buzzard
by multipowr

CAN protocol manual

buzzard40

rev. Jan-2024

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1 목차

2 소개

본 사용자 매뉴얼은 CAN 프로토콜을 사용하여 Buzzard40 제품을 제어하는 방법을 설명합니다.
CAN 기능을 갖춘 모든 장비를 컨트롤러로 사용할 수 있지만 Multipowr는 CAN을 통한 제어 방식에 익숙해지는 데 사용할 수 있는 전용 'PC 진단 도구'를 제공합니다.

3 설치 및 안전지침

buzzard40과 CAN 케이블을 안전하게 설치하고 사용하는 방법은 buzzard40의 'Safety Installation manual'에 설명되어 있습니다.

4 충전 곡선

충전 모드는 적절한 CAN 메시지 필드를 사용하여 선택할 수 있습니다.

4.1 모드 0 : CC 모드

모드 0에서는 충전 시스템이 정전류 모드(CC)입니다. 출력 전류는 Set Current 매개변수를 따릅니다. 출력 전압이 제품의 최대 출력 전압으로 제한되지 않는 한 출력 전압에 대한 제어된 제한은 없습니다.

4.2 모드 1 : CC/CV 모드

모드 1에서 충전 시스템은 정전류 모드(CC) - 정전압 모드(CV)입니다.
출력 전압은 Set Voltage 매개변수에 따라 제어됩니다.

5 CAN 메시지를 통한 Bird 작동

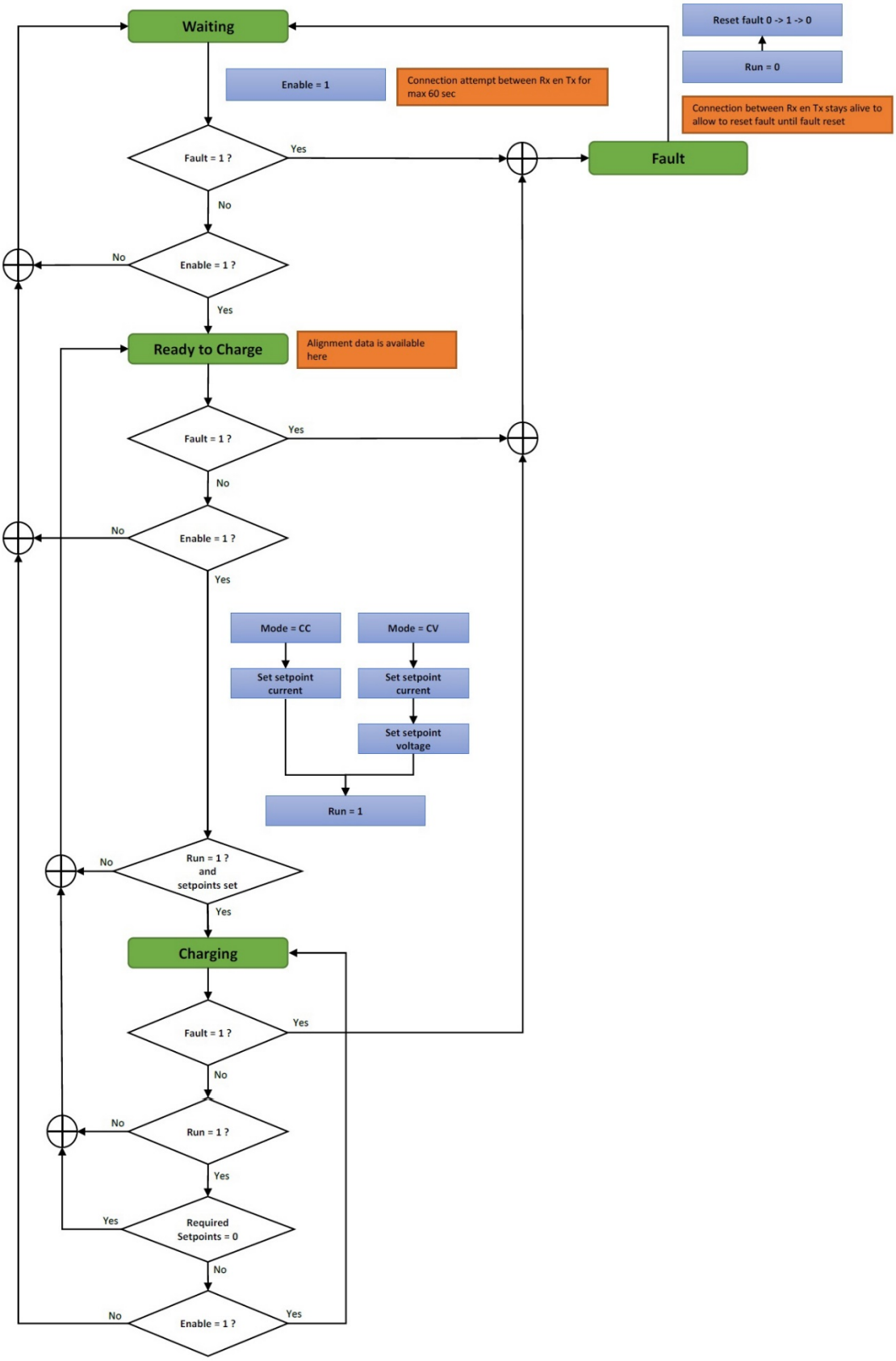


그림 5-1 : 충전 사이클의 상태 다이어그램

Battery voltage of 48V
Charging with 20A and max voltage of 57V

Start-up OR Stopped

CAN A SYSTEM COMMAND from PLC to RX

ID	Byte 0	1	2	3	4	5	6	7
0x250	0x00	0x00	0x00	0x01	0x02	0x3A	0x00	0x00
	Setpoint current 0 * 0.1A = 0A		Enable: 0 Run: 0 Reset: 0	Mode Voltage Mode	Setpoint voltage 570 * 0.1V = 57V			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x1D0	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
	Fault number 0		Warning number 0		State WAITING			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x2D0	0x00	0x00	0x01	0xE0	0x00	0x00	0x00	0x00
	Charging current 0 * 0.1A = 0A		Battery voltage 480 * 0.1V = 48V		Charging power 0 * 0.1W = 0W			

Enable system

CAN A SYSTEM COMMAND from PLC to RX

ID	Byte 0	1	2	3	4	5	6	7
0x250	0x00	0x00	0x80	0x01	0x02	0x3A	0x00	0x00
	Setpoint current 0 * 0.1A = 0A		Enable: 1 Run: 0 Reset: 0	Mode Voltage Mode	Setpoint voltage 570 * 0.1V = 57V			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x1D0	0x00	0x00	0x00	0x00	0x01	0x00	0x00	0x00
	Fault number 0		Warning number 0		State READY TO CHARGE			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x2D0	0x00	0x00	0x01	0xE0	0x00	0x00	0x00	0x00
	Charging current 0 * 0.1A = 0A		Battery voltage 480 * 0.1V = 48V		Charging power 0 * 0.1W = 0W			

