: 48 Volts DC

Temperature range: -10 to +45 °C
Humidity tolerance: 0% to 90% relative humidity, non-condensing

Rotation speed: 400°/s

Load capacity: 20kg

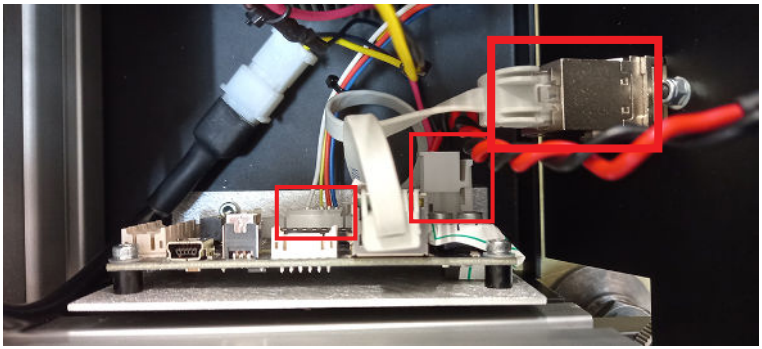
Notes

# Appendix 3 **Medium Turntable Upgrade**

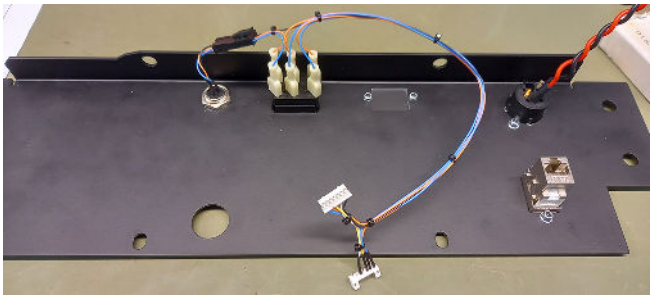
A Medium Turntable is operated traditionally controlled by the Flair motion control software. If however, you need to do use it in isolation, an upgrade kit can be added to Medium Turntable in order to operate it using a Simple Stepper Motor Controller. Use the following instructions to modify the Medium Turntable for this upgrade:

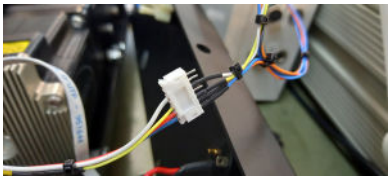
1. Screw the feet of the Medium Turntable all the way down so you can get to the screws. Remove top cover and front panel.

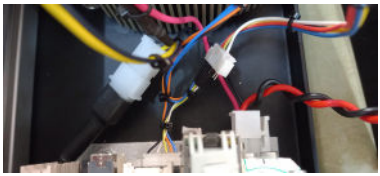
2. Unplug Stepper motor and power from PCB and network from panel.



3. With the new pane, plug the stepper motor into the 7 way plug then plug the other side onto the PCB. There is only one place it will fit.





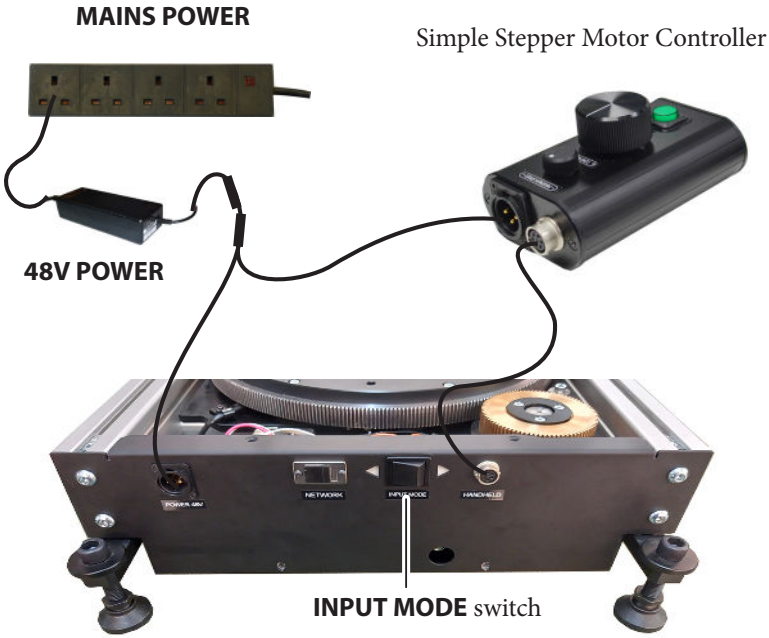


4. Plug power back onto the PCB and the network cable onto the new panel.

5. Screw on new panel and refit top cover.


## Medium Turntable Upgrade Panel Connections

The Input Mode switch on the panel can be used to toggle between control from Flair and Simple Stepper Motor Controller. In Flair mode, use the connections as described in to connect and power your Turntable. The following connection diagram represents connections when using the Medium Turntable with Simple Stepper Motor Controller.




Medium Turntable upgrade Panel

Notes

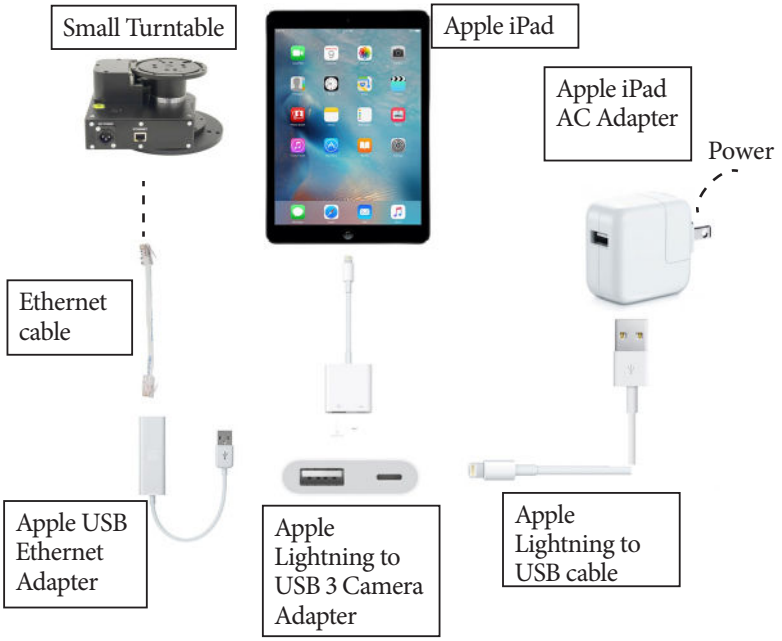
# Appendix 4 **Turntable Ethernet connection**

There is an option of connecting the Apple iPad via Ethernet.


Note

The iPad's Wi-Fi should be turned off, and in the Settings (after connecting everything together) the "Ethernet" tab will appear where the IP can be set manually to match the Turntable's subnet domain.

Alternatively, you can use Apple USB Ethernet adapter and Apple Lightning to USB 3 Camera Adapter.




1. Connect the Lightning input on the Apple USB3 Camera Adapter with the Apple Lightning to USB cable.
2. Connect the USB input on the USB 3 Camera Adapter to the Ethernet Adapter's USB output.
3. Plug the short Lightning cable to the iPad itself.
4. Connect the Turntable to the USB Ethernet adapter's Ethernet input slot via an Ethernet cable.

   The adapters need to be provided adequate power for them to work.
5. The iPad's Wi-Fi should be turned off, and in the Settings (after connecting everything together) the "Ethernet" tab will appear where the IP can be set manually to match the Turntable's subnet domain.

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