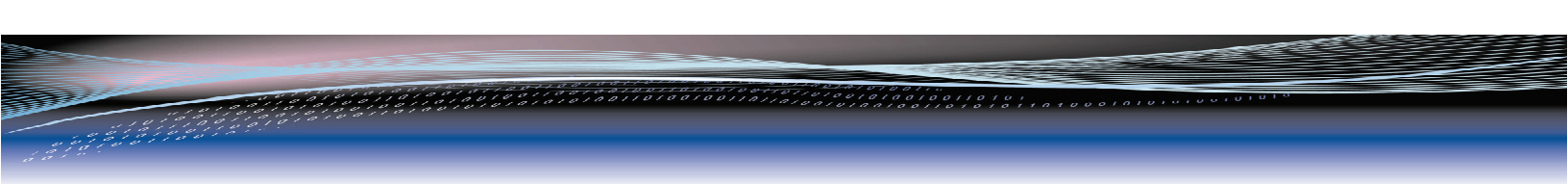


M-80 RTU Installation Instructions





Thank you for choosing Mission,

As part of Mission's commitment to provide you with the highest quality "out of the box" SCADA solutions available, this product and packaging have been thoroughly tested before leaving our manufacturing facility.

Please take a few minutes to consider the steps in this guide and confirm that you have received all the necessary parts for a successful installation, that your RTU is fully functional and that there are no site-related connectivity issues to overcome.

The steps include:

- I. Parts and Tools Required**
- II. Pre-Installation Test**
- III. Start-up Instructions**
- IV. Installing Antenna**
- V. Mounting the M-80**
- VI. Hanging the Floats**
- VII. Waterproof Connections**

A few minutes now may save you time and effort! **We also recommend to all our customers installing our Model M-80 RTU to visit our website at www.123mc.com for our free step by step installation video.** Remember our technical support staff is available at 877-993-1911 for further assistance.

Thanks,

MISSION COMMUNICATIONS, LLC

Reference Guide M-80 RTU

M-80

Suitable for use in Class 1, Division 2 groups A, B, C, D, T6

- Connect only floats to the M-80 wire harness.
- The M-80 paired float wires are NOT polarity sensitive.
- The float wires are NOT polarity sensitive.
- Do not connect floats in parallel with each other.
- 1 float to 1 set of paired M-80 wires.

Antenna

Antenna
Connection

M-80 Float
Wire Harness

High Level Float Connections

Float Wire

Low Level Float Connections

Control Document - M-80 RTU

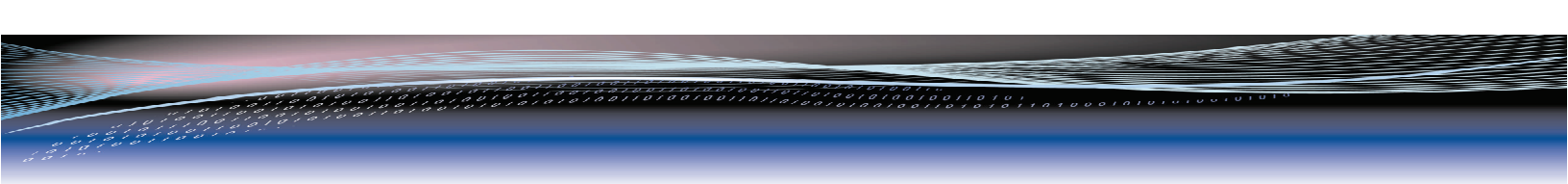
I. Parts and Tools

This installation guide is a short form guide. It is intended to highlight important steps in the M-80 installation process. If you have questions, please call MISSION'S Technical Support Help Desk at 877-993-1911 or 678-969-0021 Option 2.

BEFORE YOU START

Ensure you have the tools and parts you'll need for the installation.

Tools	Parts
Hammer Drill (Bosch Model SDS Plus-Bulldog 11234VSR) or equivalent	M-80 Installation Kit (housing, electronics, radio, battery, fittings, latching carabineer, waterproof wire connections, heat-shrink tubing)
Drill Bit Kit -24" L x 3/8" Dia. Masonry Hammer Drill Bit with SDS Connector (Bosch Model S4-HC2068) or Hilty -6" L x 3/8" Dia. Masonry Hammer Drill Bit with SDS Connector (Bosch Model S4-HC2061) or Hilty	Floats (2), Normally Closed, 95 Degree Tilt to Open, Mercury Switch, 20' Float Cable
Power Rotary Hand Saw (7 1/4")	Asphalt Sealant, 10 oz. cartridge, Ace PN 18183
Mason Rotary Saw Blade (4" dry/wet diamond blade – premium segmented) or equivalent	Waterproof, Marine Grade Shrink Tube for sealing Float Cable and Antenna Connection
Standard Hand Tools	Package of Dry Oatmeal
Plastic or Stainless Cable Ties	Magnetic Key
Caulking gun	3/8" Stainless Masonry Bolts, Washers and Nuts (2 each)



