Mini v2 Serial Commands

Command Char #								Return Variable	Comments
1	2	3	4	5	6	7	8		
:	C	#						N/A	Initiate a temperature conversion; the conversion process takes a maximum of 750 milliseconds. The value returned by the :GT# command will not be valid until the conversion process completes.
:	F	G	#					N/A	Go to the new position as set by the ":SNYYYY#" command.
:	F	Q	#					N/A	Immediately stop any focus motor movement.
:	G	C	#					XX#	Returns the temperature coefficient where XX is a two-digit signed (2's complement) hex number.
:	G	D	#					XX#	Returns the current stepping delay where XX is a two-digit unsigned hex number. See the :SD# command for a list of possible return values.
:	G	H	#					00# OR FF#	Returns "FF#" if the focus motor is half-stepped otherwise return "00#"
:	G	I	#					00# OR 01#	Returns "00#" if the focus motor is not moving, otherwise return "01#"
:	G	N	#					YYYY#	Returns the new position previously set by a ":SNYYYY" command where YYYY is a four-digit unsigned hex number.
:	G	P	#					YYYY#	Returns the current position where YYYY is a four-digit unsigned hex number.
:	G	T	#					YYYY#	Returns the current temperature where YYYY is a four-digit signed (2's complement) hex number.
:	G	V	#					DD#	Get the version of the firmware as a two-digit decimal number where the first digit is the major version number, and the second digit is the minor version number.
:	S	C	X	X	#			N/A	Set the new temperature coefficient where XX is a two-digit, signed (2's complement) hex number.
:	S	D	X	X	#			N/A	Set the new stepping delay where XX is a two-digit, unsigned hex number. Valid values to send are 02, 04, 08, 10 and 20, which correspond to a stepping delay of 250, 125, 63, 32 and 16 steps per second respectively.
:	S	F	#					N/A	Set full-step mode.
:	S	H	#					N/A	Set half-step mode.
:	S	N	Y	Y	Y	Y	#	N/A	Set the new position where YYYY is a four-digit unsigned hex number.
:	S	P	Y	Y	Y	Y	#	N/A	Set the current position where YYYY is a four-digit unsigned hex number.
:	+	#						N/A	Activate temperature compensation focusing.
:	-	#						N/A	Disable temperature compensation focusing.
:	P	O	X	X	#			N/A	Temperature calibration offset, XX is a two-digit signed hex number, in half degree increments. Example 1: :PO02# offset of +1℃ Example 2: :POFB# offset of -2.5℃

DRO v2 COMMANDS

The Moonlite DRO v2 Dual Channel motor controller communicates to a PC via FTDI USB to serial interface. The serial settings are: 9600 baud, No Start Bits, 8 data bits, 1 Stop Bit, No Flow control.

The command structure is designed to maintain compatibility with existing single channel controllers, while adding additional functionality of a second motor channel.

Primary Motor (Channel 1) commands:

Commands	RETURN VALUE	COMMAND DESCRIPTION	VARIABLE TYPE
GP	XXXX	GET Motor 1 current position	HEX
GN	XXXX	GET Motor 1 target position	HEX
GD	XX	GET Motor 1 step delay, valid values are: 0x02, 0x04, 0x08, 0x10, 0x20	HEX
GH	XX	GET Motor 1 Half Step or Full Step 0xFF if HALF step, 0x00 if FULL step	HEX
GI	XX	GET Motor 1 is moving 0x01 if MOVING, 0x00 if STOPPED	HEX
SPXXXX		SET Motor 1 current position	HEX
SNXXXX		SET Motor 1 target position	HEX
SDXX		SET Motor 1 Step Delay, valid values are: 0x02, 0x04, 0x08, 0x10, 0x20	HEX
SF		SET Motor 1 to FULL STEP	
SH		SET Motor 1 to HALF STEP	
FG		Start movement on Motor 1, move until current position equals target position.	
FQ		STOP movement on Motor 1	

Secondary Motor (Channel 2) commands:

Commands	RETURN VALUE	COMMAND DESCRIPTION	VARIABLE TYPE
2GP	XXXX	GET Motor 2 current position	HEX
2GN	XXXX	GET Motor 2 target position	HEX
2GD	XX	GET Motor 2 step delay, valid values are: 0x02, 0x04, 0x08, 0x10, 0x20	HEX
2GH	XX	GET Motor 2Half Step or Full Step 0xFF if HALF step, 0x00 if FULL step	HEX
2GI	XX	GET Motor 2 is moving 0x01 if MOVING, 0x00 if STOPPED	HEX
2SPXXXX		SET Motor 2 current position	HEX
2SNXXXX		SET Motor 2 target position	HEX
2SDXX		SET Motor 2 Step Delay, valid values are: 0x02, 0x04, 0x08, 0x10, 0x20	HEX
2SF		SET Motor 2 to FULL STEP	

2SH		SET Motor 2 to HALF STEP	
2FG		Start movement on Motor 2, move until current position equals target position.	
2FQ		STOP movement on Motor 2	

System commands:

COMMANDS	RETURN VALUE	COMMAND DESCRIPTION	VARIABLE TYPE
GT	XXXX	Sensed temperature, each count is on half degree	HEX
GV	*string*	Current software version	*string*
POXX		SET the temperature offset, default value is 0. Valid range is -20 to +20 (decimal)	HEX
PSXX		SET the temperature scale adjustment, used to adjust the gain of the temperature sensor, default value is 0. Valid range is -10 to +10 (decimal)	HEX
PRXX		SET the red backlight intensity. Valid range is 0 to 31 (decimal)	HEX
PGXX		SET the green backlight intensity. Valid range is 0 to 31 (decimal)	HEX
PBXX		SET the blue backlight intensity. Valid range is 0 to 31 (decimal)	HEX
PCXX		SET the LCD display contrast, default is 31 (decimal) Valid range is 0 to 63 (decimal)	HEX

NiteCrawler COMMANDS

MOTOR COMMANDS

The motor commands are issued per channel. They are broken into two types: “GET” commands, and “SET” commands. All commands are terminated with the '#' character.

Commands that initiate a function or set a value will return a “#” character to confirm receipt of the command.

Format:
<Channel><Command Type><Sub Command><space><value><#>

The following example sets the current position to a decimal value of 52345 counts.
Example: 1SP 52345#

<Channel>: The valid channel numbers are decimal 1 through 3.

Motor channel commands:

GET Commands	RETURN VALUE	RETURN DESCRIPTION	RETURN TYPE
xGM	“xx”	“00” if Focuser motor is not moving. “01” if Focuser motor is moving.	HEX
xGP	“ddddddddd”	Current position count, 8 digits, signed, 0 padding	DEC
xGN	“ddddddddd”	New (or Target) position count, 8 digits, signed, 0 padding	DEC
xGR	“ddd”	Motor step delay in 100 microsecond intervals	DEC

SET Commands	PARAMETER VALUE	RETURN VALUE	PARAMETER DESCRIPTION	PARAM. TYPE
xSQ		“#”	Stops motor	
xSM		“#”	Starts motor to move to the “NEW” focus position	
xSP	“ddddddddd”	“#”	Set the current position, 32 bit value, signed	DEC
xSN	“ddddddddd”	“#”	Set the New position count, 32 bit value, signed	DEC
xSR	“ddd”	“#”	Set the motor step rate in 100 microsecond intervals. Lower is faster. Minimum for focuser is 7, lifting capacity can be increased by slowing the motor down or using a larger step delay.	DEC

SYSTEM COMMANDS

System commands are for the whole focuser/rotator assembly, they will affect how the whole system performs or provide information about the whole system. There are four types of commands: “GET” commands, “SET” commands, “PARAMETER” commands, and “COLOR” commands. The color commands are provided to allow the user to choose a color scheme of their preference for the built in TFT display. All commands are terminated with the '#' character.

