

Locating Conduit for Roofing

(Using Vivax-Metrotech vScan/vScanM)



- PASSIVE (POWER/RADIO)
- ACTIVE (33kHz/131kHz)
- METAL (Ferrous metal)

Overview. We have found the **vScan** underground pipe and cable locating system to be an effective locator for roof-top applications such as commercial re-roofing. Re-roofing contractors are always looking for methods to avoid hitting the wires, conduit and steel beams underneath the decking when they drive in screws to secure a new roof. The **Vivax-Metrotech vScan** is optimally designed for locating conductors and works well for this purpose.

The **vScan** system consists of a hand-held receiver (Rx) and a transmitter (Tx). The **vScan/vScanM** Rx receiver is effective in either the passive or active modes and can even be used to detect ferrous metal objects (vScanM only).

The vScan Transmitter (Tx) provides added benefits but is not required for some re-roofing applications. We will describe the best procedures for using the vScan in this document.

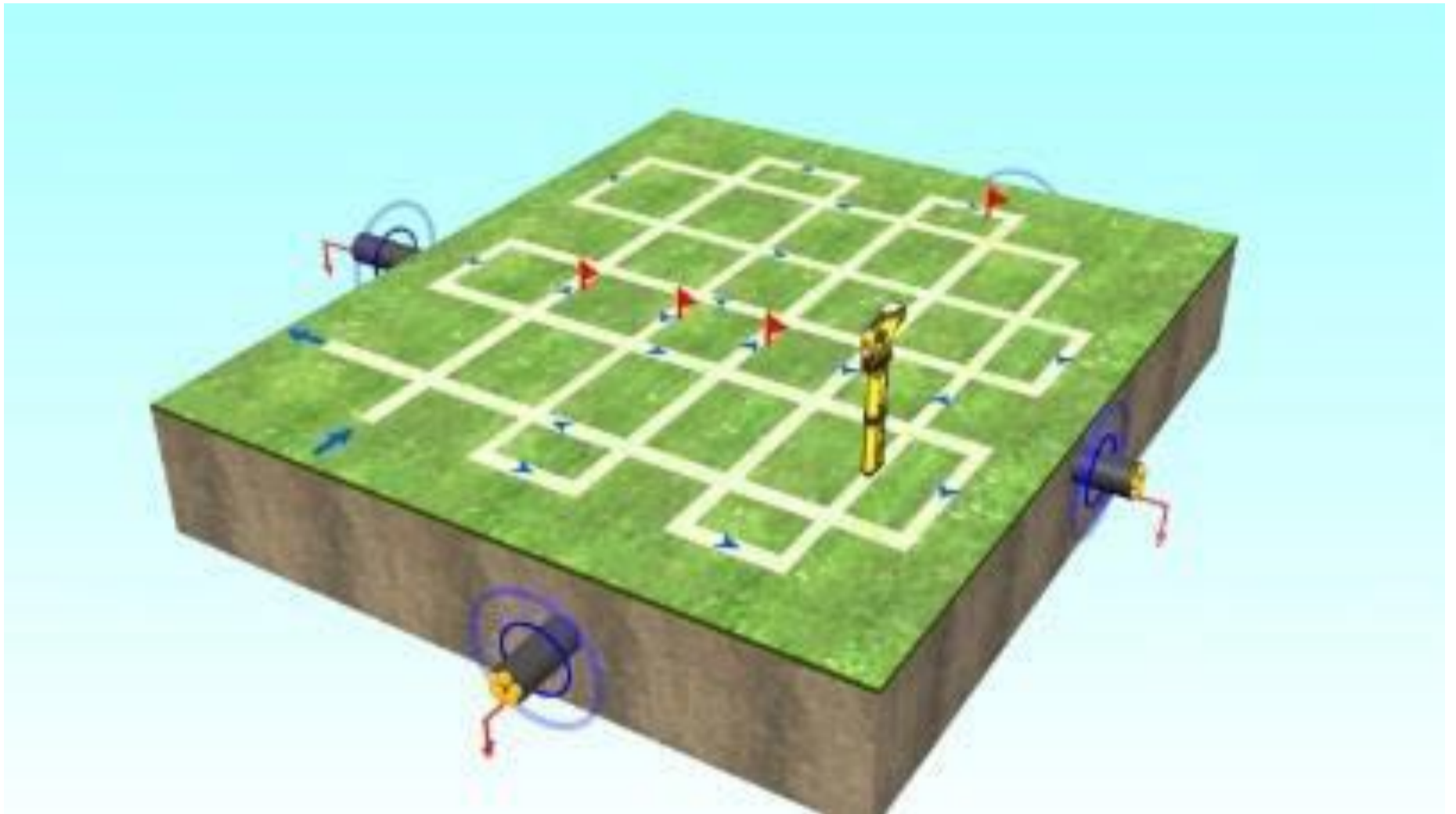
Common User Needs for Re-roofing jobs

- Avoiding conduit with live power, inactive power, low-voltage D.C., CATV, and telecom. You may not know exactly what is under the roof, but you probably want to avoid all of it.
- Avoiding the steel beams under the roof.
- Usually avoidance is the primary goal but you may also be interested in the depth feature.

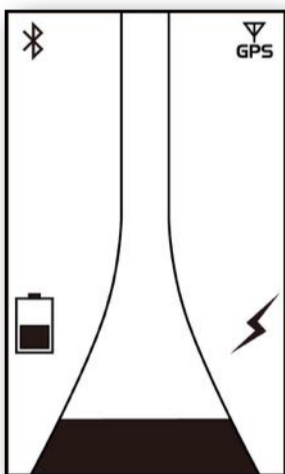
Using the vScan Receiver only in PASSIVE MODE. Recommended steps:

- Start in the **POWER** mode by selecting it using the "modes" paddle.
