

# PKP-1400 CANOPEN USER MANUAL



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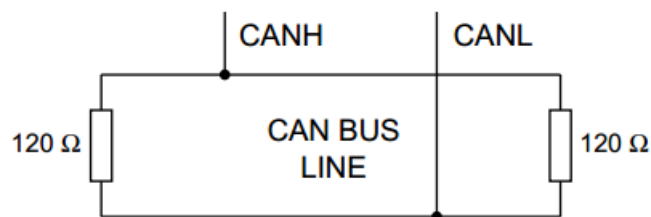
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## 1. How to connect Deutsch 4 pin:



PIN	COLOUR	FUNCTION
1	Blue	CAN L
2	White	CAN H
3	Black	Negative battery
4	Red	Vbatt. (12-24V)

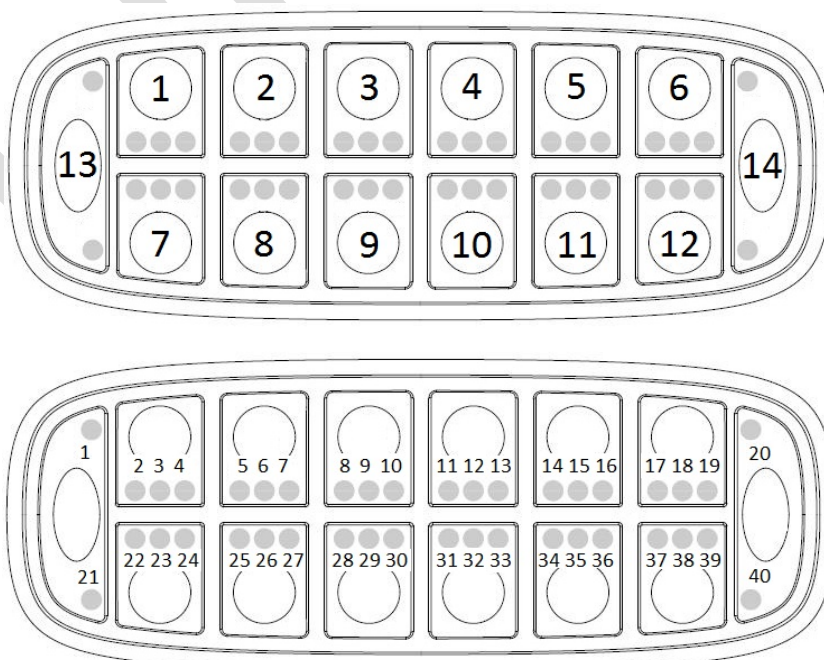


Each end of the CAN bus is terminated with 120Ω resistors in compliance with the standard to minimize signal reflections on the bus. You may need to place a 120Ω resistor between CAN-L and CAN-H.

## 2. Reference

PowerKey front view.

### PK-1400



### 3. Default settings

Setting	Default state or level	How to change
Baud Rate	125 kbit/s	Object 2010h
CANopen Node ID	15h	Object 2013h
CANopen Node State	Stop	NMT Message Start CANopen node
Key Brightness	3Fh (Maximum Brightness)	Object 2003h
Backlight Brightness	00h (OFF)	Object 2003h
Backlight Color	Amber	Object 2003h
Startup LED Light Show	Complete LED Sequence	Object 2014h
Periodic Message Transmission	Disable	Object 1800h
DEMO mode	Disable	Object 2100h
Heartbeat Message	Disable	Object 1017h
Boot-up service	Active	Object 2011h

### NMT MESSAGES

The Network Management messages follow a master-slave structure. Through NMT services, CANopen devices are initialized, started, reset or stopped. All CANopen devices are regarded as NMT slaves. NMT messages have CAN-ID always equal to 00h.

### 4. Start CANopen node (keypad activation message)

Identifier	00h	
Byte 0	01h	Start CANopen node
Byte 1	XXh	Keypad CAN ID 00h: start all the keypads 15h: start the keypad with CAN ID = 15h.
Byte 2, 7	00h	Not used

Example:

Direction	Identifier	Format	Message
To Keypad	0	Std	01 15

## 5. Enter pre-operational

<b>Identifier</b>	00h	
<b>Byte 0</b>	80h	Enter pre-operational
<b>Byte 1</b>	XXh	Keypad CAN ID 00h: enter all the keypads 15h: enter the keypad with CAN ID = 15h.
<b>Byte 2, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message
To Keypad	0	Std	80 15

## 6. Reset CANOpen node

<b>Identifier</b>	00h	
<b>Byte 0</b>	81h	Reset CANOpen node
<b>Byte 1</b>	XXh	Keypad CAN ID 00h: reset all the keypads 15h: reset the keypad with CAN ID = 15h.
<b>Byte 2, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message
To Keypad	0	Std	81 15

## 7. Stop CANOpen node

<b>Identifier</b>	00h	
<b>Byte 0</b>	XXh	02h: Stop CANOpen node 00h: Stop CANOpen node (old sw compatibility)
<b>Byte 1</b>	YYh	Keypad CAN ID 00h: stop all the keypads 15h: stop the keypad with CAN ID = 15h.
<b>Byte 2, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message
To Keypad	0	Std	02 15

## 8. Boot-up service

This service is used to signal that a NMT slave has entered the NMT state Pre-operational.

<b>Identifier</b>	700h + current CAN ID	Default 715h
<b>Byte 0</b>	00h	One data byte is transmitted with value 0.

Example:

Direction	Identifier	Format	Message
<b>From Keypad</b>	715h	Std	00h

The keypad with CAN ID 15h has entered the NMT state Pre-operational.

