

CAN COMMUNICATION DEFINITION DOCUMENT

Air power source

Issue 12

Date 08 September 2014

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Software Level: V2.0 and above

General description:

Format: big endian

Speed: 1Mbps

Note: not extended

Layout / transmit sequence for a message:

7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Byte 0		Byte 1		Byte 2		Byte 3		Byte 4		Byte 5		Byte 6		Byte 7																																																	
MSB		LSB		MSB		LSB		MSB		LSB		MSB		LSB																																																	
WORD 1				WORD 2				WORD 3				WORD 4																																																			

Eg: decimal value 4095 is transmitted as 15 (byte 1) then 255 (byte 2)

Air power source transmit:

Message	1	Transmit rate	200Hz	
CAN ID	798 (hex)			
byte	Word	contents	scalar	output
0	1	Pressure Bar	X0.05	0-12.75 Bar
1		VBATT	X0.1	0-25.5 Volts
2	2	APS state	X1	See table 3
3		Compressor Temperature	X1 -40	-40-215 Degrees C
4	3	Accumulated On Time	X36	0-2359260 seconds (36 second steps)
5				
6	4	Error Flags	X1	See table 1
7		Operation mode	X1	See table 2

Message	2	Transmit rate	200Hz	
CAN ID	788 (hex)			
byte	Word	contents	scalar	output
0	1	Motor Running Counter	X1	0-65535
1				
2	2	Duty Cycle (1 cycle)	X1	0-100%
3		Average Duty Cycle (20 Cycles)	X1	0-100%
4	3	Motor States		See table 4
5		Always 0		
6	4	CAN Transmit Errors	X1	0-255
7		CAN Receive Errors	X1	0-255

Message	3	Transmit rate	5Hz	
CAN ID	7A0 (hex)			
byte	Word	contents	scalar	output
0	1	SW version	X1	0-255 (0x14 = SW1.4)
1		Config name 1 st char	X1	ASCII character should always be in the visible ASCII set i.e. DEF
2	2	Config name 2 nd char	X1	
3		Config name 3 rd char	X1	
4	3	Config checksum	X1	0-65535
5				
6	4	Unit serial number	X1	0-65535
7				

Message	4	Transmit rate	Variable	
CAN ID	51 (hex)			
byte	Word	contents	scalar	output
0	1	Configuration		
1		Configuration		
2	2	Configuration		
3		Configuration		
4	3	Configuration		
5		Configuration		
6	4	Configuration		

*Burst at max 1KHz with 500ms dead time

Air power source receive:

Message	1	Transmit rate	200Hz	
CAN ID	799 (hex)			
byte	Word	contents	scalar	output
0	1	System enable field	X1	See table 4
1				
2	2			
3				
4	3			
5				
6	4	Override enable	X1	See NOTE 1
7				

Message	2	Transmit rate	Variable	
CAN ID	50 (hex)			
byte	Word	contents	scalar	output
0	1	Configuration		
1		Configuration		
2	2	Configuration		
3		Configuration		
4	3	Configuration		
5		Configuration		
6	4	Configuration		

*Writes to APS from PC tool

TABLE1: Error flags

Code (decimal)	Bit	Failure
0		No errors
1	0	Error Compressor Pressure sensor out of range
2	1	Error Compressor Temperature sensor out of range
4	2	Error Voltage out of range
8	3	Error Pressure Rise Fail
16	4	Error Max Pressure exceeded
32	5	Error Max Temperature exceeded
64	6	Error System run-time exceeded
128	7	Error Pressure Rise Max fail count exceeded

TABLE2: Operation mode

Code (decimal)	Bit	mode
0		System Idle
1	0	System error (see table 1)
2	1	Self control on
4	2	CAN fail self control on
8	3	CAN failed
16	4	Self control off
32	5	CAN fail self control off
64	6	CAN controlling
128	7	Override mode enable

TABLE3: APS state

Code (decimal)	Bit	Description
0 - 15	0 - 3	Log for Shiftec diagnostics only
16-128	4-7	<p align="center">State machine output:</p> 0 = only seen momentarily on power up – not used 1 = wait after compress cycle (min time between cycles) 2 = Idle / standby – waiting for signal to compress 3 = Start phase 1 (time for motor to start, max 500msec) 4 = Start phase 2 (shuts valve) – only on for 1 msec – not visible on log 5 = Running (motor started OK valve closed) 6 = Shut down phase 1 – stop motor 7 = Shut down phase 2 – open valve – only on for 1 msec – not visible on log 8 = Error

TABLE4: Motor states

Code (decimal)	Bit	Description
1	0	Motor failed
2	1	Motor Off
4	2	Motor Alive
8	3	Not used
16	4	Motor activity low exceeded
32	5	Motor activity high exceeded
64	6	Motor failed to start
128	7	Not used

TABLE5: System Enable

Code (decimal)	Bit	Description
1	0	Compressor On/Off
2	1	Reserved
4	2	Reserved
8	3	Reserved
16	4	Reserved
32	5	Reserved
64	6	Reserved
128	7	Reserved

NOTE1:

To enable the override mode a value of 0xFA11 in little endian must be sent. This puts the system into override mode. The control signal is still required to start and stop the compression cycle. Please note the user is now completely responsible for control. The over pressure, motor detection and limits are all removed.

Revision history

Latest changes highlighted in blue

Revision	Change date	Description
12	08/09/14	<ul style="list-style-type: none"> Note 1 added for override clarity
11	26/09/13	<ul style="list-style-type: none"> Revision table added! Updated to reflect changes in Version 2.0 of APS software. This includes a different use of IDs 50 and 51. New bit field definitions. ID 0x79A removed ID 0x788 added with new diagnostic information (Motor running)