- Perform a standard grid pattern sweep of the area (see picture on next page).
- When a conductor is identified, pinpoint the location by adjusting the gain to determine the location of the strongest peak signal at the lowest possible gain. "Mark" the area so that later you can avoid drilling into the known power conduit. Avoid drilling at least 3-6 inches on either side of the (Marked) peak signal along the length of the conductor. The exact area to mark will depend on how much space is available and what each roofer is comfortable with. It is certainly OK to mark the area further away than 3-6 inches if that is preferred for added security.
- Repeat sweeping a standard grid pattern as described above but this time in RADIO mode (Also see drawing on next page).
- If you find an additional conductor in RADIO mode, it could be a variety of other items to avoid, including inactive power (Conduit not in use at the moment), steel beams, low-voltage D.C., CATV, or telecom. Always pinpoint the location, and "mark" the area in the same manner as in POWER mode.
- A weaker signal in any of the modes (POWER, or RADIO) could indicate that the conductor is located further away or below the roof decking, or it could indicate that the conductor is close to the roof deck but has less current flow and generates a weaker magnetic field. In order to be safe ALWAYS mark these conductors for avoidance as well.

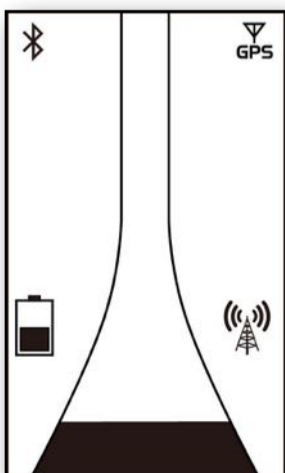
Passive Sweeping in POWER and RADIO



Grid Search



POWER Mode



RADIO Mode

Using vScan in ACTIVE mode

Using the vScan Receiver and Transmitter in ACTIVE MODE. We recommend following these steps:

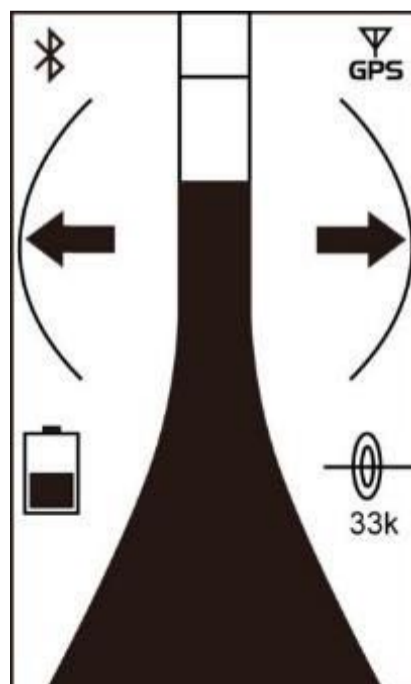
- Use the **LPC Separation Filter** for direct connect to the building (see below picture).
- Before going on the roof, plug the **LPC** into any convenient outlet in the building or on an exterior wall.
- Turn ON transmitter and select 33kHz. On any re-roofing job, ALWAYS use two different frequencies to verify results. Use 33kHz on the first sweep and then use 131kHz on the second sweep.
- Set the **vScan Tx** in Pulsed Mode (very important)
- Set the **vScan Rx receiver** in the same frequency as the **vScan Tx transmitter** and repeat the same steps described in Passive mode, starting with the standard grid search (see picture on previous page).
- In active mode you will identify the pulsing Tx signal on any conductors that are common bonded in the building. When any conductor is located in active mode, “mark” the area for avoidance using the same procedure described for Power and Radio modes on the previous pages.
- Once in the Active (Frequency) mode you can also obtain a depth estimate. Note of caution: on measuring depth the user manual states, “For best accuracy use the vScan transmitter in continuous mode (it is possible to perform depth measurements with the Tx set to pulse mode but a slight reduction in accuracy may be experienced).” Switch the Tx to continuous mode for the most precise depth estimate. Depth is based on internal instrument calculations and is always approximate, and should be treated as such.



LPC Separation Filter

vScan Screen when locating in ACTIVE mode (33kHz and/or 131kHz)

- Note that the screen now shows the Compass Line Direction Indicator (see below).
- The compass indicates the direction of the target line. When locating and taking measurements, keep the compass pointing across the display.

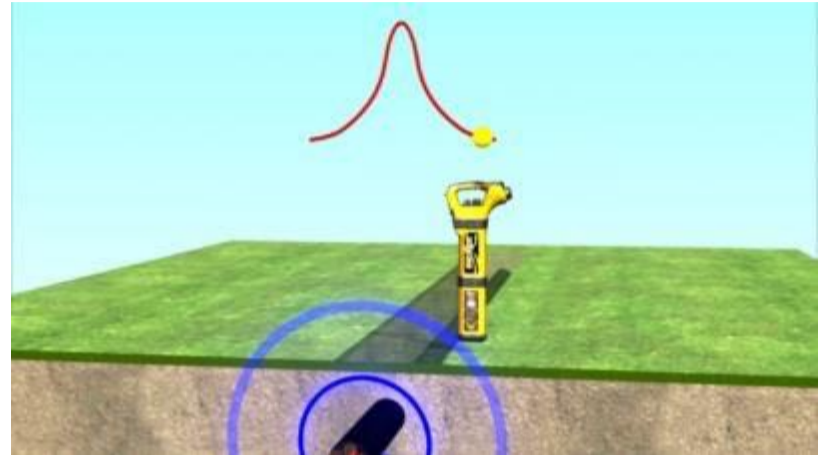


vScan Display (Locating 33kHz)

Locating in ACTIVE mode

Locating Active Signals

- Move forwards slowly, if the signal drops you are moving away from the line, if it increases you are moving towards it.
- Approach the line until the largest signal is detected. It may be necessary to reduce the sensitivity using the sensitivity control to keep it on scale.
- Use the peak level indicator to identify the largest signal.
- You are now over the target line.