Charge with 20A

CAN A SYSTEM COMMAND from PLC to RX

ID	Byte 0	1	2	3	4	5	6	7
0x250	0x00	0xC8	0xC0	0x01	0x02	0x3A	0x00	0x00
	Setpoint current 200 * 0.1A = 20A		Enable: 1 Run: 1 Reset: 0	Mode Voltage Mode	Setpoint voltage 570 * 0.1V = 57V			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x1D0	0x00	0x00	0x00	0x00	0x02	0x00	0x00	0x00
	Fault number 0		Warning number 0		State CHARGING			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x2D0	0x00	0xC8	0x01	0xE0	0x25	0x80	0x00	0x00
	Charging current 200 * 0.1A = 20A		Battery voltage 480 * 0.1V = 48V		Charging power 9600 * 0.1W = 960W			

System in fault

CAN A SYSTEM COMMAND from PLC to RX

ID	Byte 0	1	2	3	4	5	6	7
0x250	0x00	0xC8	0x20	0x01	0x02	0x3A	0x00	0x00
	Setpoint current 200 * 0.1A = 20A		Enable: 0 Run: 0 Reset: 1	Mode Voltage Mode	Setpoint voltage 570 * 0.1V = 57V			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x1D0	0x04	0x00	0x00	0x00	0x03	0x00	0x00	0x00
	Fault number 1024		Warning number 0		State FAULT			

CAN A SYSTEM STATE from RX to PLC

ID	Byte 0	1	2	3	4	5	6	7
0x2D0	0x00	0x00	0x01	0xE0	0x00	0x00	0x00	0x00
	Charging current 0 * 0.1A = 0A		Battery voltage 480 * 0.1V = 48V		Charging power 0 * 0.1W = 0W			

그림 5-2 : CAN 예제

6 CAN Matrix 프로토콜

다음 섹션에서는 기본 시스템 시작에 대해 설명합니다.

6.1 CAN bus 메시지 (IDs)

Baudrate 및 ID는 고객의 요구에 맞게 변경할 수 있습니다.

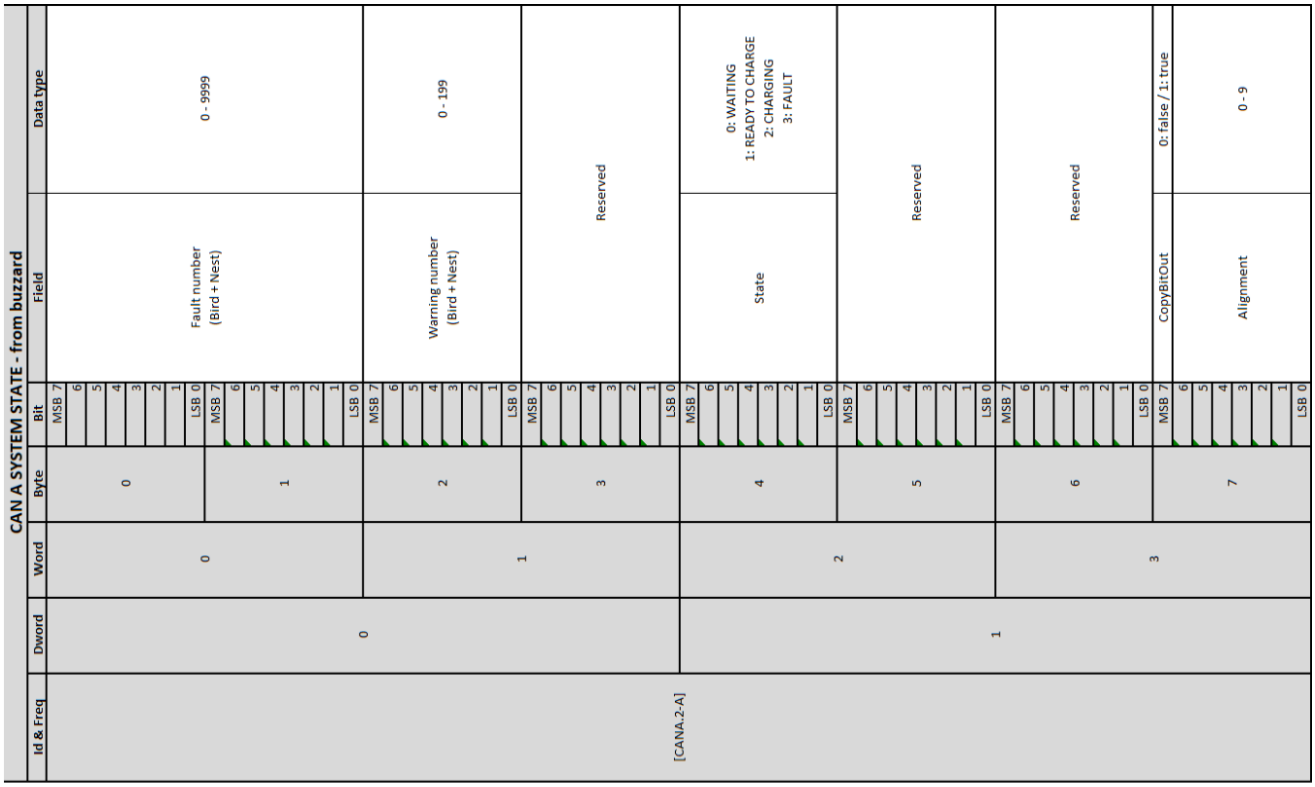
CAN MATRIX	Baudrate (default setting) : 1 Mbaud

buzzard40-Bird			
Id & Freq	**to Bird**	**ID (default setting)**	**Frequency (ms)**
[CANA.1-A]	CAN A SYSTEM COMMAND	0x250	50
[CANA.1-B]	CAN A SYSTEM REALTIME	0x350	200
	from Bird	**ID (default setting)**	**Frequency (ms)**
[CANA.2-A]	CAN A SYSTEM STATE	0x1D0	50
[CANA.2-B]	CAN A SYSTEM VALUES	0x2D0	50
[CANA.2-C]	CAN C SYSTEM EVENT LOG MESSAGE	0x3D0	50 (while enabled)

buzzard40-Nest			
Id & Freq	**to Nest**	**ID (default setting)**	**Frequency (ms)**
[CANC.1-A]	CAN C SYSTEM COMMAND	0x250	200
[CANC.1-B]	CAN C SYSTEM REALTIME	0x350	200
	from Nest	**ID (default setting)**	**Frequency (ms)**
[CANC.2-A]	CAN C SYSTEM STATE	0x1A8	200
[CANC.2-B]	CAN C SYSTEM EVENT LOG MESSAGE	0x2A8	50 (while enabled)