## PDO messages

PDO (Process Data Object) are fast telegram messages that can simply manage most important functions. There are no answers for this kind of messages. Each PDO message has an equivalent Service Data Object message.

## 9. Keys state message

The keypad must be activated, see NMT Start CANopen Node message.

- PK-1400

<b>Identifier</b>	180 + current CAN ID	Default 195h
<b>Byte 0</b>	Keys from #1 to #8 K8 K7 K6 K5 – K4 K3 K2 K1	Keys: 1=pressed; 0=released
<b>Byte 1</b>	Keys from #9 to #14 0 0 K14 K13 – K12 K11 K10 K9	Keys: 1=pressed; 0=released
<b>Byte 2, 3</b>	00h	Not Used
<b>Byte 4</b>	XXh	Tick Timer

Examples:

Direction	Identifier	Format	Message	Key state
<b>From Keypad</b>	195	Std	00 00 00 00 XX	No key pressed
<b>From Keypad</b>	195	Std	04 00 00 00 XX	Only key #3 pressed
<b>From Keypad</b>	195	std	82 00 00 00 XX	Keys #8 and #2 pressed
<b>From Keypad</b>	195	Std	00 20 00 00 XX	Only key #14 pressed
<b>From Keypad</b>	195	Std	11 00 00 00 XX	Keys #1 and #5 pressed



# 10. Set LED ON message

The keypad must be activated, see NMT Start CANopen Node message.

- **PK-1400 RED**

<b>Identifier</b>	200 + current CAN ID	Default 215h
<b>Byte 0</b>	R8 R7 R6 R5 – R4 R3 R2 R1	Red LED
<b>Byte 1</b>	R16 R15 R14 R13 – R12 R11 R10 R9	Red LED
<b>Byte 2</b>	R24 R23 R22 R21 – R20 R19 R18 R17	Red LED
<b>Byte 3</b>	R32 R31 R30 R29 – R28 R27 R26 R25	Red LED
<b>Byte 4</b>	R40 R39 R38 R37 – R36 R35 R34 R33	Red LED
<b>Byte 5, 7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	LED
To Keypad	215	Std	00 00 00 00 00 00 00 00	Turn off all the LED
To Keypad	215	Std	01 00 00 00 00 00 00 00	Only red LED #1 ON
To Keypad	215	Std	05 00 00 00 00 00 00 00	Red LED #1 and #3 ON, other LED OFF
To Keypad	215	Std	00 20 00 00 00 00 00 00	Only red LED #14 ON
To Keypad	215	Std	00 00 01 00 00 00 00 00	Only red LED #17 ON
To Keypad	215	Std	00 00 00 33 00 00 00 00	Red LED #25, #26, #29, #30 ON
To Keypad	215	Std	00 00 00 00 44 00 00 00	Red LED #35 and #39 ON

- **PK-1400 GREEN**

<b>Identifier</b>	300 + current CAN ID	Default 315h
<b>Byte 0</b>	G8 G7 G6 G5 – G4 G3 G2 G1	Green LED
<b>Byte 1</b>	G16 G15 G14 G13 – G12 G11 G10 G9	Green LED
<b>Byte 2</b>	G24 G23 G22 G21 – G20 G19 G18 G17	Green LED
<b>Byte 3</b>	G32 G31 G30 G29 – G28 G27 G26 G25	Green LED
<b>Byte 4</b>	G40 G39 G38 G37 – G36 G35 G34 G33	Green LED
<b>Byte 5, 7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	LED
To Keypad	315	Std	00 00 00 00 00 00 00 00	Turn off all LED
To Keypad	315	Std	04 00 00 00 00 00 00 00	Only green LED #3 ON
To Keypad	315	Std	10 00 00 00 00 00 00 00	Only green LED #5 ON
To Keypad	315	Std	00 21 00 00 00 00 00 00	Green LED #9 and #14 ON
To Keypad	315	Std	00 00 35 00 00 00 00 00	Green LED #17, #19, #21 and #22 ON
To Keypad	315	Std	00 00 00 42 00 00 00 00	Green LED #26 and #31 ON
To Keypad	315	Std	00 00 00 00 86 00 00 00	Green LED #34, #35 and #40 ON



## 11. Indicator LEDs brightness level

The keypad must be activated, see NMT Start CANopen Node message.

<b>Identifier</b>	400 + current CAN ID	Default 415h
<b>Byte 0</b>	XXh	Intensity 00h-3Fh → min-100%
<b>Byte 1, 7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	LED
To Keypad	415	Std	08 00 00 00 00 00 00 00	Brightness = 12,5%
To Keypad	415	Std	10 00 00 00 00 00 00 00	Brightness =25%

## 12. Backlight brightness level

The keypad must be activated, see NMT Start CANopen Node message.

<b>Identifier</b>	500 + current CAN ID	Default 515h
<b>Byte 0</b>	XXh	Intensity 00h-3Fh → 0-100%
<b>Byte 1, 7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	LED
To Keypad	515	Std	00 00 00 00 00 00 00 00	Turn off the backlight
To Keypad	515	Std	10 00 00 00 00 00 00 00	Backlight brightness=25%

## SDO Messages:

A SDO (Service Data Object) is providing direct access to object entries of a CANopen device's object dictionary.

### 13. Object 2000h: Digital input module, keys states

This module contains all the Switch State information.

A one indicates the switch is on, a zero indicates the switch is off.

The keypad must be enabled, see NMT messages.

The switch state is reported in the Keypad reply message from byte 4 to byte 5. The mapping is the same of the PDO Key state message.

