PowerXL

RAMO5/RASP5 Firmware

Firmware Release Note





Powering Business Worldwide

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1 V1.04 RAMO5 Change Notification – 15.07.2020

Existing Version 1.02 (RAMO5), initial version
New Version 1.04 (RAMO5)

1. **P5-05, P5-06 maximum limit changed**
   Maximum limit of P5-05 and P5-06 now changes to 2.

2. **P5-06 default value changed to 2**
   Default value of P5-06 is changes from 1 (motor power) to 2 (digital input status).

3. **P5-07, P5-08 hidden by default**
   Parameter P5-07 and P5-08 are now hidden by default.

4. **Fix P1-13=4 RAMO-W reset function**
   The missing REV run hand auto switch reset function added.

5. **ASi reset function update**
   ASi bits DQ0 and DQ1 together are used for fault/trip reset control. If both bits change from 0 to 1, reset will be issued. Both bits must change back to 0 at same time after reset before any valid run command can be accepted.

6. **Key switch reset function change**
   In previous release: If drive is tripped and Key switch is in zero/reset position, reset request will be issued every 1s. In new release: If Key switch changed from any other position to Zero/Reset, a manual reset action will be carried out immediately once. Then if Key switch maintain in Zero/Reset position, then the routine 1s reset interval will be active as normal.

7. **Fault LED flash control**
   In previous release: If drive is tripped, fault LED (red) will be constantly on.

   In new release: If drive tripped with sensor short circuit fault, thermistor fault or ambient over temperature fault, and fault condition is no longer exist, fault LED will flash instead of constantly on

8. **(PS) Ignore trip from IO board**
   In previous release: After user removes power supply and device will trip U-Volt, if the power is restored immediately, the trip code from IO board (Such as PTC-F) will be ignored. In new release: this bug is fixed.

2 V1.04 RASP5 Change Notification – 15.07.2020

Existing Version 1.02 (RASP5), initial version
New Version 1.04 (RASP5)

1. **Minimum current limit changed**
   Minimum current limit in P-08 has been changed to 10% of drive rated.

2. **P5-05, P5-06, P5-07 and P5-08 maximum limit changed**
   Maximum limit of P5-05 and P5-06 now changes to 3.

   P5-07 maximum limit changes to 1 and P5-08 limit changes to 0.

3. **P5-06 option 0 function change and default option changed**
   P5-06 option 0 now represents motor output torque in percentage.

   Default value of P5-06 now changes to 3.

4. **Add new parameter P5-11 for ASi command configuration**
   A new parameter P5-11 is added in this release. Range from 0 to 2 with default value 0.

   For default option 0, speed selection bits combination has been redefined (bit swapped)

   If P5-11 = 0:

	DQ0	DQ1	DQ2	DQ3
No controller enable	0	0		
FWD running	1	0		
REV running	0	1		
No controller enable	1	1		
Fixed frequency 0			0	0
Fixed frequency 1			1	0
Fixed frequency 2			0	1
Fixed frequency 3			1	1

If P5-11 = 1:

	DQ0	DQ1	DQ2	DQ3
No controller enable	0			
FWD running	1			
Fixed frequency 0		0	0	0
Fixed frequency 1		1	0	0
Fixed frequency 2		0	1	0
Fixed frequency 3		1	1	0
Fixed frequency 4		0	0	1
Fixed frequency 5		1	0	1
Fixed frequency 6		0	1	1
Fixed frequency 7		1	1	1

Note that if P5-10 is set (DQ3 is not used), then DQ1 and DQ2 will be used to select 4 preset speed as:

	DQ1	DQ2
Fixed frequency 0	0	0
Fixed frequency 1	1	0
Fixed frequency 2	0	1
Fixed frequency 3	1	1

If P5-11 = 2:

	DQ0	DQ1	DQ2	DQ3
No controller enable	0			
FWD running	1			
Normal Ramp (P1-03/04)		0		
2nd Ramp (P2-11/13)		1		
Fixed frequency 0			0	0
Fixed frequency 1			1	0
Fixed frequency 2			0	1
Fixed frequency 3			1	1

Note that if P5-10 is set (DQ3 is not used), then DQ2 will be used to select 2 preset speed: Fixed frequency 0 (DQ2=0) or Fixed frequency 1 (DQ2=1)

Ramp selection only works when Key switch in Auto mode.
ASi bits DQ0 and DQ1 together can be used as fault/trip reset control. If both bits change from 0 to 1, reset request will be issued. Both bits must change back to 0 at same time after reset before any valid run command can be accepted.