Format:
<Comand Type><Sub Command><space><value><#>

The following example gets the current temperature.
Example: GT#

System commands:

GET Commands	RETURN VALUE	RETURN DESCRIPTION	RETURN TYPE
GA	“xx#”	bit 0 for switch 1 bit 1 for switch 2	HEX
GS	“xx#”	bit 0 for Rotation home switch bit 1 for Out limit switch bit 2 for In limit switch	HEX
GT	“ddd#”	Sensor temperature in tenths of a degree, ex: 25℃ = 250d	DEC
GV	“ddd#”	System voltage in tenths of a volt, ex 12.0V = 120d	DEC

SET Commands	PARAMETER VALUE	PARAMETER DESCRIPTION	PARAM. TYPE
SH	“xx#”	Starts the Find Home routine. This routine can take up to 10 minutes if the focuser is all extended and the rotation is just clockwise of the home switch. “xx” is the hexadecimal coded value for the axis to home. bit 0 is for the Focus axis bit 1 is for the Rotation axis bit 2 is for the AUX axis **During the execution of the routine communications is not available. The focuser will transmit an “OK” when the routine is complete.**	HEX

PARAMETER Commands	PARAMETER VALUE	PARAMETER DESCRIPTION	PARAM. TYPE
PD	“ddd#”	Set the display brightness, unsigned byte, 0 through 255	DEC
PL	“ddd#”	Set the display sleep brightness, unsigned byte, 0 through 255	DEC
PV	“<string>#”	Gets the current firmware version	TEXT
PF	“<string>#”	Gets the current focuser type. Ex: “2.5 NC#” for the 2.5” Nitecrawler	TEXT
PS	“ddddd#”	Gets the current focuser serial number.	TEXT
PU	“<string>#”	Gets a user defined field, could be a user name, or identifier to specific telescope.	TEXT
PE	“xx#”	Enables or disables the encoders. Use this to prevent accidental movement during an imaging session. “00” disables the encoders “01” enables the encoders	HEX
PR	“ddd#”	Issues a reset to the micro-controller, parameter value is a pass word of “111” to reduce the chances of an accidental reset.	DEC
Pt	“ddd#”	Adjusts the temperature offset in tenths of a degree, signed decimal. Ex: -3.0℃ offset = -30	DEC
Pu	“<string>#”	Sets the user text field, up to 30 characters, only 1 space character is allowed. Ex: “TAK 106#”	TEXT

Color commands are a little more unique in that they are coded as registers not ascii visible characters. To access register 1, one would send “C 01 <xxxx>#”, where <01h> is the ASCII “1” value and where <xxxx> is the coded color value. The color code is defined as a 5-6-5, RGB. That translates into 5 bits for Red, 6 bits for Green, and 5 bits for Blue, for a total of 16 bits of color data.

Color commands sent without data will function as read commands. As an example, to read thre foreground color:
“C 01#”

To write the color RED to the foreground:
“C 01 f800#”

All commands are terminated with the '#' character.

Color examples are as follows:

RED	0xF800
GREEN	0x07E0
BLUE	0x001F
WHITE	0xFFFF
BLACK	0x0000
YELLOW	0xFFE0
CYAN	0x07FF
MAGENTA	0xF81F
ORANGE	0xFC00
AMBER	0xFE00
VIOLET	0x801F
PINK	0xF810
GRAY	0x8410

COLOR Register	PARAMETER DESCRIPTION	PARAM. TYPE
1	Foreground text color	COLOR
2	Background color	COLOR
3	Item outline color	COLOR
4	Focus axis text color	COLOR
5	Rotation axis text color	COLOR
6	Auxiliary axis text color	COLOR
7	Voltage text color	COLOR
8	Temperature text color	COLOR
11	Indicator background off color	COLOR
12	Indicator text off color	COLOR
13	Indicator background on color	COLOR
14	Indicator text on color	COLOR

Register	PARAMETER DESCRIPTION	PARAM. TYPE
20	Special case: “00” sets display orientation to normal “01” sets to a rotated display for inverted focuser orientation.	HEX

Unknown commands will receive a response of “NACK#”.