



## Applied Processor and Measurement, Inc.

### Technical Bulletin TB-0004 – Migrating to the USB version Model 400 PWM Driver / Controller

#### • Summary

The Model 400 PWM Driver / Controller was first released back in 2004. APM, Inc. has re-released the Model 400 with enhanced capability and a USB interface for easy configuration. This technical bulletin describes the changes between the 2004 version (legacy version) of the Model 400 unit and the newly released 2016 version. Also discussed are the migration considerations for using the new Model 400 unit.

Note that while it is preferred that customers migrate to using the new Model 400, **APM, Inc. will continue to offer the legacy Model 400** for RS232 based applications, our existing semi-custom applications, as well as those customers who would be more comfortable with the legacy unit for re-build, repair and replacement on existing installations.

#### • Differences Between the New Model 400 and the Legacy Model 400

- The new Model 400 uses USB with a standard mini-B connector for its communication for configuration and remote interface operation. The legacy unit used RS232 and a non-standard mini-DIN connector.
- The new Model 400 has no 'configuration mode' as on the legacy unit. Changes in settings and configuration are made immediately to the output (for example: changes to the PWM frequency).
- The new Model 400 PWM frequency may be set from 0.08 Hz to 5,000 Hz (the legacy unit PWM operating frequency was 2 to 500 Hz).
- The new Model 400 has a Model 400A option available which provides two analog inputs providing for analog control of both the PWM frequency and duty cycle.
- The new Model 400 may be USB powered for configuration. Therefore, no kit is necessary, no custom cabling or adapter is required. The unit may be USB powered when configuring, no external power supply is required.
- The new Model 400 is a lead-free, RoHS constructed product (the legacy unit is not).

#### • What Has Not Changed Between the new Model 400 and the Legacy Model 400

- **For analog to duty cycle operation, the new Model 400 is form-fit and function compatible with the legacy unit – in this case, the new Model 400 is a drop-in replacement.**
- The unit is packaged in the same enclosure with the same terminal blocks and pin-out. DIN mount packaging is also the same.
- The output drive circuit (MOSFET) configuration, components, output fusing, protection diode and jumper are all the same.
- The analog differential input is the same (fully differential, high common mode rejection). Analog control of duty cycle has the same resolution options (0.2%, 0.5% default, 1.0%).
- The digital input circuitry, voltage range and trigger level is the same.
- The current consumption and operating voltage of the new unit (9 to 24 V DC, 35mA approximate) is the same.
- The order number is the same (see below).
- **There is no change in price and delivery.**



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### • Why Has APM, Inc. Changed the Model 400?

- There are two primary reasons that the Model 400 has been re-designed:
  - o The original unit was designed back in 2002. Parts are not yet formally obsolete, however, some components in the design are not recommended for design and are not in the 'mainstream' of the electronics supply chain. APM, Inc. needed to be ahead of supply issues to continue to best serve our customers.
  - o Since the unit was designed in 2002, there are many new capabilities that may be designed into a new unit, while still maintaining the base price. APM, Inc. will be introducing additional versions of the Model 400 which perform functions such as PWM drive with proportional/current control, and current based peak and hold control.
- PC's with RS232 ports are now non-existent. USB / RS232 dongles are required for configuration of the Model 400 making this process clumsy. The new unit can be configured using a standard PC USB port, a standard USB cable, our interface software and the Model 400 unit. No additional connections or external power source is required. The Model 400 may be USB powered for configuration.
- The new Model 400 has more capability for customer semi-custom applications (2 analog inputs, thermistor input, internal current measurement, faster microcomputer with more memory).

### • What You Need To Do

- If your application uses the Model 400 analog input to control the PWM duty cycle output, you can use the new Model 400 without changing anything in your application.
- You will need to download the new graphical user interface (GUI) configuration tool to be able to configure your new unit with USB (available free on our website). APM, Inc. will also be supplying a free cable with your initial purchase of new unit(s).
- If you use RS232 to control the PWM duty cycle, you have 3 options:
  - o Continue to purchase the legacy Model 400.
  - o Convert your host software to use USB control.
  - o Use the Model 402 PWM Driver / Controller (not a form-fit-function drop-in replacement).
- While the legacy Model 400 is not recommended for new designs, you may continue to use and purchase legacy Model 400 units for your existing applications.

### • Product Support & Notes Regarding the Legacy Model 400

- Documentation for the new Model 400 is available on the APM, Inc. website under the Model 400 web page. This includes updated: datasheet, install guide, User Manual, configuration GUI, USB command reference. Note that there is no longer the need for a kit for the new Model 400, so there is no kit guide.
- Documentation for the Legacy Model 400 is also available on the APM, Inc. website.
- Legacy Model 400 units **will be supported for the life of the units**.
- Legacy Model 400 units **will continue to be available** for purchase.
- Semi-custom legacy Model 400 units will also continue to be available.
- All new semi-custom Model 400 applications will be done on new Model 400 version hardware.



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- Order Numbers, New Model 400 Unit, USB Interface

PWMC-400U	- new Model 400 unit
PWMC-400U-DIN	- new Model 400 unit, DIN mountable
PWMC-400UA	- new Model 400 unit, 2 analog inputs for analog control of PWM duty cycle and frequency
PWMC-400UA-DIN	- new Model 400 unit, 2 analog inputs for analog control of PWM duty cycle and frequency, DIN mountable

- Order Numbers, Accessories

PWMC-A-CB03	- USB cable, USB-A (PC) to USB mini-B (Model 400)
PWMC-A-FS44	- Model 400 output fuses, 4A, fast-blo, package of 10

- Order Numbers, Legacy Model 400 Unit, RS232 Interface

PWMC-400L	- legacy Model 400 unit
PWMC-400L-DIN	- legacy Model 400 unit, DIN mountable
PWMC-400L-KIT	- legacy Model 400 unit kit
PWMC-400L-DIN-KIT	- legacy Model 400 unit kit, with DIN mount unit

(kit includes: 1 legacy Model 400 unit, power adapter, pkg. of 5 output fuses, RS232/miniDIN6 cable)

- Questions?

Further questions the Model 400 may be addressed to Applied Processor and Measurement, Inc. sales or support.

- Contact Information

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