J1939 USER MANUAL

PKU SERIES KEYPAD

SW V1.7

THE POWERKEY ULTIMATE RANGE:

PKU1000
PKU1400
PKU1200M
PKU1200Mi
PKU1500M
PKU1800M
PKU2200
PKU2200M
PKU2300M
PKU2400
PKU2400M
PKU2600M
PKU2800M
PKU3500M

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POWERKEY ULTIMATE RANGE *(15mm Inserts)*

PKU1200M

PKU1200Mi

PKU1500M

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PKU2800M

PKU3500M

POWERKEY ULTIMATE RANGE *(24mm Inserts)*

PKU2200

PKU2400

POWERKEY ULTIMATE RANGE *(Laser Etched Rubber)*

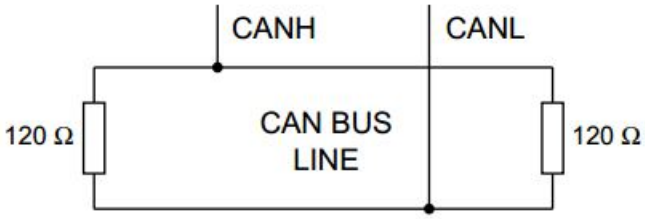
PKU1000

PKU1400

DEUTSCH PIN CONNECTION:

J1939 KEYPAD PIN-OUT:

PIN	WIRE COLOUR	FUNCTION
1	GREEN	+12/24VDC
2	YELLOW	GROUND
3	BLACK	CAN H
4	RED	CAN L



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

WARNING: To avoid breakage do not over tighten the backshell nuts - Torque Maximum 7+/- 1in.lbs

MOUNT ON A FLAT SURFACE ONLY

Nut Size*:	10-32 UNF S/S
Washer Sizes:	M5 Spring Washer S/S, M5 Flat Washer S/S
Torque Maximum:	7 +/- 1 in. lbs

***DO NOT USE NYLOC NUTS**

1. DEFAULT KEYPAD SETTINGS:

Setting	Default Value
Baud Rate	250kbps
Source Address	21h
Periodic Message	Disabled
Start -Up Flash	Normal
LED Acknowledgement	Disabled
Event Status Transmission	Enabled
Start -Up Backlight Brightness	00h(Off)
Start -Up Backlight Colour	White
Start -Up Primary LED Dim Level	3Fh (100%)

2. J1939 COMMANDS:

2.1 Key Status:

Type: Transmitted by module
ID: 18EFFF21 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x01 (Keypad Contact Status)
Byte #3: Keys #01 - #32
Byte #4: Contact State (0x00 = Switch OFF, 0x01 = Switch ON)
Byte #5: Keypad Identifier (Valid range 0x00 to 0xFD)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

*Note: Refer to Key Identifier on Page 17

Example:

	CAN ID	Format	Length	Message	Description
From Keypad	18EFFF21	Ext	8	D3 98 01 01 01 21 FF FF	Switch #1 in Keypad (Address-21h) is pressed
From Keypad	18EFFF21	Ext	8	D3 98 01 01 00 21 FF FF	Switch #1 in Keypad (Address-21h) is Released

2.2 LED Command:

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x01 (LED Command)
Byte #3: LED Number
Byte #4: LED State
Byte #5: Keypad Identifier (Valid range 0x00 to 0xFD)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

*Note: Refer to LED Identifier on Page 17

LED State:			
0x00 – Off	0x01 – Red	0x02 – Blink Red	0x03 – Alt Blink Red
0x04 – Green	0x05 – Blink Green	0x06 – Alt Blink Green	0x07 – Amber
0x08 – Blink Amber	0x09 – Alt Blink Amber	0x0A – Blue	0x0B – Blink Blue
0x0C – Alt Blink Blue	0x0D – Cyan	0x0E – Blink Cyan	0x0F – Alt Blink Cyan
0x10 - Magenta	0x11 - Blink Magenta	0x12 - Alt Blink Magenta	0x13 - White
0x14 - Blink White	0x15 - Alt Blink White		

Example:

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 01 01 01 21 FF FF	LED #1 in Keypad (Address-21h) is Turned RED
To Keypad	18EF2100	Ext	8	D3 98 01 01 02 21 FF FF	LED #1 in Keypad (Address-21h) is Blinking RED

2.3 LED Dim Level:

Type: Received by module
ID: 18EF2100 (0x21 is the De fault Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x02 (LED Dim Level Command)
Byte #3: Dim Level (0x00 - 0x3F -> 0100 %, default = 0x3F (100%))
Byte #4: 0xFF (Not Us ed)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 02 32 FF FF FF FF	Set Led Dim level to 50%
To Keypad	18EF2100	Ext	8	D3 98 02 63 FF FF FF FF	Set Led Dim level to 100%

2.4 Backlight Brightness Level :

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte#0 : 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x03 (Backlight brightness Level Command)
Byte #3: Backlight brightness Level (0x00 - 0x3F -> 0100 %, default = 0x00 (0%))
Byte #4: 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 03 32 FF FF FF FF	Set Backlight brightness level to 50%
To Keypad	18EF2100	Ext	8	D3 98 03 63 FF FF FF FF	Set Backlight brightness level to 100%

2.5 Set ECU Source Address :

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x70 (Source Address Command)
Byte #3: New Source Address (Available ranges are: 0x01 to 0x0F and 0x11 to 0xF0)
Byte #4: 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 70 32 FF FF FF FF	Set Keypad ECU address to 0x32

2.6 Periodic Status Transmission

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x71 (Periodic Status Transmission Command)
Byte #3: Periodic Status Transmission Flag (0x00 = [Off, Disabled, Reset] , 0x01 = [On, Enabled, Set])
Byte #4: 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 71 01 FF FF FF FF	Set Periodic Status Flag

2.7 Event Status Transmission:

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x72 (Event Status Transmission Command)
Byte #3: Event Status Transmission (0x00 = [Off, Disabled, Reset] , 0x01 = [On, Enabled, Set])
Byte #4: 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example:

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 72 00 FF FF FF FF	Event Status Transmission is Disabled

2.8 LED Acknowledgement :

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2 0x73 (LED Acknowledgement Command)
Byte #3: LED Acknowledge (0x00 = [Off, Disabled, Reset] , 0x01 = [On, Enabled, Set])
Byte #4 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 73 01 FF FF FF FF	LED Acknowledge is Enabled

2.9 CAN Address Claim At Boot:

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2 0x74 (CAN Address Claim At Boot Command)
Byte #3 Address Claim Enable (0x00 = [Off, Disabled, Reset] , 0x01 = [On, Enabled, Set])
Byte #4 0xFF (Not Used)
Byte #5 0xFF (Not Used)
Byte #6 0xFF (Not Used)
Byte #7 0xFF (Not Used)

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 74 01 FF FF FF FF	CAN Address claim is enabled

2.10 Heartbeat Message:

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x75 (Heart beat Message Command)
Byte #3: Heart beat Enable (0x00 = [Off, Disabled, Reset] , 0x01 = [On, Enabled, Set])
Byte #4: Heartbeat Time Period (0x05 to 0x FF – Min . value is 5 (50ms) Max is 255-0xFF (2.55 sec))
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example:

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 75 01 05 FF FF FF	Enable Heartbeat Message with 50ms Time period

2.11 Heartbeat Generated Message Format :

Type: Transmitted by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0: 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0xF9 (Heart beat Message)
Byte #3: Message Counter (0x00 to 0x FF – Increments for e ach message sent)
Byte #4: Button State Indicat or
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

*This Message is transmitted by the keypad when Heart Beat message is enabled

Example :

	CAN ID	Format	Length	Message	Description
From Keypad	18EFFF21	Ext	8	D3 98 F9 1B 03 FF FF FF	Heartbeat message with button #1 and #2 are pressed

2.12 Periodic Key Message Period

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0: 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x77 (Periodic Key Message Period Command)
Byte #3: Time Period (0x05 to 0x FF – Min . value is 5 (50ms) Max is 255-0xFF (2.55 sec))
Byte #4: 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 77 05 FF FF FF FF	Set the Periodic Key Message to 50ms

