Armada Technologies Pro800D Hi-Power Wire and Valve Locator

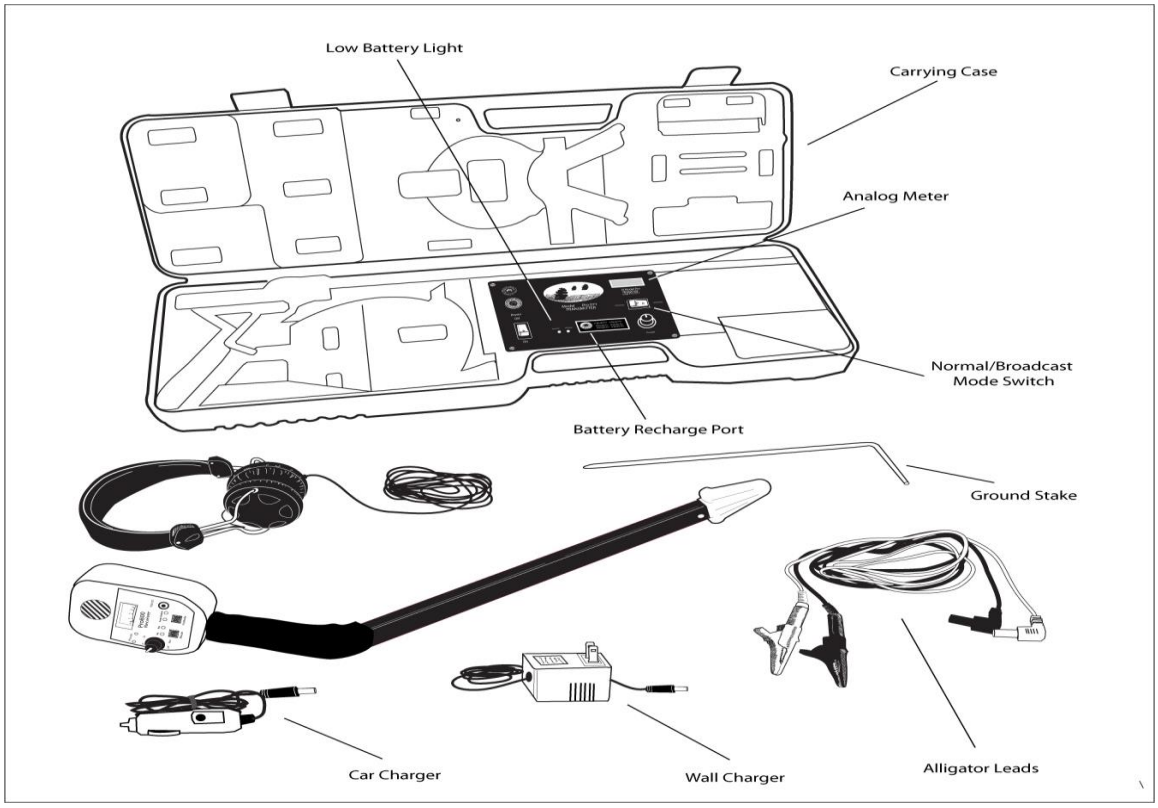
Operating Instructions

WARNING – Read and understand the instructions before operating this unit. Failure to do so could lead to injury or death.

The Armada Technologies Pro800D Hi-Power wire and valve locator is designed to track underground wiring and find lost sprinkler valves. In addition, broken or severely damaged wires may also be located. The complete Pro800D kit consists of:

- (1) Pro800R Receiving Wand
- (1) Pro800T Transmitter and Carrying Case
- (1) ProH1 Mono Headset
- (1) ProGS Ground Stake
- (1) Set of Black/Red Connecting Leads
- (1) Operating Manual

Please be sure that all items are included before operating.



Theory of Locating - Cable Locators consist of a transmitter and a receiver. In the case of the Pro800D model, the transmitter is the long black box and the wand is yellow and black. In operation, a transmitter places a specific frequency signal onto the metallic conductor you are trying to trace. This placing of an AC signal onto a cable produces an electrical current and an electromagnetic field around that cable. If the wand is close enough, this signal is received and amplified by the wand.

