



TECHNICAL SPECIFICATION

Low-Drop - Solid State Flashers

V2.2 Oct. 6, 2011



This specification outlines the mechanical and electrical attributes of:

PM-5100 – Solid State Flasher

12V, 15A, single output, single flash, DOT

PM-5200 – Solid State Flasher

12V, 30A, single output, single flash, DOT

PM-5300 – Solid State Flasher

12V, 30A, single output, selectable flash pattern

PM-5400 – Solid State Flasher

12V, 15A x 2, alternating, 2 output, selectable flash pattern

PM-5124 – Solid State Flasher

24V, 15A, single output, selectable flash pattern

PM-5424 – Solid State Flasher

24V, 6A x 2, alternating, 2 output, selectable flash pattern

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PM-5000 - SOLID STATE FLASHER SPECIFICATION

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1.0.0 Module Description

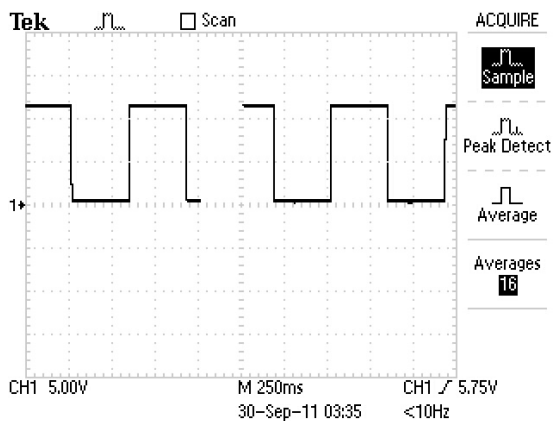
- 1.1.0 The PM-5000 series flasher modules are intended for OEM and aftermarket applications in the automotive, heavy truck, trailer, emergency vehicle, RV and off-road industries. These flashers are designed to replace standard electro-mechanical flashers commonly supplied in OEM applications. PM-5000 series flashers offer extremely low voltage drop, and as a result, can switch high current loads with low case temperatures.
- 1.2.0 The PM-5100, PM-5200 and PM-5300 are designed to be connected in series with a 12 volt lighting circuit to flash a single lamp or a bank of lamps at a predetermined flash rate. Its intended electrical connection is shown in the Product Application Diagram 2.10.2.
- 1.3.0 The PM-5124 is designed to be connected in series with a 24 volt lighting circuit to flash a single lamp or a bank of lamps at a predetermined flash rate. Its intended electrical connection is shown in the Product Application Diagram 2.10.2.
- 1.4.0 The PM-5400 is designed to be connected in series with a 12 volt lighting circuit to alternately flash two warning lights or two banks of warning lights. Its intended electrical connection is shown in the Product Application Diagram 2.10.6.
- 1.5.0 The PM-5424 is designed to be connected in series with a 24 volt lighting circuit to alternately flash two warning lights or two banks of warning lights. Its intended electrical connection is shown in the Product Application Diagram 2.10.6.
- 1.6.0 All PM-5000 series flashers are designed to flash LED and / or incandescent loads.
- 1.7.0 All PM-5000 series flashers utilize software in an embedded microcontroller to create the desired module operation.

2.0.0 Module Operation

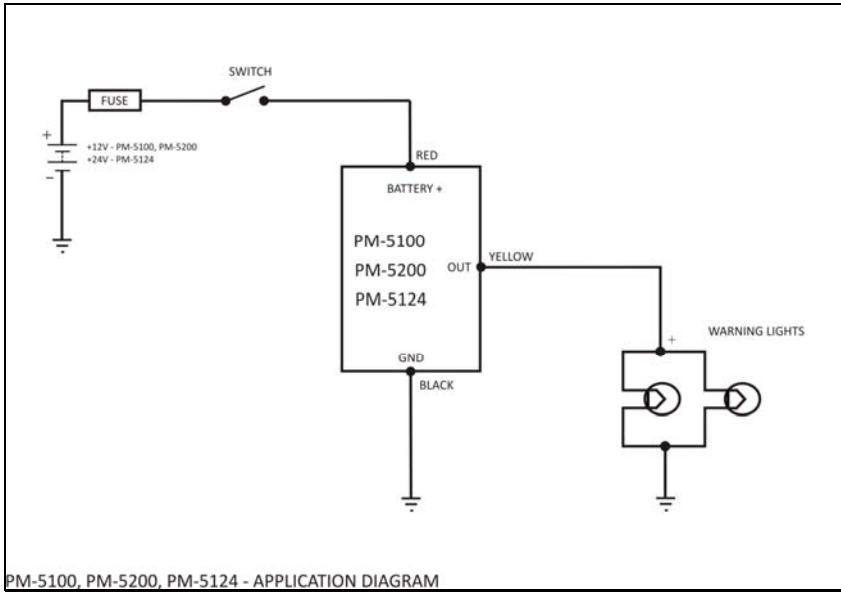
- 2.1.0 PM-5000 series flashers are designed to replace traditional electro-mechanical flashers supplied in OEM applications. In addition, the PM-5300, PM-5400, and PM-5424 offer selectable flash patterns which are utilized in the emergency and warning light markets.
- 2.3.0 PM-5100, PM-5200, PM-5300 flashers are protected from low voltage conditions by shutting off when the supply voltage is less than +9VDC.
- 2.4.0 The PM-5124 and PM-5424 are protected from low voltage conditions by shutting off when the supply voltage is less than +18VDC.
- 2.5.0 PM-5100, PM-5200, PM-5300 and PM-5400 flashers are protected from high voltage conditions by shutting off when the supply voltage is greater than +16VDC.

