MARK ROBERTS MOTION CONTROL

UNI-BOX

QUICK START GUIDE

QSG Product Code: MRMC-2269-00
Product Covered: MRMC-1577-00

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Contact information	
Mark Roberts Motion Control Ltd. Unit 3, South East Studios Blindley Heath Surrey RH7 6JP United Kingdom	
Telephone:	+44 (0) 1342 838000
E-mail:	info@mrmoco.com (sales and general enquiries) support@mrmoco.com (customer support)
Web:	www.mrmoco.com www.mrmocorentals.com

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Chapter 1 **Uni-box Panel**

Introduction to Uni-box connections

Uni-box is an MRMC axis box with a Uni board inside, usually used to drive **a single stepper** motor.

The stepper motor can be of type:

- 23B
- 17B
- 34B

The motor runs on a 48V voltage and can increase speed when supplied with higher voltage. The Uni-box can handle 12-48V; for higher voltage of 48V, a Y cable can be added to supply extra power.

The Uni-box has four stepper motor connectors. See *Uni-box connector summary* on page 2.

Uni-box connector summary

Uni-box front

Uni-box rear:

1 **MOTOR** connector for any stepper motors, such as PAN and TILT in the head, track motors, and external Lens Control Motors. For pin-out information see *Stepper motor connector* on page 3.

2 **POWER 12-48VDC** connector, for power input for the Uni-box. When the power is on, the LED next to the **POWER** connector lights up. For pin-out information see *Power 12-48V connector* on page 3.

Power LED

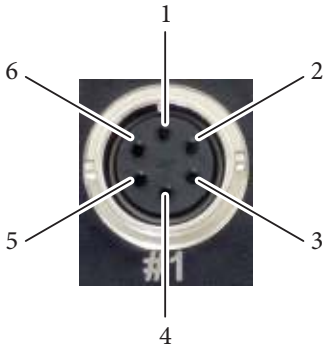
3 **ETHERNET** RJ45 connector for controlling the head using an Ethernet network connection. This Ethernet port is rated at 100 Mbits/sec but can operate at lower speeds of 10 Mbits/sec or less.

Uni-box connector pin-out information

Stepper motor connector

The Motor connector on Uni-box is typically used for a serial lens driven by a stepper motor.

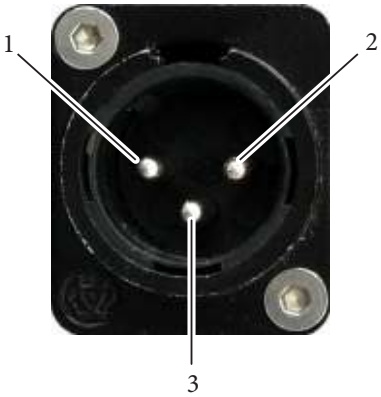
1. GND
2. 24V
3. 5V
4. Homing Datum
5. Step
6. Direction



Power 12-48V connector

Power input for the Uni-box.

1. GND
2. 48VIN
3. N/C



Adding a Uni-box in Flair

When a new Turntable, other model mover or motor driven by a Uni-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 Uni-box will need to have an Ethernet cable connected to the Ethernet hub of the Flair system, and be powered.

1. Edit the file **`C:\Flair\Flair6\Flair.ini`**. 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.

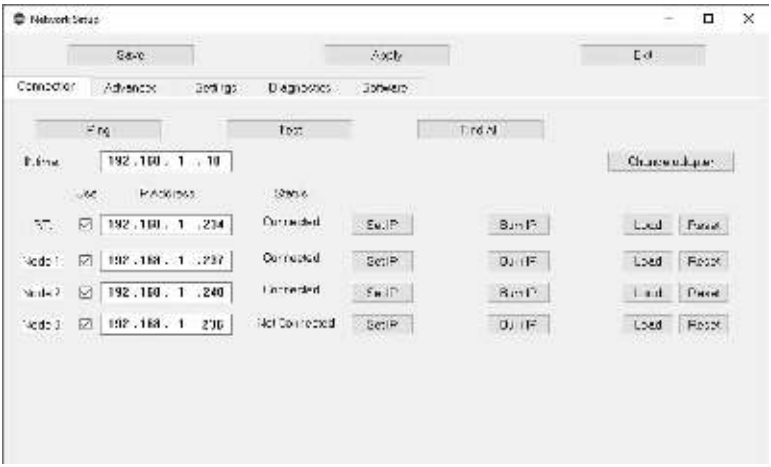
   ```
   *NetworkBoards: 3
   *NodeProgram3: Uni6Ether_II.btl
   ```

   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 Uni 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 Uni-box (**192.168.1.236** in this example – this is normally written on the box at the factory), and copy it into the node that you assigned to the Uni-box (**Node 3** in this example):



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

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.

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 a Uni-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.

