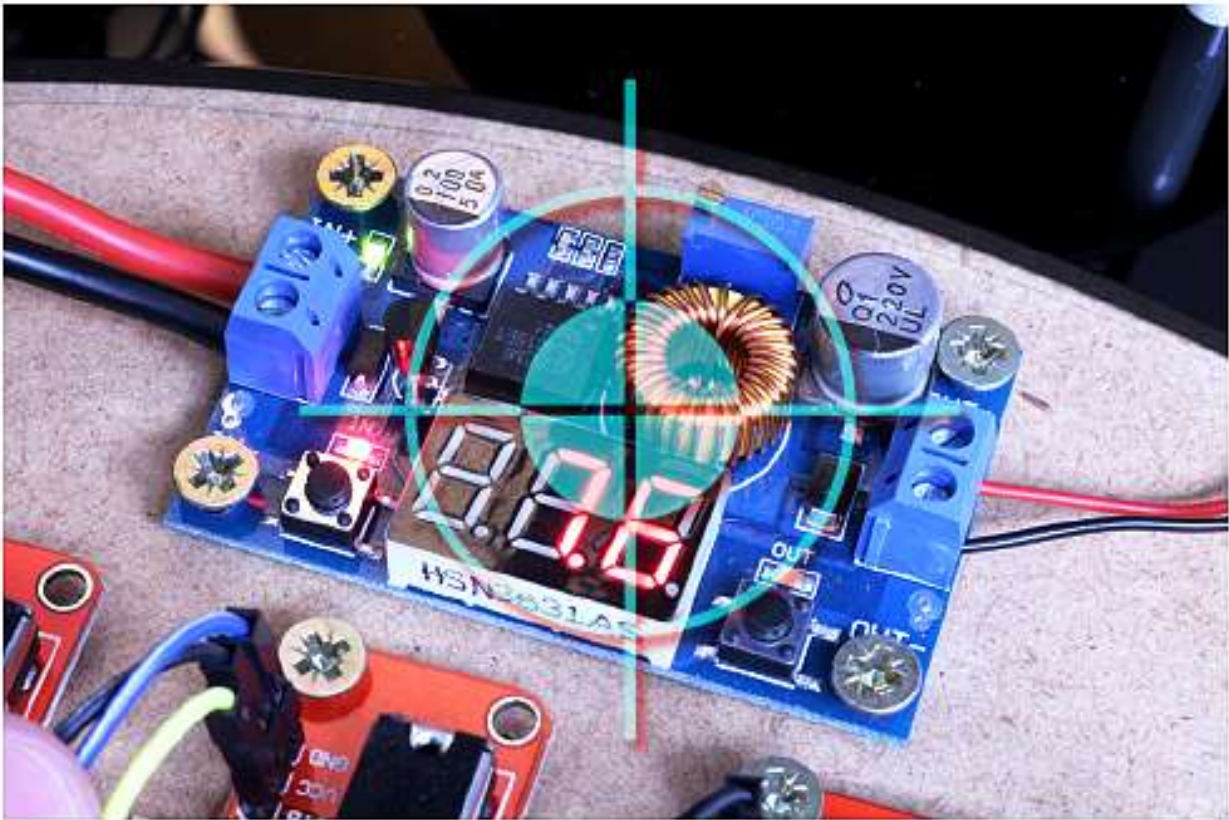
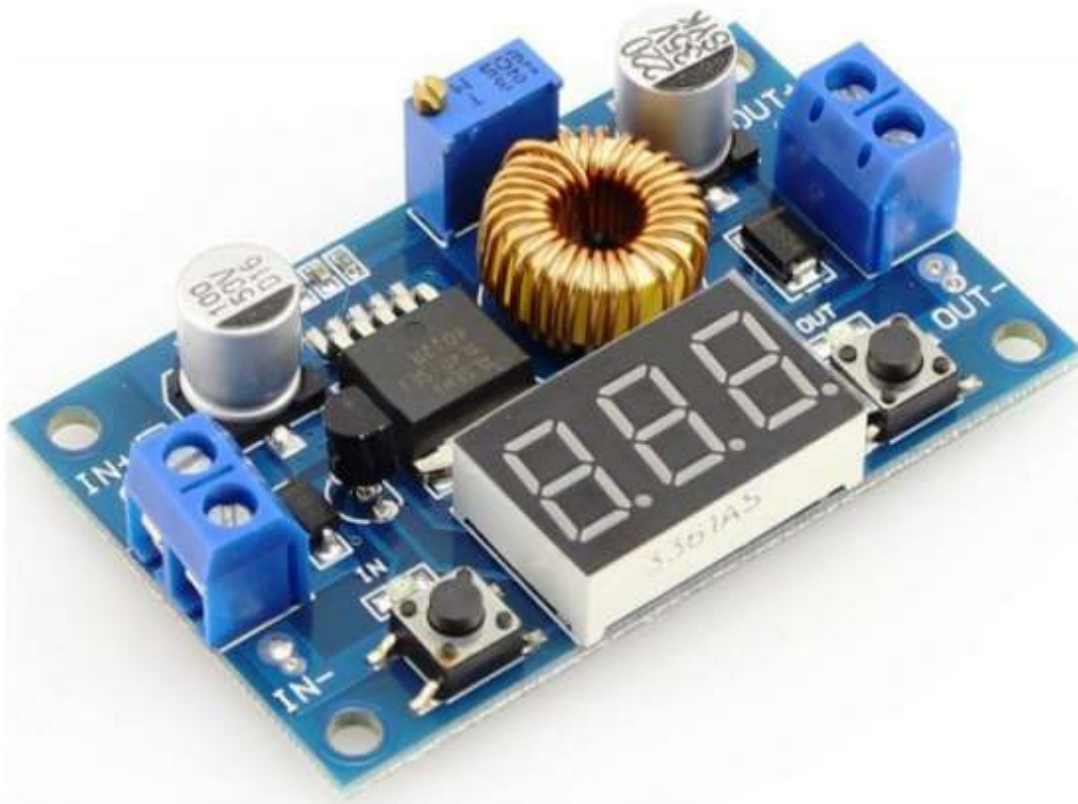


