

12-Cell A123-M1 Battery Pack Construction Kit Instructions

Parts List

- 1 – Deans Plug/Pigtail w/12-Gauge Wire
- 1 – M3x250 Threaded Rod
- 6 – G10 Spacer/Connection Plates
- 12 – M3x6 Button Head Screws
- 1 – M3x10 Button Head Screw
- 15 – M3 Self-Locking Nuts
- 3 – M3 Hex Nuts
- 10" – 126mm (5") Black PVC Shrink Wrap



Required Items Not Included

- 6 pairs of a123-M1 cells, with connecting tab attached
- 14-18 gauge wire, or desolder braid for interconnections.
- Hot Glue Gun
- Heat Gun

A123-M1 Cell Preparation

The 12-cell pack is made up of three blocks of four a123-M1 cell “clusters”. Each cluster is made from two pairs of cells that have the connecting tab between the cells intact. Each pair of cells are hot-glued together first, and then two of these pairs are glued together to form the basic 4-cell block, or cluster. Alternately, the cells in a 10-cell DeWalt pack can be separated in a way that two 4-cell clusters can be left connected, and simply hot-glued together.

Be sure each cell is at the same state of charge, before assembling the pack. The easiest way to do this is to start with cells from new DeWalt packs. All the cells in each DeWalt pack start out at about 3.29-3.30V per cell.

Pack Construction and Wiring

To start the assembly, thread one of the M3 self-locking nuts onto one end of the threaded rod. The easiest way to do this is to grasp the rod with a pair of pliers, but be sure to do so only in the area within the first couple of inches, so that no nuts have to be threaded past the scuffed area from the pliers. Next, slide one of the G10 plates down the rod, up against the self-locking nut.



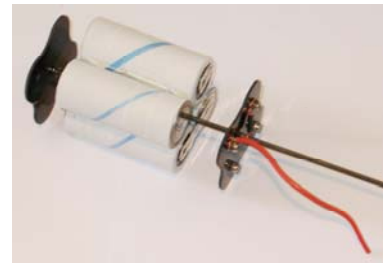
The basic concept for assembling the pack is simple. For each 4-cell cluster, a blank plate serves to support the bottom on the cluster, and to provide insulation between clusters.



Another plate is used at the top of each cluster to provide interconnections between the two pairs of already connected (via the DeWalt tabs) cells and between 4-cell clusters. The threaded rod actually serves as a conductor for one side of the completed pack. As shown, desoldering braid (from Radio Shack...) can be used for these connections, or common 16-18-gauge hookup wire may be used. For the first cluster, one of the output terminals for that cluster is connected to the threaded rod. A length of

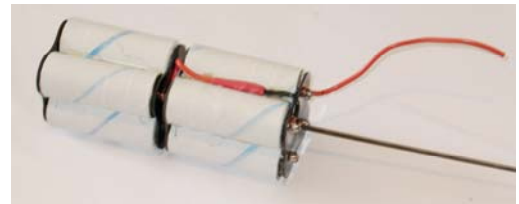
wire/desoldering braid about 2-3" long is attached to the other output terminal. This piece will be used to connect this cluster to the next.

At this point, the first 4-cell cluster is ready for assembly. The threaded rod is slid through the first 4-cell cluster, with the end plate up against the cluster bottom. The completed connector plate is then carefully slid onto the threaded rod and placed in contact with the tops of the cells in the cluster. Be sure this plate is oriented properly, with the connections over the right cell tops. Make sure the loose wire/braid is kept away from the other terminals, including the threaded rod, which now becomes a conductor.



Next, one of the regular M3 hex nuts is threaded onto the rod, in order to hold the whole assembly together. Before tightening this down, it is better to use some tape to hold everything together, and to insulate the terminals. Use a drop of Loctite on the threads, just above the top plate, and then cinch the hex nut down tight. Make sure the loose wire does not make contact with the threaded rod.

The next 4-cell cluster is assembled in a similar fashion, with a bottom insulator plate and a top connection plate. The difference is that the connector plate has short wires/braid on both output terminals. The second cluster should be taped together, like the first, and a hex nut tightened down to hold the whole assembly. The loose wire/braid from the first cluster is connected to the opposite terminal wire on the 2nd cluster, so that they are now connected in series.



The third cluster is assembled next, just like the second one, except that the final output terminal uses the one M3x10 screw, which is held in place with the last regular hex nut. Finally, the Deans pigtail can be attached to the end of the threaded rod and to the output terminal with the longer M3x10 screw, either directly, or with standard terminal lugs (not supplied).



Finally, the excess threaded rod can be cut off and the whole assembly covered with the supplied shrink wrap. Small dollops of hot glue can be used to insulate the exposed terminals.