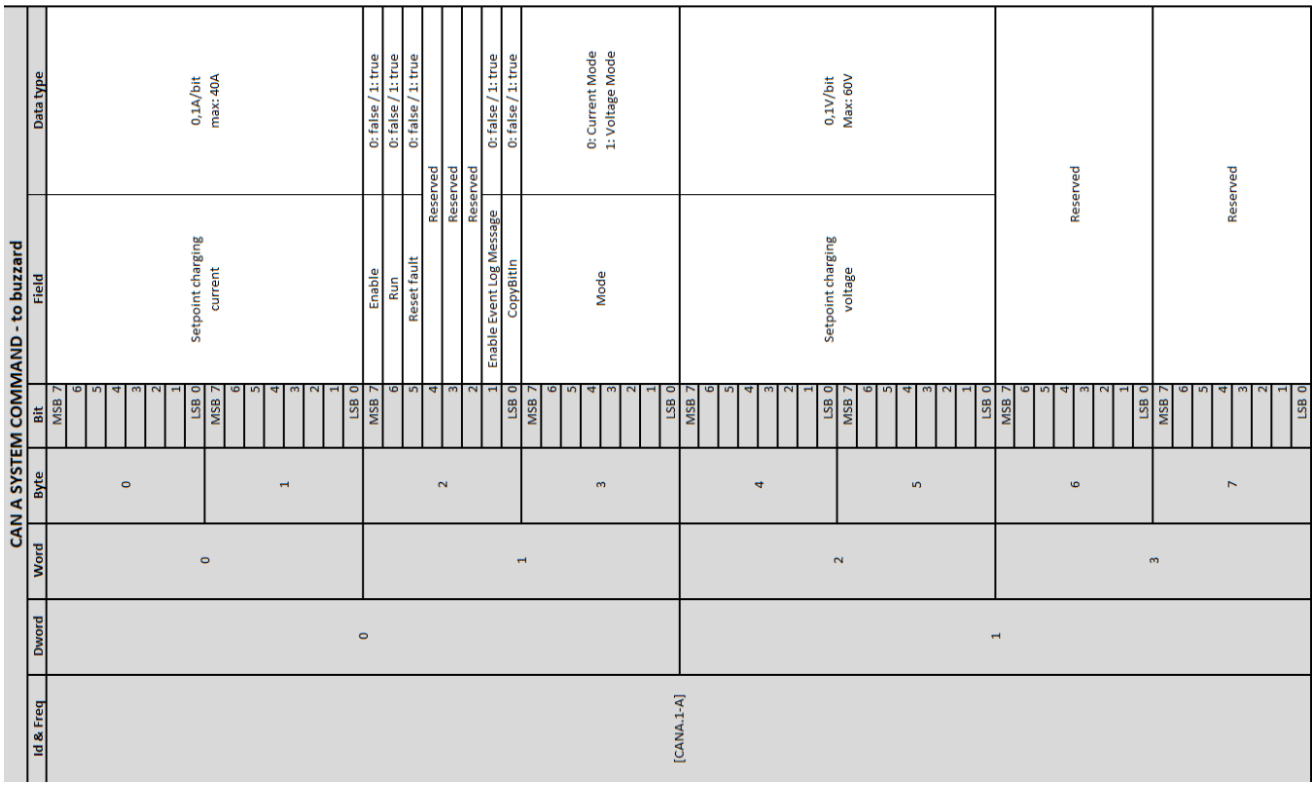
표 6-1 : PUBLIC CAN Matrix의 식별자 (기본값) 및 주기

6.2 Bird의 CAN 메시지



CAN A SYSTEM STATE - from buzzard

Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANA.2-A]	0	0	0	MSB 7	Fault number (Bird + Nest)	0 - 9999
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
			1	MSB 7		
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
		1	2	MSB 7	Warning number (Bird + Nest)	0 - 199
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
			3	MSB 7	Reserved	
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
	1	2	4	MSB 7	State	0: WAITING 1: READY TO CHARGE 2: CHARGING 3: FAULT
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
			5	MSB 7	Reserved	
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
		3	6	MSB 7	Reserved	
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
			7	MSB 7	CopyBitOut	0: false / 1: true
				6	Alignment	0 - 9
				5		
				4		
				3		
				2		
				1		
				LSB 0		



CAN A SYSTEM COMMAND - to buzzard

Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANA.1-A]	0	0	0	MSB 7	Setpoint charging current	0,1A/bit max: 40A
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
			1	MSB 7		
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
		1	2	MSB 7	Enable	0: false / 1: true
				6	Run	0: false / 1: true
				5	Reset fault	0: false / 1: true
				4	Reserved	
				3	Reserved	
				2	Reserved	
				1	Enable Event Log Message	0: false / 1: true
				LSB 0	CopyBitIn	0: false / 1: true
			3	MSB 7	Mode	0: Current Mode 1: Voltage Mode
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
	1	2	4	MSB 7	Setpoint charging voltage	0,1V/bit Max: 60V
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
			5	MSB 7	Reserved	
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
		3	6	MSB 7	Reserved	
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		
			7	MSB 7	Reserved	
				6		
				5		
				4		
				3		
				2		
				1		
				LSB 0		

