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Six Digit Cipher Lock

PN: ece-C-15-001

Figure 1

Overview:

We developed a six-digit cipher lock for a museum exhibit where the visitors needed to enter a six-digit number, which they calculated, and if correct it would release a magnetic lock. The device can use most 12-button multiplexed button pads. Our preferred choice is one with hard buttons rather than membrane switches that are generally less robust. The cipher can easily be placed into non-volatile memory by the user. They simply input the correct number and press a small button on the component side of the PCB to save it. The relay output can handle up to 30vdc at 2.0 amps. Other features can be customized into the firmware. For instance, in this case, we gave the visitors a hint when their input guess was wrong by appropriately flashing "—HI—" or "--LO—" briefly on the

display upon evaluating a wrong answer. This display provides not only numeric input but also the ability to clear the display (zero it out) and a button (”E”) to press when they are ready for an evaluation of their number. The display digits are multiplexed to reduce current draw. The display scrolls if more than six digits are input: It dumps the most significant digit to make room for the last digit entered which is the least significant digit.

The power supply requirement for cipher electronics is 12vdc at 500ma and does not include power for the locking mechanism.

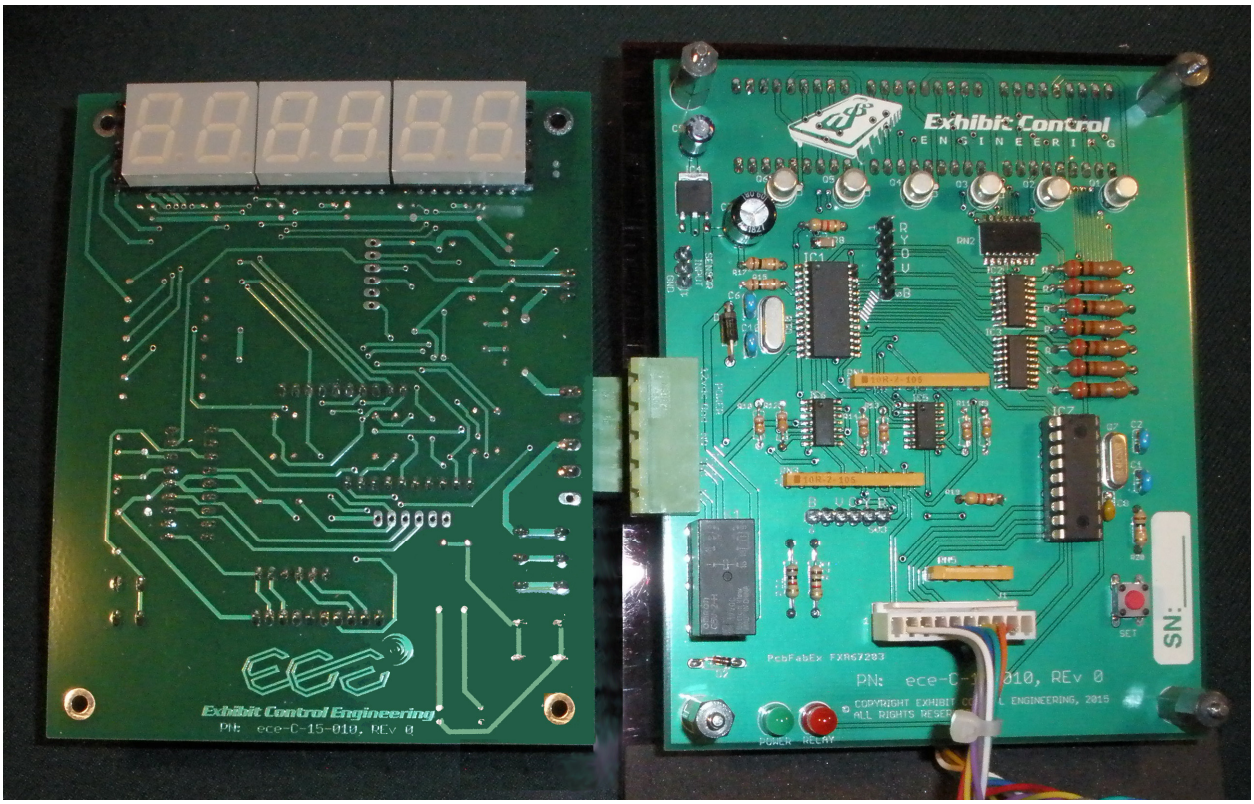

Figure 2

Figure 2 shows the display and component side of the cipher lock. The dimensions of the PCB are 5.0” x 4.0”. The minimum depth for the space for mounting needs to be approximately one and one-eighth inches deep. However the height of the seven segment displays can be adjusted at the time of manufacture from 0.5” to 1.0” above the surface of the PCB to accommodate different thicknesses of the reader rail it is installed.