



## Star-Mate LX200 Emulator v2.1 User Manual.

**Thank you** for your purchase of the 2fDesign Star-Mate LX200 Emulator. With careful use your Star-Mate will give you many years of service, and in no time you'll wonder how you ever coped without one!

To get the most out of your Star-Mate we recommend you read this manual thoroughly to familiarise yourself with the features of Star-Mate.

The Star-Mate consists of four parts.

1. Star-Mate LX200 Emulator
2. Power Link Cable
3. ST4 Link Cable
4. CD with Software & User Manual

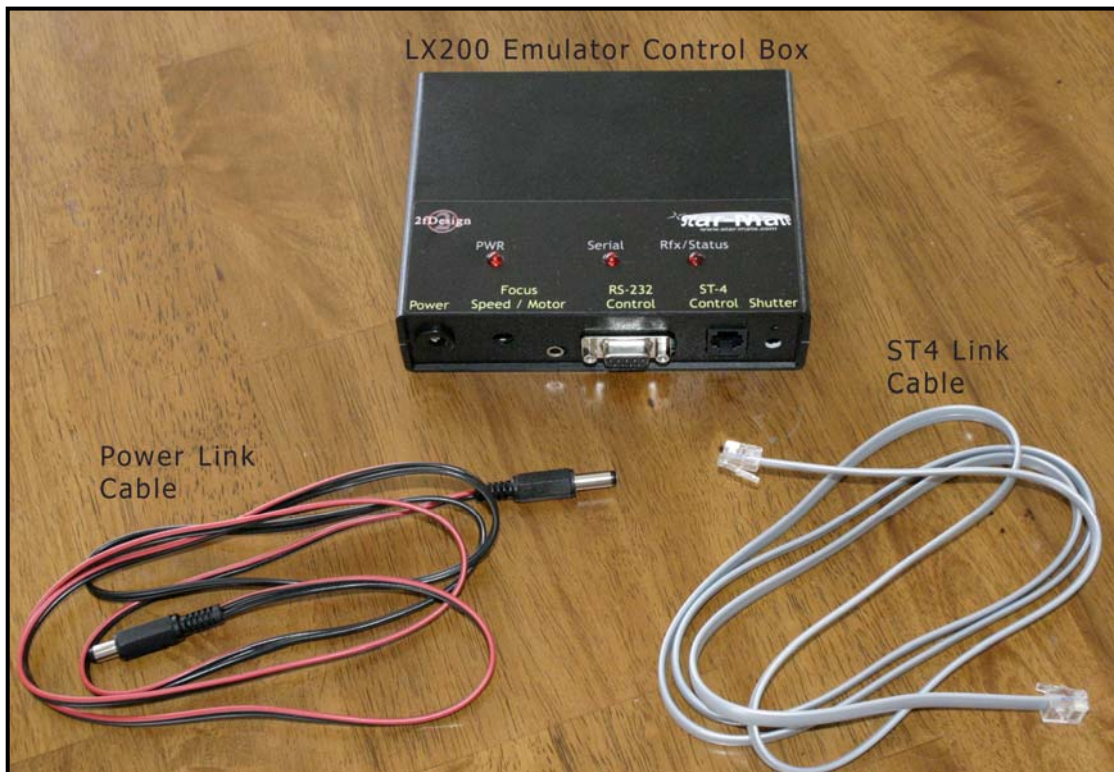


Fig 1 – Parts

## **1. Initial Setup.**

The Star-Mate controller is wired up as shown in Fig2. (Note. Losmandy drive unit not included.) Where the interface is not a Losmandy controller simply attach the ST4 cable to the ST4 port of the mount, and the power cable to the same power supply that is powering the mount. The power supply should be 12V pin positive.

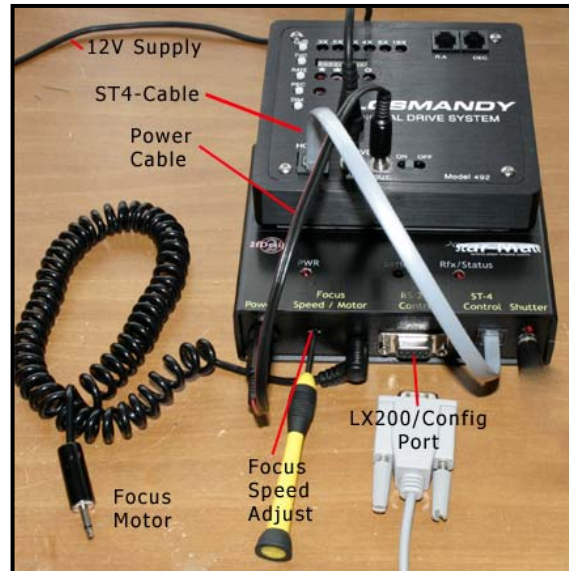


Fig2 – Setup

You are now ready to explore the features of Star-Mate.