표 6-2 : Bird의 CAN Matrix 하위 메시지 표-1

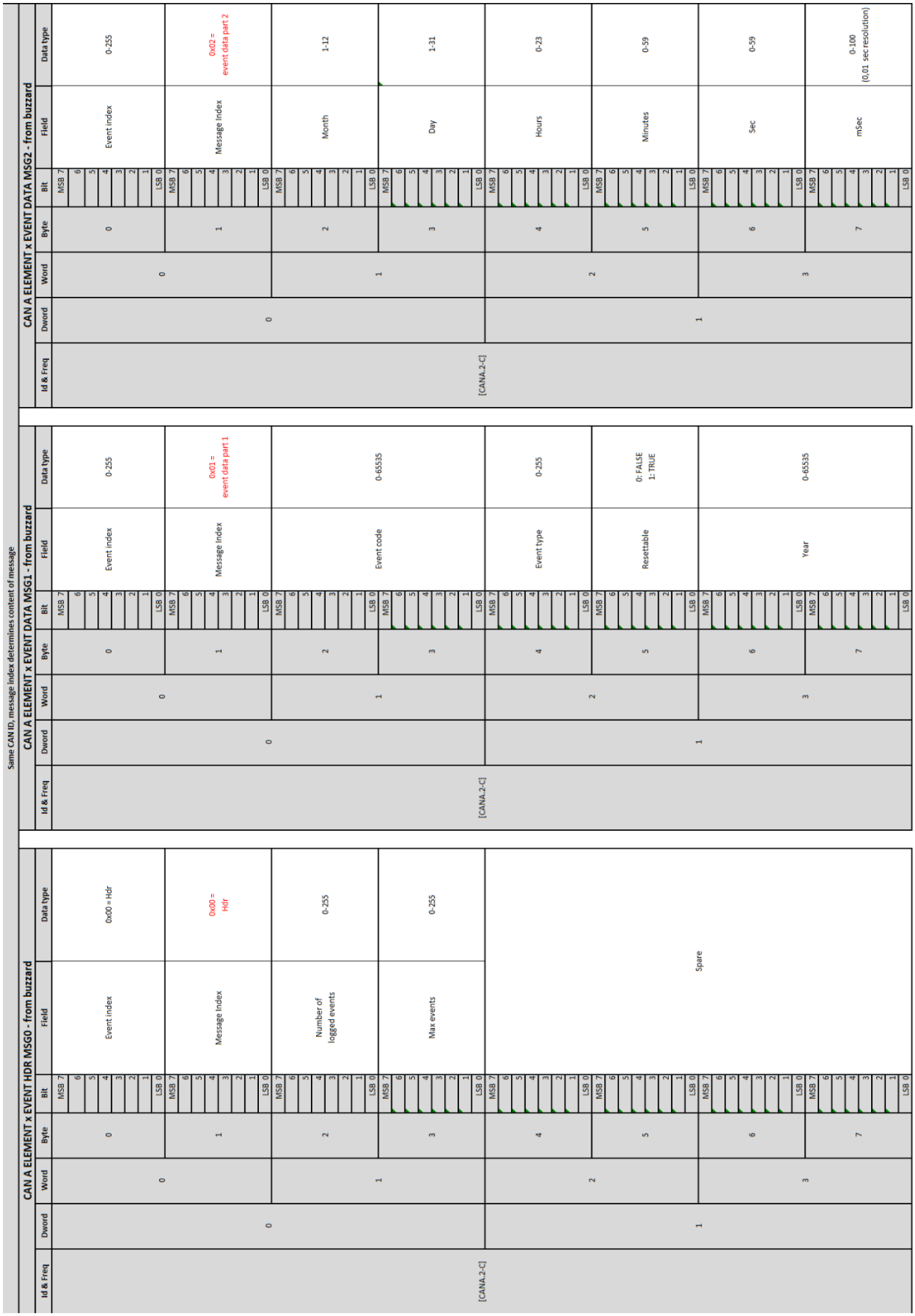
CAN A SYSTEM VALUES - from buzzard

Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANA.2-B]	0	0	0	MSB 7 6 5 4 3 2 1 LSB 0	Charging current	0,1A/bit
			1	MSB 7 6 5 4 3 2 1 LSB 0		
		1	2	MSB 7 6 5 4 3 2 1 LSB 0	Battery voltage	0,1V/bit
			3	MSB 7 6 5 4 3 2 1 LSB 0		
	1	2	4	MSB 7 6 5 4 3 2 1 LSB 0	Charging power	0,1W/bit
			5	MSB 7 6 5 4 3 2 1 LSB 0		
		3	6	MSB 7 6 5 4 3 2 1 LSB 0	Thermal usage	0 - 100
			7	MSB 7 6 5 4 3 2 1 LSB 0	Reserved	

CAN A SYSTEM REALTIME - to buzzard

Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANA.1-B]	0	0	0	MSB 7 6 5 4 3 2 1 LSB 0	Year	2000 - 3000
			1	MSB 7 6 5 4 3 2 1 LSB 0		
		1	2	MSB 7 6 5 4 3 2 1 LSB 0	Month	1 - 12
			3	MSB 7 6 5 4 3 2 1 LSB 0	Day	1 - 31
	1	2	4	MSB 7 6 5 4 3 2 1 LSB 0	Hour	0 - 23
			5	MSB 7 6 5 4 3 2 1 LSB 0	Minutes	0 - 59
		3	6	MSB 7 6 5 4 3 2 1 LSB 0	Seconds	0 - 59
			7	MSB 7 6 5 4 3 2 1 LSB 0	Reserved	

표 6-3 : Bird의 CAN Matrix 하위 메시지 표-2



Same CAN ID, message index determines content of message

CAN A ELEMENT x EVENT HDR MSG0 - from buzzard

Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANA-2-C]	0	0	0	MSB 7 … LSB 0	Event index	0x00 = Hdr
			1	MSB 7 … LSB 0	Message Index	0x00 = Hdr
		1	2	MSB 7 … LSB 0	Number of logged events	0-255
			3	MSB 7 … LSB 0	Max events	0-255
	1	2	4	MSB 7 … LSB 0	Spare	
			5	MSB 7 … LSB 0		
		3	6	MSB 7 … LSB 0		
			7	MSB 7 … LSB 0		

CAN A ELEMENT x EVENT DATA MSG1 - from buzzard

Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANA-2-C]	0	0	0	MSB 7 … LSB 0	Event index	0-255
			1	MSB 7 … LSB 0	Message Index	0x01 = event data part 1
		1	2	MSB 7 … LSB 0	Event code	0-65535
			3	MSB 7 … LSB 0		
	1	2	4	MSB 7 … LSB 0	Event type	0-255
			5	MSB 7 … LSB 0	Resettable	0: FALSE 1: TRUE
		3	6	MSB 7 … LSB 0	Year	0-65535
			7	MSB 7 … LSB 0		