II. Pre-Installation Test

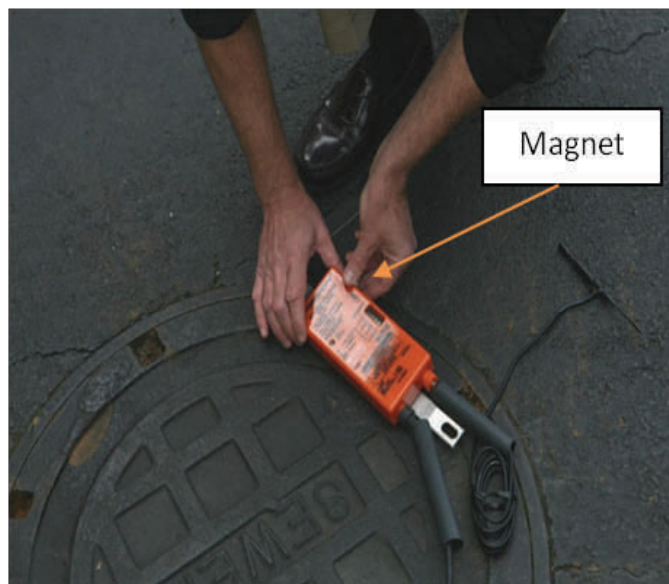
Before installing the M-80 you must ensure it will work in the desired location. Because the M-80's antenna is installed into a road surface or in or near a concrete sewer access point, there is a reasonable chance you will find locations where the M-80 will not work. The M-80 pre-installation test is designed to determine this prior to installation.

The pre-installation test requires a certain signal strength and successful cellular communications to be completed. A successful test must be performed before the M-80 will allow itself to go into normal operating mode and be used for reporting alarms.

NOTE: It is recommended to familiarize yourself with the “Magnet Stages” and their associated LED indications on the next page.

- Remove the M-80 from its shipping container
- Uncoil the antenna cable
- Attach the antenna cable SMA connector to the connector on the end of the unit. Lay the black coated antenna on the street about eight (8) inches from the lip of the man hole cover or in the case of a field access manhole, lay the antenna on the ground next to the field manhole, do not place the antenna on the manhole cover or on any other metal.
- Locate the magnetic key and locate the reed switch area on the M-80 Case which is marked by the word “MAGNET” inside of a double-ended arrow. [(←**MAGNET**←)]
- Position the magnetic key on or over the reed switch **QUICKLY** then remove – Watch for the first LED to come on solid. The LED will only stay on for 10-15 seconds ,so be prepared to swipe **QUICKLY** for the 2nd and 3rd mode tests or if the LED goes out just swipe it on again.

NOTE: Refer to the M-80 Startup Instructions on the next page for the remainder of the test. After the test is successfully completed, remove the antenna lead from the M-80 unit and proceed to antenna installation, mounting of the unit, and installing the floats.



III. Start Up Instructions

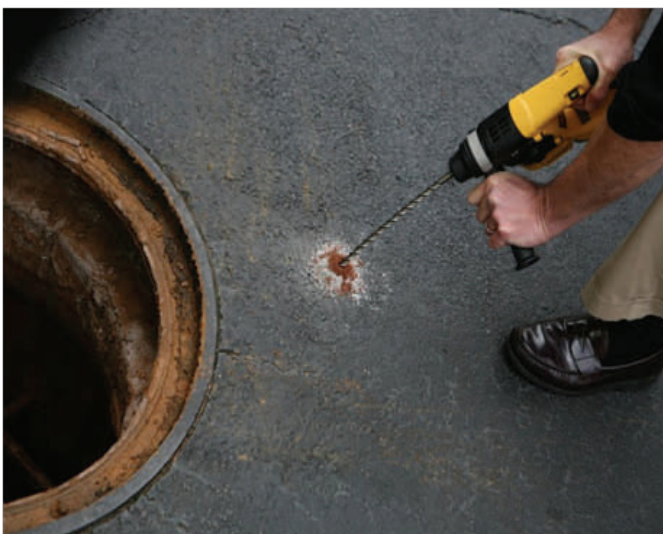
Use the supplied magnet to move the M-80 through the setup stages and finally into operate mode by positioning the supplied magnet on the marked target (← **MAGNET** →) for ~1 second and then move and keep the magnet at least one foot away.