- **PK-1400**

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	00h	CAN Object 2000h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	01h	Sub index
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
<b>To Keypad</b>	615	Std	40 00 20 01 00 00 00 00	
<b>Keypad reply</b>	595	Std	4B 00 20 01 00 00 00 00	No key pressed
			4B 00 20 01 01 00 00 00	Key 1 pressed
			4B 00 20 01 02 00 00 00	Key 2 pressed
			4B 00 20 01 00 20 00 00	Key 14 pressed
			4B 00 20 01 03 00 00 00	Key 1 and 2 pressed
			4B 00 20 01 20 01 00 00	Key 6 and 9 pressed
			4B 00 20 01 FF 3F 00 00	All keys pressed

## 14. Object 2001h: Digital output module.

This module sets and reads the LED Outputs States. A one indicates the LED is on, a zero indicates the LED is off.

### a) Set LED ON

- PK-1400  
LED From L1 to L32

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	23h	Set Device Register
<b>Byte 1</b>	01h	CAN Object 2001h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	XXh	XX: Sub index 01h: Red LED from L1 to L32 02h: Green LED from L1 to L32
<b>Byte 4</b>	XXh	L8 L7 L6 L5 – L4 L3 L2 L1
<b>Byte 5</b>	XXh	L16 L15 L14 L13 – L12 L11 L10 L9
<b>Byte 6</b>	XXh	L24 L23 L22 L21 – L20 L19 L18 L17
<b>Byte 7</b>	XXh	L32 L31 L30 L29 – L28 L27 L26 L25

Examples:

Direction	Identifier	Format	Message	Data
<b>To Keypad</b>	615	Std	23 01 20 01 04 10 20 80	Set red LED #3, #13, #22 and 31 ON
<b>Keypad reply</b>	595	Std	60 01 20 01 00 00 00 00	
<b>To Keypad</b>	615	Std	23 01 20 02 80 20 10 01	Set green LED #8, #14, #21 and #25 ON
<b>Keypad reply</b>	595	Std	60 01 20 02 00 00 00 00	

### LED From L33 to L40

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	01h	CAN Object 2001h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	XXh	04h: Red LED from L33 to L40 05h: Green LED from L33 to L40
<b>Byte 4</b>	XXh	L40 L39 L38 L37 – L36 L35 L34 L33
<b>Byte 5,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
<b>To Keypad</b>	615	Std	2F 01 20 04 01 00 00 00	Set red LED #33 ON
<b>Keypad reply</b>	595	Std	60 01 20 04 00 00 00 00	
<b>To Keypad</b>	615	Std	2F 01 20 05 3E 00 00 00	Set green LED #34, #35, #36, #37 and #38 ON
<b>Keypad reply</b>	595	Std	60 01 20 05 00 00 00 00	

## b) Read LED ON

The LEDs have the same mapping of Set LED ON message

- PK-1400

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	01h	CAN Object 2001h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	XXh	XX: Sub index 01h: Red LED from L1 to L32 02h: Green LED from L1 to L32 04h: Red LED from L33 to L40 05h: Green LED from L33 to L40
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
<b>To Keypad</b>	615	Std	40 01 20 01 00 00 00 00	Read red LED from #1 to #32
<b>Keypad reply</b>	595	Std	43 01 20 01 FF FF FF FF	All red LED from #1 to #32 are ON
<b>To Keypad</b>	615	Std	40 01 20 02 00 00 00 00	Read green LED from #1 to #32
<b>Keypad reply</b>	595	Std	43 01 20 02 0A 0B 0C 00	Green LED #2, #4, #9, #10, #12, #19, #20 are ON
<b>To Keypad</b>	615	Std	40 01 20 04 00 00 00 00	Read red LED from #33 to #40
<b>Keypad reply</b>	595	Std	4F 01 20 04 03 00 00 00	Red LED #33, #34 are ON
<b>To Keypad</b>	615	Std	40 01 20 05 00 00 00 00	Read green LED from #33 to #40
<b>Keypad reply</b>	595	Std	4F 01 20 05 06 00 00 00	Green LED #34, #35 are ON

## 15. Object 2002h: Digital output module.

This module sets and reads the LED Blink States.

Each bit position represents the corresponding LED. A one indicates the LED is blinking, a zero indicates the LED is normal. If the blink message is sent when the LED is already ON, the LED blinks in alternate mode.

### a) Set LED blink

- **PK-1400**  
**LED From L1 to L32**

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	23h	Set Device Register
<b>Byte 1</b>	02h	CAN Object 2002h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	XXh	XX: Sub index 01h: Red LED blink from L1 to L32 02h: Green LED blink from L1 to L32
<b>Byte 4</b>	XXh	L8 L7 L6 L5 – L4 L3 L2 L1
<b>Byte 5</b>	XXh	L16 L15 L14 L13 – L12 L11 L10 L9
<b>Byte 6</b>	XXh	L24 L23 L22 L21 – L20 L19 L18 L17
<b>Byte 7</b>	XXh	L32 L31 L30 L29 – L28 L27 L26 L25

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	23 02 20 01 04 00 00 00	Set red LED #3 blink
Keypad reply	595	Std	60 02 20 01 00 00 00 00	
To Keypad	615	Std	23 02 20 02 00 20 00 00	Set green LED #14 blink
Keypad reply	595	Std	60 02 20 02 00 00 00 00	
To Keypad	615	Std	23 02 20 01 00 00 88 00	Set red LED #20 and #24 blink

### LED From L33 to L40

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	02h	CAN Object 2002h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	XXh	04h: Red LED blink from L33 to L40 05h: Green LED blink from L33 to L40
<b>Byte 4</b>	XXh	L40 L39 L38 L37 – L36 L35 L34 L33
<b>Byte 5,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 02 20 04 01 00 00 00	Set red LED #33 blink
Keypad reply	595	Std	60 02 20 04 00 00 00 00	
To Keypad	615	Std	2F 02 20 05 1C 00 00 00	Set green LED #35, #36 and #37 blink
Keypad reply	595	Std	60 02 20 05 00 00 00 00	

