

Header						Address	Sub-Address	Command	Data Length	Data
0	0	0	0	0	FF	0-FF	0-FF	0-FF		

Main	Notes	Action	Sub-Address	Command	Command (HEX)	Data Length	Data											
							Byte 1	2	3	4	5	6	7	8	9	10	11	12
		NOOP	0	0	0	0												
		Reserve for core protocol	0	1	1	0												
	Starts planned move	Start	0	2	2	0												
		Pause	0	3	3	0												
	Stops planned move. Must be executed before controller will accept other commands.	Stop	0	4	4	0												
	Toggles on/off state of debug LED	Debug LED	0	5	5	0												
		Timing Master	0	6	6	0												
		Set Stored Name	0	7	7	1-10	String [1-10 Characters, Null-terminated, Null padded]											
		Set Device Address	0	8	8	1	2-255 [Byte]											
		Set Common Line for Step Pulsing	0	9	9	1	0,1,2 [Byte]											
		Return Home All Motors	0	10	A	0												
		Motors Max Step Rate	0	11	B	2	Steps/Second [Int]											
		Alt Input Edge (RISING, FALLING, or CHANGE)	0	12	C	1	0,1,2 [Byte]											
		Alt I/O Mode	0	13	D	2	Ring (0-255) [Byte]	Tip (0-255) [Byte]										
		Set Joystick Watchdog	0	14	E	1	True/False (1,0) [Byte]											
		Alt Output Before Shot Delay Time	0	15	F	2	Time (ms) [Int]											
		Alt Output After Shot Delay Time	0	16	10	2	Time (ms) [Int]											
		Alt Output Before Shot Time	0	17	11	2	Time (ms) [Int]											
		Alt Output After Shot Time	0	18	12	2	Time (ms) [Int]											
		Alt Output Trigger level	0	19	13	1	HIGH/LOW (1,0) [Byte]											
		Max Program Run Time	0	20	14	4	Max Run Time (mS) [Ulong]											
		Start Program Delay	0	21	15	4	Start Time Delay (seconds) [Ulong]											
		Set SMS / Continuous Program Mode	0	22	16	1	0 (SMS), 1 (Time Lapse Cont.), 2 (Video Cont.) [Byte]											
		Set Joystick Mode	0	23	17	1	True/False (1,0) [Byte]											
	Causes the motors to go back and forth between the start and stop positions	Set Ping-Pong Flag	0	24	18	1	True/False (1,0) [Byte]											
		Send all Motors to Program Start	0	25	19	0												
		Set Program Start point	0	26	1A	0												
		Set Program Stop point	0	27	1B	0												
	True indicates 24 FPS, false indicates 30 FPS	Set Frames/Second Flag	0	28	1C	0	True/False (1,0) [Byte]											
		Status Request	0	100			<Status Type>											
		Firmware Version	0	100	64	0	Value Type [Byte]	Version #	<returns> with header and master address in front (00 00 00 00 00 FF 00 00 01 Length Data)									
		Run Status	0	101	65	0	Value Type [Byte]	0 = Stopped, 1 = Paused, 2 = Running										
		Run Time	0	102	66	0	Value Type [Ulong]	Time (ms)										
		Currently Exposing	0	103	67	0	Value Type [Byte]	True/False										
		Timing Master Value	0	104	68	0	Value Type [Byte]	True/False										
		Name	0	105	69	0	Value Type [String]	String [1-10 Characters, Null-terminated, Null padded]										
		Motors Max Step Rate	0	106	6A	0	Value Type [Ulong]	Steps/Second										
		Voltage Reading	0	107	6B	0	Value Type [Fixed]	Voltage (V) (Fixed point – must divide by 100 on master side)										
		Current to Motors	0	108	6C	0	Value Type [Fixed]	Current (amps) (Fixed point – must divide by 100 on master side)										
		Alt Input Edge (RISING, FALLING, or CHANGE)	0	109	6D	0	Value Type [Byte]	0,1,2										
		Alt I/O Mode	0	110	6E	0	Value Type [Int]	(Byte 0) Ring, High/Low (1,0)	(Byte 1) Tip, High/Low (1,0)									
		Limit Switch High/Low Status	0	111	6F	0	Value Type [Int]											
		Alt Output Before Shot Delay Time	0	112	70	0	Value Type [Ulong]	Time (ms)										
		Alt Output After Shot Delay Time	0	113	71	0	Value Type [Ulong]	Time (ms)										
		Alt Output Before Shot Time	0	114	72	0	Value Type [Ulong]	Time (ms)										
		Alt Output After Shot Time	0	115	73	0	Value Type [Ulong]	Time (ms)										
		Alt Output Trigger level	0	116	74	0	Value Type [Byte]	HIGH/LOW (1,0)										
		Start Program Delay	0	117	75	0	Value Type [Ulong]	Start Time Delay (seconds)										
		SMS / Continuous Program Mode	0	118	76	0	Value Type [Byte]	0 (SMS), 1 (Cont.), 2 (Vid. Cont.)										
		Controller Power Cycle	0	119	77	0	Value Type [Byte]	True/False (1,0)										
		Joystick Mode	0	120	78	0	Value Type [Byte]	True/False (1,0)										
		Ping-Pong Flag	0	121	79	0	Value Type [Byte]	True/False (1,0)										
		Joystick Watchdog Mode Status	0	122	7A	0	Value Type [Byte]	True/False (1,0)										
	Reports the percentage complete of the current program as a whole number	Program % Complete	0	123	7B	0	Value Type [Byte]	0-100										
	The three least significant bits of the byte represent the motor attach states for each of the motors. Motor 1 = bit 0, motor 2 = bit 1, motor 3 = bit 2.	Check Motor Attachment	0	124	7C	0	Value Type [Byte]	0-7										
	Reports the total length in milliseconds of the program based on currently set parameters, not just the currently elapsed time.	Total Program Run Time	0	125	7D	0	Value Type [Ulong]	Time (ms)										
		Program Complete?	0	126	7E	0	Value Type [Byte]	True/False (1,0)										
	True indicates 24 FPS, false indicates 30 FPS	Check Frames/Second Flag	0	127	7F	0	Value Type [Byte]	True/False (1,0)										

[illegible]

[illegible]

		Address	Sub-Address	Command	Data Length	Data	
Broadcasts	These function the same as the start, stop, and pause commands above, but can be used to synchronize movement of multiple controllers.	Start	1	0	1	0	
		Stop	1	0	2	0	
		Pause	1	0	3	0	
	Use this to assign an address to a controller with an unknown address. Don't use when controllers are daisy-chained together.	Assign Address	1	0	4	1	2-255

Note: nodes do not give a response to broadcast commands.

Query Value Types	
0	Byte
1	Unsigned Int
2	Int
3	Long
4	Unsigned Long
5	Float
6	String

The floats are actually fixed points. They are multiplied by 100 and transmitted as longs, so they need to be divided by 100 on the master side to resolve the true value.