Allow 5-10 seconds for each stage to complete. Upon completion of each stage, advance to the next stage by re-positioning the magnet on the target for approximately one second. See stage tests below:

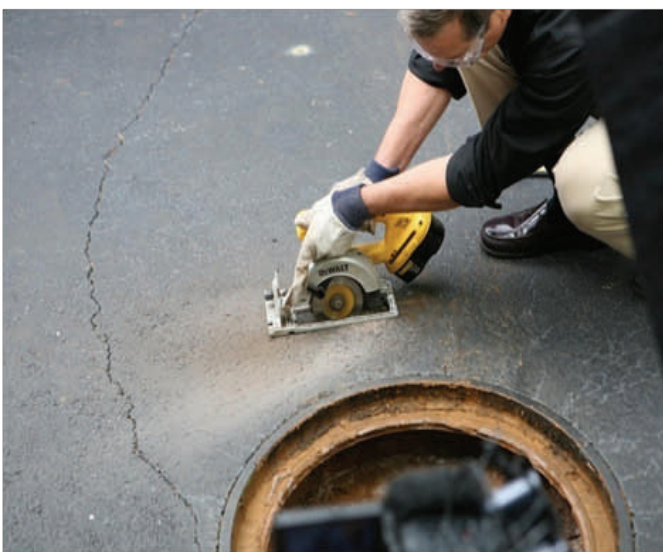
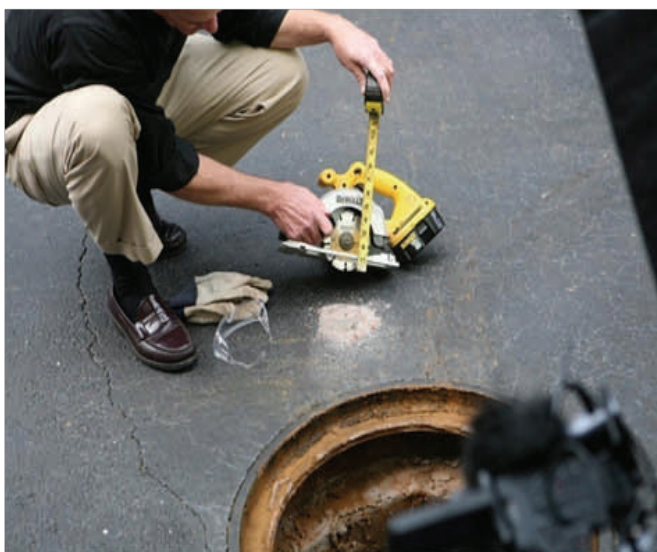
MAGNET TEST USAGE	LED INDICATION	DESCRIPTION	SUCCESSFUL RESULT	FAILURE
0	None	Shipping Mode	Unit is asleep with minimal power Consumption	
1	1st LED blinks RED	Standby Mode	1st LED blinks RED	Consult Support
2	2nd LED blinks RED	Receive Test Mode	After about 20 seconds the LEDs will flash GREEN to indicate radio signal strength: 4 GREEN : very good 3 GREEN : good 2 GREEN : ok 1 GREEN : marginal 0 GREEN : unacceptable	If 0 or 1 GREEN LEDs illuminate, reposition antenna and retest. Consult Tech Support
3	3rd LED blinks RED	Radio Transmit Test Mode Optional Float Tests	GREEN LED indicates test was passed LED positions I and II will light, respectively, when floats I and II are electrically “closed”	No GREEN LED, Consult Tech Support
4	4th LED lights GREEN for 10 seconds, then no LEDs blink (to conserve power), however, radio LED will blink when alarmed	Operate Mode	Unit is transmitting. Leave as is. To further test, tip float for at least 60 seconds; radio LED should light. Verify receipt of alarm at website	No radio LED (on float tip) Consult Support

IV. Installing the Antenna

From the edge of the in-road manhole cover measure outward 8 to 10 inches from the edge. Using the 6" x 3/8" drill bit, drill a hole 1-1/2" vertically down into the road. Switch to the 24" x 3/8" drill bit. Place the 24" bit in the starter hole and tilt the bit at a 30 to 45 degree angle towards the underground sewer vault. In this manner you can drill through the roadbed and into the sewer vault.



