MRMC
MARK ROBERTS MOTION CONTROL

LINEAR ACTUATOR

QUICK START GUIDE

QSG Product Code: MRMC-2232-00
Product Covered: MRMC-2219-00

Linear Actuator Quick Start Guide

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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.

Power and connections

- Do not plug in or attempt to operate an obviously damaged unit.

General care

- Do not force switches or external connections.

- 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 the equipment dry. The system has **not** been made weatherproof. Do not use with wet hands.

- Keep away from pets and children.

- Keep cables tidy. Use cable ties to keep them out of harm's way.

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 Linear Actuator from Mark Roberts Motion Control (MRMC). Flair compatible Linear Tubular actuator with a 300mm of linear movement can be used in wet conditions with vertical and off-axis loads.

Connecting the cables (Single Linear Actuator)

Linear Actuator

Mains -
Single Phase
Power

Control Box

Mains -
Single Phase
Power

Hex Box Rear

IP 192.168.1.237

MRMC-2234

24V DC

Hex Box Front

Connect to the
ethernet network of
the master robot
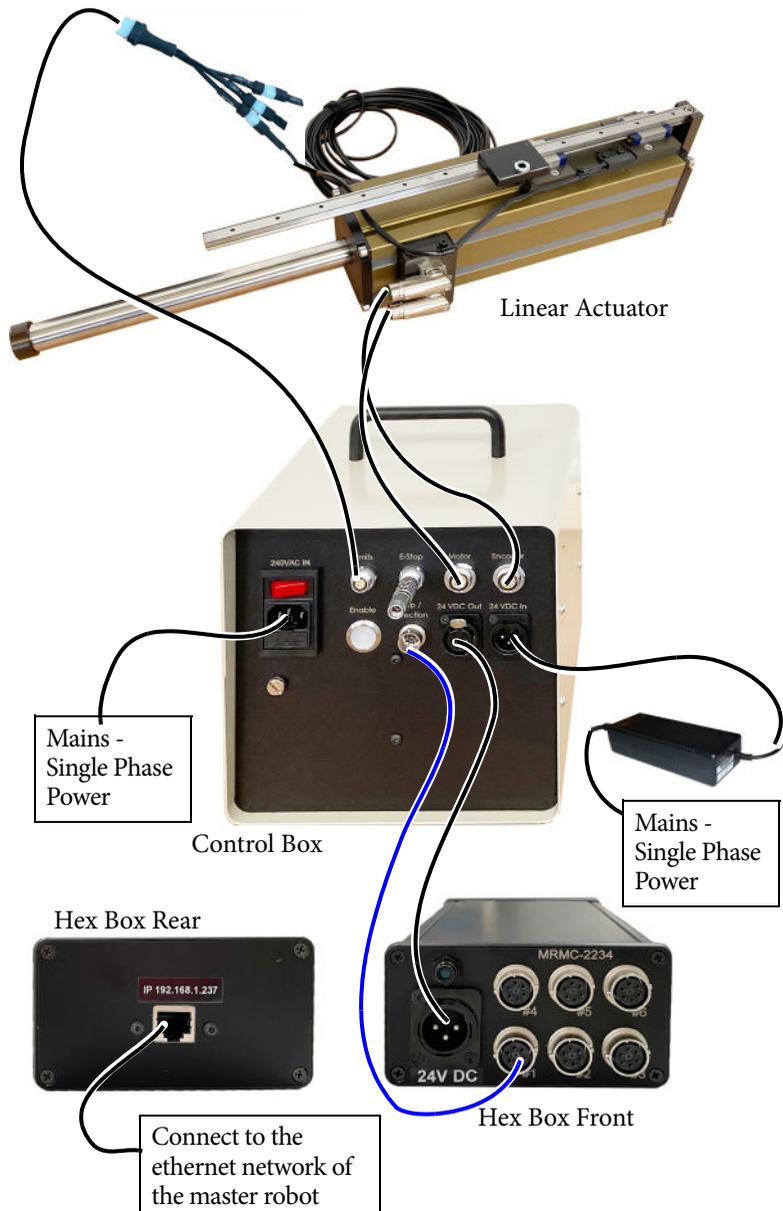
Connecting the cables (Two Linear Actuators)