## b) Read LED blink

The LEDs have the same mapping of Set LED ON message

- **PK-1400**

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Set Device Register
<b>Byte 1</b>	02h	CAN Object 2002h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	XXh	XX: Sub index 01h: Red LED from L1 to L32 02h: Green LED from L1 to L32 04h: Red LED from L33 to L40 05h: Green LED from L33 to L40
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 02 20 01 00 00 00 00	Read red LED blinking from #1 to #32
Keypad reply	595	Std	43 02 20 01 3F 00 00 00	Red LED from #1 to #6 are blinking
To Keypad	615	Std	40 02 20 02 00 00 00 00	Read green LED blinking from #1 to #32
Keypad reply	595	Std	43 02 20 02 03 00 00 00	Green LED #1, #2 are blinking
To Keypad	615	Std	40 02 20 04 00 00 00 00	Read red LED blinking from #33 to #40
Keypad reply	595	Std	4F 02 20 04 78 00 00 00	Red LED from #36 to #39 are blinking
To Keypad	615	Std	40 02 20 05 00 00 00 00	Read green LED blinking from #33 to #40
Keypad reply	595	Std	4F 02 20 05 08 00 00 00	Green LED #36 is blinking

## 16. Object 2003: Brightness Level

### a) Set Indicator LEDs brightness level

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	03h	CAN Object 2003h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	01h	Sub index
<b>Byte 4</b>	XXh	Intensity 00h-3Fh → min-100%
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 03 20 01 10 00 00 00	LED brightness = 25%
Keypad reply	595	Std	60 03 20 01 00 00 00 00	

### b) Backlight brightness level

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	03h	CAN Object 2003h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	02h	Sub index
<b>Byte 4</b>	XXh	Intensity 00h-3Fh → 0-100%
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 03 20 02 10 00 00 00	Backlight brightness = 25%
Keypad reply	595	Std	60 03 20 02 00 00 00 00	

### c) Backlight color

<b>Identifier</b>	615h (600h + current CAN ID)		
<b>Byte 0</b>	2Fh	Set Device Register	
<b>Byte 1</b>	03h	CAN Object 2003h	
<b>Byte 2</b>	20h		
<b>Byte 3</b>	03h	Sub index	
<b>Byte 4</b>	XXh	Backlight Color	
		01h: red	06h: violet
		02h: green	07h: white/light blue
		03h: blue	08h: amber/orange
		04h: yellow	09h: yellow/green
		05h: cyan	
<b>Byte 5,7</b>	00h	Not used	

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 03 20 03 01 00 00 00	Red backlight color
Keypad reply	595	Std	60 03 20 03 00 00 00 00	



#### d) Set default backlight color

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	03h	CAN Object 2003h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	04h	Sub index
<b>Byte 4</b>	XXh	Backlight Color
		01h: red 02h: green 03h: blue 04h: yellow 05h: cyan
		06h: violet 07h: white/light blue 08h: amber/orange 09h: yellow/green
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 03 20 04 03 00 00 00	Blue default backlight color
Keypad reply	595	Std	60 03 20 04 00 00 00 00	

#### e) Set startup Indicator LEDs brightness level

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	03h	CAN Object 2003h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	05h	Sub index
<b>Byte 4</b>	XXh	Intensity 00h-3Fh → min-100%
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 03 20 05 10 00 00 00	Brightness = 25%
Keypad reply	595	Std	60 03 20 05 00 00 00 00	

#### f) Set startup backlight brightness level

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	03h	CAN Object 2003h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	06h	Sub index
<b>Byte 4</b>	XXh	Intensity 00h-3Fh → 0-100%
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 03 20 06 3F 00 00 00	Backlight brightness = 100%
Keypad reply	595	Std	60 03 20 06 00 00 00 00	

## 17. Object 2010h: Baud rate setting

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	10h	CAN Object 2010h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	00h	Sub index
<b>Byte 4</b>	XXh	Baud rate 00h: 1000k 01h: Reserved (force to 125k) 02h: 500k 03h: 250K 04h: 125k (Default) 05h: Reserved (force to 125k) 06h: 50k 07h: 20k
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 10 20 00 03 00 00 00	Baud rate = 250k
Keypad reply	595	Std	60 10 20 00 00 00 00 00	

## 18. Object 2011h: Set Boot-up service

Object 2011h message enables or disables the boot up message sent by the keypad at power up to the CAN network.

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	11h	CAN Object 2011h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	00h	Sub index
<b>Byte 4</b>	XXh	00h: Not active 01h: Active
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 11 20 00 00 00 00 00	Boot-up service not active
Keypad reply	595	Std	60 11 20 00 00 00 00 00	

## 19. Object 2012h: Set device active on startup

If keypad is active on startup don't need the Start CANopen command from host.