This is a succinct account of my experience with the cheap electronic power supply module from China, “DC-DC Module 5-A/7-W (ERPC0575DC) XL4015.” I have used quite a few over the years and have to say that these types of modules are great for hobbyists and makers. Here is the module I have tried, but don’t take this information for granted. There are countless suppliers and very high variance with most modules, not to mention some room for user misplay!

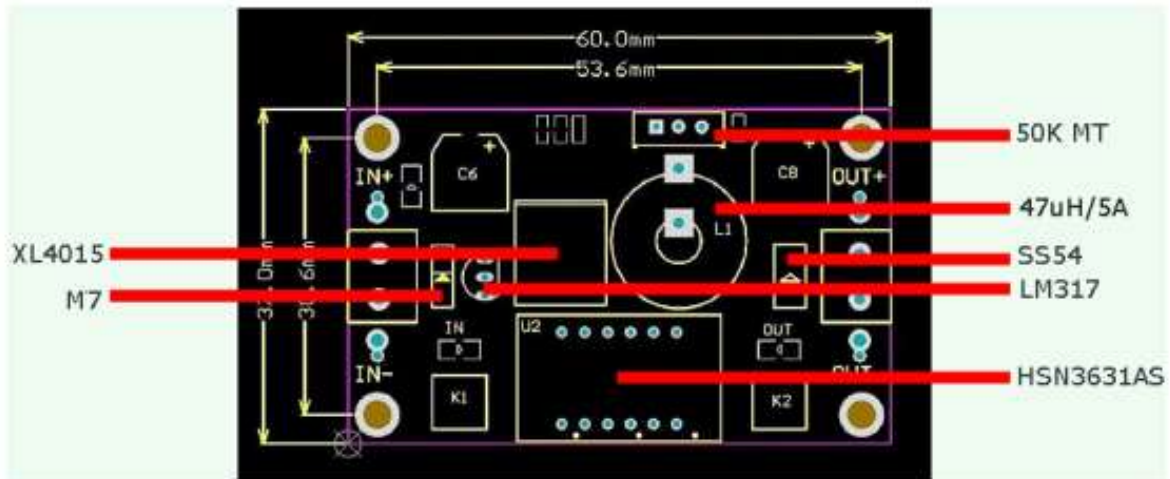


I chose this module because it had an output rating of up to 5 A, more than the cheaper versions that we see online. It also included an on-board digital voltmeter with an option to show either input or output voltages. At first sight, I thought that this was a digitally controllable power supply with +/- buttons to adjust the output voltage as required. It was a misconception as it is, in fact, a 180-KHz fixed-frequency PWM buck (step-down) dc/dc module capable of driving a 5-A load with high efficiency, low ripple, and excellent