5. **P6-04 definition change**
   The current limit in P6-04 now reference to drive rated current instead of motor rated current (P1-08).

6. **P4-01 upper limit change**
   The upper limit for P4-01 changes from 100.0% to 200.0%

7. **Key switch reset function change**
   In previous release: If drive is tripped and Key switch is in zero/reset position, reset request will be issued every 1s.
   In new release: If Key switch changed from any other position to Zero/Reset, a manual reset action will be carried out immediately once. Then if Key switch maintain in Zero/Reset position, then the routine 1s reset interval will be active as normal.

8. **Fault LED flash control**
   In previous release: If drive is tripped, fault LED (red) will be constantly on.
   In new release: If drive tripped with sensor short circuit fault, thermistor fault or ambient over temperature fault, and fault condition is no longer exist, fault LED will flash instead of constantly on

9. **(PS) Bugfix in dc current injection**
   Fixed error that effectively disabled dc current injection at start and stop.

10. **(PS) Ignore trip from IO board**
    In previous release: After user removes power supply and device will trip U-Volt, if the power is restored immediately, the trip code from IO board (Such as PTC-F) will be ignored.
    In new release: this bug is fixed.

11. **(PS) P6-04 refers to drive rated current rather than motor rated current**
    In previous release: P6-04 refers to motor rated current.
    In new release: P6-04 refers to drive rated current.

12. **(PS) Bugfix in under-torque protection.**
    Under-torque protection is enabled as soon as speed reference is higher than > 5.0Hz, drive trips when actual torque (not current) is lower than under-torque setting for more than 20.0s.

3 V1.05 RAMO5 Change Notification – 22.10.2021

Existing Version 1.04 (RAMO5)
New Version 1.05 (RAMO5)

1. **Reduce the change over time from Ext-24V mode to normal operation**
   In previous release, when drive is powered by external 24V (e.g. ASi) already and mains supply is provided later, it will take about 3.2s for drive to enter normal operation.
   In this new release, the change over time has been reduced to about 2s.

2. **Add P1-13 function support in 'AUTO' mode for Ethernet/Profinet**
   In previous release, the auto mode operation when P-13 >1 is not fully implemented for Ethernet/Profinet operation as per ASi network.

   In this new release, function has been added with the following definition:

   PLC command off means: control word has no Run command (bit 0 = 0) or Fast stop is active (bit 5 = 1) or Coast stop is active (bit 3 = 1)

5 V1.05 RASP5 Change Notification – 22.10.2021

Existing Version 1.04 (RASP5)
New Version 1.05 (RASP5)

1. **Reduce the change over time from Ext-24V mode to normal operation**
   In previous release, when drive is powered by external 24V (e.g. ASi) already and mains supply is provided later, it will take about 3.2s for drive to enter normal operation.
   In this new release, the change over time has been reduced to about 2s.

2. **Add P1-13 function support in 'AUTO' mode for Ethernet/Profinet**
   In previous release, the auto mode operation when P-13 >1 is not fully implemented for Ethernet/Profinet operation as per ASi network.

   In this new release, function has been added with the following definition:

   PLC command off means: control word has no Run command (bit 0 = 0) or Fast stop is active (bit 5 = 1) or Coast stop is active (bit 3 = 1)

   FF1 Reset: FWD = control word direction bit clear (bit 1 = 0), REV = control word direction bit set (bit 1 = 1)

3. **Disable negative speed reference from Ethernet/Profinet**
   All speed reference via fieldbus Ethernet/Profinet should be positive, negative speed reference value will be rejected for RASP now.

4. **Default parameter value changes**
   New default value has been given to the following parameters