- 2.6.0 PM-5124 and PM-5424 flashers are protected from high voltage conditions by shutting off when the supply voltage is greater than +32VDC.
- 2.7.0 PM-5000 series flasher’s internal software continually monitors and debounces the grey and white wire inputs, allowing either permanent connections or switches that can be used for flash pattern selection.
- 2.8.0 PM-5000 series flashers utilize internal high-side driver output devices to drive the output load. By measuring fault status feedback current from these drivers with the A/D inputs of the microcontroller, short circuit protection is achieved. If short circuit or excessive load output current causes the high-side driver’s internal temperature to go beyond its maximum temperature, its fault status output will be read by the module’s software as part of a controlled protection strategy.
- 2.9.0 In a short circuit fault condition, PM-5000 series flashers will protect the module by turning off the shorted output until the next time battery power to the flasher is cycled off and on again. Should the fault condition remain after power is cycled off then back on, the module will shut down again. Each fault is counted and stored in non-volatile memory. To reduce the risk of electrical combustion, the module will not function if 250 faults are counted.
- 2.10.0 PM-5100, PM-5200, PM-5124 Module Operation
- 2.10.1 When +12V is applied to the red (battery) wire of the PM-5100, PM-5200 or +24V on the PM-5124, the flasher will switch the output on and off at a rate of 90 +/- 5 FPM (flashes per minute).
- 2.10.2 PM-5100, PM-5200, PM-5124 Flash Timing Chart

Single Flash, 90 FPM



- 2.10.3 Product Application Diagram – PM-5100, PM-5200, PM-5124 Single Output Flasher



2.11.0 PM-5300 – Module Operation

2.9.1 When +12V is applied to the red (battery) wire of the PM-5300, the flasher will switch the output on and off at a rate of 90 +/- 5 FPM.

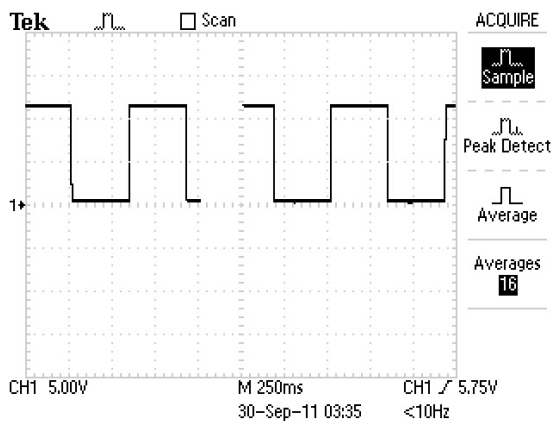
2.9.2 When operating, if +12V is applied to the grey wire of the PM-5300 the flasher will double flash the output at a rate of 90 +/- 5 DFPM.

2.9.3 When operating, if +12V is applied to the white wire of the PM-5300, the flasher will quad flash the output at a rate of 90 +/- 5 QFPM.