It is very important to understand that the circuit you are creating follows the laws of physics and electricity. A cable transmitter creates an electrical current (AC) that travels down the cable, through grounding to the earth, and then back to the transmitter through the ground stake. The tracing signal will always travel on the path of least resistance. If there is too much resistance or no circuit path, no current will flow and no locate will be possible. So keep in mind that when a signal is heard, it is because the signal has a complete path that is creating an electrically friendly way for the signal to travel back to the transmitter. The signal doesn't just randomly wander through the dirt. It follows a path provided for it, whether it is a pipe, wire, reinforcing bar. etc.

It is also important to note that in the tracing circuits, a return path needs to be present. Basically, the return path completes the circuit. In most cases, this will be the earth ground as the signal transmits down the cable and returns to the ground stake. However, any return is possible, so a common wire could work. Or if you have a looped wire, like a dog fence, the loop itself returns to the start and therefore provides a 'ground' instead of the ground stake. You don't have to use a ground stake but you do have to give the signal a way to return to the transmitter.

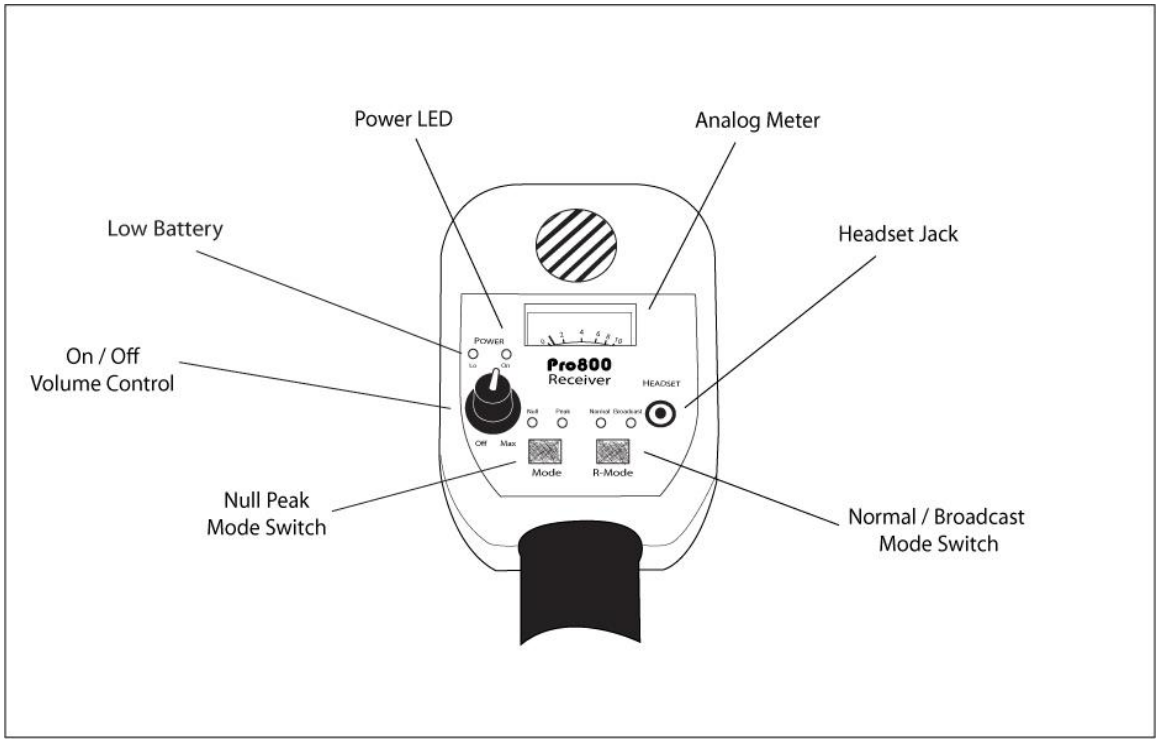
Battery - The Pro800D uses 8 “D” sized batteries, located inside the transmitter battery compartment. For the Pro800D, similarly remove the battery compartment cover and install the batteries, paying particular attention to the positive and negative poles.