Locating Active Signals

- Having pinpointed the position of the target line continue to trace the route of the line to a point outside the area of interest.
- Use the detachable headphone speaker if in very high ambient noise environments.



Taking Depth/Current Readings

- It is only possible to take depth and signal current readings in the active modes.
- Before taking a measurement, pinpoint the line as previously described.
- Place the vScan on the ground and make sure it is vertical and the compass is exactly across the display.
- Press the “i” button and the depth and signal current will be displayed. (Note that not all models have these features enabled.)
- Momentarily press the On/Off pushbutton to exit the information screen.



CAUTION

- Care should be taken when taking Depth and Current readings as the results can be effected by distorted signals.
- Take care at:
 - Bends
 - Changes in depth
 - Congested areas
 - “T” joints



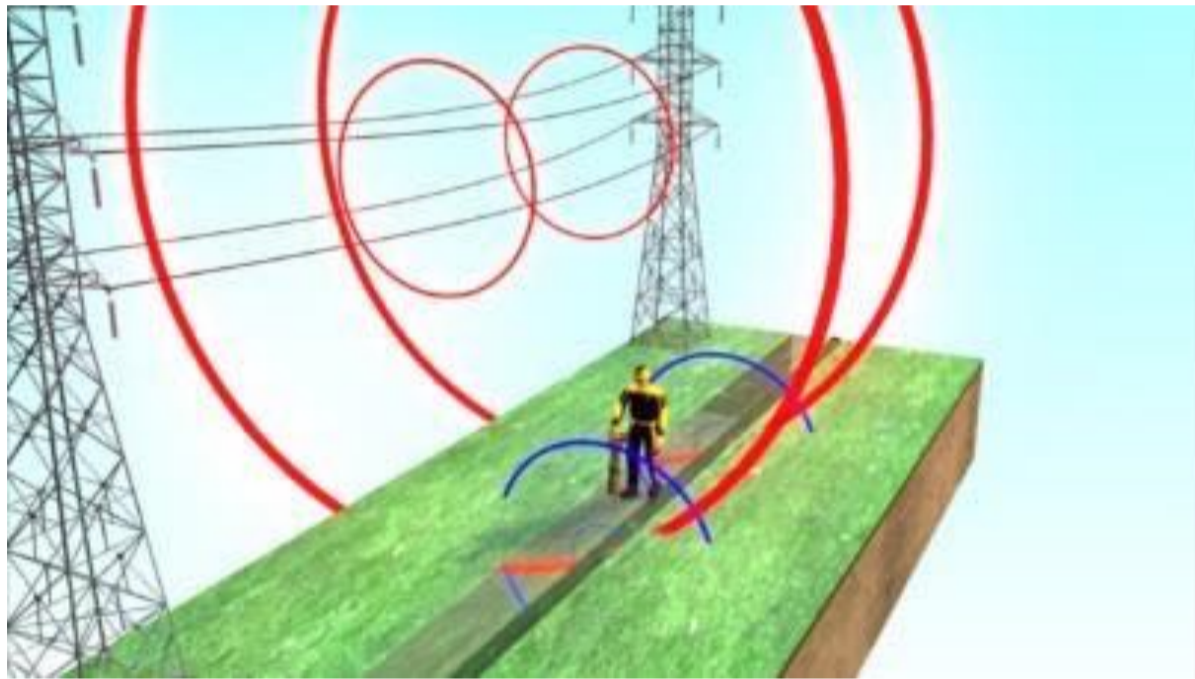
When to use PASSIVE and ACTIVE



When is it best to Use PASSIVE and/or ACTIVE Modes?