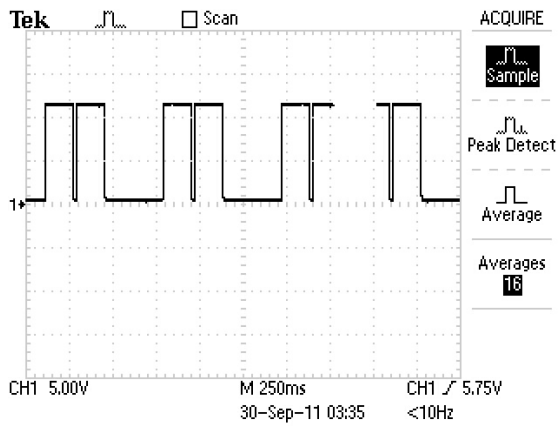
2.9.4 When operating, if +12V is applied to the white wire and the grey wire of the PM-5300, the flasher will strobe flash the output at a rate of 360 +/- 20 FPM.

2.9.5 PM-5300 Flasher Timing Charts:

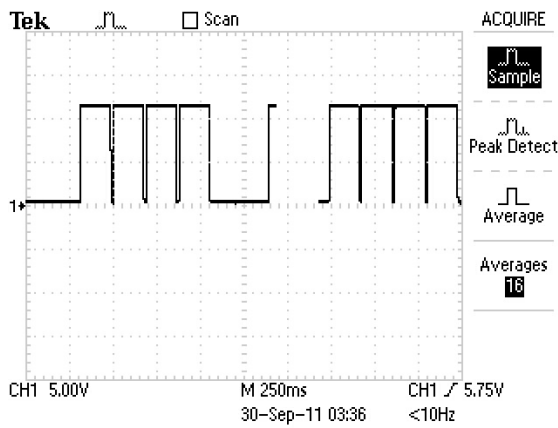
Single Flash, 90 FPM



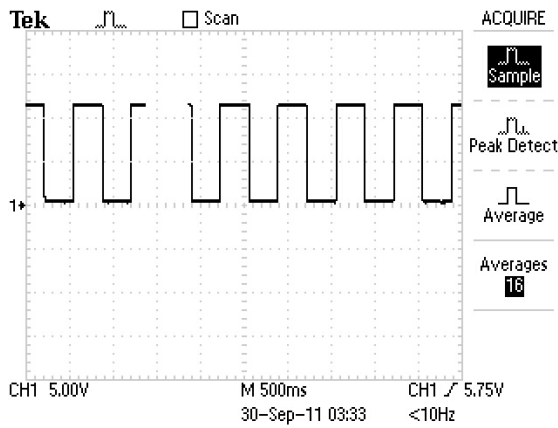
Double Flash, 90 DFPM



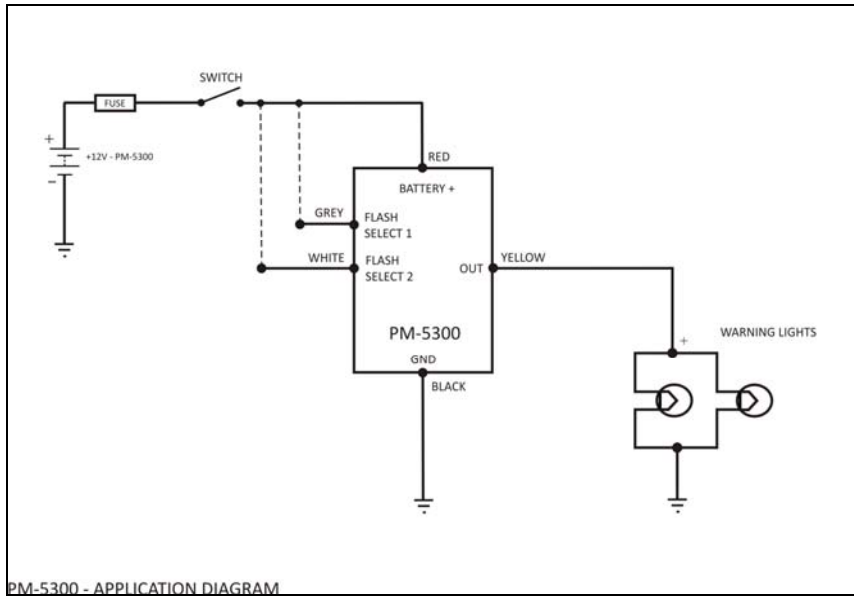
Quad Flash, 90 QFPM



Strobe Flash, 360 FPM



2.9.6 Product Application Diagram – PM-5300 Single Output, Solid State Flasher



2.10.0 PM-5400, PM-5424 – Alternating Flasher – Module Operations

2.10.1 When +12V is applied to the red (battery) wire of the PM-5400, or +24V with the PM-5424, the flasher will alternately switch the left and right outputs on and off, with each output flashing at a rate of 90 +/- 5 FPM.