A 9 volt square battery is used in the receiver. To install this battery, remove the battery compartment cover located on the back of the Pro800 receiver. It is sometimes helpful to use a flat tool in the battery cover notch to open the battery cover. Install the 9 volt battery by connecting it to the battery boot inside the battery compartment. Don't yank or pull hard on the battery boot. Replace the battery cover.

To test that the batteries have been correctly installed, turn on the wand and the transmitter. LEDs will light on both if the batteries have been connected correctly. If not, repeat the installation procedures. In the case of the Pro800D, the battery compartment is designed to hold the batteries tightly so if you do not get a signal for power, try adjusting the batteries by rolling them or moving them forward and backward until the power does come on.

WARNING – Do not touch the metal red or black alligator clips on the transmitter cords when the power is on. There is danger of injury or death should this occur.

Battery Condition LEDs- There are low battery indicator LED lights on both the transmitter and receiver. These LEDs light up when the battery power has been diminished enough to affect the performance of the Pro800 (about 10 volts in the transmitter, 7 volts in the wand). After the low battery light has come on, the LED will dim as the available battery power gets weaker. The LED will not light at all if the battery is completely drained of power.



Operation - Begin by powering off the controller and removing the common wire and any target wires from the controller. Never submit any controller to voltage from any test equipment. With the transmitter off, connect the red alligator lead to the wire you want to trace (target wire) and the black alligator lead to the included ground stake. Insert the ground stake into the soil or earth ground perpendicular to the path of the wire and as far from the transmitter as possible. Do not use common grounds such as pipes or electrical grounds unless you have no choice. An independent ground stake usually works better than a common ground. If you do not have access to direct ground, and extension wire can be used.

Make sure the transmitter and receiver are both in the “Normal” mode for direct connection of the alligator leads.

Turn the Pro800 transmitter on. Adjust the power output knob and increase the power until a reading between 4 and 8 is achieved. **If you cannot achieve a reading of 4, turn the unit off and retry your grounding operation above**. A good ground is crucial for optimum operation. Soil conditions can affect this and you may wish to moisten the grounding area. Also, re-check batteries for proper connection and operation. Do not overpower the unit by turning it up past 10 on the meter. You won't hurt the unit but you will waste battery power with no additional performance.

Tracing Wire - After the transmitter has been properly connected (above) and verified to have a good ground (4 or higher meter reading) and power, turn on the receiving wand by turning the volume knob on the front control panel (illustration above). The unit defaults to the normal mode with null reception at every start-up. Place the receiver near the operating transmitter. A beeping sound should be heard indicating that the receiver is working properly. A high pitched tone could indicate that you are too close to the receiver or your batteries are low. A fading or scratchy signal indicates low battery.

There are 2 optional methods for reception of the signal; Null or Peak. The receiver defaults to Null every time it is turned on. Null means an absence of signal when pointed directly at the cable in question and louder to the left and/or right of it a few inches. Peak means the opposite, that the signal is loudest over the cable. You may select which mode suits you best. In general, the closer you are to the cable, the louder the signal should be except for directly over the cable in the Null mode.

Begin the wire trace by sweeping the area approximately 5-10 feet from the transmitter. Begin by searching for the null response. Until the null is acquired, you may receive audible responses of varying degrees. Follow the signal response until the signal is lost while marking the path as you trace.

NOTE – When connecting directly to a cable, place the transmitter and receiver in the NORMAL mode. The receiver and transmitter must always be in the same mode to operate correctly.

The on/off control on the front of the receiver regulates the volume level of the receiver, both headphones and external speaker. Additionally, the analog meter on the front of the receiver will indicate the reception power level visually. After connecting and turning on the transmitter and the receiver, point the receiver toward the ground in the direction of the cable and listen for the beeping signal.