## **2. RS-232 Control**

Slew & Focus Control can also be done using the RS-232 port. Eg. AutoGuiding, Goto and AutoFocus.

The RS-232 port is compatible with the Meade LX200 generic protocol and accepts the following commands.

GR# Get Telescope RA (not fully implemented but needed to allow connection)  
GS# Get Sidereal Time (not fully implemented but needed to allow connection)  
GD# Get Telescope DEC (not fully implemented but needed to allow connection)

GVP# Get Telescope Product Name (Returns "Starmate")  
GVN# Get Telescope Firmware (Returns Starmate firmware version)

F+# Focus Up  
F-# Focus Down  
FQ# Focus Stop

Mn# Move North  
Ms# Move South  
Me# Move East  
Mw# Move West  
Qn# Stop North  
Qs# Stop South  
Qe# Stop East  
Qw# Stop West  
Q# Stop All

### **Serial port settings**

Baudrate: 9600

Start bits: 1

Stop bits: 1

Parity: None

Handshaking: None

### **Status LED's**

The Star-Mate has three Status LED's.

- **Power:** Indicates power to the controller.
- **Serial:** Flashes in sync with activity on the RS-232 control port
- **RFx/Status:** Indicates an ST4 of Focus signal is Active.

## 4. Software

### ChanSet Utility

*Note: LX200 Emulator units will only respond to Telescope Slew & Focus Commands.*

The serial port also provides access to the Star-Mate for setup using ChanSet Utility (See Fig3).

Using the ChanSet Utility users can do the following.

1. Change the RF channel used. This is useful if one channel is susceptible to interference or if there is another Star-Mate close by using the same (or close) channel.
2. Provides basic telescope slew and focus control for testing etc.
3. Allows the user to set the 5 exposure times and time between exposure times.
4. Allows the user to reverse the button settings for RA & DEC slewing.
5. Provides a mechanism for uploading the latest firmware to the Star-Mate. This is password protected and should only be used under direction from 2fDesign.

### Changing the RF Channel.

Connect the controller to a PC via a serial port and hit CONNECT.

Press READ to read the current RF channel setting.

Change the RF setting to any number between 1 and 100, and press WRITE.

Then you need to transfer the Channel setting to the handheld unit.

Press and hold Focus+ & Focus- buttons together for 12 seconds. The handheld LED will flash fast. Press the WRITE TO REMOTE button on ChanSet and follow the on screen instructions. If the RF channel setting is not made on the handheld within 20s the handheld will revert back to it's original setting.

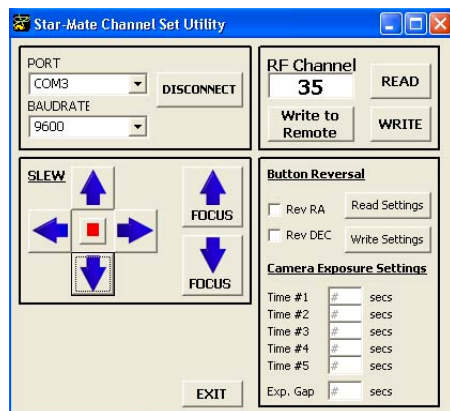


Fig 3 – ChanSet Utility Screenshot

## **5. Specifications**

### **Control Box Receiver**

Power Supply: 8-15VDC. Standard power plug. 12V nominal.

Polarity: Pin positive.

Slew Guide Port: Standard ST4 compatible RJ11 Socket

Focus Port: Relay Controlled 3.5mm socket.

Adjustable speed via screw pot.

LED's: 1x Power, 1x RS-232 activity, 1x Status/Rf

### **RS-232**

Fully compliant RS-232 serial communication port.

LX-200 compatible command Set.

Settings: 9600 Baud, 8bits, 1 stop bit, no handshaking.

### **Focus Motor Control**

5-10VDC determined by trimpot setting.

Bi-directional Relay control.

Standard 3.5mm plug & cable as found on JMI NGF type focus motors.

### **ST4 output**

Common MOSFET voltage-free switched outputs.

## **6. Contact Information.**

For the latest software and user information log onto <http://www.star-mate.com>

Star-Mate is designed and built in New Zealand by..

2fDesign Ltd

<http://www.2fdesign.co.nz>

20 Henare Street  
Palmerston North  
New Zealand

Ph: +64 6 354 9522

e-mail: [rob@star-mate.com](mailto:rob@star-mate.com)

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