



Star-Mate v11.1 User Manual.

Thank you for your purchase of the 2fDesign Star-Mate.

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 two parts.

1. Handheld Remote
2. Star-Mate Controller

Additional accessories that are supplied with your Star-Mate.

1. Camera Shutter Cable
2. Power link Cable
3. ST4 link Cable
4. 2x AA Alkaline Batteries
5. Double sided adhesive tape for mounting of the Controller
6. CD with Software and User Manual



Fig 1 – Parts

1. Initial Setup.

The Handheld unit requires 2xAA batteries (supplied). Insert them by removing the single screw and placing them as shown.

We recommend that only good quality alkaline batteries be used in the handheld unit.

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.

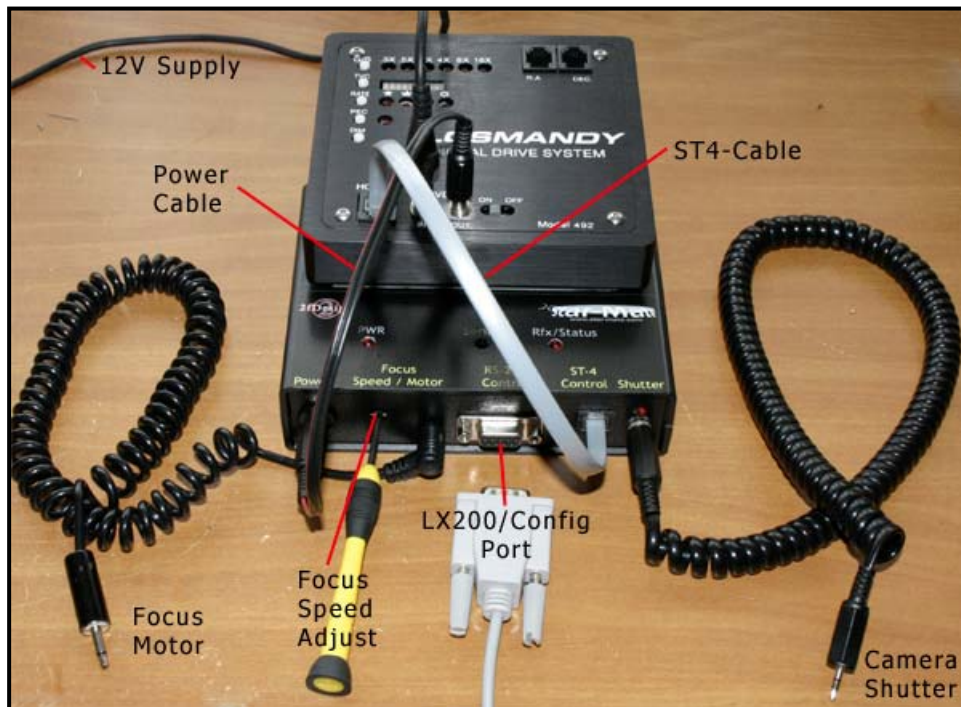


Fig2 – Setup

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

Slewing

The four buttons on the handheld are labelled Slew. These simply move the telescope in the direction indicated with left/right being RA, and Up/Down being DEC. The direction of the buttons can be reversed by using the ChanSet software utility (see software section), or by pressing the Speed button while slewing (see Slew Speed button details).

The Slew buttons are always active regardless of the mode the Star-Mate is in.

Slew Speed

The Speed button has two modes & three functions.

1. Changes the Slewing Speed of the Losmandy controller.
2. If held down for two seconds the Star-Mate enters exposure mode and the camera shutter is activated. The current exposure time setting is also flashed (see below for details).
3. While Slewing (in either RA or DEC axis) pressing the Speed button will change the orientation of the axis currently activated. This is useful for getting the Slew direction to match eyepiece movement. This function is active in both normal or exposure control modes.

Camera Exposure

The Star-Mate provides a simple means for controlling a camera in BULB mode.

The Star-Mate has 5 configurable exposure time settings, plus a Bulb setting. Initial default exposure times are 60,120,180,240,300 seconds + Bulb. The exposure times can be changed using the ChanSet utility. See software section for more details.

When in Exposure mode the Star-Mate will take 10 exposures in sequence with 15seconds between each shot. The time between each shot can also be configured using the ChanSet utility. The control of the exposure setting is done using the Focus buttons on the handheld when in exposure mode.

To exit Exposure mode, simply press and hold the Speed Button again for two seconds.

2. Focus / Exposure Control

Non-Exposure Mode

The focus buttons activate the focus motor connected to the Star-Mate.

The focus motor speed is set by adjusting the trimpot on the controller with a small screwdriver.

Exposure Mode

The focus buttons control the camera exposure settings. Settings are indicated to the user by flashing the LED on the handheld* and also flashing the Status LED on the controller.

Focus Up: Pressing this button shows the current exposure time. Pressing the Focus Up button again advances the exposure time to the next setting.

Focus Down: Pressing this button shows the current Exposure count (how many exposures have been taken including the current one).

Also upon first entering Exposure mode the current time setting is flashed immediately.

** On occasions the Handheld may not flash the current setting as requested while the controller does. This is a problem with single shot RF transmission, and a solution is currently being investigated. It does not indicate a fault with the handheld.*

3. 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 RF signal being received, and indicates Exposure settings when in Exposure mode.

4. Software

ChanSet Utility

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.

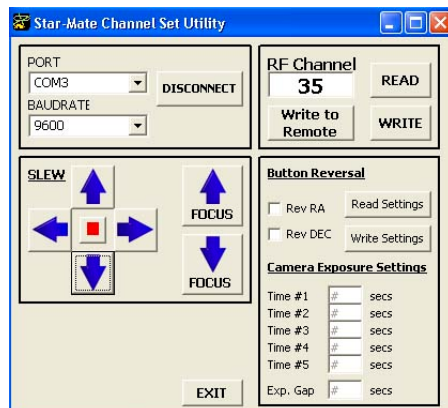


Fig 3 – ChanSet Utility Screenshot

5. Specifications

General

RF Frequency: 2400 - 2524MHz (Channel Specific) International ISM Band

Number of Channels: 125 (100 currently active)

Number of Addresses: 4,294,967,296 (set by factory)

Range: 16m diameter guaranteed. Up to 50m with 10% missed codes.

Handheld Transmitter

Power Supply: 2.6-3.5VDC. 2xAA batteries (Alkaline Recommended)

Output RF Power: 0dBm

Transmission Mode: Bi-Directional. Continuous transmit while button pressed.

Antenna: 1.5dB Gain Internal.

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

Output RF power: 0dBm

Antenna: 1.5dB Gain Internal.

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.

Camera Exposure

Standard 2.5mm plug found on Canon 300D and similar EOS cameras

Open Drain MOSFET output, focus & shutter closed simultaneously. Recommended for use in manual focus modes only.

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..

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