



HP ELECTRONIK

Technical manual for

HP9642

CAN bus keypad & LED

Firmware version 1.0



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Please note: This manual is for Firmware 1.0, to upgrade your existing HP9642 Panel, Please Contact us.

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.



1) CAN bus protocol

1.1) Setup

Default CAN bus ID = 0x450

Byte 0 select between different setup functions.

1.1.1) General setup:

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Setup number = 1							
1	Backlight PWM: 0..255							
2								
3								
4								
5								
6								
7								



1.2) Keys



M=Momentary (On When Pushed)

T= Toggle (On, first push, Off, second Push, On Third Push, Off fourth Push

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								



1.3) Keys, sequence

Default CAN bus ID = 0x452

Sequence A: (First Push One Channel on, Second Push another Channel on, Third Push Both off)

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

Sequence B: (First Push One Channel on, Second Push One more channel on, Third Push Both off)

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

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



2) LED

Controlled by up to 6 CAN bus messages (ID's),

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								

This explains how to setup "Green LED" on the Panel.

The screenshot shows the Powerbox Tool interface with the 'CAN Export' tab selected. The 'BIT SETUP LED GREEN' section is active, displaying a table for CAN data configuration. The CAN ID is set to 0x454. The table maps bits of four data bytes to various vehicle functions.

Channel Output status, If bit = 1 the channel is ON	KEY8 Bit 7	KEY7 Bit 6	KEY6 Bit 5	KEY5 Bit 4	KEY4 Bit 3	KEY3 Bit 2	KEY2 Bit 1	KEY1 Bit 0
Data Byte 0	Windscreen Heat	Wiper HS	Servo	Fuel HP	Alternator MAG	Starter Relay	+15 IGN ECU	Window UP
Data Byte 1	DISABLED	DISABLED	DISABLED	DISABLED	High Beam Right	Fog rear	Rearlight L+R	Aux Led
Data Byte 2	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED
Data Byte 3	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED



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This explains how to setup "Red LED" on the Panel.

Powerbox Tool - [No Name]

File Connection Tools Help

General Diagnostic Inputs CAN Inputs Virtual Inputs **CAN Export** Outputs Flash Low Battery Start Button Low Current Socket info

CAN Export 1 | CAN Export 2 | CAN Export 3 | CAN_Export 4

Enable

Channel ERROR bit, if bit = 1 the channel is in error state

BIT SETUP LED RED

CAN ID: 0x 455

Refresh: 100 msec

CAN data	KEY8 Bit 7	KEY7 Bit 6	KEY6 Bit 5	KEY5 Bit 4	KEY4 Bit 3	KEY3 Bit 2	KEY2 Bit 1	KEY1 Bit 0
Data Byte 0	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	Starter Relay	+15 IGN ECU	Window UP
CAN data	Bit 7	Bit 6	Bit 5	Bit 4	KEY12 Bit 3	KEY11 Bit 2	KEY10 Bit 1	KEY9 Bit 0
Data Byte 1	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED
CAN data	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data Byte 2	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED
CAN data	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data Byte 3	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED



3) Examples:

These examples shows how to setup a button for Fan – stage 1 of (2). Used with sequence A.

First push one channel is on, Second Push another channel is on, and First channel is off.

Third Push – Both Channels is off.

Used with Button number 8 in the panel.

The screenshot shows the configuration window for 'CSW8SQA#1-Heat'. On the left, a 'CAN Input Configuration' list includes items like 'CAN Fuel', 'CAN Pit', 'CAN MOVE', 'CAN MAP SW', 'CAN DONT KNOW', 'CAN TPS', 'CSW1 IGN', 'CSW2 Engine', 'CSW3 Start', 'CSW4 Change', 'CSW5 Fuel', 'CSW6 Servo', 'CSW7 Wiper', 'CSW8 Heat', 'CSW9 Aux', 'CSW10 Light', 'CSW11 Rain Li', 'CSW12 Aux Light', 'CSW8SQA#1-Heat', and 'CSW8SQA#2-Heat'. The 'CAN bit rate' is set to '1 Mbit/s'. The 'General' tab is active, showing 'No CAN data: Set Off'. The 'ON parameter' section has 'CAN ID' '0x452' and 'Data' '0 Lo 2 3 4 5 6 7 & 84'. The 'OFF parameter' section has 'CAN ID' '0x452' and 'Data' '0 Lo 2 3 4 5 6 7 |& 84'. At the bottom, 'Enable CAN via Input' is checked, and 'CAN switching enabled if input is active' is unchecked, with 'SW1 Ignition' selected in the dropdown.

This screen dump explains step 2 of (2).