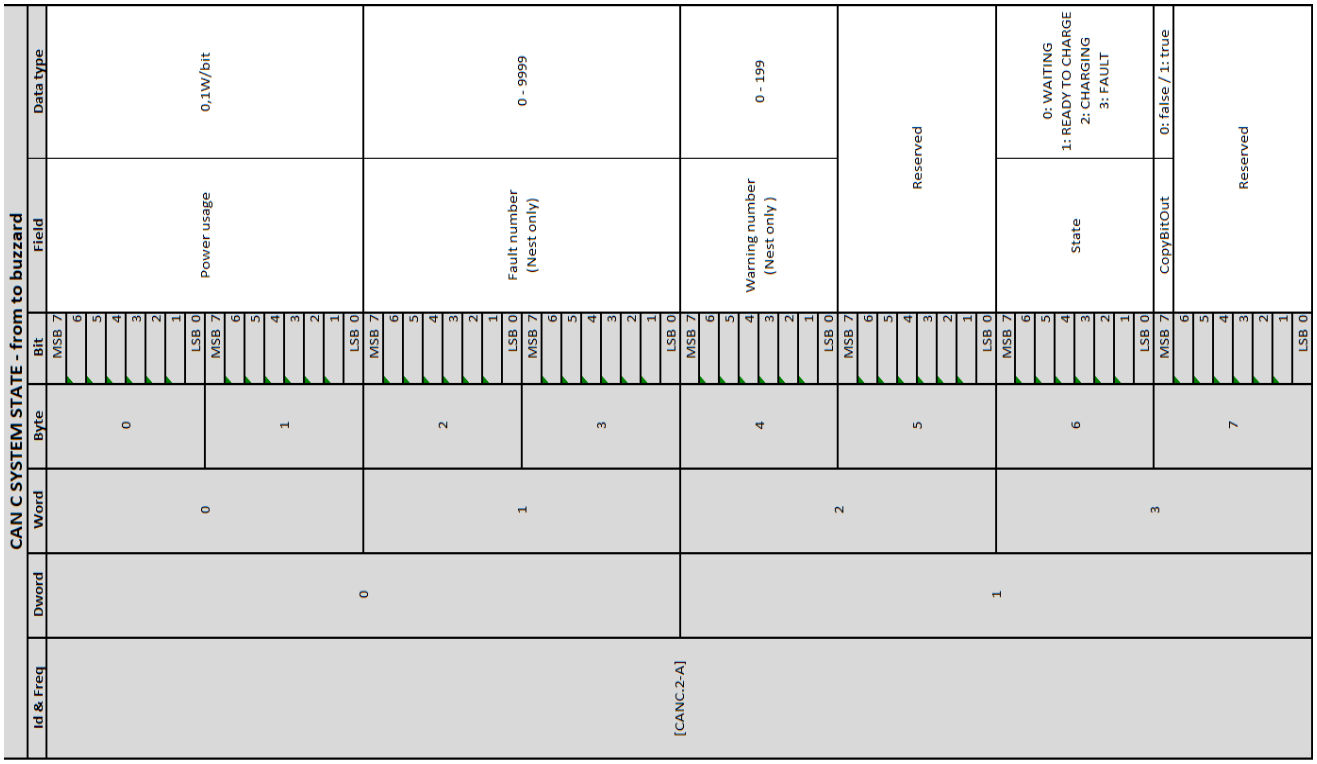
CAN A ELEMENT x EVENT DATA MSG2 - from buzzard

Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANA-2-C]	0	0	0	MSB 7 … LSB 0	Event index	0-255
			1	MSB 7 … LSB 0	Message Index	0x02 = event data part 2
		1	2	MSB 7 … LSB 0	Month	1-12
			3	MSB 7 … LSB 0	Day	1-31
	1	2	4	MSB 7 … LSB 0	Hours	0-23
			5	MSB 7 … LSB 0	Minutes	0-59
		3	6	MSB 7 … LSB 0	Sec	0-59
			7	MSB 7 … LSB 0	mSec	0-100 (0,01 sec resolution)

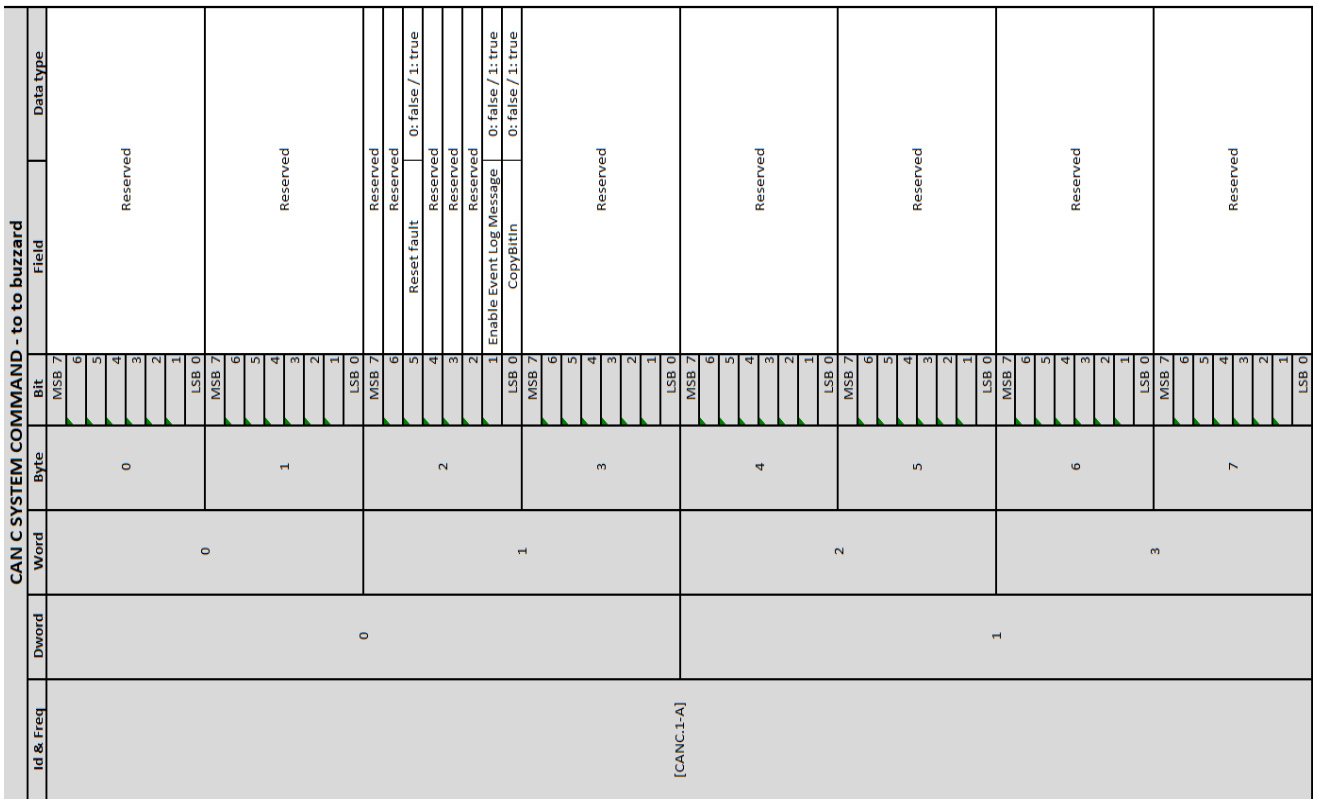
MSG0 is protocol header explaining the number of logged event (DTC) en the maximum number of logged events (DTCs).
MSG 1 and MSG2 will contain the information per event (DTC). 'Event code' means current existing DTC code. 'Event type' is 'Fault', 'Warning', ...
Plese provide us 'real time clock message', in this case we can give you the exact time stamp when event occured.