   P6-02 = 100%

   P6-03 = 0.025s

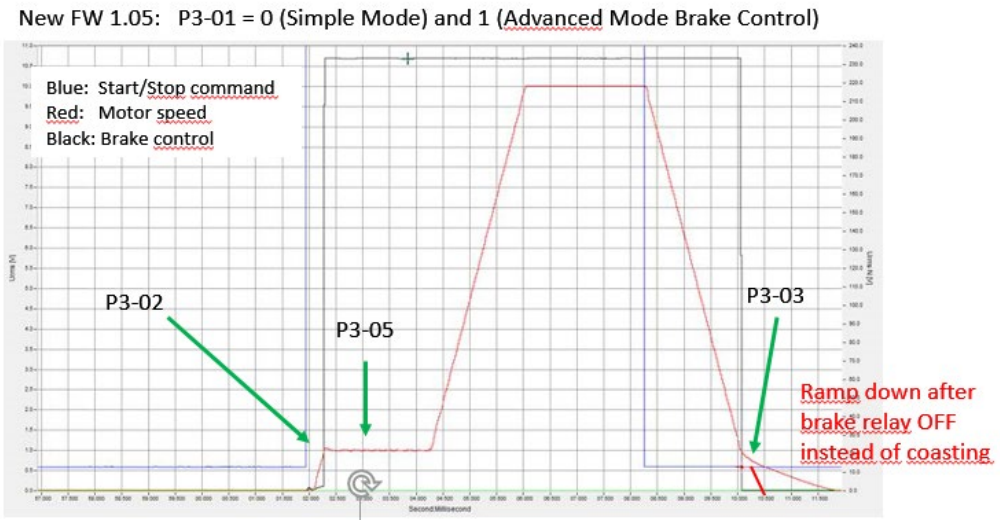
   P6-15 = 2.5%

   P6-17 = 0

   P6-14 default value as shown in table below:

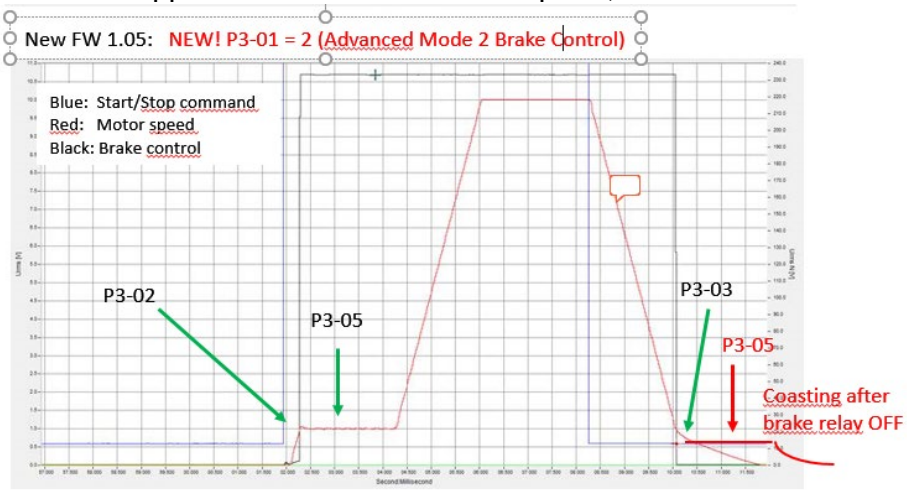
Power rating	0.75kW	1.1kW	1.5kW	2.2kW	3.0kW	4kW
P6-14 default	15ms	20ms	25ms	35ms	50ms	75ms

5. **Change in Advanced Mode Brake Control (P3-01 = 1)**
   Drive will now ramp to stop (R2S) rather than coast to stop (C2S) after receiving a STOP! Command and arriving at brake apply speed (P3-03)



6. **Added New Advanced Mode 2 Brake Control Option (P3-01 = 2)**
   A new option has been added to P3-01 for advanced brake control (P3-01=2).

   After receiving a STOP! command, drive will ramp down to Brake Apply Speed (P3-03) and remain at this speed for the time specified on P3-05 waiting for the motor brake to be applied. After this time has expired, drive will coast to stop (C2S).



6 V1.06 RAMO5 Change Notification – 01.05.2023

Existing Version 1.05 (RAMO5)
New Version 1.06 (RAMO5)

1. **Change to the limit switch trigger and reset logic**
   The limit switch trigger and reset logic has been changed to make it compatible with RAMO4.
   Main difference is the reset handling when both FWD and REV limit switches are triggered in the same travel cycle.

2. **ASi sensor status bit logic same as terminal input regardless of P3-06 and P3-07 setup**
   In this new release, ASi sensor status bit will reflect true sensor terminal input status regardless P3-06 and P3-07 setup.

7 V1.06 RASP5 Change Notification – 01.05.2023

Existing Version 1.05 (RASP5)
New Version 1.06 (RASP5)

1. **Add ASi Parameter Access**
   Add ASi read parameter support (10 bytes): Motor current, Motor voltage, Drive temperature and Run time

2. **Add P2-38 for ramp resolution selection**
   If P2-38 = 1, then P1-03, P1-04, P2-11, P2-13 and P0-62 ramp time have two decimal place resolution. Range will be reduced to 0.00s to 300.00s

   If P2-38 = 0, then ramp resolution stays with 1 decimal place resolution as all previous release.

