

PWRM17225

Installation/User Guide

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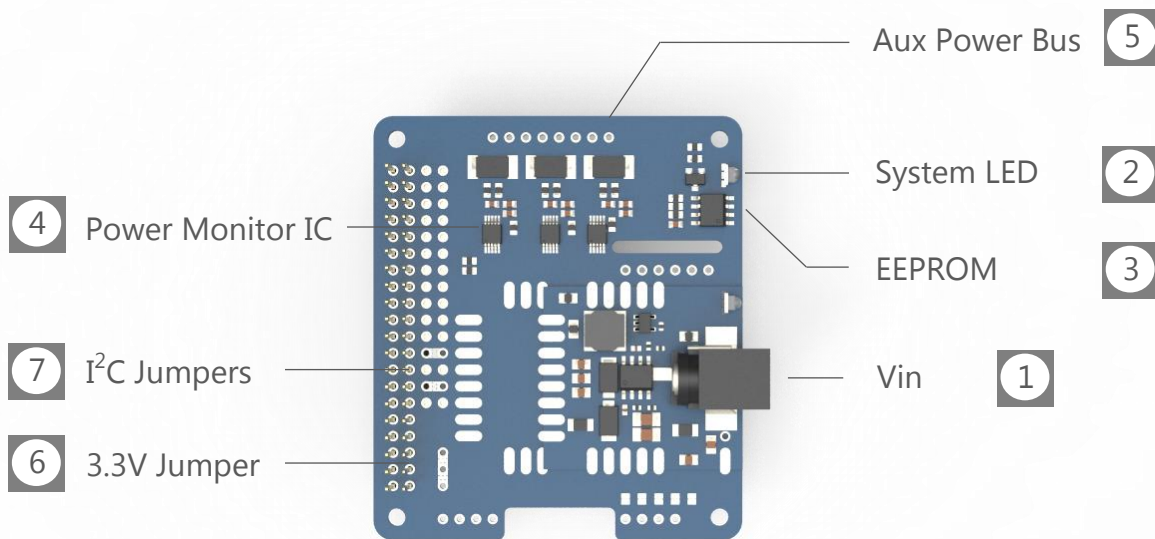
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OVERVIEW

The PWRM17225 family of power modules is designed to supply DC power output at multiple voltage levels and over a wide input range. Its main power output provides 5Vdc into the 40 pin header pinout defined by the Raspberry Pi®. It also incorporates an 8 pin power bus that supplies the same 5Vdc, Vout (direct connection to Vin) and 3.3Vdc.



- 1 Vin – 2.1mm x 5.5mm center positive DC barrel jack (7.5 – 36Vdc).
- 2 System LED – connected to pin 22 (GPIO25) of 40 pin header.
- 3 EEPROM – ID EEPROM connected to pin 27 (ID_SD) and pin 28 (ID_SC).
- 4 Power Monitor IC – INA226 Current and Power Monitor I2C
- 5 Power Bus – symmetrical multi-voltage auxiliary power
- 6 3.3V option jumper
- 7 I²C option jumpers

CONFIGURATION

There are several jumper options on the PWRM17225 module that enable various options. See Table 1 for a list of the configuration options.

Table 1 Configuration Jumpers

Option	States	Description
3V3 Jumper	RPI_3V3	This selects the SBC 3.3V as the source for the 3.3V circuits on this module and the Aux Power Bus 3V3 conductors (Default setting)
	PS_3V3	This selects the PWRM17225* 3.3V as the source for the 3.3V circuits on this module and the Aux Power Bus 3V3 conductors
I ² C Jumpers (2)	Connected	Connects the 40 pin header I ² C1 pins directly to the monitor ICs (Default setting)
	Unconnected	Disconnects the I2C bus from the monitoring ICs

* Only available on the PWRM17225-20W module

NOTE: Jumpers can be connected using a 0.100 in. header connector (not provided) or adding a wire to the provided holes to form a bridge jumper.

! WARNING: DO **NOT** jumper the RPI_3V3 and PB_3V3 connections simultaneously. This could damage the PWRM17225 and the SBC.