표 6-4 : Bird의 CAN Matrix 하위 메시지 표-3

6.3 Nest의 CAN 메시지

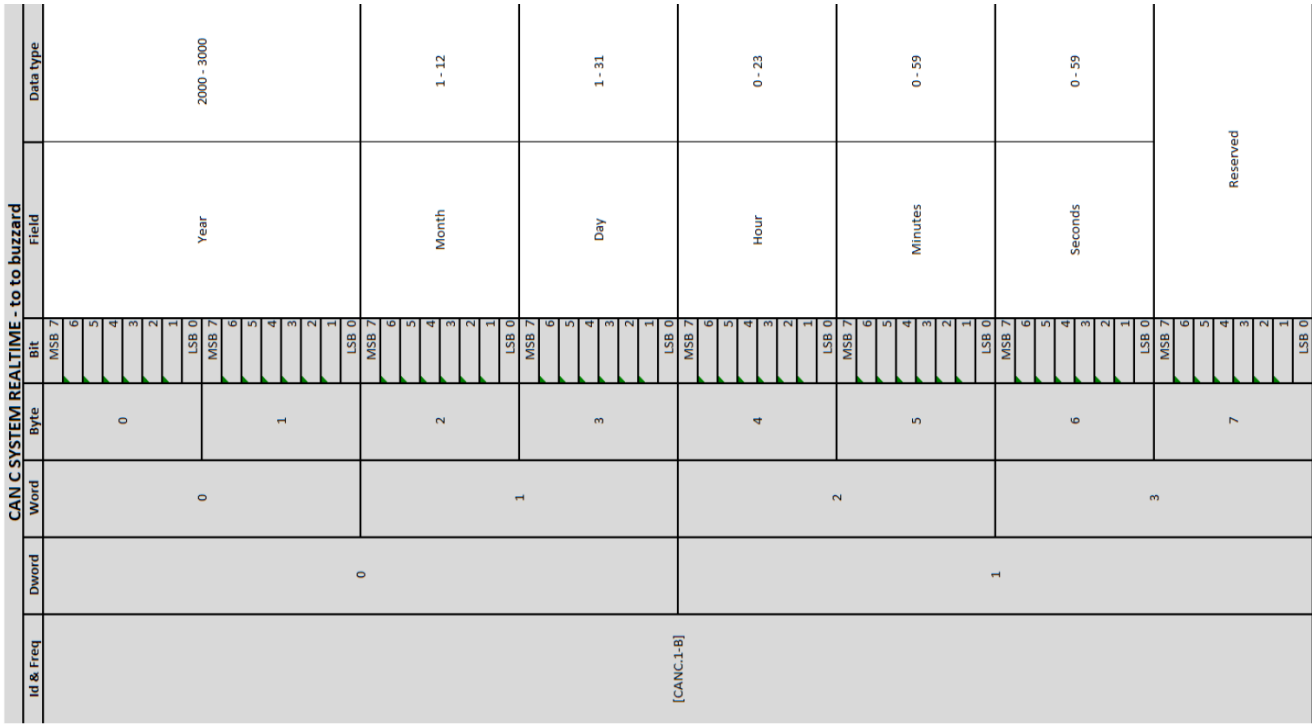


CAN C SYSTEM STATE - from to buzzard							
Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANC.2-A]	0	0	0	MSB 7 … LSB 0	Power usage	0,1W/bit
			1	MSB 7 … LSB 0		
		1	2	MSB 7 … LSB 0	Fault number (Nest only)	0 - 9999
			3	MSB 7 … LSB 0		
	1	2	4	MSB 7 … LSB 0	Warning number (Nest only)	0 - 199
			5	MSB 7 … LSB 0	Reserved	
		3	6	MSB 7 … LSB 0	State	0: WAITING 1: READY TO CHARGE 2: CHARGING 3: FAULT
			7	MSB 7	CopyBitOut	0: false / 1: true
				MSB 6 … LSB 0	Reserved	



CAN C SYSTEM COMMAND - to to buzzard							
Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANC.1-A]	0	0	0	MSB 7 … LSB 0	Reserved	
			1	MSB 7 … LSB 0	Reserved	
		1	2	MSB 7	Reserved	
				6	Reserved	
				5	Reset fault	0: false / 1: true
				4	Reserved	
				3	Reserved	
				2	Reserved	
				1	Enable Event Log Message	0: false / 1: true
				0	CopyBitIn	0: false / 1: true
			3	MSB 7 … LSB 0	Reserved	
	1	2	4	MSB 7 … LSB 0	Reserved	
			5	MSB 7 … LSB 0	Reserved	
		3	6	MSB 7 … LSB 0	Reserved	
			7	MSB 7 … LSB 0	Reserved	

표 6-5 : Nest의 CAN Matrix 하위 메시지 표-1



CAN C SYSTEM REALTIME - to to buzzard							
Id & Freq	Dword	Word	Byte	Bit	Field	Data type
[CANC.1-B]	0	0	0	MSB 7 6 5 4 3 2 1 LSB 0	Year	2000 - 3000
			1	MSB 7 6 5 4 3 2 1 LSB 0		
		1	2	MSB 7 6 5 4 3 2 1 LSB 0	Month	1 - 12
			3	MSB 7 6 5 4 3 2 1 LSB 0	Day	1 - 31
	1	2	4	MSB 7 6 5 4 3 2 1 LSB 0	Hour	0 - 23
			5	MSB 7 6 5 4 3 2 1 LSB 0	Minutes	0 - 59
		3	6	MSB 7 6 5 4 3 2 1 LSB 0	Seconds	0 - 59
			7	MSB 7 6 5 4 3 2 1 LSB 0	Reserved	

표 6-6 : Nest의 CAN Matrix 하위 메시지 표-2

표 6-7 : Nest의 CAN Matrix 하위 메시지 표-3

7 CANopen 프로토콜

7.1 CANopen 사용하기

buzzard40은 CANopen 프로토콜을 지원합니다.
Bird 및 Nest용 EDS 파일을 받으려면 Multipowr에 문의하세요.

7.2 Bird의 CANopen 프로토콜

NODE ID		
Node	**Range**	**Default (HEX)**
Bird	0x01-0x7F	**0x64 (*)**
Master	0x01-0x08	**0x01**
(*) change in case of pararallel devices		

BAUDRATE	
Supported Baudrates	**Default**
125K 250K 500K 1M	**250k**

RXM-PAD NODE			
PDO	**Message length**	**Cycle time (ms)**	**Info**
RPDO 1	8	100	MASTER - System Command
TPDO 1	8	200	Bird - System Status 1
TPDO 2	8	200	Bird - System Status 2
HB Bird	1	1000	Bird - Heartbeat
HB master	1	1000	MASTER - Heartbeat

