

This installation manual is a short form guide. It is intended to highlight important steps in the M-110 and M-800 installation process. You should read the **MISSION Model M110/M800 RTU Installation and Users' Guide** before installing a MISSION unit for the first time. If you have questions, please call MISSION's technical support Help Desk at 877-993-1911 or 678-969-0021.

BEFORE YOU START

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

| Tools | Parts |
|--|--|
| Power Drill (Charged Batteries!) | M-110 or M-800 Box / Kit |
| Drill Bits | 3/4" Flex Conduit (6-8 feet typical) |
| Hole Saw (for stainless steel 3/4" conduit hole) | Flex Conduit Fittings (straight or elbow) |
| Hack Saw (may be needed) | Uni-Strut Rail / Mounting Hardware (may be needed) |
| Wire Fish Tool (may be needed) | Std 1.4" DIN Rail For Relays (may be needed) |
| 1/8" Flat Blade Screwdriver (for RTU terminal connections) | DIN Mounted Relays and Bases (may be needed) |
| Standard Hand Tools | 22/18 Gauge Wire (or Mission wiring harness) |
| Multi Meter with AC and DC Measurement | Tie Wraps (for wire dressing) |

AT THE SITE

1. **Test / Power the M-110/M-800.** Unlike the M-100, the M-110 and/or M-800 needs to be tested at each site. Digital cellular coverage is very good, however, is not currently as comprehensive as the original cellular network that the M-100 used. Additionally, the M-110/M-800 transmits thousands of times more data and hundreds of times more transmissions than the M-100. It is recommended that you confirm coverage with MISSION for all applications prior to site installation. The following procedures will only take a few minutes to conclude.

Using the included battery and antenna set the MISSION RTU on top of the control cabinet or near it and attach the antenna. *DO NOT* set on the ground. If installing an M-113 or M-803 "FlatPak" you may have to hold the antenna at its base. *DO NOT* lay the antenna on its side or on metal. Connect the battery Black lead first, then Red. The vertical Status LEDs should all illuminate, and then turn off.

The Mission RTU then begins to connect to the wireless network. The red LED on the radio itself will come on solid and then start to blink. The top LED on the vertical LED stack on the lower left of the main board will light up. As the Mission RTU goes through its connecting sequence the green vertical LED will sequence down the vertical LED stack. (The red LED on the radio should continue blinking). Once the vertical LED reaches the bottom of the stack it will turn red. You should then here 3 beeps only. Also the Carrier LED located to the top left of the radio board should be on solid. If this is the case the RTU is then communicating with the carrier and logged into Mission.

The radio is now "logged onto" the network. *If this Does Not happen call MISSION immediately.* Note the Yellow trouble LED may illuminate and begin to blink. This is indicative of the lack of end-of-line resistors on some of the digital inputs, however, should not be concerning at this point. Their use will be covered later in this guide.

The MISSION RTU will beep 3 times when making connection to the MISSION computer center. This will indicate successful connection. Note, if the Red LED on the radio is solid, there is a problem with connectivity. **The test is successful if and only when the horizontal input LEDs start flashing, the Carrier LED on the radio board is on solid, and the top vertical Status LED remains illuminated Green. There should be no Red LEDs on solid but should be blinking.** At this time the MISSION RTU will begin sending startup messages. The M110 and M-800 have a signal strength LED feature as with the

M-100. At this time you may push (one second) and release the small white button to the left of the Vertical LED stack and the unit will display the current signal strength via the vertical LEDs. The unit will display signal strength via the LEDs for about 20 seconds, then revert to displaying status information. MISSION recommends that two or more green LEDs be on for good connectivity, or you may call MISSION to have the signal strength read remotely. If it is not better than -95dB (one green LED lit) then you probably will have to elevate the antenna or use a high gain antenna. Power down the MISSION RTU and proceed with permanent installation. If input LEDs do not illuminate or the Red LED on the radio remains illuminated, immediately call MISSION technical support (877-993-1911 or 678-969-0021).

