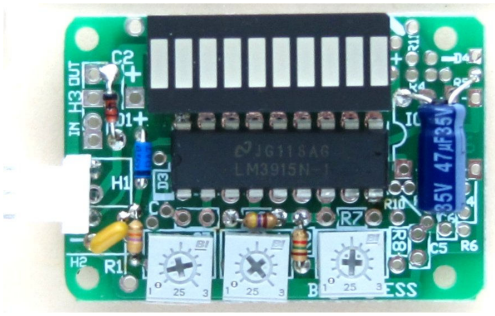
Multi-purpose Bargraph Display Meter



The BM Bargraph Meter is a 10-segment LED display meter for quick visual indication of voltage inputs or signal levels. Its small size, integrated, multi-function design makes it very useful as multi-purpose indicators. It is compatible with the LM391x series of bargraph display drivers for linear or VU meter applications. The adjustable display scale range can be used for expanded scale voltmeters or signal displays.

Features:	Benefits:
- BAR or DOT mode selection	- Small size for tight installations
- Adjustable brightness control	- Easy-to-use and setup
- Use with LM3914/5/6	- Quick visual indication of signal
- Constant current LED display	- Simple, integrated module
- Adjustable input display scale range	
- Easy-to-use integrated design	Applications:
- Small and economical	- Voltmeter, current meter
- Cascadeable for extended display	- Signal, VU level meter
- Op-Amp circuit for low signals	- Expanded scale meter
- Bandpass circuit for audio level display	- Audio spectrum display

Technical Specifications:

Typical LM3914/5/6 module.

Operating voltage:	4.5-15V DC, up to 30V with optional LM7808/12 regulator.
Dimension:	1.77”x1.2” (45x30.5mm).
PCB:	1/16” FR4, ROHS, HASL, double-sided, plated holes,
Input signal range (nominal):	0.0-1.25V, VR divider adjustable, 0.0-0.13V W/op-amp
Internal reference voltage:	1.25V
Operating temperature:	-15^{0}C to +45^{0}C
Standby current (LEDs off):	8mA
Input current into signal pin:	<0.07mA (approx. 70K Ohms resistance)
Maximum current (BAR mode):	120mA
Maximum current (DOT mode):	20mA, current limited.
Minimum full scale input voltage:	1.25V
Minimum input differential voltage:	0.5V, R set adjustable.
Minimum first segment on:	One tenth of maximum input signal voltage
Accuracy:	+/- 1 Segment (LED) at 100mV differential per segment
Accuracy drift (+45^{0}C)	+ 1 segment (LED) at 100mV differential per segment

Note: Do not use in wet or damp locations. Do not exceed the specifications of the unit.
The unit should be mounted away from sunlight for easier viewing of the display.
See BM Bargraph Meter schematic and LM3914, LM3915 or LM3916 data sheets for more technical information.

Control Adjustments

INPUT ADJUST	Adjusts the maximum input level (10th LED).
LOW ADJUST	Adjusts the minimum start level (first LED).
BRIGHTNESS	Sets the minimum brightness level of the display.
INPUT	Input power and signal connections.

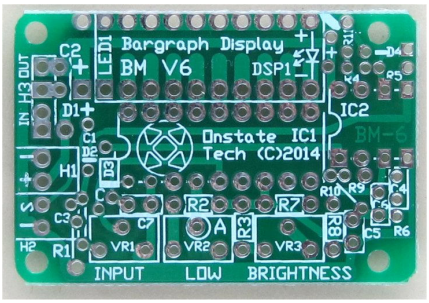
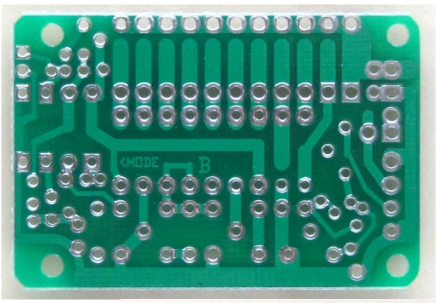
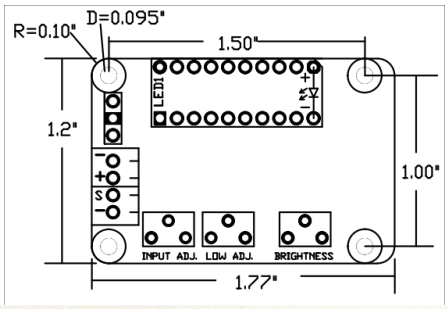
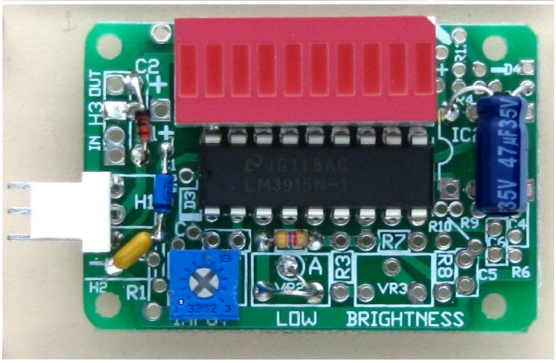
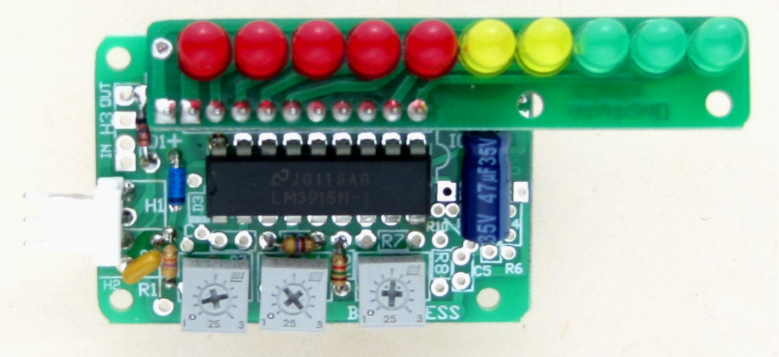
Setup

The internal circuit high input reference voltage (full scale, pin 6/7) is fixed at approximately 1.25 volts. Only the low reference voltage (first LED) needs be adjusted (LOW ADJ). The minimum input voltage to display a full-scale reading is 1.25V. The minimum differential input voltage is 0.5V. Adjust R2 for different input differentials.

Set VR1 to center and VR2 to CW (right side). Apply power and calibration input signal. Adjust VR1 until the meter displays full scale (10th LED). If the minimum display scale is not 0V, apply minimum signal for 1st or no LED display. Adjust VR2 for 1st or no LED display. Test display with varying input signal. Fine adjustment on VR1/2 maybe required for accurate 1st or 10th LED display.

All components are available from Digi-Key (digi-key.com) All resistors are 1/8W. VRs are Bourns 3362P series for top adjust or 3362S for side adjust.

For Cascading Bargraph Meters:

1. High ref. of low bargraph (1st) must be connected to low ref. of 2nd bargraph.
2. Both signal inputs must be connected together only 1 adjustment VR1 is required.
3. Lower bargraph (1st display module) setup. Cut signal trace at pin #6 to pin #7 (location B). Solder jumper wire location B (1st module) to location A (2nd module).
4. High bargraph (2nd) setup. Remove VR2. (low ref. adj). Remove R1. Connect both inputs together (location C).

A light dependent resistor (PDV-P9203-ND or similar) can be added and connected parallel to VR3 for automatic brightness control.