Fardriver serial communications messages. (speed is 19200 bps, 8 bit, no stop bits)

Jesper, 2024-10-17

Sync	Address	Addr (Hex)	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11
0xAA	0	00	MTPAAngle	HALL position	Gear/Roll	Follow		RPM	Motor Error Flags	Bit 7 = Brake		Idout	Idout	
0xAA	1	01	Voltage (100mV steps)		Current		ModRatio? Some Thr data? 0-70 hex	Workstat	Iqin			Throttle		
0xAA	2	02												
0xAA	3	03	Zero Phase A		Zero Phase C									
0xAA	4	04	Bit 0-1 = Thr Mode, Bit 2-3 = WeakChar		MOS temp (deg C)				Line Current Coefficient		Temp Coeff			
0xAA	5	05	Never seen any messages with this address											
0xAA	6	06	Motor Limit Coeff 500 rpm	Motor Limit Coeff 1000 rpm	Motor Limit Coeff 1500 rpm	Motor Limit Coeff 2000 rpm	Motor Limit Coeff 2500 rpm	Motor Limit Coeff 3000 rpm	Motor Limit Coeff 3500 rpm	Motor Limit Coeff 4000 rpm	Motor Limit Coeff 4500 rpm	Motor Limit Coeff 5000 rpm	Motor Limit Coeff 5500 rpm	Motor Limit Coeff 6000 rpm
0xAA	7	07	Motor Limit Coeff 6500 rpm	Motor Limit Coeff 7000 rpm	Motor Limit Coeff 7500 rpm	Motor Limit Coeff 8000 rpm	Motor Limit Coeff 8500 rpm	Motor Limit Coeff 9000 rpm		CAN Bus #		Speedo Analog RPM	PID AN	PID LM
0xAA	8	08										Bit 0 - MotorDir		
0xAA	9	09					Max Speed (rpm)		Mid Speed Max (rpm)			ACCStep	Bit 6= ! MOE, MonitorWay in bits 0-2 and 7	Bit 1-3 = WeakResp, Bit 5-7 = Backthrottle
0xAA	10	0A	4 times Max Line Current					Rated Power (100W steps)	4 times Max Phase Current		Changes with RatedVoltage	PID SpeedSKI	Throttle LOW (50mV steps)	Throttle HIGH (50mV steps)
0xAA	11	0B	OV Protect		OV Restore		LowVolProt (100mV steps)		LowVolRestore (100mV steps)		4 times StopBack Current		4 times MaxBack Current	
0xAA	12	0C		ECOAccRatio low 4 bits	PID StartKI	PID MidKI	PID MaxKI	PID StartKP	PID MidKP	PID MaxKP			Time???	
0xAA	13	0D	motor temp (deg C)	Throttle ADC Reading, 12 bits			Battery Capacity (Ah)	Bit 0-2 = Brake Config	Bit 0-2 = PC13 config				Back Speed	
0xAA	14	0E		Temp Detect/Sensortype							Bit 0-2 = Park, Bit 3 =?, Bit 4-7 = SpeedPulse		Low Speed Max (rpm)	
0xAA	15	0F			Bit 0=OverTempMot		Bit 1 - MotorDir	something with default gear setting	bit 2 = reverse					something with gear setting
0xAA	16	10												
0xAA	17	11	something related to reverse/gear and the setting of MaxPhase Current											
0xAA	18	12					LowSpeedLineRatio (0x80 == 100%)		MidSpeedLineRatio (0x80 == 100%)	LowSpeedPhaseRatio (0x80 == 100%)	MidSpeedPhaseRatio (0x80 == 100%)			
0xAA	19	13												
0xAA	20	14												
0xAA	21	15						Bit 0-5 = Morsecode						
0xAA	22	16	EREG 500 RPM in %	EREG 1000 RPM in %	EREG 1500 RPM in %	EREG 2000 RPM in %	EREG 2500 RPM in %	EREG 3000 RPM in %	EREG 3500 RPM in %	EREG 4000 RPM in %	EREG 4500 RPM in %	EREG 5000 RPM in %	EREG 5500 RPM in %	EREG 6000 RPM in %
0xAA	23	17	EREG 6500 RPM in %	EREG 7000 RPM in %	EREG 7500 RPM in %	EREG 8000 RPM in %	EREG 8500 RPM in %	EREG 9000 RPM in %					FreeThrottle	

Legend:
- Verified field by debugging my controller
- Field with verified bits, but there may be more
- Field where functionality is not understood
- Field titles from other sources, thas has not been verified
- Unknown field

NOTE: This is decoded with a ND96530_23_ARG15, that was reflashed with ND72530_23_ARA17, as original firmware was lost.
This might affect some of the values

Field 0.2
Bit 6 = regen??????

Bit 5 = Direction Forward
Bit 4 = Rolling
Bit 2-3 = Gear, 00=high, 11=mid, 10=low, (00=Disabled)
Bit 0-1 = Gear, 10=Reverse, 01=Forward, 00=Neutral

Field 0.3
follow enabled	24
follow dis	25
EABS when brake	26
EABS when release	27

Field 0.6 - 0.7
According to other docs, this should be a 16 bit field with motor error codes. However, these doesn't match the Brake bit 7 in 0.7

Field 0.8 - 0.11
Definitely some currents here. The field names are from another source

Field 1.2
I never get anything else than zero here.

Field 0.8 - 0.11
Not sure what this is.

Field 1.0, 1.6, 11.8 and 11.10
The actual current is 1/4 of the value in the field

Field 5.5 - 5.8
Max value here is 0x80, which corresponds to 100%.

17.0 - 17.1
This field is related to the setting of Max Phase Current. But also, on the setting of the default Gear Setting.

Max Phase Current	Field value
20	195
30	292
40	390
50	488
60	585
70	683
80	781
90	878
100	976

10.8
Related to the setting of Rated Voltage.

Rated Voltage	Field value
40	100
50	100
55	80
60	57
65	15
70	0