2. **Mount the MISSION RTU, AC transformer, Wet Well Module (optional) and Relays (optional).** Where are you going to mount the MISSION RTU? Determine where it's best to mount the M-110 or M-800. Is the antenna **ABOVE ALL METAL** (it should be)? Do not mount the antenna so that it is against metal (no closer than 4 inches). FlatPak units mount to the control cabinet inner door (dead front) with connection wires going through the 2 large housing holes. Do you have enough conduit to reach from the MISSION RTU to the cabinet? If using a wet well module, will its Blue connecting cable reach from the wet well module to the MISSION RTU main board? Where are you going to mount the MISSION A/C transformer that is included? It should be near a 120 VAC and neutral source (near the control circuit breaker). It is not recommended to mount the AC transformer inside any MISSION enclosure. If you are using a MISSION Ametek / US Guage level sensor you must determine how you will feed / route the level sensor cable through the float conduit to the MISSION RTU. Is the 40-foot cable long enough? It can be extended if care is used. Are you going to hook up other existing analog devices and how? MISSION also provides a general analog wiring guide or you can call MISSION technical support. All wiring inside the MISSION enclosure should be low voltage. Mount the optional relays (pump fails etc.) near their source. MISSION provides self-tap screws for most items.
3. **Cut the Conduit and Wiring Holes.** Drill/pull the conduit holes in the control cabinet and MISSION RTU (NEMA 4 or NEMA 1). FlatPaks have 2 large holes in their back plate to drill through the cabinet inner door and provide wire access. With the FlatPak unit you must mount the antenna on top of the control cabinet. Unscrew the antenna from the base. Use included gaskets to seal. Use sealant if desired around the outer edge.
4. **Pull the Wires and Cables.** **CAUTION - TURN OFF ALL STATION POWER!** Before final connection of flex conduit, first pull the wet well cable (if used), then the AC and input wires (MISSION includes a pre-stripped 8 conductor cable which most customers use). Lay wires in wire trays with excess near terminations. Replace wire race covers. **Ensure Loose Wires Are NOT Touching Any Other Equipment!**
5. **Connect Digital Inputs.** **POWER SHOULD STILL BE OFF!** MISSION's default input connections are as follows - Inputs 1,2, and 3 are pump runtime accumulators, Input 4 is high wet well, Inputs 5 and 6 are pump 1 fail and pump 2 fail, and Inputs 7 and 8 are unassigned. See the wiring diagram on the M-800 door and unit set up sheet in the packing box. This can be changed if needed by calling MISSION.

Inputs MUST NOT have 120VAC or Any Voltage supplied through the wires! ALL inputs MUST BE dry contacts! Test this for both the open and closed relay positions. This is the #1 Installation Mistake.

The M-800 is expecting **Normally Open** contacts that close on alarm or event. You may use normally closed contacts on inputs 4 through 8, however, you must tell MISSION Technical Support on the unit set up form or via the telephone. **You MUST use normally open contacts on pump runtime inputs!**

Use the 1000 -Ohm end-of- line resistors supplied. Use 2 separate wires for each input. **Do NOT Use a Common Input Wire!**

The 1000-Ohm resistors supplied go across the digital input connections at the relays / terminal blocks. This is a parallel connection across the monitored relay contacts. It provides wire supervision similar to a fire alarm panel. Not installing them will result in wire fault alarms. The Yellow wires with Black centers are 1000-Ohm resistors with 6-inch wire pigtails. Use these when bridging across relay bases. **Do Not connect anything to input 3 if there is no 3rd pump run time!** Connect small 1000-Ohm resistors to any unused alarm input terminals.

6. **Connect Wet Well Module Wires (optional).** If using a wet well module there **Must Not be Any Connections to Inputs 1 through 4** on the MISSION RTU main PCB board. Connect the wires labeled Pump 1 and Pump 2 to the pump run relay bases or the hour meter bases. **These are the ONLY input wires that attach to 120VAC contact points.** The pump 1 and 2 wires are designed to sense 120VAC when the pumps are running. The wet well module will indicate to inputs 1 and 2 on the MISSION RTU board that the pumps are on / off. This is done through the Blue connection cable. Connect the float and control wires from the wet well module. Disconnect the high-level alarm float wires from the control panel terminal block. Connect these wires to the wet well modules wires labeled "to float" with the wire nuts supplied. **Ensure that the float wire connects ONLY to the high wet well float wire! This is a Common Error.** Connect the wires labeled "control panel" to the control panel terminals that are used to hold the high float wires. When the wet well module "senses" the high float go into an alarm state it will mimic a contact closure for the control panel so it will still operate as before. Additionally, the module will indicate to input 4 on the MISSION RTU main board that there is a high wet well. Plug in the Blue connection cable to the wet well module and to the "telephone" style plug on the MISSION RTU main board. Reference the installation sheet in the wet well module packaging.
7. **Connect the MISSION AC Transformer.** The Black leads from the transformer are the primary (120 VAC side) and the Yellow supply 12 VAC that powers the MISSION RTU. It is acceptable to run the 12 VAC inside the same cable / conduit as the digital inputs or wet well module cable.
8. **Double- Check the Wiring Connections before Re-Powering the Pump Station.**
9. **Initially Power the MISSION RTU with Its Battery Only. Do Not Power the Station Yet.** Black lead first, then Red (12 VDC). Watch the LEDs to make sure it powers up as previously described in section 1. Allow the unit adequate time to perform its power-up sequence and synchronization to the network. 5 to 10 minutes is generally adequate for the process to successfully conclude.
10. **Power the Pump Station. Immediately focus on the MISSION Main Board.** Check to ensure the MISSION RTU is still operating. If somehow a wiring mistake has been made and 120VAC is being fed to the MISSION RTU main board it will be evident. If there appears to be a mistake, **Immediately Power Down the Station** before it permanently damages the MISSION RTU unit.
11. **Test the Installation. It is HIGHLY RECOMMENDED that the Following Tests Be Thoroughly Done to Ensure the Customer or End User Gets Proper Notifications!**
 - **Test AC.** Check the Yellow TRB LED. It should not be on steady. If it is, the MISSION RTU is not wired properly for 12VAC. If the yellow LED is blinking then one of the alarm inputs (4 – 8) does not have / sense the 1000-Ohm end-of-line resistors. The Yellow LED should be off.
 - **Test Battery.** The Red Bat LED should be off. If it is on check battery wires, then battery voltage. If below 11.8 VDC the Red Bat LED will be illuminated. If it measures below 10 VDC, then the battery may be bad.
 - **Test Radio Connection.** Check the vertical LED marked "A". It should be on steady. If not call MISSION at 877-993-1911 or 678-969-0021.

