

CAN BUS - COMMUNICATION PROTOCOL for HBCi3

For FW : 6.22 or newer

BASE address	
Standard	Extended
BASE = 0 + D09.Offset[P37]	BASE = 0x14A30000 + D09.Offset[P37]

Speed : D06.CAN bus Speed (*parameter*)
Version : D07.CAN bus version - Standard / Extended (*parameter*)
Tx period : D08.CAN bus packet repeating period (*parameter*)
Base offset : D09.CAN bus device address OFFSET (*parameter*)
Data length : 8 Byte

Input request command packet

- for parameter : C02[P69] = "direct motor PWM control":

Packet 0					
Address: BASE + 0					
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Input request	Int32 signed	$B3 \cdot 2^{24} + B2 \cdot 2^{16} + B1 \cdot 2^8 + B0$	$\frac{1}{1023}$ range : (-1024 to 1023)	Throttle : 60,7% =0,607 inputRequest=0,607·1023 =621 =0x0000026D hexa B3 =0 B2=0 B1 = 2 (0x2) B0= 109 (0x6D) Throttle : = -100% = -1 inputRequest= -1·1023 =-1023 =0xFFFFFC01 hexa B3 =0xFF B2=0xFF B1 = 0xFC B0= 0x01
BYTE 1					
BYTE 2					
BYTE 3					
BYTE 4	Flags	Uint8	B4	Bit pattern	Bit 0: Propeller parking request(according par.S01) Bit 1 : reserved Bit 7 : reserved
BYTE 5	reserved		0 (keep zero)		
BYTE 6	reserved		0 (keep zero)		
BYTE 7	reserved		0 (keep zero)		

- for parameter : C02[P69] = " constant rpm of the motor":

Packet 0					
Address: BASE + 0					
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Input request	Int32 signed	$B3 \cdot 2^{24} + B2 \cdot 2^{16} + B1 \cdot 2^8 + B0$	1 RPM	Throttle : 2500 RPM inputRequest=2500 =0x000009C4 hexa B3 =0 B2=0 B1 = 0x09 B0= 0xC4 Throttle : = - 60 000 inputRequest= -60000 =0xFFFF15A0 hexa B3 =0xFF B2=0xFF B1 = 0x15 B0= 0xA0
BYTE 1					
BYTE 2					
BYTE 3					
BYTE 4	reserved		0 (keep zero)		
BYTE 5	reserved		0 (keep zero)		
BYTE 6	reserved		0 (keep zero)		
BYTE 7	reserved		0 (keep zero)		

Telemetry packets :

Packet 1					
Address :		BASE + 1			
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Battery (terminal) voltage	uint16 unsigned	$B1 \cdot 2^8 + B0$	0.1V	$4 \cdot 2^8 + 73 = 1097$ Real value = 109,7V
BYTE 1					
BYTE 2	Battery current	int16 signed	$B3 \cdot 2^8 + B2$	0.1A	
BYTE 3					
BYTE 4	RPM	int32 signed	$B7 \cdot 2^{24} + B6 \cdot 2^{16} + B5 \cdot 2^8 + B4$	1 RPM	
BYTE 5					
BYTE 6					
BYTE 7					

Packet 2					
Address :		BASE + 2			
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Motor temperature	int16 signed	$B1 \cdot 2^8 + B0$	1°C	$0 \cdot 2^8 + 120 = 120$ Real value = 120°C
BYTE 1					
BYTE 2	ESC temperature	int16 signed	$B3 \cdot 2^8 + B2$	1°C	$255 \cdot 2^8 + 246 =$ 65526 uint = -10 int Real value = -10°C
BYTE 3					
BYTE 4	reserved				
BYTE 5					
BYTE 6	External sensor temperature	int16 signed	$B7 \cdot 2^8 + B6$	1°C	
BYTE 7					

Packet 3					
Address :		BASE + 3			
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Output PWM	int16 signed	$B1 \cdot 2^8 + B0$	$\frac{1}{1023}$	$3 \cdot 2^8 + 20 = 793$ Real value = 808/1023 =0,775 = 77,5%
BYTE 1					
BYTE 2	Input PWM	int16 signed	$B3 \cdot 2^8 + B2$	$\frac{1}{1023}$	
BYTE 3					
BYTE 4	reserved				
BYTE 5					
BYTE 6	reserved				
BYTE 7					

Packet 4					
Address :		BASE + 4			
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Error	Uint32 unsigned	$B3 \cdot 2^{24} + B2 \cdot 2^{16} + B1 \cdot 2^8 + B0$	Bit pattern	$64 \cdot 2^{24} + 4 \cdot 2^{16} + 0 \cdot 2^8 + 2 =$ 0x80030002 (hexa) →codes: 0x80000000 + 0x00020000 + 0x00010000 + 0x00000002 100000000000011000000000000010(binary)
BYTE 1					
BYTE 2					
BYTE 3					
BYTE 4	Warning	Uint32 unsigned	$B7 \cdot 2^{24} + B6 \cdot 2^{16} + B5 \cdot 2^8 + B4$	Bit pattern	
BYTE 5					
BYTE 6					
BYTE 7					

Packet 5					
Address :		BASE + 5			
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Notice	uint32 unsigned	$B3 \cdot 2^{24} + B2 \cdot 2^{16} + B1 \cdot 2^8 + B0$	Bit pattern	
BYTE 1					
BYTE 2					
BYTE 3					
BYTE 4	reserved				
BYTE 5					
BYTE 6	ESC init status	uint16 unsigned	$B7 \cdot 2^8 + B6$		
BYTE 7					

Packet 6					
Address :		BASE + 6			
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	Battery internal voltage	uint16 unsigned	$B1 \cdot 2^8 + B0$	0.1V	
BYTE 1					
BYTE 2	External feeding voltage	uint16 unsigned	$B3 \cdot 2^8 + B2$	0.001V	
BYTE 3					
BYTE 4	Phase current - MAX	uint16 unsigned	$B5 \cdot 2^8 + B4$	1A	
BYTE 5					
BYTE 6	Phase current - AVG	uint16 unsigned	$B7 \cdot 2^8 + B6$	1A	
BYTE 7					

Packet 7					
Address :		BASE + 7			
	Value	Size	Value calculation	Resolution	Example :
BYTE 0	reserved				
BYTE 1					
BYTE 2	reserved				
BYTE 3					
BYTE 4	reserved				
BYTE 5					
BYTE 6	Internal BUS voltage	uint8 unsigned	B6	0.1V	
BYTE 7	MOS-FET temperature	uint8 unsigned	B7	1°C	