Linear Actuator 1

Linear Actuator 2

Mains -
Single Phase
Power

Mains -
Single Phase
Power

Hex Box Front

Hex Box Rear

IP 192.168.1.237

MRMC-2234

24V DC

Connect to the
ethernet network of
the master robot
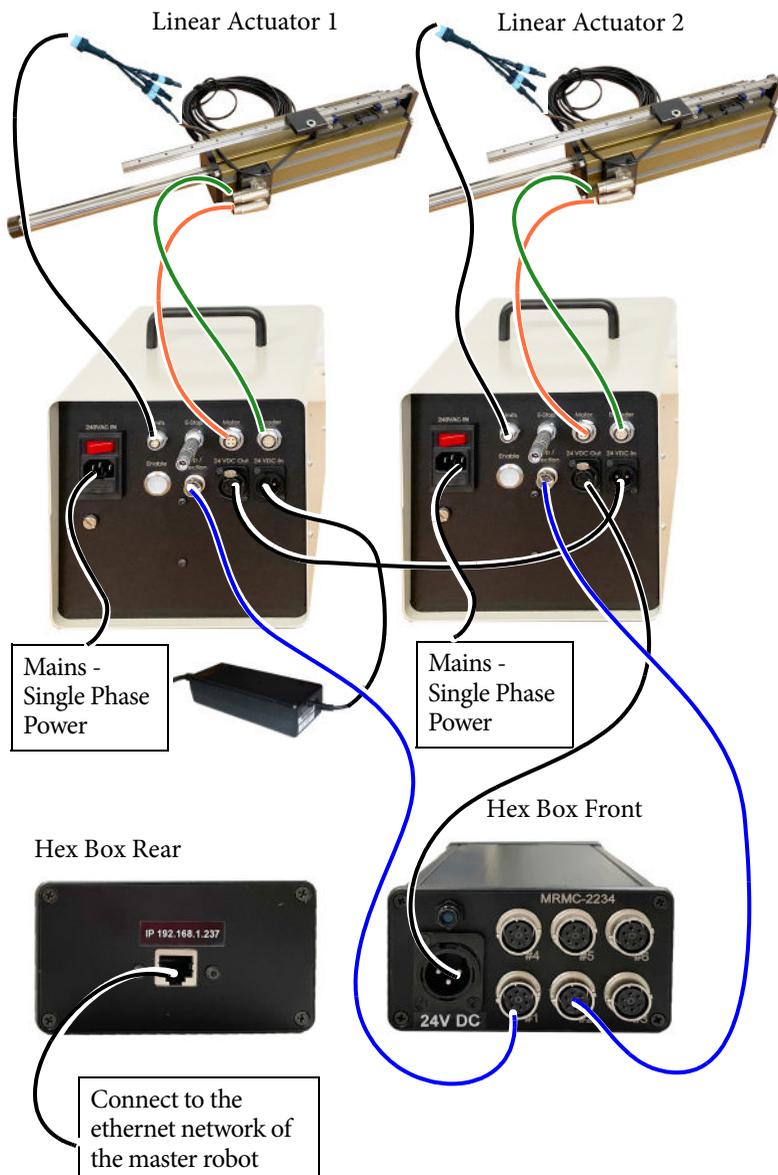
Adding a 6-axis Hex box in Flair

When a new Turntable, other model mover or motor driven by a 6-axis Hex box needs to be added to a Flair system, there is a set of steps that need to be followed to get this information on the nature of the item into Flair so the network can detect it and load it on bootup.

Devices are added to the network as nodes identified by their IP address, and it is possible that there may be duplicated IP addresses which will need to be handled before this is possible.

The additional Hex box will need to have an Ethernet cable connected to the Ethernet hub of the Flair system, and be powered.

1. Edit the **Flair.ini** file. This file is a text file that you can edit with any text editor such as Notepad, either directly or by using the Flair menu option **Help > View .ini File**. You need to add or edit some lines in the file similar to the following lines.

    *NetworkBoards: 3
    *NodeProgram3:Hex6Ether_II.btl

    The keywords used in the above table are described below:

    *   ***NetworkBoards**: This line shows the number of network boards (nodes) in the system. You need to increase this by one (1) to cater for the new Hex board. For example, if the number of network boards was 2 increase it by 1 to make it 3.

    *   ***NodeProgram3**: For the node that you are assigning the new board to (node 3 in this case), add a reference to the node program, or **.btl** file, that you want Flair to load on that node when starting up. The **.btl** file is already supplied with Flair so you don't need to copy or download it from elsewhere. For example, in this the new board is assigned to node 3, the **.btl** file will be added to **NodeProgram3**.