The screenshot shows the configuration window for 'CSW8SQA#2-Heat'. The 'CAN Input Configuration' list is scrolled down to show 'CSW8SQA#1-Heat', 'CSW8SQA#2-Heat', 'CSW10SQB#1-Ligh', and 'CSW10SQB#2-Ligh'. The 'CAN bit rate' is '1 Mbit/s'. The 'General' tab is active, showing 'No CAN data: Set Off'. The 'ON parameter' section has 'CAN ID' '0x452' and 'Data' '0 Lo 2 3 4 5 6 7 & 128'. The 'OFF parameter' section has 'CAN ID' '0x452' and 'Data' '0 Lo 2 3 4 5 6 7 |& 128'. At the bottom, 'Enable CAN via Input' is checked, and 'CAN switching enabled if input is active' is unchecked, with 'SW1 Ignition' selected in the dropdown.



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These examples shows how to setup a button for Light – stage 1 of (2). Used with sequence B.
First push one channel is on, Second Push one more channel is on, and First channel stays on
Third Push – Both Channels is off.

Used with Button number 10 in the panel.

The screenshot shows the 'CAN Input Configuration' window for 'CSW10SQB#1-Ligh'. The 'CAN bit rate' is set to 1 Mbit/s. The 'CAN Input Configuration' list on the left includes various CAN signals, with 'CSW10SQB#1-Ligh' selected. The 'General' tab is active, showing 'No CAN data: Set Off'. The 'ON parameter' section has 'CAN ID' 452 and 'Data' 0 1 2 3 4 Lo 6 7 & 4. The 'OFF parameter' section has 'CAN ID' 452 and 'Data' 0 1 2 3 4 Lo 6 7 |& 4. The 'Enable CAN via Input' section has 'CAN switching enabled if input is active' checked and 'SW1 Ignition' selected.

This example is explaining step 2 (2).

The screenshot shows the 'CAN Input Configuration' window for 'CSW10SQB#2-Ligh'. The 'CAN bit rate' is set to 1 Mbit/s. The 'CAN Input Configuration' list on the left includes various CAN signals, with 'CSW10SQB#2-Ligh' selected. The 'General' tab is active, showing 'No CAN data: Set Off'. The 'ON parameter' section has 'CAN ID' 452 and 'Data' 0 1 2 3 4 Lo 6 7 & 8. The 'OFF parameter' section has 'CAN ID' 452 and 'Data' 0 1 2 3 4 Lo 6 7 |& 8. The 'Enable CAN via Input' section has 'CAN switching enabled if input is active' checked and 'SW1 Ignition' selected.



List of Parameters:

Parameters to set the inputs from switch panel – Momentary is = ON WHEN PRESSED

SW1 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 1

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 1

SW2 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 2

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 2

SW3 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 4

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 4

SW4 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 8

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 8

SW5 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 16

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 16

SW6 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 32

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 32

SW7 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 64

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 64



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SW8 Momentary:

ON PARAMETER: CAN ID: 451 Data: 0=LO & 128

OFF PARAMETER: CAN ID: 451 Data: 0=LO !& 128

SW9 Momentary:

ON PARAMETER: CAN ID: 451 Data: 1=LO & 1

OFF PARAMETER: CAN ID: 451 Data: 1=LO !& 1

SW10 Momentary:

ON PARAMETER: CAN ID: 451 Data: 1=LO & 2

OFF PARAMETER: CAN ID: 451 Data: 1=LO !& 2

SW11 Momentary:

ON PARAMETER: CAN ID: 451 Data: 1=LO & 4

OFF PARAMETER: CAN ID: 451 Data: 1=LO !& 4

SW12 Momentary:

ON PARAMETER: CAN ID: 451 Data: 1=LO & 8

OFF PARAMETER: CAN ID: 451 Data: 1=LO !& 8



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Parameters to set inputs from switch panel – Toggle is = ON with first press – OFF with second press – ON with third press – OFF with fourth press etc.

SW1 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 1

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 1

SW2 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 2

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 2

SW3 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 4

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 4

SW4 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 8

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 8

SW5 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 16

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 16

SW6 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 32

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 32

SW7 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 64

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 64



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SW8 Toggle:

ON PARAMETER: CAN ID: 451 Data: 3=LO & 128

OFF PARAMETER: CAN ID: 451 Data: 3=LO !& 128

SW9 Toggle:

ON PARAMETER: CAN ID: 451 Data: 4=LO & 1

OFF PARAMETER: CAN ID: 451 Data: 4=LO !& 1

SW10 Toggle:

ON PARAMETER: CAN ID: 451 Data: 4=LO & 2

OFF PARAMETER: CAN ID: 451 Data: 4=LO !& 2

SW11 Toggle:

ON PARAMETER: CAN ID: 451 Data: 4=LO & 4

OFF PARAMETER: CAN ID: 451 Data: 4=LO !& 4

SW12 Toggle:

ON PARAMETER: CAN ID: 451 Data: 4=LO & 8

OFF PARAMETER: CAN ID: 451 Data: 4=LO !& 8