TREEFORT
ENTERTAINMENT

MO-SYS L40

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MO-SYS L40

The L-40 is a light weight 2-axis head for high-end digital cinematography is ideal for medium sized camera packages, for example ARRI Alexa with a large zoom lens, such as Optimo 12:1 or Panavision 12:1. At the core of the L-40 is a highly robust and precise motor drive with zero backlash, providing lag-free operation.

M A N U A L

mo-sys

L40

User Manual

2023

INNOVATORS FOR VIRTUAL

PRODUCTION & IMAGE ROBOTICS

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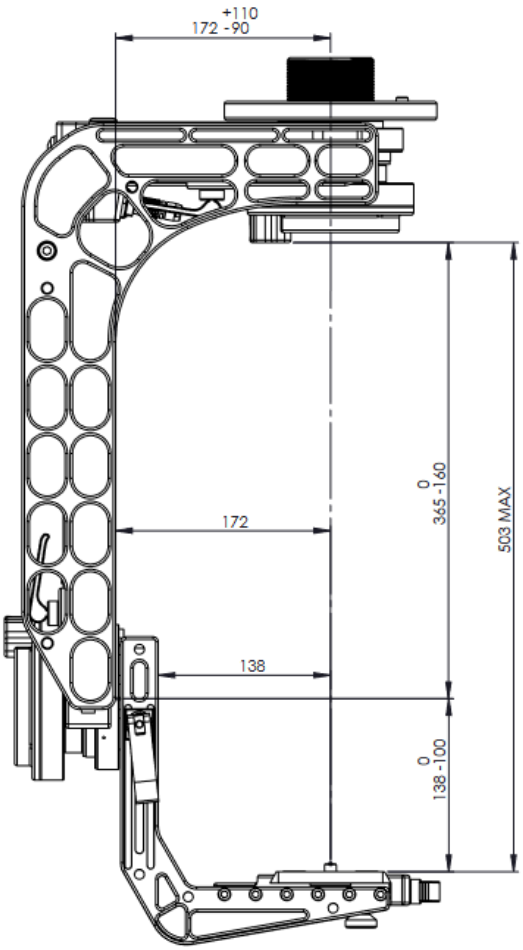
Specifications

Maximum Load	40kg
Maximum Speed	180° /Second
Weight of Head	18kg
Power	24V (PSU 110-200v)

Dimensions:
Scale 1:10
Measurements in (mm)



System Overview

The Mo-Sys L40 is a two-axis head with backpan and an optional roll axis. The lattice designed L40 can hold a max payload of 40kg and a max speed of 180 degrees / second.

This manual will guide you through the basics of connecting the system, mounting and balancing the camera package, and operating settings.