    Remember to save the file after you have edited it. When this Flair is booted, Flair will attempt to load all the boards it has been informed about in Flair.ini. It may fail to do so until correct connections are made and correct IP addresses are set.

2. In the Flair menu, click on **Setups > Network Setup**. The first screen is the Connection tab.

3. In the pop-up, click on the **Find** button.

4. In the Find results, find the IP address of the Hex box (**192.168.1.237** in this example – this is normally written on the box at the factory), and copy it into the node that you assigned to the Hex (**Node 3** in this example):

5. Click **Set IP**.

6. In the Network Setup pop-up, click on the buttons **Save** and **Apply**.

7. Click **Load** and exit the Network Setup.

   If the IP address is correct and does not conflict with any other IP on the system, and you have put the correct software name in Flair.ini then clicking on the Load button will load the board. On the next restart, Flair should automatically recognise all the nodes and load the `.btl` files into them.

Even if the IP address is correct and there are no conflicts of address, the software may not be set correctly. If you now look at the Software tab it will give the PC address of the software it has tried to load, and if you click on **Select,** it will open the Btls folder and allow you to choose another software file to load. You can then Reload and it will attempt to load that new software. If this works you will need to put that software name into Flair.ini to enable it to work next time you boot Flair.

> Note
>
> Even though the specified .btl file might load, this does not guarantee that it is the correct software for your Flair setup. Older systems my need older versions of software loaded to work best.

Adding a Stepper Motor Axis in Flair

You can use them as an additional axes in the main robot – such as Bolt or Bolt Mini Model Mover – Flair setup. Ensure that you have added the axis box you have in Flair that you are using to drive the linear actuator.

To add a stepper motor in Flair:

1. Add 1 to the values of ***Axes** and ***Shownaxes** in the Flair.ini file.

    - ***Axes**: This will give you how many axes you have. To add two Linear Actuators, increase this value by 2.

    - ***ShownAxes**: This will be the shown axes and if it's less then the '**axes**' value, then you will have the slider bar at the bottom to scroll to the axes that are not visible.

2. Edit the node numbers and port numbers in axis set up to match the port in which the motor is plugged into your Hex box.
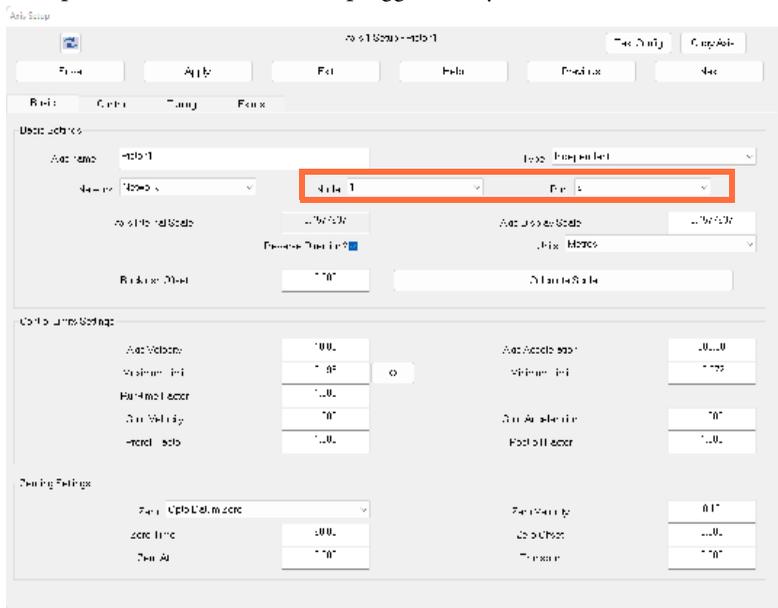
3. Similarly, add any additional axes and specify the node and port numbers.