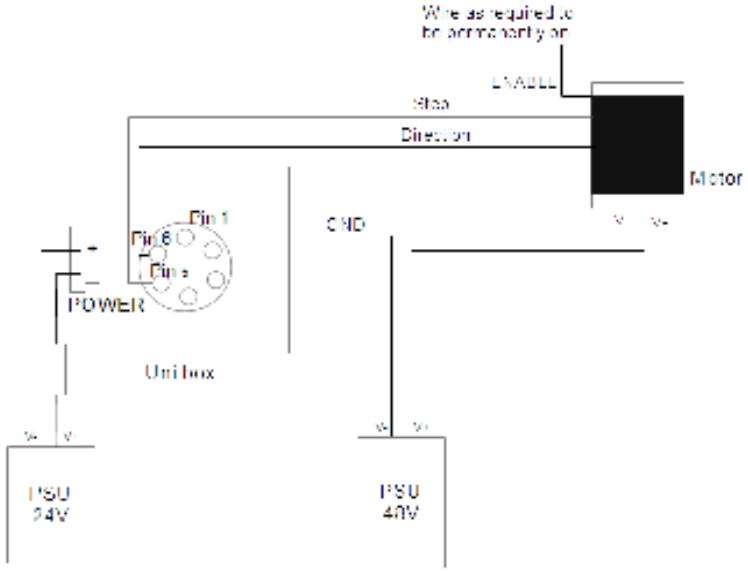
Once you have added the board to Flair you may still need to set up the axes. Refer to Flair manual for further details or the video "Flair Axis Setup" in the Tutorial Videos section of Resources on www.mrmoco.com.

Notes

Appendix 1 **Connecting Stepper Motors to Uni-box**

Connecting any other stepper motor to Uni-box

For a Stepper motor requiring 24V input, connect the V- to Pin 1 and V+ to Pin 2 on the Stepper connector. For a Stepper motor that requires more than 24V use a Y cable, as follows. In this case, Pin 2 is not connected.



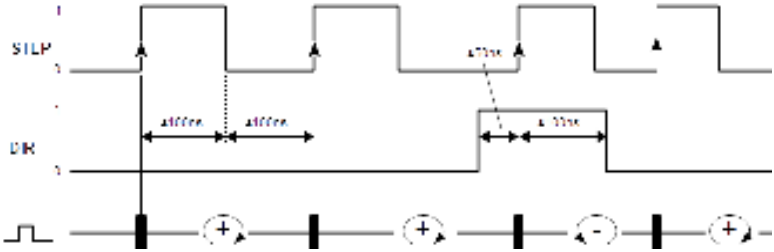
Also, if the motor driver requires 5V of Power, Pin3 in the stepper connector can be used.

Stepper drive pulse/direction

The signal input of Step and Direction from the Uni-box can be used for interfacing the pulse/direction input clock type. Note that the CW/CCW clock type is not supported by the Uni-box.

Step/direction inputs

The motor angle step with the rising edge of the STEP signal, the direction of rotation is controlled by the DIR signal.

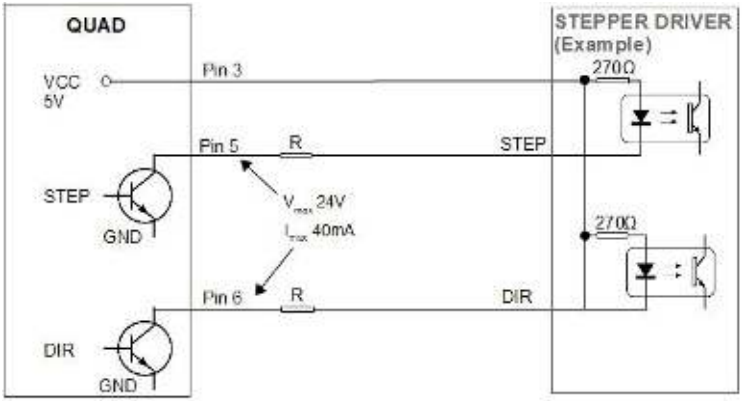


Signal	Signal value	Meaning
STEP	Rising edge	Angle step
DIRECTION	0/open 1	Clockwise direction Counterclockwise operation

Step and Dir outputs from the four motor ports are open collector outputs. Absolute maximum current is 40 mA, so depending on what voltage you use, and on your stepper driver electronics (diagram only shows an example) you may need to add some resistance (R) on the cable.

It is possible to use higher voltage as long as the current is kept within the limit, but it is highly recommend to use 5V output from MRMC Uni board (pin3). Absolute maximum is 24V, and should never be exceeded.

There is no enable line, therefore the enable input on the driver needs to be wired permanently enabled.



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Mark Roberts Motion Control Ltd.
Unit 3, South East Studios, Blindley Heath, Surrey RH7 6JP
United Kingdom
Telephone: +44 (0) 1342 838000
info@mrmoco.com
www.mrmoco.com