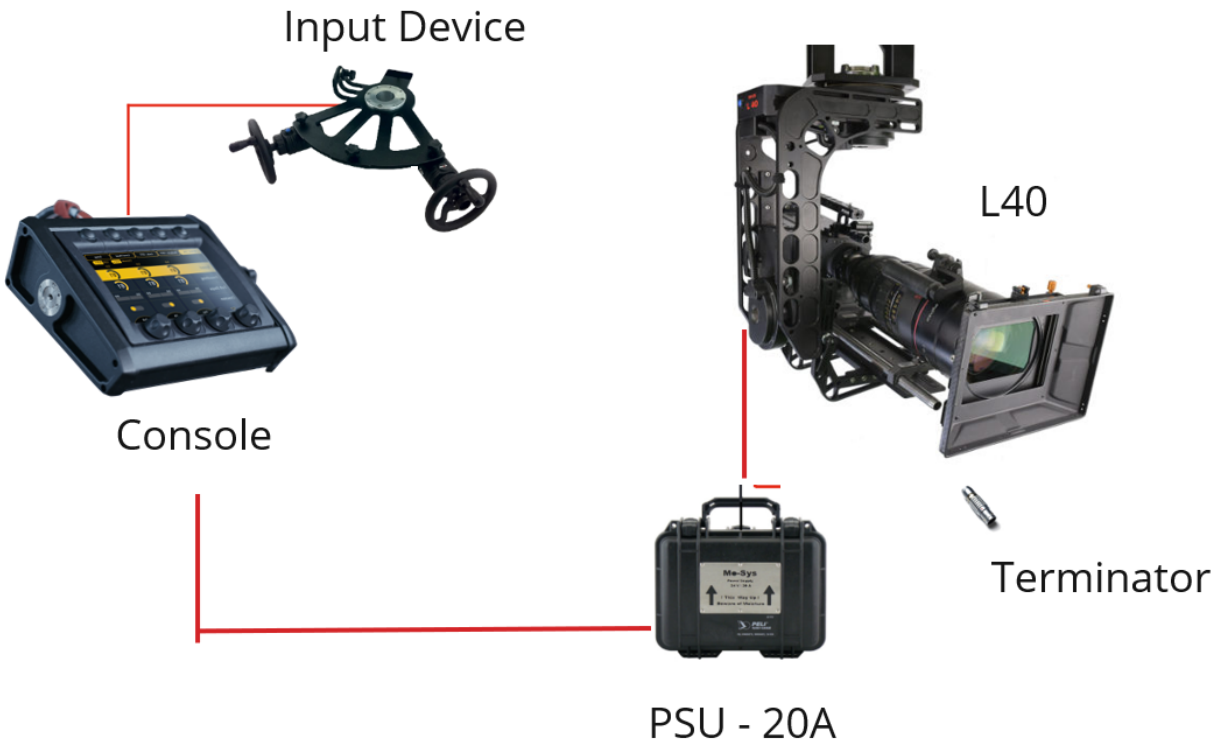
System Architecture

The system is comprised of:

- Mo-Sys L40 robotic head
- Remote Console, which is used to set the operating parameters of the head.
- An input device, (hand wheels, joystick, panbar)
- Power Supply

The kit also includes:

- PanBar
- 3x Mo-Sys BUS Cables
- Button Console
- Terminator plugs
- Mo-Sys Roll Ring with Adaptor Plate (optional)
- Gateway (optional)



L40 Setup

General Setup

To begin setup, connect the PSU to the control console using the 3 pin XLR power cable. Both ARRI and Panavision polarity 24V supplies or batteries can be connected to the back of the console to provide power. Either XLR connector on the console can be used. The second one is provided to allow hot swapping of batteries without powering down the system, but two batteries should not be left connected for long periods.

An emergency mushroom is provided, which will turn off motor power in a panic situation. The system is connected using BUS cables in a daisy chain configuration. Any empty BUS connectors should be filled with Terminator plugs. Alternatively, a Wireless Link (Radio Kit) can replace the cable between the console and head.

Two BUS connectors are provided on the back of the console. One BUS Cable can be used to connect the console to the L40 head, and another BUS cable connects to the input device (handwheels).

The handwheels kit consists of one master module (with bus connectors on the back) and a slave module. The slave unit connects to the master unit with the green strain relief right angle handwheel cable.

By default, the master module controls the pan axis. On the side of the Master handwheel are connectors for 2 slave

modules. The connector closest to the rear of the master module is for the tilt axis slave.

Radio Kit Setup

A radio kit can be used to connect the console to the head replacing a Mo-Sys BUS cable. This section explains how to set this up.

To set up the radio kit, you will need: An additional power supply, two additional terminators, two radio modules, and an additional BUS cable.

Start by building two separate Mo-Sys networks, each with a radio module and power supply.

