Bill of materials for RM3100 PVC pipe mount:

For 1 ¹/₂ inch and 2 inch PVC

-PVC pipe, 2 or 3 feet, depending upon burial depth. 2 foot lengths standard at Lowes, Home Depot -PVC slip T fitting, 1 -PVC slip plug fitting, 3

-Cerrxian-Cnlinko RJ45 shielded female to female bulkhead connector

https://www.amazon.com/CERRXIAN-Ethernet-Industrial-Waterproof-Connector/dp/B07GZHYVBS

-60mm bubble spirit level (glued to plug fitting on top of T fitting for leveling)

https://www.amazon.com/Measuring-Circular-Bullseye-Furniture-Instruments/dp/B07VT4P7TT/ref=sr_1_4? dchild=1&keywords=round+bubble+level&qid=1621642557&sr=8-4

or equivalent on eBay.

-Shielded Cat5 jumper cable, length to suit distance from connector in T fitting to the location of the adapter board; excess can be coiled up inside the pipe.

-Plastruct 1/16 inch U channel stock (craft stores, eBay, Amazon) for fixturing the adapter board firmly in the pipe.

Suggested hand tools in addition to a good variable speed 3/8 drill or bench drill press and drill index, small machinists vise to hold PVC plugs for drilling.

-Fine tooth PVC saw

-Step drill for 1 inch max diameter hole size, see typical step drill in photo

-8 inch half round bastard file

-80, 220 and 320 grit sandpaper (to flatten end of plug fittings and remove sharp edges from PVC pipe cuts

-solvent type cement for polystyrene, PVC, etc (thin liquid, brush applied, not PVC pipe cement)

1 $\frac{1}{2}$ inch and 2 inch plug fittings, typical step drill, 8 inch half round bastard file, Cerrxian connector with calipers reading 1 inch across flats as indicated below. Note that the connector fastening nut in the 1 $\frac{1}{2}$ inch plug fitting doesn't quite fit all the way in.





A one inch hole made with the step drill fits across the connector flats. Use the half round file to shape the hole to fit the threaded diameter, leaving the one inch dimension for the flats.

That locks the connector body in place against rotation in use or when tightening the lock nut.

Two problems remain: if a $1 \frac{1}{2}$ inch pipe is used, the lock nut doesn't quite fit all the way to the inside rear of the plug face. Filing a little off each point on the lock nut will enable it to seat.

The larger issue is the thickness of the face of the plug fitting, which is just about the thread depth of the connector body. Access to a lathe would allow reducing the face thickness by 1/2, giving enough 'bite' to the thread.

Without a lathe, simply sand down the lettering and embossing on the face of the plug using sandpaper on a flat block with a figure 8 motion to ensure even material removal. Then, simply epoxy the connector in place, without the rubber gasket, and without the lock nut. Mounting the bubble spirit level on the top of the T fitting can also be done by first flattening the lettering an embossing on another plug fitting and then, using epoxy or silicone rubber, cement the level in place, keeping it centered.

Do not permanently glue the plug fittings into the T fitting. Rather, apply a thin layer of clear silicone rubber caulk (or glue GE Advanced Silicone 2) to the outside of the plug and the inside of the T arm, mating the two with some rotation to insure even distribution. When cured, apply a bead around the joint.

Siliconing of the base plug at the bottom of the pipe and the top of the T can be the last assembly steps. Clear access will be needed to insert the male shielded Cat5 jumper RJ into the Cerrexian connector inside the T.

It is possible that a simple 3D printed fixture for holding the RM3100 adapter board assembly will be made available at some point. An alternate method for securing the magnetometer is a fixed and stable position will be detailed next.