Additionally, the feedback of your locate is given in 3 manners; audible external speaker, headset, or analog meter. Any of these three options indicate signal strength that is being received by the Pro800D.

Finding Faults – Breaks or severe wire damage can be found with the Pro800D. The setup of the unit is the same as when tracing wire. The difference comes in the reception. Whereas the traced wire continues to emit a signal along the path of the cable, a break will cause the signal to stop at the point of the break. A nick or damage will cause the signal drop to a lower level but not necessarily end. Either the speaker or the analog meter on the receiver will indicate this drop.

Be sure the cable or wire you are tracking is grounded. To trace a cable, it must be grounded, either mechanically or capacitively. Mechanical means a direct physical ground. Capacitively generally means non-ducted cable. The signal needs a path to return to the ground stake and without it, you will not get a good locate. A bad ground is indicated on the transmitter analog meter when the needle cannot achieve a 4 or better even at full power. In many cases, a direct buried cable fault will provide this grounding and allow for a cable to be located. When no current is flowing and the transmitter is on, the analog meter will show 2.

Do not let the receiver level go above 10. You are looking for a drop in signal and you may not see it if the analog meter is pegged to the right.

A general rule is the greater the damage to a cable, the greater the drop off in signal at the point of damage. Conversely, minimal damage or weak grounding will show little change. This is an art and small faults are sometimes difficult to locate. Practice and experience will help immensely in this task.

Finding Solenoids and Valves – There are generally 2 accepted methods to find a lost solenoid/valve.

The first method is to connect the red lead of the transmitter to the station wire leading to that valve and the black to ground as described above. Operate the Pro800 and Pro800D as above and begin your locate. When you reach the point where a valve/solenoid is located, the signal will expand into a large (approx. 2-4ft) diameter area of signal. Many times this signal volume will get louder. This is your indication that you are over a valve or solenoid.

The second method starts by tracing the wire path as previously described. Irrigation valves are located in null mode only. Once the wire path has been traced you must power the transmitter off, remove the black lead from the earth ground and connect it to the common wire. In the case of multiple common wires it is suggested that you isolate and connect to the common wire that services the target valve. Connecting to multiple commons will work, however it weakens the signal response.

Power the transmitter on and adjust the output signal to suit your needs. High power output is not necessary and will limit battery life. It is advised that you once again point the receiver at the transmitter to assure that both units are on and functioning properly.

Slowly follow the pre-marked wire path. There will be an absence of signal response due to cancelling of the parallel wires until you near the valve. As you move closer to the valve the receiver will begin making a chattering sound which will intensify and distort, turn the volume down and take your time.

Even with the volume at its lowest setting the response of the valve solenoid will be very loud. Pinpointing the exact location of the solenoid is possible by decreasing the volume and taking your time. The lower the volume is, the more accurate you can be.

Slowly start moving the receiver in an X pattern above the high pitched area, continue reducing the volume while moving the tip of the receiver closer to the ground. Between the proximity of the receiver tip to the ground and the reduction in volume you can tell exactly where the valve solenoid is. Use a probe to find the outline of the valve box before excavating. This will assure that unwanted damage isn't a result of your locate. Once the valve is located, verify that it is indeed your target either manually, with the Pro48, or from the controller.

There may be more than one valve on the cable being traced. You may wish to continue past the first valve located to determine if other valves are also located on this wire.

Broadcast Mode – Broadcast mode is different from using the direct method of connection that has previously been discussed. It is not as precise or strong as direct connecting, but when access to cables is limited or just a quick scan is required, Broadcast Mode can be very useful.

Broadcast mode is excellent for finding telephone or cable TV lines. It is less useful with wires attached to solenoids. The principle in use with Broadcast mode is AC induction. On ordinary wires, that works well. And it can work for sprinkler wire but the solenoid has to be eliminated from the circuit. This can be done by disconnecting the solenoid and grounding the wire manually. The problem is that the solenoid acts as a signal dampener with AC inductance. By removing the solenoid from the circuit, you can find sprinkler wires in broadcast mode. Deactivated 2-Wire systems do not have this issue and are traceable as they exist in the ground.