For instance, one network might have:

- Radio (*Small*)
- Console
- Input devices
- Terminators *(on either end of the network)*
- PSU (10A)

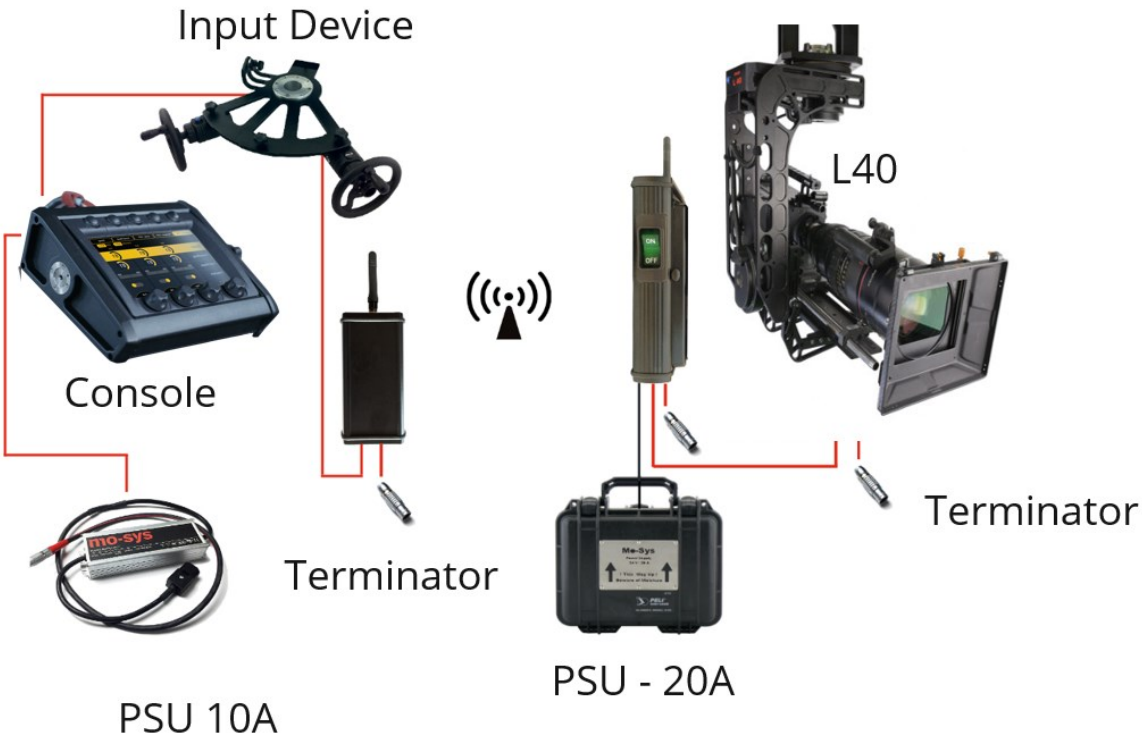
The other network might have:

- Radio *(large)*
- L40 head
- PSU (20A)
- Terminators

The small radio is referred to as the 'Master'. For best performance, always place the Master on the console side of the bus with the input device. The small PSU connector had a built-in terminator. **Always power up the console side first, followed by the head.** The Master radio LED will light up within two only light up if the Master is powered on. It will take up to ten seconds to light up.

L40 Setup

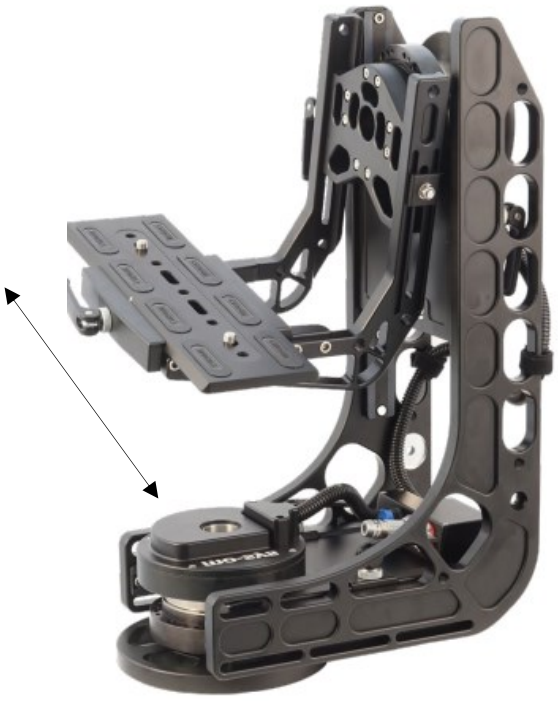
Typical Radio Setup



Balancing

The L40 has very strong motors but it is a good idea to balance the camera to reduce power consumption and reduce risk of damage to camera/lens in event of power failure.