표 7-1 : Bird의 CANopen 파라미터

MASTER node

RPDO 1 : MASTER - System Command 1

Name	ObjectNr-Subindex	Type	BE/LE	Info
Enable	0x4200-0	uint8	LE	0: Disconnect from TX 1: Connect to TX
Reset	0x4201-0	uint8	LE	0: Reset faults off 1: Reset faults on
Mode	0x4203-0	uint8	LE	0: Current control 1: Voltage control
Charge Voltage Request	0x2276-0	uint16	LE	Unit = (1/256)V
Charge Current Request	0x6070-0	uint16	LE	Unit = (1/16)A
Run	0x4202-0	uint8	LE	0: Stop charging but keep connection to TX 1: Start charging

buzzard-Bird node

TPDO 1 : Bird - System Status 1

Name	ObjectNr-Subindex	Type	BE/LE	Info
Actual Charging Current	0x2002-0	uint16	LE	Unit = (1/256)A
Actual Charging Voltage	0x2101-0	uint16	LE	Unit = (1/256)V
Max Available Charger Current	0x4212-0	uint16	LE	Unit = (1/16)A
Charger Output Status	0x2006-0	uint16	LE	Bit 15-12: 0: Charger output off 1: Charger output on

TPDO 2 : Bird - System Status 2

Name	ObjectNr-Subindex	Type	BE/LE	Info
Fault Number	0x2051-0	uint16	LE	See fault code tab
Warning Number	0x2050-0	uint8	LE	See warning code tab
Charger State	0x2007-0	uint8	LE	0: Waiting 1: Ready to charge 2: Charging 3: Fault
Alignment	0x2008-0	uint8	LE	0: Bad alignment 9: Very good alignment
Thermal usage	0x2009-0	uint8	LE	0: Good 100: Derating will start
Actual charging power	0x2102-0	uint16	LE	Unit = (1/16)W

MASTER - Heartbeat

Name	ObjectNr-Subindex	Type	BE/LE	Bit info
NMT status	-	uint8	LE	0x7F: Pre-operational 0x05: Operational 0x04: Stopped 0x00: Boot

RX - Heartbeat

Name	ObjectNr-Subindex	Type	BE/LE	Bit info
NMT status	-	uint8	LE	0x7F: Pre-operational 0x05: Operational 0x04: Stopped 0x00: Boot

Non PDO mapped objects

Name	ObjectNr-Subindex	Type	BE/LE	Bit info
Maximum charging voltage	0x4208-0	uint16	LE	Unit = (1/256)V
Application state	0x5003-1	uint8	LE	Reserved (Used by Diagnostic tool)
	0x5003-2	uint8	LE	
	0x5003-3	uint8	LE	
Application state request	0x5004-1	uint8	LE	
	0x5004-2	uint8	LE	
	0x5004-3	uint8	LE	
DiagBlock	0x5010-1	uint8 array [350]	LE	
	0x5010-2	uint8 array [350]	LE	
DiagBlock Address	0x5011	uint8		
DiagBlock Ready	0x5012	uint8		

표 7-2 : Bird의 CANopen 매트릭스

7.3 Nest의 CANopen 프로토콜

NODE ID		
Node	**Range**	**Default (HEX)**
Nest	0x01-0x7F	**0x64 (*)**
Master	0x01-0x08	**0x01**
(*) change in case of pararallel devices		

BAUDRATE	
Supported Baudrates	**Default**
125K 250K 500K 1M	**250k**

RXM-PAD NODE			
PDO	**Message length**	**Cycle time (ms)**	**Info**
RPDO 1	8	100	MASTER - System Command
TPDO 1	6	200	Nest - System Status 1
HB node	1	1000	Nest - Heartbeat

표 7-3 : Nest의 CANopen 파라미터

Master node

RPDO 1 : MASTER - System Command 1				
Name	**ObjectNr-Subindex**	**Type**	**BE/LE**	**Info**
Reset	0x4201-0	uint8	LE	0: Reset faults off 1: Reset faults on
Reserved	0x00005-0	uint8	LE	-
Reserved	0x00005-0	uint8	LE	-
Reserved	0x00005-0	uint8	LE	-
Reserved	0x00005-0	uint8	LE	-
Reserved	0x00005-0	uint8	LE	-
Reserved	0x00005-0	uint8	LE	-
Reserved	0x00005-0	uint8	LE	-

buzzard-Nest node

TPDO 1: TX - System Status 1				
Name	**ObjectNr-Subindex**	**Type**	**BE/LE**	**Info**
Power Usage	0x2102-0	uint16	LE	Unit = (1/16)W
Fault number	0x2051-0	uint16	LE	See fault code tab
Warning Number	0x2050-0	uint8	LE	See warning code tab
Charger State	0x2007-0	uint8	LE	0: Waiting 1: Ready to charge 2: Charging 3: Fault

TX - Heartbeat				
Name	**ObjectNr-Subindex**	**Type**	**BE/LE**	**Bit info**
NMT status	-	uint8	LE	0x7F: Pre-operational 0x05: Operational 0x04: Stopped 0x00: Boot

Non PDO mapped objects				
Name	**ObjectNr-Subindex**	**Type**	**BE/LE**	**Bit info**
Application state	0x5003-1	uint8	LE	Reserved (Used by Diagnostic tool)
	0x5003-2	uint8	LE	
	0x5003-3	uint8	LE	
Application state request	0x5004-1	uint8	LE	
	0x5004-2	uint8	LE	
	0x5004-3	uint8	LE	
DiagBlock	0x5010-1	uint8 array [350]	LE	
	0x5010-2	uint8 array [350]	LE	
DiagBlock Address	0x5011	uint8		
DiagBlock Ready	0x5012	uint8		

