

Dear Valued TRINAMIC Customer,

Due to an end-of-life statement from one of our suppliers of components (driver stage transistors (MOSFETs)) we would like to inform you of a hardware change of the following modules:

- **TMCM-1021**
- **PD28-1-1021-TMCL**
- **PD28-3-1021-TMCL**

PCN-2016-01-01 is an updated version of PCN-2013-10-22. New production lots will include hardware changes listed in detail below. If you have any questions, please contact your sales partner.

Hardware changes

In addition to the MOSFETs a number of improvements have been included in the new module based on customer feedback and general technological progress:

- **MOSFETs:** The new driver stage is more powerful (less heat dissipation) than the previous / currently used ones. The module now supports two motor current ranges (up-to 0.7A RMS (same as current version) and up-to 1.4A RMS motor current (new)). Switching between these two ranges can be done in software (lower current range: SAP 179, 0, 1 (default), higher current range: SAP 179, 0, 0). The lower current range (up-to 0.7A RMS / SAP 179, 0, 1) is the default one in order to maintain 100% compatibility in terms of motor current settings. For the lower current range the motor current can be scaled down using TMCL command SAP 6, 0, 0 ... 255 as known from the current version. Same settings will result in same motor current values as with current version. After switching to the higher current range (SAP 179, 0, 0) similar scaling is possible with the high current range, also. Due to the extended current settings the module supports NEMA11 (28mm) bipolar stepper motors using the lower current range and also NEMA17 (42mm) bipolar stepper motors using the higher current range - making it possible to use just one module type in a mixed NEMA11 / NEMA17 system environment (if desired / applicable).
- **RS485 transceiver:** the RS485 transceiver has been replaced with the SN65HVD1781 transceiver offering better fault protection (up-to 70V fault protection) and

supporting more nodes in one network (up-to 255 nodes network with TMCL firmware). The supply voltage of the transceiver IC has been reduced to +3.3V (supported by the transceiver IC) in order to reduce power consumption.

- General purpose outputs OUT0 / OUT1: the driver circuit of the open-drain output MOSFETs has been modified in order to ensure glitch-free power-up. That is, output MOSFETs will not turn briefly on while processor still in reset / not initialized.
- Processor speed: the processor crystal has been changed to 16MHz and the onboard voltage regulator design has been improved in order to allow processor core frequencies of 32MHz (previously 16MHz and 8MHz depending on firmware version)
- Conformal coating of both sides of the PCB. Provides improved protection against humidity and dust / swarf (e.g. in case of the motor mounted versions PD28-x-1021: tiny metal parts on the PCB attracted by the encoder magnet might lead to malfunction of the unprotected device).

Compatibility

Notes on hardware compatibility:

- PCB outline and mounting holes have not been changed
- Position of connectors, signal assignment and type / function of signals have not been changed
- Position and type of LED have not been changed
- The lower motor current setting range (up-to 0.7A RMS) is fully compatible with current TMCM-1021 modules (TMCL and hardware compatible)

Notes on firmware compatibility:

- Starting with firmware version V1.29 new firmware versions for the TMCM-1021 module may be used on new hardware (version V1.4) and also on previous hardware (version V1.2). There is an automatic hardware version detection integrated in the new firmware + bootloader for the new hardware version.
- Old firmware versions cannot be used with new hardware version (mainly due to different processor crystal). If it is absolutely necessary to use an older

firmware version with the new hardware version (without using the new features) please contact TRINAMIC.

- Firmware functionality for hardware version V1.4 remains fully compatible with latest firmware version for V1.2 hardware – that is, TMCL programs for previous hardware versions are expected to operate without any modifications on new hardware version, also.

This improvement is classified as a major change.

Products Affected

Article Name	Affected Article Numbers	NEW Article Numbers
TMCM-1021 (FW 1.19)	10-0230	10-0280
TMCM-1021	10-0204	10-0242
PD28-1-1021-TMCL	30-0149	30-0241
PD28-3-1021-TMCL	30-0180	30-0242

Timing

Trinamic will include changes in new production lots.

Effective date for hardware release	31.01.2016
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This PCN notice should be acknowledged within 30 days. Lack of acknowledgement of PCN within 30 days constitutes acceptance of change.