



7929 SW Burns Way
Suite B
Wilsonville, OR

Phone: 503 344-5085
Fax: 503 682-9014
sales@rinehartmotion.com

PM100 User Manual Gen3 Features

Revision 0.1



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Revision History

Version	Description of Versions / Changes	Responsible Party	Date
0.1	Initial version	Azam Khan	8/3/2011
0.2	Additional description of changes	Chris Brune	1/8/2013

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1. Introduction

RMS has introduced a change to the PM100 family. There has been an upgrade to the feature set of the circuit boards used in the PM100 family.

The PM100 uses 3 main circuit boards. All of the circuit boards within the PM100 have been changed to incorporate these upgrades. In addition the connections between the circuit board have been changed to allow for easier manufacturing.

Every effort has been made to make these changes as transparent to the user as possible. The hardware has built in features to allow the firmware to automatically determine what type of hardware is connected. The GUI displays a notice about the type of hardware as either G2 or G3.

The new style PM100 is referred to a Gen3, the previous units are referred to as Gen2. Generally units beginning with a serial number of 371 are Gen3.

The new Gen3 PM100 units have following changes:

- (a) Different number of RTDs
- (b) Resolver excitation level can be adjusted
- (c) Additional Digital Inputs
- (d) Additional Analog Inputs
- (e) Added an Analog Output
- (f) Hardware based over-voltage detection
- (g) Additional Relay Outputs
- (h) Added future capability to use a Hall Encoder

The above changes may require the user to set up these options properly through the GUI.

To assist with the firmware configuration there is also a hardware version (HW Version) parameter stored with the EEPROM parameters. This HW Version tells the firmware some additional information about the hardware.

Model	Gen2 HW Version	Gen3 HW Version
PM100DX	2342	23450
PM100DZ	2344	23455
PM100DXR	2345	23452



1.1 Setting up RTDs:

In the new Gen3 units, there are only two RTDs available instead of five as previously. The two available RTDs are RTD1 and RTD2. These RTDs are now configurable to select either a 100 Ohms RTD or a 1000 Ohms RTD through a GUI parameter, RTD_Select_Command_(BITS_1_0).

The new RTD1 is connected to the same connector pins as Gen2 RTD4. The new RTD2 is connected to the same connector pins as Gen2 RTD5. For motor types that use an RTD the motor temperature sensing is automatically changed to read from RTD1 and RTD2 for Gen3 units. The only motor types that were using RTDs were only using RTD4 and RTD5 on Gen2 units thus it does not require any harness changes to change to a Gen3 unit.

Following GUI parameters can be used to configure and confirm the set up of RTD1 and RTD2:

Parameter	Description
RTD_Select_Command_(BITS_1_0)	This parameter is used to select values for the two RTDs as follows: Bit 0: Configures RTD1 Bit 1: Configures RTD2 Set this parameter to one of the following values to select the desired configuration for RTD1 and RTD2: 0: RTD1 = 1K Ohms RTD2 = 1K Ohms 1: RTD1 = 100 Ohms RTD2 = 1K Ohms 2: RTD1 = 1K Ohms RTD2 = 100 Ohms 3: RTD1 = 100 Ohms RTD2 = 100 Ohms
RTD_1_Select_Output_Status	This is the hardware output pin that shows the status of RTD1 configuration. 0: RTD1 is selected for 1K Ohm 1: RTD1 is selected for 100 Ohm
RTD_2_Select_Output_Status	This is the hardware output pin that shows the status of RTD2 configuration. 0: RTD2 is selected for 1K Ohm 1: RTD2 is selected for 100 Ohm
RTD_1_Selected_Value_(Ohms)	This parameter can be used for additional confirmation of RTD1 selection. This shows the value of RTD1



	as either 100 or 1K based on the chosen configuration.
RTD_2_Selected_Value_(Ohms)	This parameter can be used for additional confirmation of RTD2 selection. This shows the value of RTD2 as either 100 or 1K based on the chosen configuration.

1.2 Resolver Excitation Level:

New Gen3 units are equipped with 8 different resolver excitation levels. The 8 levels are configured using a 3 bit command. Not all excitation levels can be used with all resolver configurations. The PM100 firmware will automatically set the correct excitation level hence it is not necessary for the user to change this configuration. The following information is only provided so that the user is aware of the process in case this configuration has to be changed.

Following GUI parameters can be used to configure excitation filter for the resolver:

Parameter	Description
Exc_Filter_Command_(BITS_2_1_0)	This parameter is used to select values for the three Excitation Filter outputs as follows: Bit 0: Configures 'Excitation Filter 1' Bit 1: Configures 'Excitation Filter 2' Bit 2: Configures 'Excitation Filter 3' Set this parameter to a value between 0 and 7. Any value above 7 will reset the parameter back to 0. The default value for this parameter is 5.
EXC_Filter_1_Output_Status	0: The output is 0 1: The output is 1
EXC_Filter_2_Output_Status	0: The output is 0 1: The output is 1
EXC_Filter_3_Output_Status	0: The output is 0 1: The output is 1



1.3 Additional Inputs and Outputs:

RMS has not currently defined any software functionality for the additional inputs and outputs. RMS in the future may expand the software to use this additional functionality.

The additional signals are connected to pins in such a way that they should not require any harness changes.

Pin #	Gen2 Signal	Gen2 Description	Gen3 Signal	Gen3 Description
J1-4	RTD1	1000 Ohm RTD Input	AOUT	Analog Output (0 – 5V)
J1-16	RTD2	1000 Ohm RTD Input	AIN6	Analog Input 6 0-5V _{FS}
J1-27	RTD3	1000 Ohm RTD Input	RLY6	High-side Relay Driver
J1-18	<reserved>	DO NOT CONNECT	AIN5	Analog Input 5 0-5V _{FS}
J1-29	<reserved>	DO NOT CONNECT	RLY5	High-side Relay Driver
J1-32	<reserved>	DO NOT CONNECT	DIN7	Digital Input 7 - STB
J1-10	<reserved>	DO NOT CONNECT	DIN8	Digital Input 8 - STB

1.4 Hardware Over-voltage Detection:

RMS has added an additional hardware over-voltage detection feature. This feature will detect if the DC bus voltage exceeds a certain threshold (~ 425V for PM100DX, ~ 850V for PM100DZ). This fault is logically ORed into the Hardware Gate Fault. Thus the Hardware Gate Fault can occur for either a IGBT Gate Driver fault or for a hardware detected DC Bus over-voltage.

If the DC Bus over-voltage is detected it will automatically latch off all IGBTs via hardware (does not require software to be operational).

1.5 Hall Encoder:

RMS has added the ability in hardware to connect a hall encoder. At this time RMS is not supporting the hall encoder via software. Contact RMS if hall encoder support is required.

Pin #	Gen2 Signal	Gen2 Description	Gen3 Signal	Gen3 Description
J2-5	<reserved>	DO NOT CONNECT	HALL_A	Hall Encoder Chan. A
J2-13	<reserved>	DO NOT CONNECT	HALL_B	Hall Encoder Chan. B
J2-20	<reserved>	DO NOT CONNECT	HALL_C	Hall Encoder Chan. C