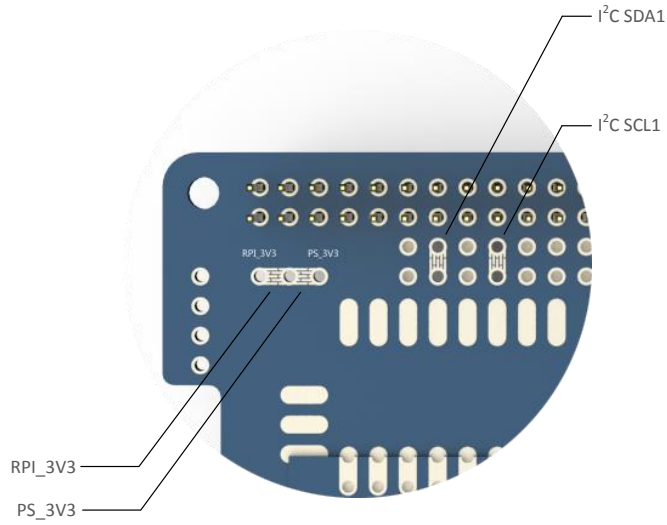
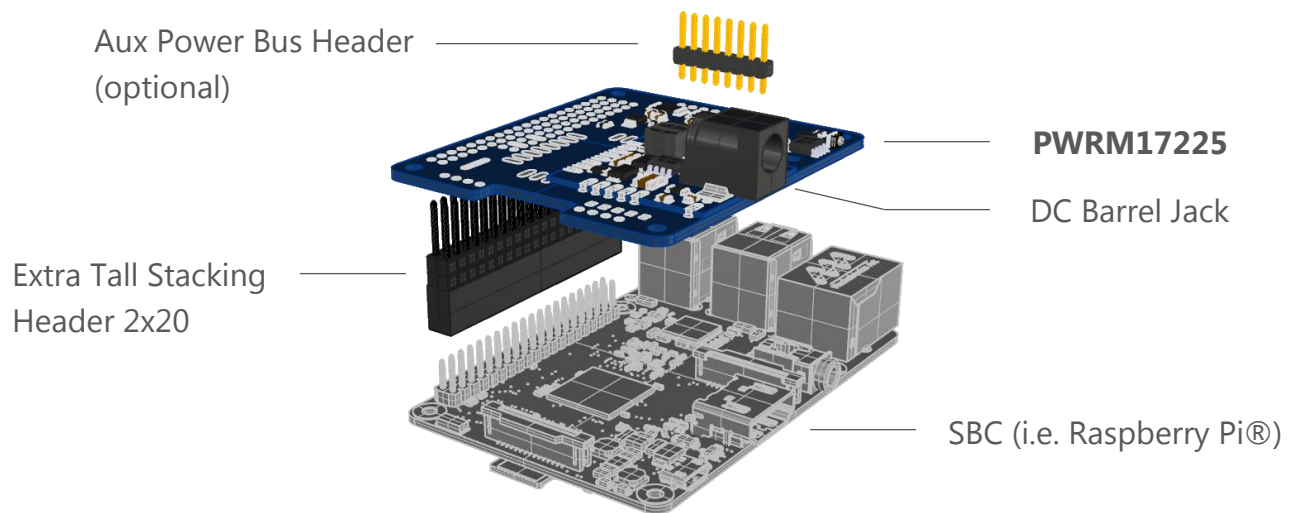


Figure 1 Jumpers

INSTALLATION



Before installing the PWRM17225 check that the jumpers (solder bridges) are configured to the desired functionality.

To install the PWRM17225 onto a SBC –

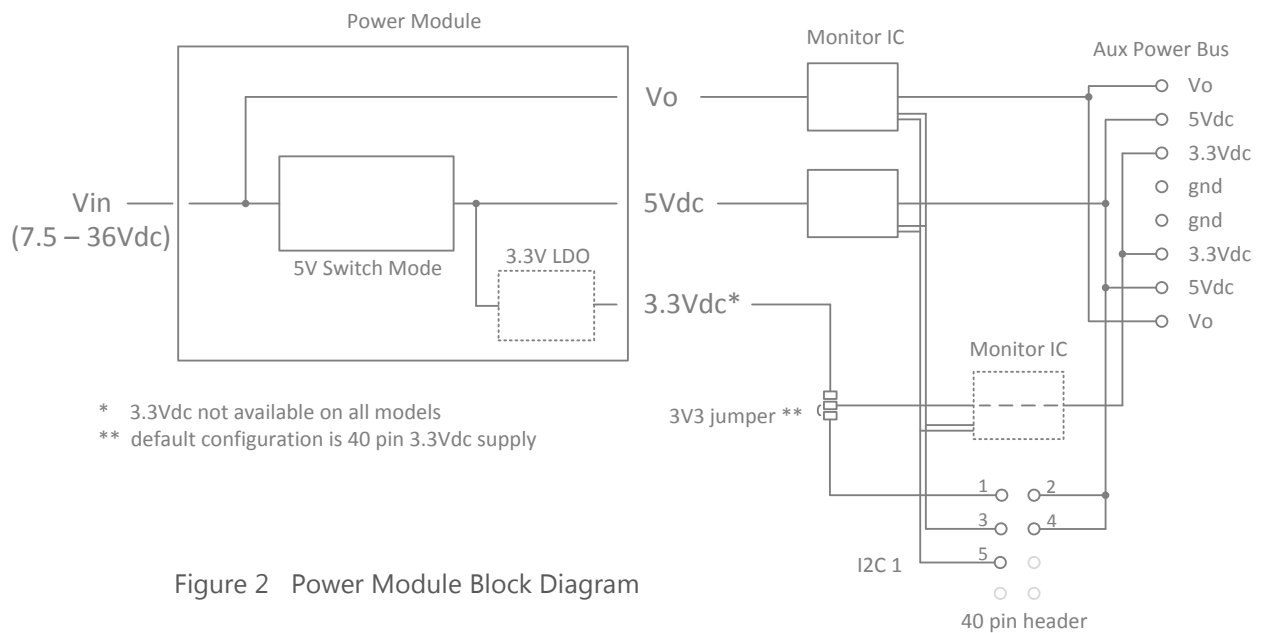
- Solder the 40 pin stacking header onto the PWRM17225
- Solder the 8 pin auxiliary power bus header onto the PWRM17225 if additional power connections are needed.
- Insert the SBC into the stacking connector of the PWRM17225
- Plug power adapter into PWRM17225 DC Barrel jack (2.1mm x 5.5mm positive center 7.5 – 36Vdc)