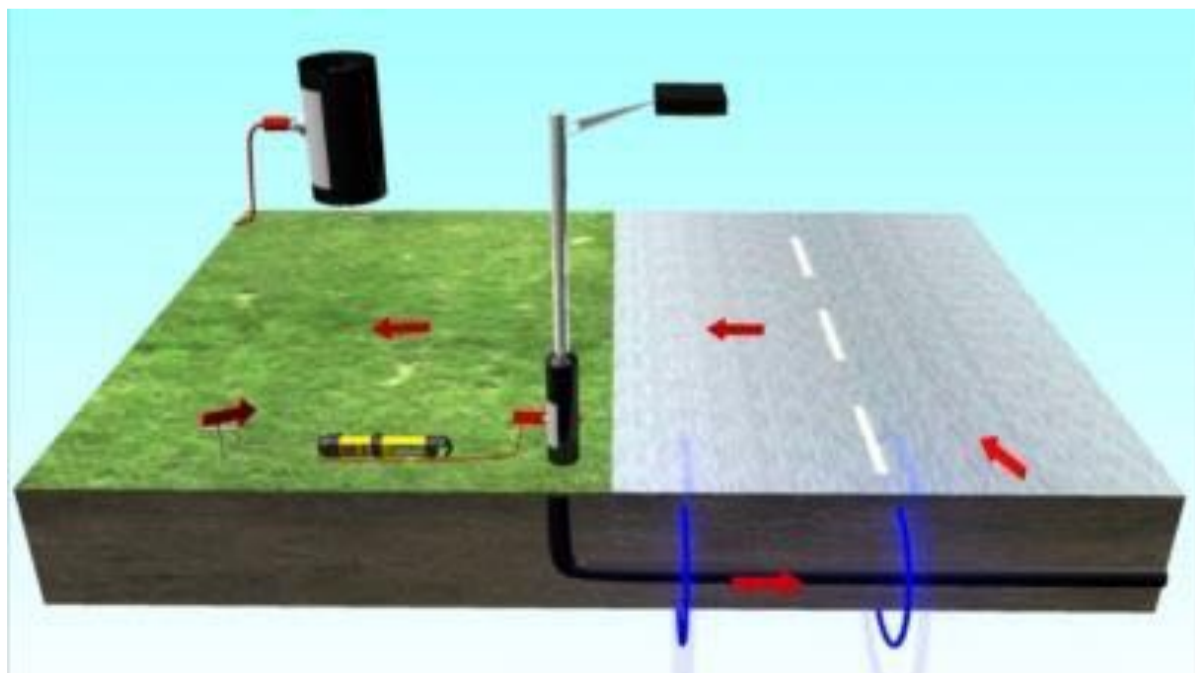
Passive mode provides a number of benefits to the roofer:
(Using only the vScan receiver)

- It is the most cost effective way to avoid damage
- It is simpler and easier to use
- It will locate live circuits in Power mode
- It will locate inactive circuits, steel beams, and other conductors in Radio mode



The Active mode provides these additional benefits:
(Using both the vScan receiver and transmitter)

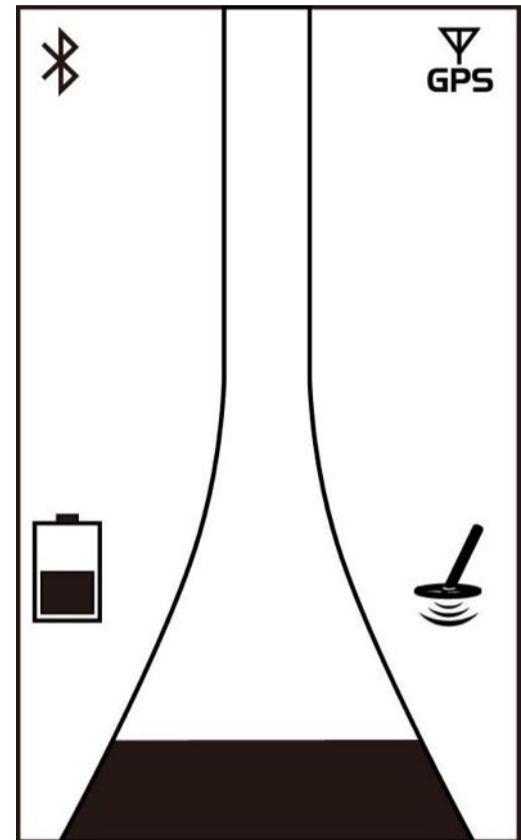
- You get a stronger signal on inactive circuits
- Better differentiation in types of conductors
- Approximate depth of conductor
- The pulsing signal is clearly identified