Broadcast mode uses an inductive antenna located in the transmitter case to broadcast a signal around the case in an approximately 20 foot radius in all directions. It allows the user to transmit or induce signal from the transmitter directly into the ground. Any grounded metallic cable (without solenoid) traveling through this electromagnetic field will pick up at least some of the tracing signal, making that conductor traceable with the wand.

There is nothing a user needs to do with any controls to use Broadcast Mode other than the selection of Broadcast mode on the transmitter and receiver. To do this, **place both the transmitter and receiver in the Broadcast Mode by selecting "Broadcast" on the selector switch**. Place the transmitter on the ground over the cable you wish to trace and turn it on. A vertical position of the case increases the power induced into the ground. Do not tightly shut the transmitter case as it will turn the transmitter off. The transmitter is now inducing signal approximately up to 20 feet from it, and energizing any conductors in that field. You may now trace any conductor that has picked up that signal.

The Broadcast Mode automatically tracks in Null Mode. However, due to weaker signal inherent in inducing signal, it may sometimes appear as a peak signal.

Also note, when the user is within 20 feet of the transmitter, you cannot trace a cable because the signal from the case itself will overpower the induced cable signal. The user will always hear the transmitter signal within 20 feet of the transmitter case.

The Broadcast mode does not have a power output adjustment on the transmitter. To indicate this, the analog needle on the transmitter normally should read 10 or more. In addition, remember that ALL conductors in the ground that can pick up the signal will. Therefore, tracking is better in non-congested areas.

It is important to understand the uses and limitations of Broadcast Mode when compared to direct connection with the alligator clips.

How to determine depth - Find the null over the wire path and mark it. Then place the tip of the receiver on the ground at the mark. Without lifting the receiver tip from the ground, lower the top of the receiver to approximately a 45 degree angle and slowly walk the receiver away from the wire path until you reacquire the null. The distance between the wire path and the newly established null is the approximate depth of the target.

Determining target accuracy - This is a very easy to perform method of determining target accuracy. Place the tip of the receiver on the ground directly over your suspected target location, switch from null to peak by pressing the mode selection pad. The peak and null responses will agree if the locate is accurate. If the peak and null are off by more than a few inches the location is not accurate. Toggling between the null and peak modes often when locating the wire path will assure you of accuracy and help build your confidence.

Helpful Hints – Increases in signal strength and/or the size of the area it is occurring from usually indicates some type of anomaly in the cabling. Things that could cause this are valves (as described above), nicks, cuts, bad splices, or cut wires. Cable in good condition does not normally change the tone or strength, other than a very gradual loss of reception over distance, but it is possible. Slack loops of extra wire left in the ground at installation are an example of a condition that would cause an increase of signal and yet have no problem.

Also, soil condition makes a huge difference in the performance of cable locators. Basically a circuit is being created from the transmitter, through the cable, out through the ground and back to the ground stake. Any discontinuity in any of these links will cause the locator to not work. Be sure your ground stake is secure and in the dirt and that the transmitter is connected to the cable you want to track.

The soil serves as the return path for the circuit. When using direct connection methods, you may have to condition dry or sandy soils to increase the conductivity of the soil by adding a little water at the ground stake. The best way to really learn the Pro800D is to use it. Set up a test site at your home or office and get used to how it works. There is no substitute for experience in the art of locating.

Warranty – Armada Technologies warranties all products for 12 months from manufacturing defects from the date of retail purchase. Armada Technologies will repair or replace any component that is returned to Armada Technologies within 12 months of purchase and does not exhibit signs of abuse or misuse. It is Armada Technologies sole discretion to determine this condition. Armada Technologies also reserves the right to require a proof of purchase in order to determine date and validity of purchase.

Batteries are not covered by warranty.

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