Identifier	600h + current CAN ID	Default 615h
Byte 0	2Fh	Set Device Register
Byte 1	12h	CAN Object 2012h
Byte 2	20h	
Byte 3	00h	Sub index
Byte 4	XXh	00h: Not active 01h: Active
Byte 5,7	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 12 20 00 01 00 00 00	Set device active on startup
Keypad reply	595	Std	60 12 20 00 00 00 00 00	

## 20. Object 2013h: Set CANopen node ID

Identifier	600h + current CAN ID	Default 615h
Byte 0	2Fh	Set Device Register
Byte 1	13h	CAN Object 2013h
Byte 2	20h	
Byte 3	00h	Sub index
Byte 4	XXh	XX: New node id (00h-7Fh), default 15h
Byte 5,7	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 13 20 00 18 00 00 00	New CANopen node ID = 18h
Keypad reply	598	Std	60 13 20 00 00 00 00 00	

## 21. Object 2014h: Set startup LED show

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	14h	CAN Object 2014h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	00h	
<b>Byte 4</b>	XXh	Sub index
		00h: Not active
		01h: Complete LED sequence (default)
		02h: Amber fast flash
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 14 20 00 00 00 00 00	Startup LED show not active
Keypad reply	595	Std	60 14 20 00 00 00 00 00	

## 22. Object 2015h: LED Power supply

This feature enables or disables the power supply of the LEDs. When the power supply is disabled the LED are not accessible and the keypad enters low power mode.

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	2Fh	Set Device Register
<b>Byte 1</b>	15h	CAN Object 2015h
<b>Byte 2</b>	20h	
<b>Byte 3</b>	00h	
<b>Byte 4</b>	XXh	Sub index
		00h: Disable
		01h: Enable (default)
<b>Byte 5,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 15 20 00 00 00 00 00	LED power supply disabled
Keypad reply	595	Std	60 15 20 00 00 00 00 00	

## 23. Object 2100h: Set DEMO mode

This message enables the Demo mode function. Demo mode is a special feature that consists in different LED states for each button pressing. Refer to the appendix “Demo mode instructions” to try these special features. Disconnect and reconnect the keypad after the enable message to enter this mode. To exit the Demo mode, send the Disable Demo mode command or another command message.

Identifier	600h + current CAN ID	Default 615h
Byte 0	2Fh	Set Device Register
Byte 1	00h	CAN Object 2100
Byte 2	21h	
Byte 3	00h	Sub index
Byte 4	XXh	00h: Not active
		01h: Active
Byte 5,7	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2F 00 21 00 01 00 00 00	Set DEMO mode active
Keypad reply	595	Std	60 00 21 00 00 00 00 00	

## 24. Object 2BFFh: BUS setting

Identifier	600h + current CAN ID	Default 615h
Byte 0	2Bh	Set Device Register
Byte 1	FFh	CAN Object 20FFh
Byte 2	20h	
Byte 3	XXh	Sub index
		01h: Reserved 02h RS485 bus
Byte 4	XXh	00h: Not active
		01h: Active
Byte 5,7	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2B FF 20 02 00 00 00 00	Set RS485 bus not active
Keypad Reply	595	Std	60 FF 20 02 00 00 00 00	

## 25. Object 1017h: Producer heartbeat time

The producer heartbeat time shall indicate the configured cycle time of the heartbeat.

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
	2Bh	Set device register
<b>Byte 1</b>	17h	CAN Object 1017h
<b>Byte 2</b>	10h	
<b>Byte 3</b>	00h	Sub index
<b>Byte 4</b>	YYh	YYh: Heartbeat time in LSByte milliseconds
<b>Byte 5</b>	XXh	XXh: Heartbeat time in MSByte milliseconds
<b>Byte 5, 7</b>	00h	Not used

Heartbeat time: XXYYh (from 000Ah to FEFh: 10ms to 65534 milliseconds).

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 17 10 00 00 00 00 00	Read heartbeat time
Keypad reply	595	Std	4B 17 10 00 64 00 00 00	Heartbeat time = 100ms
To Keypad	615	Std	2B 17 10 00 00 00 00 00	Switch off the heartbeat
Keypad reply	595	Std	60 17 10 00 00 00 00 00	
To Keypad	615	Std	2B 17 10 00 32 00 00 00	Set heartbeat time = 50ms
Keypad reply	595	Std	60 17 10 00 00 00 00 00	
To Keypad	615	Std	2B 17 10 00 F4 01 00 00	Set heartbeat time = 500ms
Keypad reply	595	Std	60 17 10 00 00 00 00 00	

## Heartbeat message

The heartbeat mechanism for a CANopen device is established by cyclically transmitting the heartbeat message by the heartbeat producer. One or more CANopen devices in the network are aware of this heartbeat message. If the heartbeat cycle fails for the heartbeat producer, the local application on the heartbeat consumer will be informed about that event. If a CANopen device starts with a value for the heartbeat producer time unequal to 0 the boot-up message is regarded as first heartbeat message.

<b>Identifier</b>	700h + current CAN ID	Default 715h
<b>Byte 0</b>	XXh	XXh: State of heartbeat producer 00h: Boot-up 05h: Operational 7Fh: Pre-operational

Example:

Direction	Identifier	Format	Message	Data
From Keypad	715h	Std	00h	Boot up
From Keypad	715h	Std	7Fh	Pre-operational
To keypad	00h	Std	01h 15h	Start keypad with CAN id =15h
From Keypad	715h	Std	05h	Operational

## 26. Object 1000h: Device Type

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	00h	CAN Object 1000h
<b>Byte 2</b>	10h	
<b>Byte 3, 7</b>	00h	Not used

Example:

<b>Direction</b>	<b>Identifier</b>	<b>Format</b>	<b>Data</b>
<b>To Keypad</b>	615	Std	40 00 10 00 00 00 00 00
<b>Keypad reply</b>	595	Std	43 00 10 00 91 01 0B 00

Device profile number 191h: Generic I/O module

I/O functionality:

Digital input = implemented;

Digital output = implemented;

Analogue input = not implemented;

Analogue output = not implemented.

## 27. Object 1001h: Error Register

This object is not yet implemented in the device.