2.13 Demo Mode:

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x7A (Demo mode Command)
Byte #3: Demo Mode Enable (0x00 = [Off, Disabled, Reset] , 0x01 = [On, Enabled, Set])
Byte #4: 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example:

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 7A 01 FF FF FF FF	Enable Demo Mode

2.14 Start-Up Backlight Brightness Level:

Type: Received by module
ID: 18EF2100 (0x21 is the Default Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x7B (Start -up Backlight brightness Level Command)
Byte #3: Start -up Backlight brightness Level (0x00 - 0x3F -> 0100 %, default = 0x00 (0%))
Byte #4: 0xFF (Not Used)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example:

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 7B 32 FF FF FF FF	Set Start-up Backlight brightness level to 50%
To Keypad	18EF2100	Ext	8	D3 98 7B 63 FF FF FF FF	Set Start-up Backlight brightness level to 100%

2.15 Start-Up LED Dim Level:

Type: Received by module
ID: 18EF2100 (0x21 is the De fault Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x7C (Start-up LED Dim Level Command)
Byte #3: Start-up Dim Level (0x00 - 0x3F -> 0100 %, default = 0x3F (100%))
Byte #4: 0xFF (Not Us ed)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Example:

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 7C 32 FF FF FF FF	Set Start-up Led Dim level to 50%
To Keypad	18EF2100	Ext	8	D3 98 7C 63 FF FF FF FF	Set Start-up Led Dim level to 100%

2.16 Backlight Colour:

Type: Received by module
ID: 18EF2100 (0x21 is the De fault Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0x7D (Backlight Color Command)
Byte #3: Backlight Color
Byte #4: 0xFF (Not Us ed)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

Backlight Colour			
0x00 – Red	0x01 – Green	0x02 – Amber	0x03 – Blue
0x04 – Magenta	0x05 – Cyan	0x06 – White	--

Example :

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 7D 01 FF FF FF FF	Set Backlight Color to Green

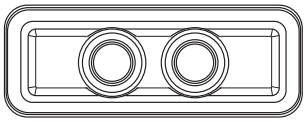
2.17 Enter Boot Mode:

Type: Received by module
ID: 18EF2100 (0x21 is the De fault Source Address)
Length: 8 Bytes
Byte #0 0xD3 (Header Byte 1)
Byte #1: 0x98 (Header Byte 2)
Byte #2: 0xF0 (Boot Mode Command)
Byte #3: 0xFF (Not Us ed)
Byte #4: 0xFF (Not Us ed)
Byte #5: 0xFF (Not Used)
Byte #6: 0xFF (Not Used)
Byte #7: 0xFF (Not Used)

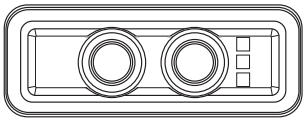
Example:

	CAN ID	Format	Length	Message	Description
To Keypad	18EF2100	Ext	8	D3 98 F0 FF FF FF FF FF	Set the Keypad in Boot Mode