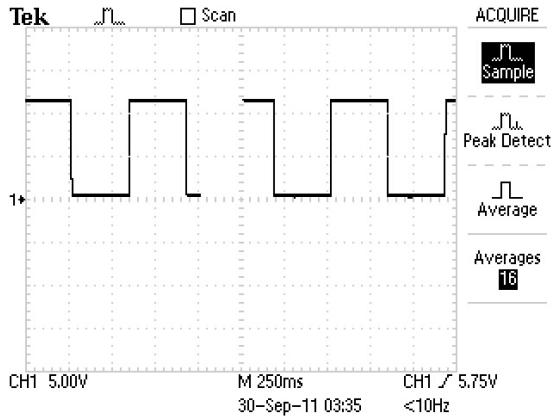
2.10.2 When operating, if +12V is applied to the grey wire of the PM-5400, or +24V with the PM-5424, the flasher will alternately double flash the left and right outputs, with each output flashing at a rate of 90 +/- 5 FPM.

2.10.3 When operating, if +12V is applied to the white wire of the PM-5400, or +24V with the PM-5424, the flasher will alternately quad flash the left and right outputs, with each output flashing at a rate of 90 +/- 5 FPM.

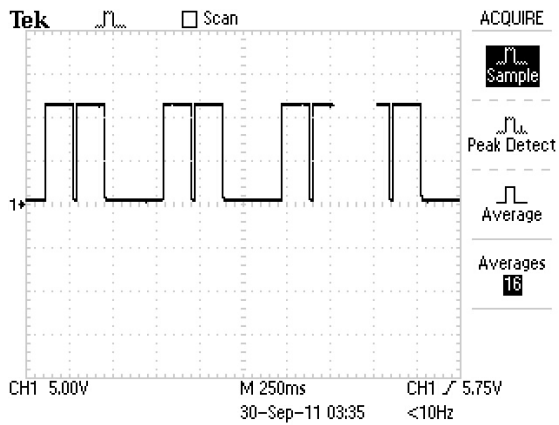
2.10.4 When operating, if +12V is applied to the white wire and the grey wire of the PM-5400, or +24V with the PM-5424, the flasher will alternately strobe the left and right outputs, with each output flashing at a rate of 180 +/- 20FPM.

2.10.5 PM-5400, PM-5424 Flasher Timing Charts

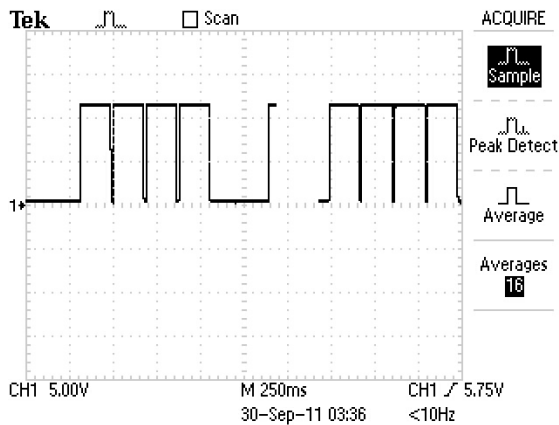
Single Flash, 90 FPM



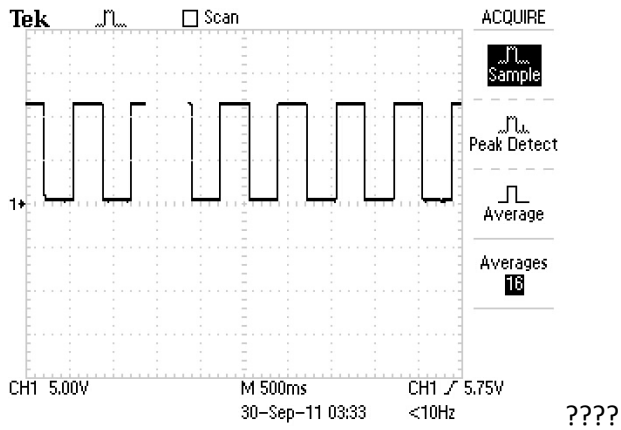
Double Flash, 90 FPM



Quad Flash, 90 FPM



Strobe Flash, 180 FPM



2.10.6 Product Application Diagram – PM-5400, PM-5424 - Alternating, Solid State Flasher