With a 3/8" hole from the road surface into the sewer vault, a cut must be made in the road for the antenna elements (the top of the "T" portion of the dipole antenna). Using a power rotary saw with a masonry blade set to 1" depth, cut a 12" long slit across the top of the starter hole. Make several parallel cuts to accommodate the antenna element's width.



Clean out any loose material from the slit to prevent damage to the antenna or cable. You may want to use the small drill bit to root out the slit of debris or make wider if necessary. Feed the connector end of the antenna cable into the hole and through the sewer vault. Pull the cable through so that the Black antenna elements sit down in the 12" slit in the road and below the road surface.



Once the antenna is seated correctly, apply the road tar sealant (included) on top of the antenna and slit. After the asphalt sealant is injected into the groove, use the included plastic knife to work the sealant into the groove and to smooth its surface.



Then sprinkle the dry oatmeal on top of the sealant to help prevent movement of the sealant from the action of road traffic.



Now place a paper towel over the oatmeal/cornmeal and use your shoe to tap down the sealant.



The asphalt sealant placed into the antenna groove cut into the road or sidewalk is sticky for about four hours. The oatmeal/cornmeal speeds the drying of the sealant and prevents the tacky sealant from being drawn out of the groove by foot or road traffic while it is drying!

This procedure ensures that the sealant surrounds the antenna (making it waterproof) and that the assembly stays permanently in the road/concrete.

V. Mounting the M-80

NOTE: DO NOT ATTEMPT TO OPEN THE M-80 DEVICE AT ANYTIME AS IT HAS NON-SERVICEABLE PARTS INSIDE.

The M-80 is intended to be mounted under the iron manhole casting via 3/8" x 2" stainless steel masonry bolts. Hang the M-80 from these bolts and secure by nuts. The unit may be mounted either vertically or horizontally. The masonry bolts insert into 3/8" holes drilled into the leveling bricks found below the manhole casting.

Mark the holes that the M-80 will hang from and drill a 1-1/2" deep masonry bolt hole into the concrete/brick area just below the iron manhole casting using a hammer drill with 3/8" bit. Insert the masonry bolt. Tap the bolt into the hole with a hammer.



Tighten the nut clockwise onto the bolt. This will expand the masonry bolt to secure it into the hole. Next, loosen the nut and remove the nut and washer from the bolt. Slip the end of the M-80 stainless steel strap over the mounting bolt. Place a washer and nut on each bolt and securely tighten.

NOTE: *This would be a good time to figure out your float height and tie a loop knot at the place on the float wire that it will hang from the carabiner of the M-80.*

NOTE: Do not permanently secure the M-80 at this time as it will need to be pulled out for waterproofing the antenna and float connections. See **Waterproofing Connections Instructions** below

VI. Hanging the Floats

Before making any final connections, waterproofing or installation you'll want to get an idea of what height you're going to want your float(s) to hang at. This can be done at the time the masonry bolts are put in to secure the M-80.

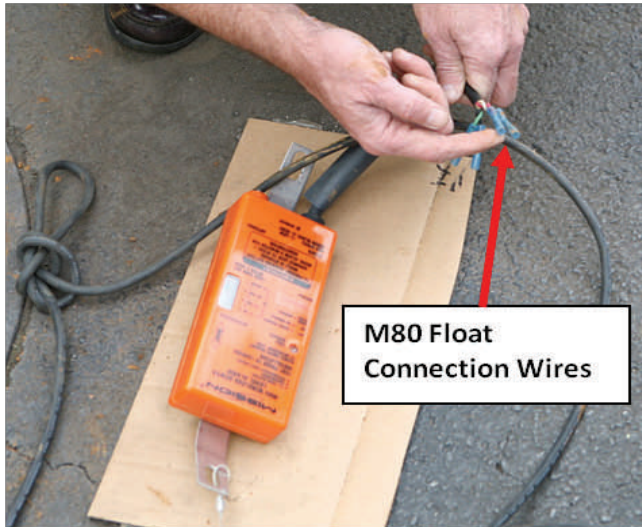


The M-80 has two float inputs on its connection wire harness. The RED and WHITE wires are the Digital Input 1 (typically the low float and called “Surcharge Alarm”) and the GREEN and BLACK wires are for Digital Input 2 (typically the higher float and called “High Level Alarm”).