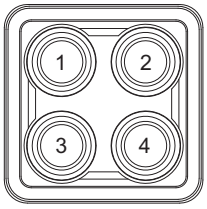
KEY & LED IDENTIFIER



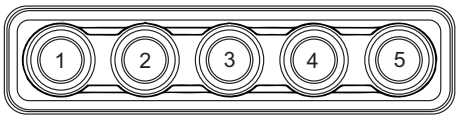
PKU1200M



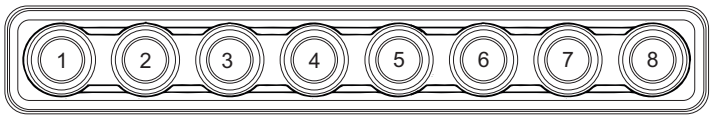
PKU1200Mi



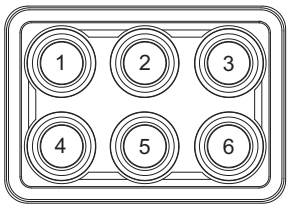
PKU2200M



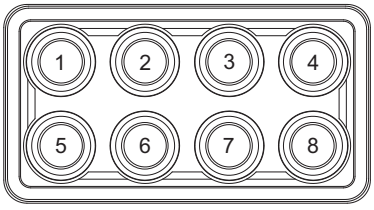
PKU1500M



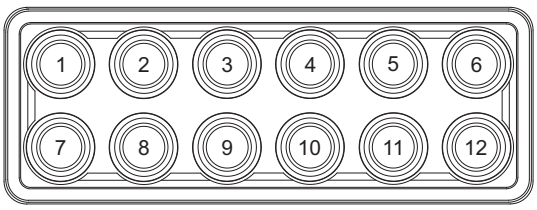
PKU1800M



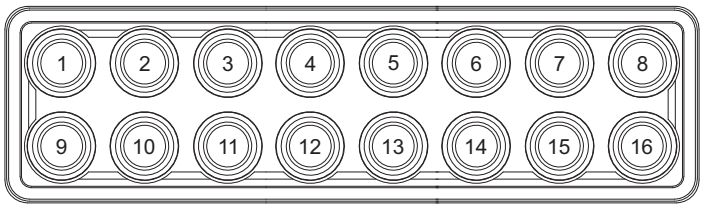
PKU2300M



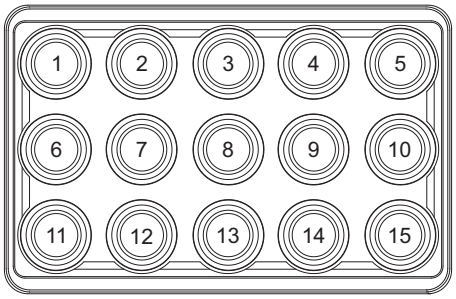
PKU2400M



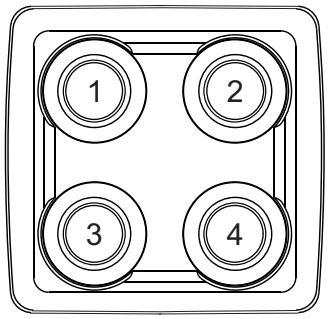
PKU2600M



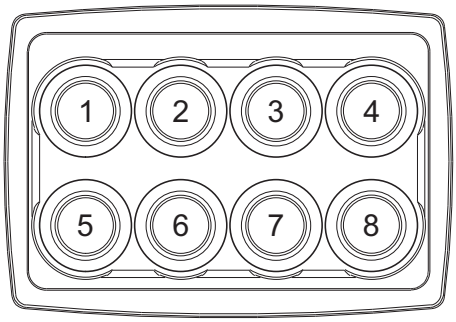
PKU2800M



PKU3500M

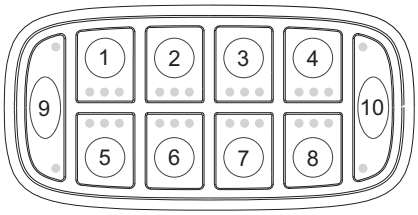


PKU2200

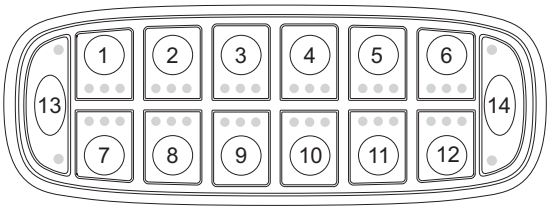


PKU2400

KEY IDENTIFIER

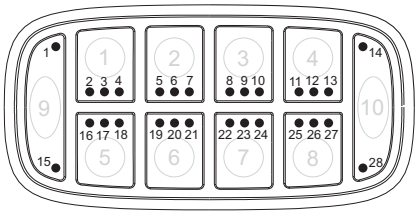


PKU1000

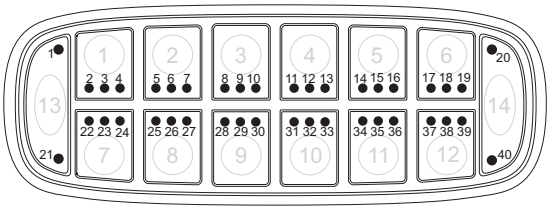


PKU1400

LED IDENTIFIER



PKU1000



PKU1400

REVISION HISTORY

Date	Version	Comment	Compatible SW Version
9/09/21	1.0	Document Created	Version 1.7