- **Test Vertical Status LEDs.** A good installation **ALWAYS** has the Green "A" LED on, while the Green DAL LED is blinking quickly. The "SID" LED will continuously blink. The Green "REG", "ACK", and "PAG" LEDs should remain off except when data is being sent; then the "REG" LED will light during transmission. All Yellow and Red LEDs should be off. The Red "BAT" LED will blink when the MISSION RTU is charging its battery.
 - **Test Alarm Inputs.** Check the horizontal input LEDs on the main MISSION RTU board. If any are blinking the input does not sense a 1000-Ohm resistor. Check the wiring / connections of the resistors. Pump run inputs (1 – 3) do not blink. Test any alarm relay input by actually putting them into an alarm state. If not possible then short out the 1000-Ohm resistor at the relay / terminal connections. The corresponding input LED should turn on. If not check wiring / connections. Ensure that all alarm inputs when CLOSED cause the corresponding MISSION RTU input LED to turn on. It is recommended that you work with MISSION Tech Support to confirm that alarms are being properly transmitted and received at the host website. Remember, ***the M-110 and M-800 inputs are different from the M-100. They only have a 1 second delay on transmission.*** A short closure / opening **WILL** be transmitted. This can be changed if desired.
 - **Test Pump Runtime Inputs.** Turn on pump 1. MISSION RTU input 1 LED should illuminate. If not check the wiring and/or end-of-line resistors. Repeat step for pump 2 and 3 if used.
 - **Test High Level Alarm.** *It is Recommended to Perform this Test!* Open wet well. Pull high-level float up and put into alarm condition. Ensure that the MISSION RTU input 4 LED turns on. If not check wiring (wet well module, etc.). Also check the high level float itself. Do not leave the installation until this alarm function is working. The alarm should be received at the host website and viewable by MISSION Tech Support within a matter of seconds (typically less than 15) following the de-bounce period.
 - **Test Wet Well Module** (if used). By performing the above pump run and high-level alarm tests you will have tested the wet well module as well. The Green power LED should always be on. The Yellow pump run LEDs come on when pumps are running. The Red high level alarm LED should turn on when the high float is closed (typically alarm).
 - ***Did the Customer Get the Correct Alarm Notifications / Phone Calls From the Tests? Please Ask!***
12. **Site Commissioning.** ***MISSION Does Not Consider an Installation Complete until it has been Fully tested by the End User.*** It is imperative that **ALL** alarm points be tested and that alarm notifications are accurately received and acknowledged by the customer or end user. All alarm recipient phone, pager, and fax numbers, as well as e-mail and e-pager addresses must also be tested. The customer or end user must ensure that the system is properly setup with MISSION for e-mail or fax notification of unit trouble or outage alerts. Additionally, it is recommended that the customer or end user test all alarm points at least every 6 months to ensure all electrical components and alarm parameters are still functioning as desired and that alarms are being received and acknowledged by all recipients as desired.
13. **Completion of Unit Set up Form.** This is important. It is how MISSION configures and labels your unit inputs. Please provide us with an accurate street address AND Zip Code. This is needed for accurate plotting of the unit on your homepage map. A Longitude / Latitude reading will also work. Also, please provide us your name and cell number so we can contact you with any questions. ***FAX THIS TO MISSION at 678-969-0541.*** In emergencies we can take this information over the phone, however, require you to fax it to us later for time and documentation reasons. We will get it entered immediately.
14. **Clean Up Installation Site.** Lock MISSION enclosure if possible and clean up the site as appropriate.