line and load regulation. A multi-turn potentiometer is included for output voltage adjustment. The digital voltmeter simply displays the current input or output voltage (it can also be calibrated for accuracy).

The output voltage is adjustable from 1.25 to 35 V from an input of 4 to 38 V. Note that the input voltage must be at least 1.5 V higher than the required output voltage.



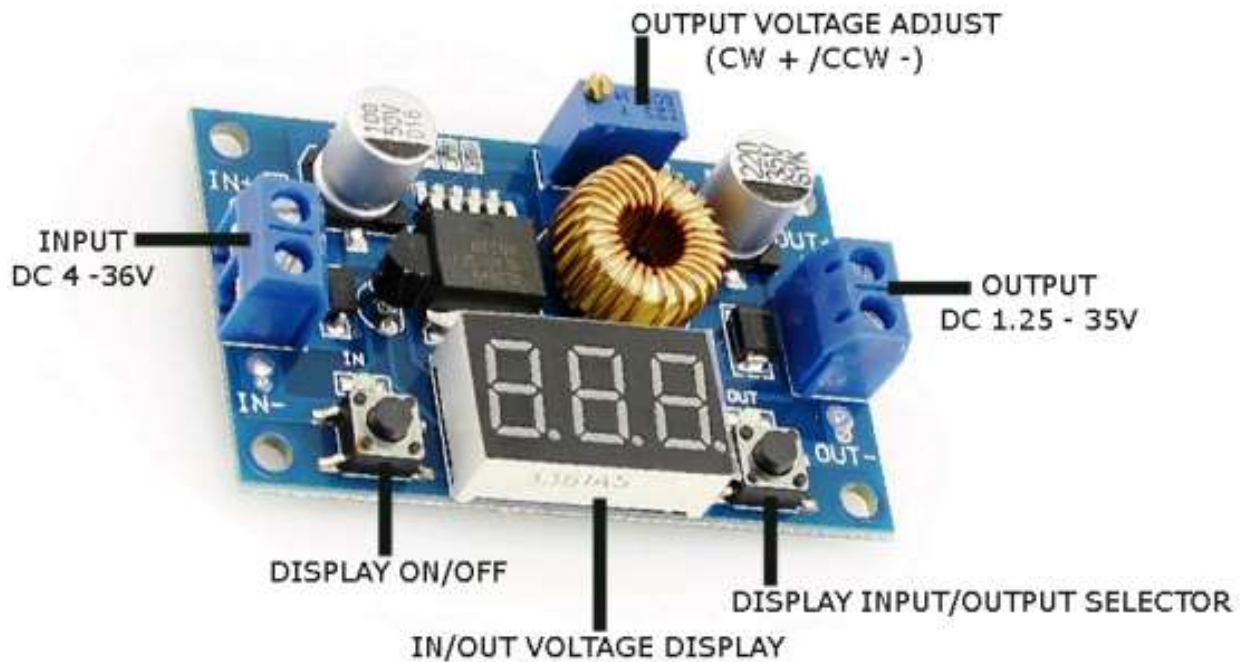
The module is available as a pre-populated board and requires zero soldering — it comes ready to go out of the box. Also, there's an extra heatsink for the XL4015 chip included with it. Major components in the module are showed in the following figure:



- XL4015: DC/ DC 180-KHz Buck Converter, 5 A/36 V
- M7: SMD version of 1N400x Diode (used here for circuit protection)
- HSN3631AS: Numeric Three-Digit LED Display, Red
- LM317: Adjustable Voltage Regulator (used here as the dvm power supply)
- SS54: Schottky Diode 40 V/5 A
- 47 uH/5 A: Power Inductor
- 50K MT: Multi-Turn Preset Potentiometer 50K