4.   After adding, the Flair screen appears like this:
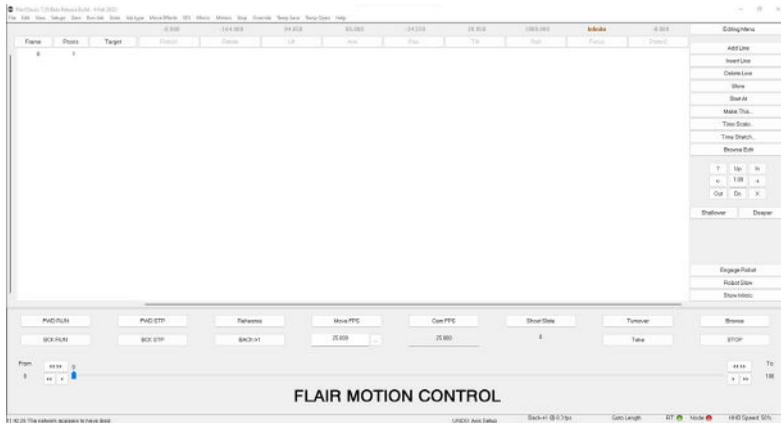
Using Linear Actuator

Connect the cables, a shown. Ensure that the Linear Actuator is added is Flair as an axis. Ensure that the Estop jumper is added in the control box. Press the Enable button; the LED should turn green.

Before you start using the Linear Actuator, it needs to be homed. To do so, move it to the far negative and then, in the Flair screen, right-click the axis name and select **Zero Home**.

The Linear Actuator is ready to be used.

> Note
>
> Pressing the Enable button, does not disable the Linear Actuator. To disable or emergency stop the actuator, unplug the E-stop jumper.

> Caution!
>
> Because of the power and velocity of this motor, it must be safely secured to some support and people should stay clear of it when is enabled.

Troubleshooting Finding Boards in Flair

Once you have physically connected with an Ethernet cable and powered on the added board, and Network setups is open, if you click on Find, it will broadcast a signal to see all the boards on the system, and will tell you their IP address settings. If they do not appear, then they are not connected or not powered; Or there is an IP address duplicated on two boards!

> Note
>
> It may be necessary to unplug temporarily the other boards on the system for the new board to show up!

You may then find you have conflicts in that the board you want to connect will have the same IP address as the one already on the system. The Find button will not find two boards with the same IP address. This often occurs where you want to use the spare Ultibox from your Bolt as a model mover, and it has been set up to have the same IP, 192.168.1.237 as the present Ultibox mounted on the Bolt arm.

Changing IP Addresses

The facility to change an IP address is built into the system, but to work it must have the board you want to change already loaded.

If you find that whatever you do the new board does not appear, try cycling the power to the network hub. Sometimes a hub may not "look" for any additional devices unless rebooted.

Unfortunately, you cannot load two identical IP boards and then change one, you have to load the incorrect board by doing a Find with other boards not connected, to find its IP, then set that IP in the Network setup screen, with its duplicated IP board disconnected. When you are connected to it you can change the IP in Network Setups to a new IP and press Set IP to make that the IP address Flair looks for, and press Burn IP to burn that IP into the new board.

Once you have a new IP address burnt into the new board, put a new label on it for future reference, and you should then be able to plug back in any boards that were unplugged before making the change.

The list of IP addresses and boards loaded in sequence will be found in the Network.ini file.

Because you now have the new board written into your Flair.ini it will try to load every time you load Flair, and will give you a warning saying it did not load if it is not plugged in on later shoots. Of course this does not matter as the rest of the network will still work, you just need to know Flair looked for it and did not find it.

Network Status

Under the Status heading in Network Setup, 'Connected' appears if it is connected and being used by an axis in Flair. If it says 'Unassigned' it means it is connected but you have not assigned that board to any axis in Flair. Example, you have just added a node to be node 3 as an Hex box, but you have no axis assigned to Network Node 3 in the Flair Screen. You will need to assign your axes to that node for them to work.

There are coloured blobs in the bottom right of the Flair screen. A red blob means its not connected to that node, a blue blob means its connected but not assigned, a green blob means its connected and in use by an axis.

Once you have added the board to Flair you may still need to set up the axes. Refer to Flair manual for further details or the video "Flair Axis Setup" in the Tutorial Videos section of Resources on www.mrmoco.com.

Appendix 1 **Specifications**

Temperature range: 0-40 °C
Humidity tolerance: 0% to 85% relative humidity, non-condensing

Total payload: 5kg

Max Speed: 5m/s (no payload)

Max Stroke length: 300mm

Power supply: 240/120V Mains to Copley, 24V Input for Copley Logic

13A Standard Fitting, 5A Standard MRMC Supply

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