## 28. Object 1008h: Manufacturer Device Name

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	08h	CAN Object 1008h
<b>Byte 2</b>	10h	
<b>Byte 3, 7</b>	00h	Not used

1° additional byte

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	60h	Read Device Register Next Byte
<b>Byte 1, 7</b>	00h	Not used

2° additional byte

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	70h	Read Device Register Next Byte
<b>Byte 1, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 08 10 00 00 00 00 00	
Keypad reply	595	Std	41 08 10 00 0B 00 00 00	
To Keypad	615	Std	60 00 00 00 00 00 00 00	
Keypad reply	595	Std	00 42 6C 69 6E 6B 4D 61	BlinkMa
To Keypad	615	Std	70 00 00 00 00 00 00 00	
Keypad reply	595	Std	17 72 69 6E 65 00 00 00	rine

Manufacturer Device Name: BlinkMarine

The first byte of the last data message replied is 17h.

## 29. Object 1009h: Manufacturer Hardware Revision

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	09h	CAN Object 1009h
<b>Byte 2</b>	10h	
<b>Byte 3, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 09 10 00 00 00 00 00	
Keypad reply	595	Std	43 09 10 00 32 30 5F 56	V_02

Manufacturer Hardware Revision: V\_02

## 30. Object 100Ah: Manufacturer Firmware Revision

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	0Ah	CAN Object 100Ah
<b>Byte 2</b>	10h	
<b>Byte 3, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 0A 10 00 00 00 00 00	
Keypad reply	595	Std	43 0A 10 00 30 2E 32 56	V2.0

Manufacturer Firmware Revision: V2.0

## 31. Object 100Bh: Model ID

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	0Bh	CAN Object 100Bh
<b>Byte 2</b>	10h	
<b>Byte 3, 7</b>	00h	Not used

1° additional byte

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	60h	Read Device Register second byte
<b>Byte 1, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 0B 10 00 00 00 00 00	
Keypad reply	595	Std	41 0B 10 00 07 00 00 00	
To Keypad	615	Std	60 00 00 00 00 00 00 00	
Keypad reply	595	Std	01 50 4B 31 34 30 30 00	PK1400

Model ID: PK1400

## 32. Object 1018h: Identity Data

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	18h	CAN Object 1018h
<b>Byte 2</b>	10h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	Vendor Id
	04h	Serial number
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 18 10 00 00 00 00 00	
Keypad reply	595	Std	4F 18 10 00 04 00 00 00	4
To Keypad	615	Std	40 18 10 01 00 00 00 00	
Keypad reply	595	Std	43 18 10 01 E2 03 00 00	000003E2h

Blink Marine Vendor Id: 000003E2h

## 33. Object 1400h: Receive PDO communication Parm 0

Describes the Receive Parameters for the red LED state PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	00h	CAN Object 1400h
<b>Byte 2</b>	14h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	COB Id
	02h	Transmission Type
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 00 14 00 00 00 00 00	
Keypad reply	595	Std	4F 00 14 00 02 00 00 00	2
To Keypad	615	Std	40 00 14 01 00 00 00 00	
Keypad reply	595	Std	43 00 14 01 15 02 00 40	4000 0215h
To Keypad	615	Std	40 00 14 02 00 00 00 00	
Keypad reply	595	Std	4F 00 14 02 FE 00 00 00	FEh

Receive PDO communication Parm 0:

- Number of mapped objects: 2;
- COB id: 200h + NODE ID;
- Transmission Type: FEh.

## 34. Object 1401h: Receive PDO communication Parm 1

Describes the Receive Parameters for the green LED state PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	01h	CAN Object 1401h
<b>Byte 2</b>	14h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	COB Id
	02h	Transmission Type
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 01 14 00 00 00 00 00	
Keypad reply	595	Std	4F 01 14 00 02 00 00 00	2
To Keypad	615	Std	40 01 14 01 00 00 00 00	
Keypad reply	595	Std	43 01 14 01 15 02 00 00	4000 0315h
To Keypad	615	Std	40 01 14 02 00 00 00 00	
Keypad reply	595	Std	4F 01 14 02 FE 00 00 00	FEh

Receive PDO communication Parm 1:

- Number of mapped objects: 2;
- COB id: 300h + NODE ID;
- Transmission Type: FEh.

## 35. Object 1402h: Receive PDO communication Parm 2

Describes the Receive Parameters for indicator LED brightness

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	02h	CAN Object 1402h
<b>Byte 2</b>	14h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	COB Id
	02h	Transmission Type
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 02 14 00 00 00 00 00	
Keypad reply	595	Std	4F 02 14 00 02 00 00 00	2
To Keypad	615	Std	40 02 14 01 00 00 00 00	
Keypad reply	595	Std	43 02 14 01 15 02 00 00	4000 0415h
To Keypad	615	Std	40 02 14 02 00 00 00 00	
Keypad reply	595	Std	4B 02 14 02 FE 00 00 00	FEh

Receive PDO communication Parm 2:

- Number of mapped objects: 2;
- COB id: 400h + NODE ID;
- Transmission Type: FEh.

## 36. Object 1403h: Receive PDO communication Parm 3

Describes the Receive Parameters for backlight LED brightness

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	03h	CAN Object 1403h
<b>Byte 2</b>	14h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	COB Id
	02h	Transmission Type
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 03 14 00 00 00 00 00	
Keypad reply	595	Std	4F 03 14 00 02 00 00 00	2
To Keypad	615	Std	40 03 14 01 00 00 00 00	
Keypad reply	595	Std	43 03 14 01 15 02 00 00	4000 0515h
To Keypad	615	Std	40 03 14 02 00 00 00 00	
Keypad reply	595	Std	4F 03 14 02 FE 00 00 00	FEh

Receive PDO communication Parm 3:

- Number of mapped objects: 2;
- COB id: 500h + NODE ID;
- Transmission Type: FEh.