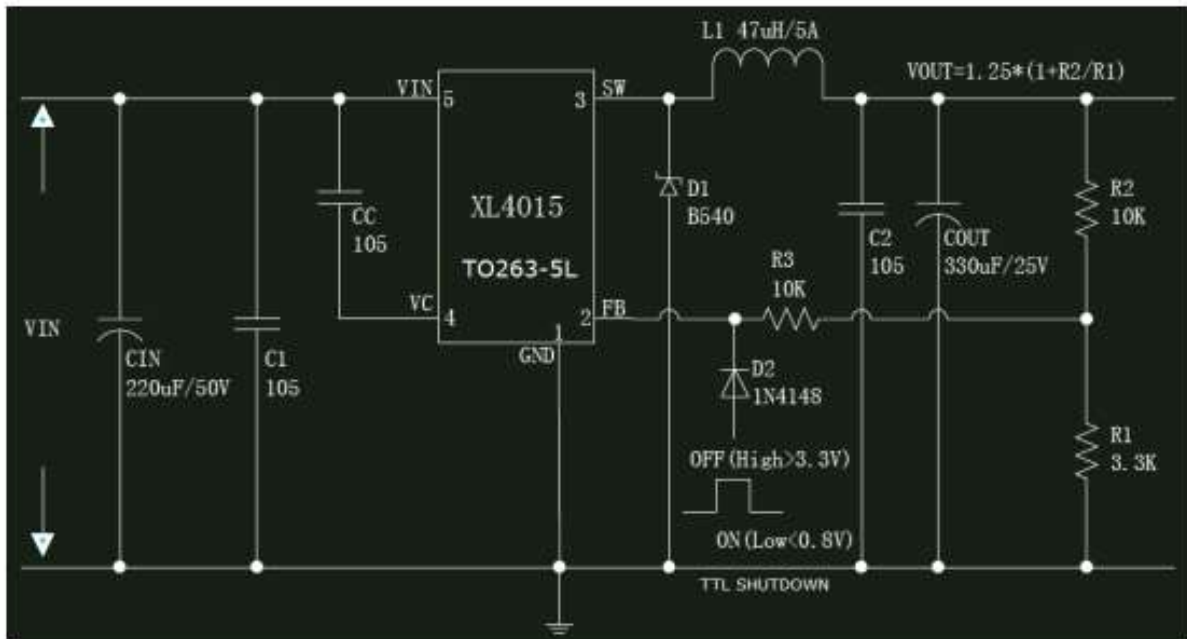
In addition to this, there is a small microcontroller in the digital voltmeter circuit (my teardown article will be published in the near future). It's most likely an 8-bit MCU from STMicroelectronics or Holtek.

## Setup Guide



- Power up the module with a stable and accurate dc power supply (such as a regulated 6-V power supply). Then short-press the button on the right side to select which one you need to adjust (input or output). Long-pressing the button on the right side (holding it for >2 s) makes the module enter calibration mode. After releasing the button, the related LED will blink to indicate which voltage is now calibrating, and the numeric display will blink with the present value.
- Short-press the button to change the present value. For example, if your power supply is 6 V but the result of voltage meter is 5.8 V, you need to set the value to 6 V.
- Short-press the button on the right side to increase the voltage by one unit. Short-press the button on the left side to reduce the voltage by one unit.
- Long-press button on the right side to store the redressed value.
- The preset pot sets the actual output voltage. Calibrate the output voltage reading on the digital voltmeter in the same way above. For example, if your actual output is 3 V but the result on the voltmeter is 4 V, you need to set the value to 3 V. The redressed value will be stored in the non-volatile memory of the module.

Remember, if you are facing difficulties in the calibration process for the first time, just turn the preset pot counterclockwise for 10 rotations as the default output voltage (factory preset) is around 20 V. Also attach the heatsink that comes with the module if you are a power user!



This is absolutely a good device, but without access to a plentiful supply of these modules, it is hard to say if there are any unseen anomalies in the design itself or if the modules contain bad parts. Anyway, I prefer a multi-turn potentiometer (with a long shaft) in lieu of the nasty preset pot for the sake of user convenience.