HUGS Protocol definition

	Revision	Date	Description
Revision	1.0	4/13/2020	Original
	2.0	5/8/2020	Change to Little Endian.Change to metric speeds. (mm/s)
	2.1	5/14/2020	Add new Motion Response with Velocity, Position, Power.
	2.2	7/20/2020	Remove any response for NOR (no response)
	3.0	1/1/2021	Added new Dual commands to be used by the single debug port on the master.

Note: HUGS uses a binary format, rather than an ASCII character format, so it is not directly printable.
Note: All HUGS multi-byte values are sent as little-endian. That is, the LSB is sent first and the MSB sent last.

	0	1	2	3	4	5	L+4	L+5	L+6	L+7
Send/Rec	BOM	LEN	DEST/SEQ	CMD_ID	RSP_ID	DATA: LEN Bytes		CRC		EOM

BOM	Beginning Of Message Character:	Slash	"/"
LEN	Length of variable Data. 0 - 0xF7		
DEST/SEQ	LSN (Lower 4 bits) TARGET Identifier. 0-15	0x0 = HOST, 0xF = ALL	
	MSN (Upper 4 bits) Message Sequence. Cycles through 0-15		
CMD_ID	On a command, this will be the required action. Indicates how to interpret variable data section		
	On a response, the CMD_ID will be RSP		
RSP_ID	On a command, this is the required Response: Indicates what data should be returned.		
	On a response, theRSP_ID will be the type of data bing returned in the response.		
DATA	Variable number of data bytes . Length defined by LEN parameter		
CRC	16-bit Cyclic Redundancey Check of Bytes 0 to L+4		
EOM	End Of Message character:	Newline	\n 0x0A

Command IDs	**Name**	**Value**	**LEN**				
No Operation	NOP	0x00	0				
Response	RSP	0x01	0				
Reset Pos	RES	0x02	0				
Enable	ENA	0x03	0				
Disable	DIS	0x04	0				
Set Power	POW	0x05	2	+/-1000		Def 0	
Set Speed	SPE	0x06	2	mm/s (+/- 5000)		Def 0	
Set ABS Pos	ABS	0x07	2	mm (+/- 32767)		Def 0	
Set Rel Pos	REL	0x08	2	mm (+/- 32767)		Def 0	
Set Watchdog	DOG	0x09	2	mS (0-65535)		Def 1000	
Set Mode	MOD	0x0A	2	0,1,2,3	0-255mmPs	Def 1,250	0=PID,1=STEPPER,2=Hybrid
Set Dual Speed	DSPE	0x86	4	mm/s (+/- 5000) FW		deg/s (+/- 1425) CW	+=forward, +=clockwise
Power Down	XXX	0xFF	0				

Response ID	**Name**	**Value**	**LEN**	**Data**			
No Response	NOR	0x00	0				
Motion	SMOT	0x01	9	STATUS	mm/s (+/- 6000)	mm (+/- 2,147,483,648)	+/-1000
Power	SPOW	0x02	3	STATUS	+/-1000		
Velocity	SSPE	0x03	3	STATUS	mm/s (+/- 6000)		
Position	SPOS	0x04	5	STATUS	mm (+/- 2,147,483,648)		
Voltage	SVOL	0x05	3	STATUS	mV (0-65535)		
Current	SAMP	0x06	3	STATUS	mA (0 65535)		
Watchdog	SDOG	0x07	3	STATUS	mS (0 65535)		
PID	SFPI	0x09	7	STATUS	F Output	P Output	I Ouput
DualMotion	DSMOT	0x81	13	STATUS	mm/s (+/- 5000) FW	deg/s (+/- 1425) CW	mm (+/- 2,147,483,648) LEFT WHEEL
Stopped	STOP	0xFF	1	STATUS			

STATUS	Bit	7	6	5	4	3	2	1	0
						MOD 1	MOD 0	Enabled	ESTOP