## 37. Object 1600h: Receive PDO mapping Parameter 0

Describes the mapping of red LED state PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	00h	CAN Object 1600h
<b>Byte 2</b>	16h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	PDO Mapping Entry 1
	02h	PDO Mapping Entry 2
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 00 16 00 00 00 00 00	
Keypad reply	595	Std	4F 00 16 00 03 00 00 00	2
To Keypad	615	Std	40 00 16 01 00 00 00 00	
Keypad reply	595	Std	43 00 16 01 20 01 01 20	2001 01 20
To Keypad	615	Std	40 00 16 02 00 00 00 00	
Keypad reply	595	Std	43 00 16 02 08 04 01 20	2001 04 08

Receive PDO mapping Parameter 0:

- Number of mapped objects: 2;
- Set LED red 1-32: Object 2001h, Sub index 01h, Length 20h;
- Set LED red 33-40: Object 2001h, Sub index 02h, Length 08h;

## 38. Object 1601h: Receive PDO mapping Parameter 1

Describes the mapping of green LED state PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	01h	CAN Object 1601h
<b>Byte 2</b>	16h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	PDO Mapping Entry 1
	02h	PDO Mapping Entry 2
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 01 16 00 00 00 00 00	
Keypad reply	595	Std	4F 01 16 00 02 00 00 00	2
To Keypad	615	Std	40 01 16 01 00 00 00 00	
Keypad reply	595	Std	43 01 16 01 20 02 01 20	2001 02 20
To Keypad	615	Std	40 01 16 02 00 00 00 00	
Keypad reply	595	Std	43 01 16 02 08 05 01 20	2001 05 08

Receive PDO mapping Parameter 1:

- Number of mapped objects: 2;
- Set LED green 1-32: Object 2001h, Sub index 02h, Length 20h;
- Set LED green 33-40: Object 2001h, Sub index 05h, Length 08h

## 39. Object 1602h: Receive PDO mapping Parameter 2

Describes the mapping of red LED blink state PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	02h	CAN Object 1602h
<b>Byte 2</b>	16h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	PDO Mapping Entry 1
	02h	PDO Mapping Entry 2
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 02 16 00 00 00 00 00	
Keypad reply	595	Std	4F 02 16 00 02 00 00 00	2
To Keypad	615	Std	40 02 16 01 00 00 00 00	
Keypad reply	595	Std	43 02 16 01 20 01 02 20	2002 01 20
To Keypad	615	Std	40 02 16 02 00 00 00 00	
Keypad reply	595	Std	43 02 16 02 08 04 02 20	2002 04 08

Receive PDO mapping Parameter 2:

- Number of mapped objects: 2;
- Set LED red blink 1-32: Object 2002h, Sub index 01h, Length 20h;
- Set LED red blink 33-40: Object 2002h, Sub index 04h, Length 08h;

## 40. Object 1603h: Receive PDO mapping Parameter 3

Describes the mapping of green LED blink state PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	03h	CAN Object 1603h
<b>Byte 2</b>	16h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	PDO Mapping Entry 1
	02h	PDO Mapping Entry 2
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 03 16 00 00 00 00 00	
Keypad reply	595	Std	4F 03 16 00 02 00 00 00	2
To Keypad	615	Std	40 03 16 01 00 00 00 00	
Keypad reply	595	Std	43 03 16 01 20 02 02 20	2002 02 20
To Keypad	615	Std	40 03 16 02 00 00 00 00	
Keypad reply	595	Std	43 03 16 02 08 05 02 20	2002 05 08

Receive PDO mapping Parameter 3:

- Number of mapped objects: 3;
- Set LED green blink 1-32: Object 2002h, Sub index 02h, Length 20h;
- Set LED green blink 33-40: Object 2002h, Sub index 05h, Length 08h;

## 41. Object 1604h: Receive PDO mapping Parameter 4

Describes the mapping of Indicator LED brightness PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	04h	CAN Object 1604h
<b>Byte 2</b>	16h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	PDO Mapping Entry 1
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 03 16 00 00 00 00 00	
Keypad reply	595	Std	4F 03 16 00 01 00 00 00	1
To Keypad	615	Std	40 03 16 01 00 00 00 00	
Keypad reply	595	Std	43 03 16 01 08 02 03 20	2003 01 08

Receive PDO mapping Parameter 4:

- Number of mapped objects: 1;
- Set Indicator LED brightness: Object 2003h, Sub index 01h, Length 08h



## 42. Object 1605h: Receive PDO mapping Parameter 5

Describes the mapping of Backlight brightness PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	05h	CAN Object 1605h
<b>Byte 2</b>	16h	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	PDO Mapping Entry 1
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 03 16 00 00 00 00 00	
Keypad reply	595	Std	4F 03 16 00 01 00 00 00	1
To Keypad	615	Std	40 03 16 01 00 00 00 00	
Keypad reply	595	Std	43 03 16 01 08 02 03 20	2003 02 08

Receive PDO mapping Parameter 5:

- Number of mapped objects: 1;
- Set Backlight brightness: Object 2003h, Sub index 02h, Length 08h

## 43. Object 1800h:

### a) Transmit PDO Communication Parm 0

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	00h	CAN Object 1800h
<b>Byte 2</b>	18h	
<b>Byte 3</b>	00h	Highest sub-index supported
	01h	COB Id
	02h	Transmission Type
	05h	Event Timer
<b>Byte 4,7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 00 18 00 00 00 00 00	
Keypad reply	595	Std	4F 00 18 00 05 00 00 00	5
To Keypad	615	Std	40 00 18 01 00 00 00 00	
Keypad reply	595	Std	43 00 18 01 95 01 00 40	4000 195h
To Keypad	615	Std	40 00 18 02 00 00 00 00	
Keypad reply	595	Std	4F 00 18 02 FE 00 00 00	FEh
To Keypad	615	Std	40 00 18 05 00 00 00 00	
Keypad reply	595	Std	4B 00 18 05 00 00 00 00	0 = OFF

Transmit PDO communication Parm 0:

- Highest sub-index supported: 5;
- Address base: 195h=180h+ NODE ID;
- Transmission Type: FEh;
- Event timer: XXYY in milliseconds, 0 = OFF.