   Note that ramp parameter internal value will not be changed by P2-38.

8 V1.07 RASP5 Change Notification – 12.05.2023

Existing Version 1.06 (RASP5)
New Version 1.07 (RASP5)

1. **Add Parameter P5-12 Fieldbus Start Mode**
   A new parameter P5-12 has been added for fieldbus start control.

   Default is 0, the fieldbus start operation will be same as all previous firmware release.

   When set P5-12 to 1, an effective edge-r start sequence is required under following conditions:

   a) When drive is powered up for the first time or recover from external 24V mode.
   b) When drive is tripped and reset back to normal condition
   c) When Key switch is switch to the “Auto” for the first time
   d) When drive STO input is closed from open condition

   When edge-r is active, start command can only be accepted after stop command is received from external fieldbus master device.

9 V1.07 RAMO5 Change Notification – 24.05.2024

Existing Version 1.06 (RAMO5)
New Version 1.07 (RAMO5)

1. **Add Parameter P5-12 Fieldbus Start Mode**
   A new parameter P5-12 has been added for fieldbus start control.

   Default is 0, the fieldbus start operation will be same as all previous firmware release.

   When set P5-12 to 1, an effective edge-r start sequence is required under following conditions:

   a) When drive is powered up for the first time or recover from external 24V mode.
   b) When drive is tripped and reset back to normal condition
   c) When Key switch is switch to the “Auto” for the first time

   When edge-r is active, start command can only be accepted after stop command is received from external fieldbus master device.

2. **Add handling support for power stage watchdog reset**
   Handling support for power stage reset has been added in this release. See also point 4.

3. **(PS) Fix bug – RAMO ignores RUN command if reverse command is received immediately after run command**
   In previous firmware, If a REVERSE command is received by RAMO immediately (around 40ms) after RUN command, RAMO will ignore the RUN command, unless RAMO is powered off and powered on again.

   In current firmware, this bug is fixed.

4. **(PS) Change – Reduce U-Volt trip level following requirement from Eaton**
   In previous firmware, if the input voltage to RAMO is low, but not lower than the allowed input voltage range, drive may trip U-Volt.

   In current firmware, the U-Volt trip level is reduce to 380Vdc from 400Vdc.

5. **(PS) Add watchdog for power stage firmware**
   Power stage firmware will restore the control automatically if power stage firmware halts due to certain reasons.

10 V1.08 RAMO5 Change Notification – 29.04.2025

Existing Version 1.07 (RAMO5)
New Version 1.08 (RAMO5)

1. **Reduce U-Volt trip level**
   Reduce the under voltage trip level of DC bus voltage to 375V DC, this will help with scenario when input voltage is low.

11 V1.09 RAMO5 Change Notification – 22.05.2026

Existing Version 1.08(RAMO5)
New Version 1.09 (RAMO5)

1. **Improve shutdown indication timing**
   The SYM_400V_S2_DISPLAY_OFF threshold has been changed from 375 to 1500. As a result, the flag now becomes active when the DC bus voltage passes through approximately 371.70 V, rather than approximately 92.9 V.

   This provides an earlier indication of a shutdown event to the IO processor, allowing it to respond sooner during rapid DC bus collapse conditions.

2. **Use unfiltered DC bus value for shutdown indication**
   The SYM_400V_S2_DISPLAY_OFF flag is now assessed against the unfiltered U_DC_Bus value instead of U_DC_Bus_Filtered.

   This removes the delay introduced by the DC bus filtering and allows the shutdown indication flag to be sent to the IO processor more quickly.

3. **Improve parameter synchronisation between IO and PS processors**
   A new function, Send_Mes99_Check(), has been incorporated to guarantee parameter synchronisation between the IO and PS processors before operation can commence.

   This ensures that the required operating parameters are correctly synchronised before the drive is allowed to run.

4. **Prevent false undervoltage trips during start commands**
   The mntr_V_Init function has been updated to accept an argument that differentiates between start-up initialisation and start command handling.

   This prevents the U_DC_Bus_Filtered accumulator from being reinitialised during start commands, removing the identified root cause of false undervoltage trips under specific operating conditions.

12 V1.08 RASP5 Change Notification – 10.08.2026

Existing Version 1.07 (RASP5)
New Version 1.08 (RASP5)

1. **Change under voltage trip level**
   In new firmware, the under voltage (U-Volt) trip level is reduced to 305V from 320VDC.

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10/2026 MZ034006EN

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