Balance the camera package >



Console Instructions

Navigation Menu

The navigation menu consists of five quick action buttons along the top of the screen.

Motors - [ON/OFF] This will turn the L40's motors on or off.

Lock - [ON/OFF] This will lock the L40's axis so that they cannot be physically moved, the head will stay energised, but the lock will prevent any accidental movement.

Backpan - [ON/OFF] When switched On, this option enables the Backpan function. The L40 will continue to point the camera in the same direction in Pan, regardless of any movement of the mount it is attached to. This is particularly useful when the head is mounted to a crane and the crane arm is swung in an arc. The operator can concentrate on framing the shot rather than compensating the crane arm motion.

Bus Info – This will take you a menu which shows all the input and output devices connected to the console. Various input devices are available, such as the panbar, joystick and handwheels. You can adjust a particular input to an output device, should more than one be corrected.

Setup – For adjusting input direction, backpan smoothing and more.

The battery voltage of both the console and the L40 can be seen in the right of the menu.

Use the left knob to scroll up and down the menu and the others to change the value of the variable within each axis.

Within the three Axis': Pan, Tilt and Roll, different paraments can be adjusted. The knobs turn in different increments. You can increase the increments by pressing the knob down once, going from 1 to 10 to 100 and more depending on the variable.

Speed: Adjustable between 1-10 , changes the speed of the head relative to the input device.

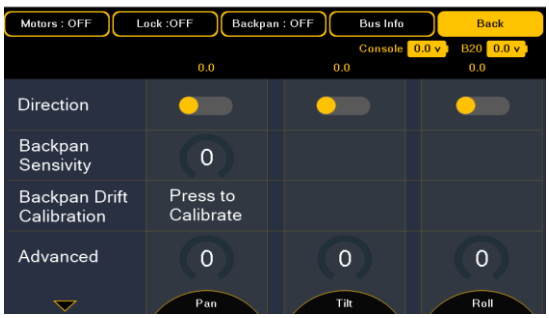
Smoothing: adjustable between 1-10. Controls the takeup and release smoothing of the input devices.

Soft Stops: Soft stops provide a limit to the axis range of travel. To set up soft stops, press the knob on the axis you want to change. You must then set the first position, move the camera to your first position using your input device and press the knob again. Now you can set your second position, press the knob again and your soft stop should now be configured.

To delete a soft stop position, navigate to the correct dial position and press and hold the knob until the icon stops flashing.

Feathering – This sets the ramping or deceleration curve into the set soft stops. A low value will cause the head to stop abruptly, increasing the feathering value will ramp the value into a smoothing stop.

Setup Info



Direction: This will change the direction of the L40 relative to the input device control movement.

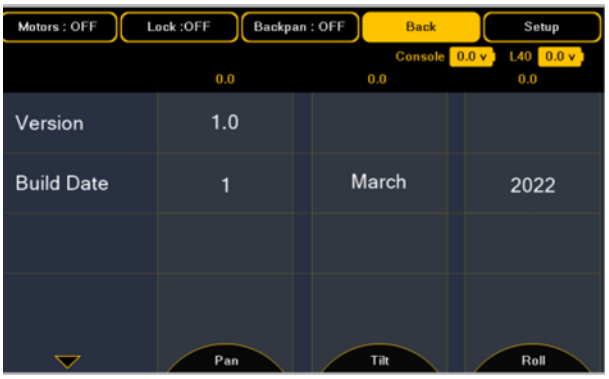
Backpan Sensitivity: Adjustable between 1-10, changes how sensitive the gyro stabilisation of the backpan is. Normally set this to a middle value if the backpan causes a resonance, reduce the sensitivity.