## b) Set periodic state transmission

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	2Bh	Set device register
<b>Byte 1</b>	00h	CAN Object 1800h
<b>Byte 2</b>	18h	
<b>Byte 3</b>	05h	Sub index
<b>Byte 4</b>	YYh	YYh: Event timer period in LSByte milliseconds
<b>Byte 5</b>	XXh	XXh: Event timer period in MSByte milliseconds
<b>Byte 5, 7</b>	00h	Not used

Event timer period: XXYYh (from 000Ah to FFFFh: 10ms to 65534 milliseconds).

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	2B 00 18 05 00 00 00 00	Switch off the periodic transmission
Keypad reply	595	Std	60 00 18 05 00 00 00 00	
To Keypad	615	Std	2B 00 18 05 32 00 00 00	Set period = 50ms
Keypad reply	595	Std	60 00 18 05 00 00 00 00	
To Keypad	615	Std	2B 00 18 05 F4 01 00 00	Set period = 500ms
Keypad reply	595	Std	60 00 18 05 00 00 00 00	

## 44. Object 1A00h Transmit PDO Mapping Parameter

Describes the mapping of KEY state PDO Message.

<b>Identifier</b>	615h (600h + current CAN ID)	
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	00h	CAN Object 1A00h
<b>Byte 2</b>	1Ah	
<b>Byte 3</b>	00h	Number of mapped objects
	01h	PDO Mapping Entry 1
<b>Byte 4,7</b>	00h	Not used

Examples:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	40 00 1A 00 00 00 00 00	
Keypad reply	595	Std	4F 00 1A 00 01 00 00 00	1
To Keypad	615	Std	40 00 1A 01 00 00 00 00	
Keypad reply	595	Std	43 00 1A 01 10 01 00 20	2000 01 10

Transmit PDO Mapping Parameter:

- Number of mapped objects: 1;
- Switch state: Object 2000h, Sub index 01h, Length 10h;

## 45. Object 2200h: Serial number string

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	40h	Read Device Register
<b>Byte 1</b>	00h	CAN Object 2200h
<b>Byte 2</b>	22h	
<b>Byte 3,7</b>	00h	Not used

1° additional byte

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	60h	Read Device Register second byte
<b>Byte 1, 7</b>	00h	Not used

2° additional byte

<b>Identifier</b>	600h + current CAN ID	Default 615h
<b>Byte 0</b>	70h	Read Device Register third byte
<b>Byte 1, 7</b>	00h	Not used

Example:

Direction	Identifier	Format	Message	Data
To Keypad	615	Std	41 00 22 00 00 00 00 00	
Keypad reply	595	Std	41 00 22 00 08 00 00 00	
To Keypad	615	Std	60 00 00 00 00 00 00 00	
Keypad reply	595	Std	00 46 46 46 46 46 46 46	FFFFFFF
To Keypad	615	Std	70 00 00 00 00 00 00 00	
Keypad reply	595	Std	1D 46 00 00 00 00 00 00	F

Serial number: ascii FFFFFFFF

## 46. Set CAN protocol

This set of messages are used to change to the desired CANbus protocol.

- Change from CANopen to J1939:

Direction	Identifier	Format	Message	Data
To Keypad	615h	Std	2B FF 20 01 01	Change to J1939

- Change from J1939 to CANopen:

Direction	Identifier	Format	Message	Data
To Keypad	18EF2100h	Ext	04 1B 80 00 FF FF FF FF	Change to CANopen

## APPENDIX: DEMO Mode instructions

In DEMO Mode you can try the following functions by pressing buttons on the PK1400.

Entering this mode, you turn on key-LEDs with color red.

For the key 1, each time you press the button you can change the color of key-LEDs with this sequence:

1. Green;
2. Color 03\* ;
3. Color 04\*\* ;
4. OFF.

For the key 4, each time that you press the button, there are different steps in this sequence:

1. Complete LED show of all colors: at first with red, then green, color 03\* , and at the end color 04\*\* ;
2. Turning on/off each single key-LED with the possibility to change color pressing key 1;
3. Pause step 2;
4. Return to the starting demo mode state.

If you press the other keys, you have no effect.

## 47. Revision history

Date	Manual Revision	Comment	Related SW version
20/06/2016	1.0	Preliminary	-
12/07/2016	1.1	Added PDO 400h and 500h. Updated examples for the object 2000h. Added object 2001h, 2002h, 2003h, 2014h, 2015h, 20FFh.	1.0
20/03/2017	1.2	New software release with protocol change message.	2.0
14/03/2018	1.3	New version: <ul style="list-style-type: none"><li>• Added set CAN PROTOCOL command</li><li>• Added demo mode instructions</li><li>• Corrected messages of objects 1400h, 1401h, 1402h, 1403h</li><li>• Added objects 1604h, 1605h</li></ul>	x.x

\* Obtained by mixing red at 50% and green at 100%

\*\* Obtained by mixing red at 25% and green at 100%