표 7-3 : Nest의 CANopen 매트릭스

8 에러와 경고 메시지

buzzard40-Bird				
Fault Name	**Fault Type**	**Resettable**	**Service Required (replace / Multipowr)**	**Fault Number**
Reverse current protection	Service		A reverse current was detected, which predicts hardware failure	1001
Battery disconnected during charging	Resettable	Battery has been disconnected during charging		1002
Temperature sensor electronics 1	Service		Defect temperature sensor ELECTRONICS	1004
Temperature sensor electronics 2	Service		Defect temperature sensor ELECTRONICS	1005
Temperature sensor coil 1	Service		Defect temperature sensor COIL	1006
Temperature sensor coil 2	Service		Defect temperature sensor COIL	1007
Temperature sensor rectifier 1	Service		Defect temperature sensor RECTIFIER	1008
Temperature sensor rectifier 2	Service		Defect temperature sensor RECTIFIER	1009
Overtemperature on electronics	Resettable	Temperature of electronics too high		1012
Overtemperature on coil	Resettable	Temperature of coil too high		1013
Overtemperature on rectifier	Resettable	Temperature of rectifier too high		1014
No communication Bird <> Nest	Resettable	Wireless communication between Nest and Bird has disappeared		1016
Output contactor 1	Service		Bird output contactor should be closed but isn't closed	1017
Output contactor 2	Service		Bird output contactor should be opened but isn't opened	1018
Output contactor 3	Service		Bird output contactor opened because of cirult defect	1019
Nest not found	Resettable	Nest not found within 60s after Bird enable CAN command		1020
Wireless link hardware failed	Service		Wireless module could not be initialised	1021
Pairing	Service		Near field system defect	1022
Output voltage too low	Resettable	The battery voltage is too low during Bird enable (<= 18V)		1024
Internal hardware	Service		Internal precharge circuit defect OR Dump Circuit Defect OR internal DCDC Defect	1025
Can timeout	Resettable	Repetition frequency of CAN messages not respected OR CAN bus hardware interruption		1031
Overcurrent protection	Resettable	The internal overcurrent protection was triggered		1033
AC leakage current	Service		Bird internal short between circuitry and metal chassis	1034
HW not enabled	Resettable or Service	Missing HW enable Bridge	Internal DCDC defect	1041
Output voltage too high	Resettable	Output voltage > 60V		1042
Internal circuit clock failed	Service		Internal circuit clock stopped working	1043
Internal DCDC voltage 1	Service		The internal DCDC volage is too low < 8V, defect in circuitry	1053
Internal DCDC voltage 2	Service		The internal DCDC volage is too high > 16V, defect in circuitry	1054
Internal current sensor reference	Service		The internal current sensor reference voltage not correct	1057
Internal fuse broken	Service		Internal DCDC fuse broken	1058
Temperature sensor electronics 1	Service		Defect temperature sensor ELECTRONICS	1059
Temperature sensor electronics 2	Service		Defect temperature sensor ELECTRONICS	1060
Temperature sensor coil 1	Service		Defect temperature sensor COIL	1061
Temperature sensor coil 2	Service		Defect temperature sensor COIL	1062
Temperature sensor rectifier 1	Service		Defect temperature sensor RECTIFIER	1063
Temperature sensor rectifier 2	Service		Defect temperature sensor RECTIFIER	1064
Dump circuit not resettable	Service		Dump circuitry is defect	1067
Reverse current circuit not resettable	Service		Reverse current circuitry defect	1068
Contactor circuit	Service		Contactor driving circuitry defect	1069
Wireless link hardware failed	Service		Wireless module could not be initialised	1070
Overcurrent circuit not resettable	Service		Overcurrent circuitry defect	1075
Reset by software protection watchdog	Resettable	Bird has been reset by software protection watchdog		1076

표 8-1 : Bird 에러 메시지

buzzard40 -Nest				
Fault Name	**Fault Type**	**Resettable**	**Service Required (replace / Multipowr)**	**Fault Number**
Overvoltage grid	Resettable	Grid voltage too high		1101
Overcurrent grid	Resettable	Grid current too high		1102
Internal DC overcurrent	Resettable or Service	Internal DC current hardware trip level	If external fuse jumps, service needed	1104
Aligment OR airgap	Resettable	The Bird is not correctly aligned OR the airgap Bird-Nest is too large		1105
Temperature sensor electronics 1	Service		Defect temperature sensor ELECTRONICS	1112
Temperature sensor electronics 2	Service		Defect temperature sensor ELECTRONICS	1113
Temperature sensor rectifier 1	Service		Defect temperature sensor RECTIFIER	1114
Temperature sensor rectifier 2	Service		Defect temperature sensor RECTIFIER	1115
Temperature sensor pad heatsink 1	Service		Defect temperature sensor PAD HEATSINK	1116
Temperature sensor pad heatsink 2	Service		Defect temperature sensor PAD HEATSINK	1117
Temperature sensor coil 1	Service		Defect temperature sensor COIL	1118
Temperature sensor coil 2	Service		Defect temperature sensor COIL	1119
Overtemperature on electronics	Resettable	Temperature of electronics too high		1120
Overtemperature on rectifier	Resettable	Temperature of rectifier too high		1121
Overtemperature on pad heatsink	Resettable	Temperature of pad heatsink too high		1122
Overtemperature on coil	Resettable	Temperature of coil too high		1123
No communication Bird <> Nest	Resettable	Wireless communication between Nest and Bird has disappeared		1124
Internal circuit clock failed	Service		Internal circuit clock stopped working	1125
Grid switched off	Resettable	Grid has been switched off OR long coltage dip on grid		1126
Wireless link hardware failed	Service		Wireless module could not be initialised	1127
Wrong Bird type found	Resettable	Wrong Bird type detected, 40A Nest product can only workign with 40A Bird products		1135
Internal current sensor reference	Service		The internal current sensor reference voltage not correct	1136
Can timeout	Resettable	Repetition frequency of CAN messages not respected OR CAN bus hardware interruption		1137
Nest pad not found	Resettable or Service	Nest pad is not connected on Nest wallbox	Defect on Nest pad	1138
No communication Nest wallbox <> pad	Resettable or Service	Repetition frequency of CAN messages not respected OR CAN bus hardware interruption		1139
Temperature sensor electronics 1	Service		Defect temperature sensor ELECTRONICS	1151
Temperature sensor electronics 2	Service		Defect temperature sensor ELECTRONICS	1152
Temperature sensor rectifier 1	Service		Defect temperature sensor RECTIFIER	1153
Temperature sensor rectifier 2	Service		Defect temperature sensor RECTIFIER	1154
Reset by software protection watchdog	Resettable	Bird has been reset by software protection watchdog		1162

표 8-2 : Nest 에러 메시지

buzzard40-Nest	
Warning Name	**Waning Number**
Derating by electronics temperature	051
Derating by rectifier temperature	052
Derating by coil out temperature	053

표 8-3 : Nest 경고

buzzard40-Bird	
Warning Name	**Waning Number**
Derating by electronics temperature	001
Derating by coil temperature	002
Derating by rectifier temperature	003

표 8-4 : Bird 경고

9 병렬연결 된 Bird의 작동

각 Bird는 개별적으로 제어되어야 하므로 각 장치는 CANopen에서 고유한 장치 ID(노드 ID)를 얻어야 합니다.
기본 장치 ID 변경은 'MULTIPOWR PC 진단 도구'를 사용하여 CAN을 통해 수행할 수 있습니다.
Bird가 충전 중이면 다른 Bird와 Nest의 페어링이 방해를 받을 수 있습니다.
따라서 충전을 시작하기 (Run = 1로 설정) 전에 먼저 Bird와 Nest를 각각 페어링 (Enable = 1로 설정) 하세요.

1. 상　　호 : 하나테크
2. 품　　명 : 미약 전계강도 무선기기
3. 모 델 명 : BUZZARD-NEST-2800W
4. 제 조 자 : IN2POWER
5. 제조국가 : 벨기에
6. 제조년월 : 20　년　　월　　일
7. 적합등록 : R-RS-9HT-INCHARGE-TX-25

1. 상　　호 : 하나테크
2. 품　　명 : Wireless 40A receiver
3. 모 델 명 : BUZZARD-BIRD-40A
4. 제 조 자 : IN2POWER
5. 제조국가 : 벨기에
6. 제조년월 : 20　년　　월　　일
7. 적합등록 : R-RS-9HT-INCHARGE-RX-40

Contact

buzzard by multipowr

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