NOTE: An external power supply capable of supplying $\geq 20\%$ additional power than required should be used to ensure enough power is provided to the SBC system including all connected peripheral devices.

It should also comply with relevant regulations and standards applicable in the country of intended use.

OPERATION

Input power is passed directly to the auxiliary power bus (Vo), converted to provide 5Vdc through a switch mode buck DC to DC converter and then converted to 3.3Vdc through a linear regulator* as shown in Figure 2.



The 3V3 jumper is provided to select the source of the 3.3Vdc for the power module circuits and any additional circuits powered from the auxiliary power bus. The SBC can power all 3.3V circuits or, if available, the power module can provide this power.

The 5Vdc power output is diode protected, but the 3.3Vdc and Vo outputs are not protected.

NOTE: Additional output protection for the power monitoring devices is recommended when powering inductive loads from the auxiliary power bus.

Table 2 Model vs Power Capability

Model	5V	3V3*	Vo
PWRM17225 – 10W	2.0 (A _{max})	-	4.0 (A _{max})
PWRM17225 – 20W	3.5 (A _{max})	0.8 (A _{max})	4.0 (A _{max})

* 3.3V source is not available on all models

Aux Power Bus

The Auxiliary Power Bus is designed to provide additional power to other add-on modules at various voltages.

The 3.3Vdc and 5Vdc outputs are intended to power additional digital logic and analog circuits while the Vo output is intended for interface circuits or powering other devices attached to the SBC system.

The Vo output is connected directly to the Vin port which provides added flexibility for a particular application. If the external application requires 12Vdc simply use a 12Vdc source to power the PWRM17225 and it will generate the 3.3Vdc and 5Vdc plus provide 12Vdc at the Vo output. The PWRM17225 is designed for an input range from 7.5Vdc to 36Vdc.

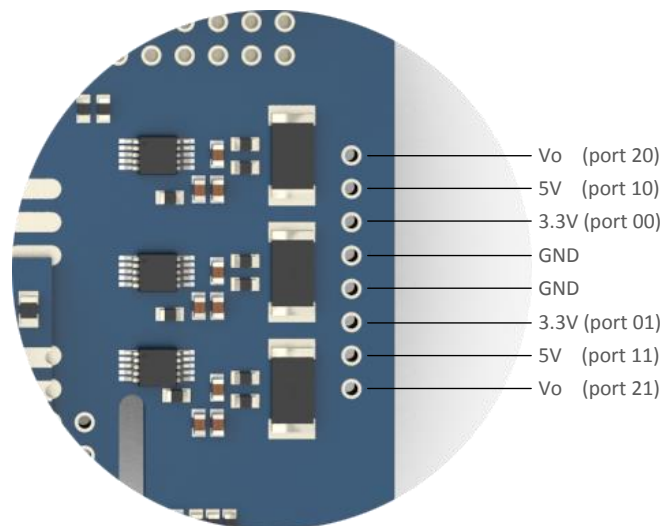


Figure 3 Aux Power Bus Pinout

Monitoring

As shown in the diagram all current flows through the monitoring circuits to the 40 pin header and the auxiliary power bus. This allows the SBC (i.e. Raspberry Pi®) to monitor overall power consumed at any time plus all power consumed by other circuits powered from the auxiliary power bus.

It should be noted that the overall power consumption of the SBC can be monitored, but this only includes the 5Vdc main input power. It is not possible to monitor the 3.3Vdc consumed internally by the SBC individually, but it is included in the 5Vdc power.

Each power monitoring IC has a unique I²C address as defined in Table 3.

Table 3 Power Monitoring I²C Addr

Vo	5V	3V3*
0x40	0x41	0x44

Detailed specifications and programming instructions can be found in the latest INA226 data sheet.

SOFTWARE

Software is available to read the current and voltage for each of the power ports on the PWRM17225 and display it in a standard modern web browser.

To download the software go to the following link and look for PWRM17225.

<http://www.made-systems.com/resources.html>

MECHANICAL

Dimensions (mm)