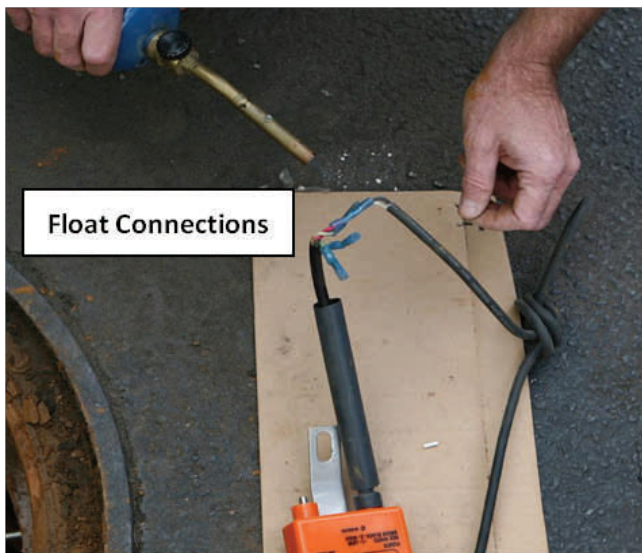
NOTE: The float wires are not polarity sensitive, just be sure the float wires are in either the Red and White pair or the Green and Black pair on the M-80 connection wire harness.

If using only 1 float connect it to the RED and WHITE pair of the M-80 wire harness and short the GREEN and BLACK pair together.

NEVER connect multiple floats in parallel to 1 set of wires. Connect 1 float to 1 set of M-80 connection wires.

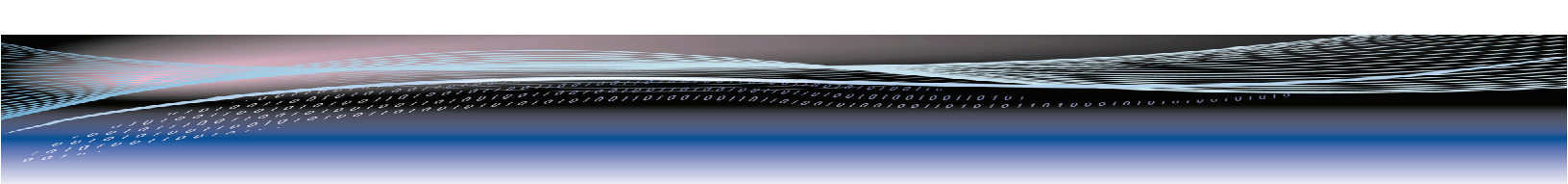


Make sure the heat shrink tubing is on the M-80 wire harness before making connections as this will be placed over the connections once the wires are terminated and the blue connectors are heated.



NEVER allow the floats to hang directly from the M-80 without using the latching support hook (carabineer). The float wire “pigtail” that exits from the M-80 **IS NOT** designed to support the weight of the hanging floats and doing so will eventually destroy the float wire seal and allow water into the M-80.

Additionally, the Installer should not place the level sensing floats at such a height so that the M-80 will send alarms during normal sewer flow.



VII. Waterproof Connections

WATERPROOF CONNECTIONS

USE CAUTION WITH A HEAT GUN OR OPEN FLAME IN THE HAZARDOUS GAS ENVIRONMENT OF THE SEWER!

Before connecting the floats, slide the longer of the pieces of large heat-shrink tubing over the float cable “pigtail”. Connect the surcharge float to the red/white wire pair. Use a good crimping tool and make secure. Using a heat gun, shrink the ends of the butt connectors. Repeat on the second float, if used. **If not used, insure that the connectors of the pigtail are shorted together.** Once the float connections are made and the butt connectors are heat-shrink sealed, slide the larger heat-shrink tube down over the butt connector(s). Heat-shrink seal the float connections. With the antenna installed into the road and its cable feeding into the sewer vault, blow the cable connector clean. Slide the shorter piece of the large heat-shrink tubing over the antenna cable. Attach the SMA connector to the M-80 connector. Then slide the large tubing over the plastic flange and insure it is snug against the M-80 housing. Heat-shrink this tubing. Using loops of about 6” diameter, bundle the excess antenna cable, avoiding sharp bends in the cable since that will damage it. Secure the cable with plastic ties onto the support hook. Then proceed to hang the float(s) at proper height from the support hook, securing them with wire ties.

Please call Mission Technical Support at 678-969-0021 or 877-993-1991 to identify the unit and confirm proper operation.

M-80 Mounted Vertically





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