Backpan Drift Calibration: The L40 is fitted with a high precision gyro to sense and compensate for rotation of the supporting structure. The gyro has very good immunity from drift but in extreme circumstances such as large temperature changes, drift might become an issue. If it does then the gyro is very simple to recalibrate. To recalibrate, the motors of the head must be disabled to prevent any vibration from affecting the readings. The head must be completely static relative to the ground so it would be better to remove the head from a crane arm and lay it on the floor. Once ready, press the Gyro recalibrate button (picture) and wait for the progress message to say the process is complete. The drift should now have been calibrated out

Advanced: Advanced setup and settings. These should not be required in normal usage and would only be accessed under guidance form a Mo-Sys representative. To enter the advanced menu, you must first enter the security code. The code consists of three different dials, each ranging from 1-100. (code is 3-20-5)

Bus Info

Bus info is used to see connectivity information on your input and output devices. Through the bus number, you can see which device is connected and currently active. To change your input device, navigate to the correct bus number and press down on the third knob. You can now turn it to swap between different input devices, press down again to confirm your choice.



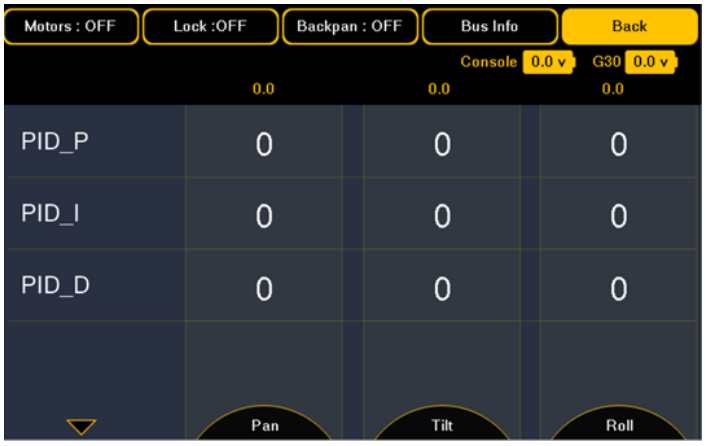
When scrolling to the bottom of the bus info page, you will find the console software version

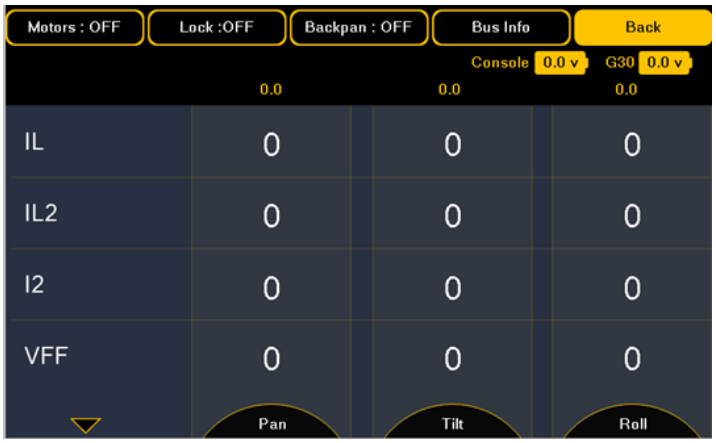
Advanced Instructions

The advanced settings are for advanced users only. Improper use of these settings could cause damage to your L40 head. Be sure to make a note of the values before changing them in case you need to go back!

PID: These are parameters to adjust the motor control of the L40.

These values should only be changed by advanced users. Incorrect values can cause unpredictable results and excessive noise.





Encoder Resolution: This is factory set and shouldn't ever be changed.

Excessive Error: This is a safety margin and should not be changed.

Maximum Velocity & Acceleration: These values are factory set. If a value is set too high for the power supply voltage, it will be impossible for the head to reach and excessive error will occur.