

Technical manual for

# HP9642

CAN bus keypad & LED

Firmware version 2.4

## Table of content

1) DIP switch.....	3
2) CAN bus protocol.....	3
2.1) Setup.....	3
2.1.1) General setup: .....	3
2.1.2) Night/Day brightness control. ....	3
2.2) Keys.....	4
2.3) Keys, sequence.....	4
3) LED .....	5
3.1) Firmware version 1.xx .....	5
3.2) Firmware version 2.xx .....	5

## 1) DIP switch

- Switch 1 Off = Backlight default On \*) See note.
- Switch 1 On = Backlight default Off \*) See note.
- Switch 2 Off = CAN bus speed= 1000 kbit/s.
- Switch 2 On = CAN bus speed= 500 kbit/s.

Note: Backlight setting may be overwritten by CAN setup message.

## 2) CAN bus protocol

### 2.1) Setup

Default CAN bus ID = 0x450

Byte 0 select between different setup functions.

#### 2.1.1) General setup:

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Setup number = 0 or 1							
1	Backlight PWM: 0= No change, 1= Off, 2..255.							
2	Light intensity for green LED (PWM): 0= No change, 15..255.							
3	Light intensity for red LED (PWM): 0= No change, 15..255.							
4								
5								
6								
7								

#### 2.1.2) Night/Day brightness control.

Dedicated CAN message for setting fixed LED PWM values (brightness) for day/night mode.

##### **CAN bus ID= 0x72F**

##### **Data byte 0 = 09 set brightness for day mode:**

Backlight PWM set to 100  
Green LED PWM set to 90  
Red LED PWM set to 65

##### **Data byte 0 = 04 set brightness for night mode:**

Backlight PWM set to 20  
Green LED PWM set to 25  
Red LED PWM set to 18

## 2.2) Keys

Default CAN bus ID = 0x451

Byte	Bit 7 128	Bit 6 64	Bit 5 32	Bit 4 16	Bit 3 8	Bit 2 4	Bit 1 2	Bit 0 1
0	M-key 8	M-key 7	M-key 6	M-key 5	M-key 4	M-key 3	M-key 2	M-key 1
1	M-key 16	M-key 15	M-key 14	M-key 13	M-key 12	M-key 11	M-key 10	M-key 9
2	Sequence A			M-key 21	M-key 20	M-key 19	M-key 18	M-key 17
3	T-key 8	T-key 7	T-key 6	T-key 5	T-key 4	T-key 3	T-key 2	T-key 1
4	T-key 16	T-key 15	T-key 14	T-key 13	T-key 12	T-key 11	T-key 10	T-key 9
5	Sequence B			T-key 21	T-key 20	T-key 19	T-key 18	T-key 17
6	Sequence D				Sequence C			
7	Version number, major (1).				Version number, minor (1).			

## 2.3) Keys, sequence

Default CAN bus ID = 0x452

Byte	Bit 7 128	Bit 6 64	Bit 5 32	Bit 4 16	Bit 3 8	Bit 2 4	Bit 1 2	Bit 0 1
0	Sequence key 4-A		Sequence key 3-A		Sequence key 2-A		Sequence key 1-A	
1	Sequence key 8-A		Sequence key 7-A		Sequence key 6-A		Sequence key 5-A	
2	Sequence key 12-A		Sequence key 11-A		Sequence key 10-A		Sequence key 9-A	
3	Sequence key 4-B		Sequence key 3-B		Sequence key 2-B		Sequence key 1-B	
4	Sequence key 8-B		Sequence key 7-B		Sequence key 6-B		Sequence key 5-B	
5	Sequence key 12-B		Sequence key 11-B		Sequence key 10-B		Sequence key 9-B	
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0

Sequence A:

Press	Decimal	Binary
#1	1	0 1
#2	2	1 0
#3	0	0 0

Sequence B:

Press	Decimal	Binary
#1	1	0 1
#2	3	1 1
#3	0	0 0

### 3) LED

#### 3.1) Firmware version 1.xx

Default CAN bus ID for green LED = 0x454

Default CAN bus ID for red LED = 0x455

Byte	Bit 7 128	Bit 6 64	Bit 5 32	Bit 4 16	Bit 3 8	Bit 2 4	Bit 1 2	Bit 0 1
0	Key 8	Key 7	Key 6	Key 5	Key 4	Key 3	Key 2	Key 1
1					Key 12	Key 11	Key 10	Key 9
2								
3								
4								
5								
6								
7								

#### 3.2) Firmware version 2.xx

LED status are controlled by logical OR from CAN messages received on ID:

- 0x454
- 0x455

LED is switch off when CAN signal change from 1 to 0, or after a 5 second timeout.

Byte	Bit 7 128	Bit 6 64	Bit 5 32	Bit 4 16	Bit 3 8	Bit 2 4	Bit 1 2	Bit 0 1
0	Green 8	Green 7	Green 6	Green 5	Green 4	Green 3	Green 2	Green 1
1					Green 12	Green 11	Green 10	Green 9
2	Red 8	Red 7	Red 6	Red 5	Red 4	Red 3	Red 2	Red 1
3					Red 12	Red 11	Red 10	Red 9
4	Green 8	Green 7	Green 6	Green 5	Green 4	Green 3	Green 2	Green 1
5					Green 12	Green 11	Green 10	Green 9
6	Red 8	Red 7	Red 6	Red 5	Red 4	Red 3	Red 2	Red 1
7					Red 12	Red 11	Red 10	Red 9

Note: This implementation is in most cases backward compatible with version 1.xx firmware.