Using METAL detector mode (**vScanM** only)

Locating a Steel beam

- Select the **METAL** mode using the “modes” paddle.
- Before locating Metal structure it is necessary to perform a simple set up procedure.
- Switch on the vScanM and select the cover locate mode using the mode switch. The cover locator icon should be shown on the screen.
- Hold the vScanM well away from any metallic objects.
- Momentarily press the “i” button. The bar graph will show close to zero deflection and there should be a slow pulse sound from the speaker. The unit is now set up.
- Hold the locator just a small distance from the ground (approximately 2” or 50mm). Now sweep the area in a grid action in a similar way to sweeping for a buried cable. Keep the locator vertical and avoid swinging it. As a metallic object is approached, the bar graph will start to deflect more and the speaker tone will increase.
- Find the peak signal by moving the locator forward and back and then side to side. Use the peak level indicator to help pinpoint the position of largest signal. The largest peak signal will indicate the position of the center of the buried cover.



NOTE

The sensitivity control does not function when using the M mode.

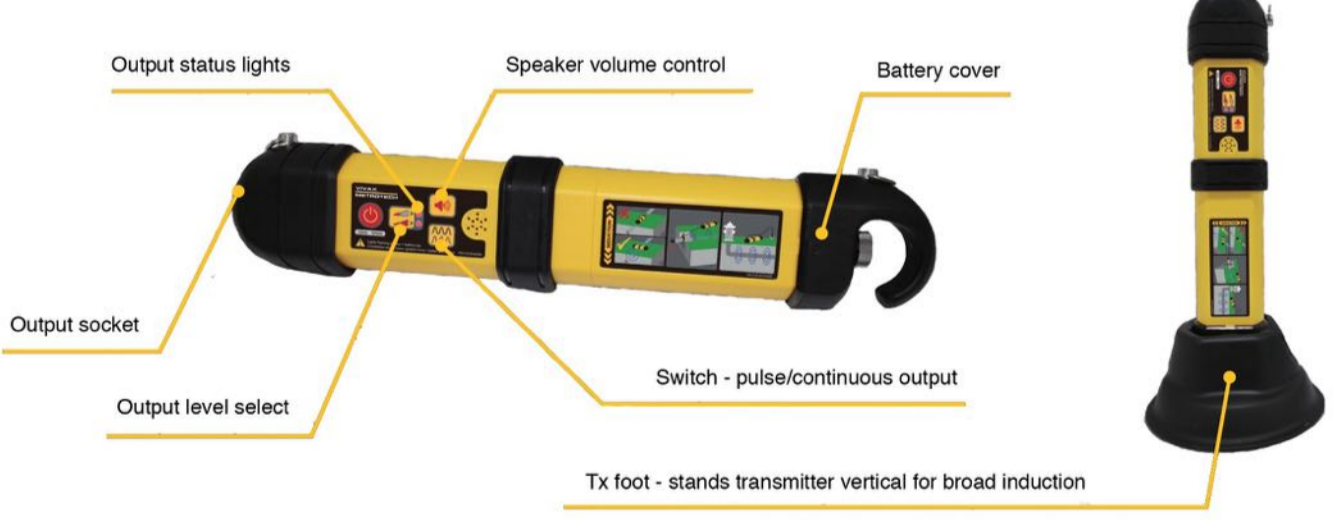


Model vScan/vScanM Details

vScan & vScanM Receiver



1 Watt Transmitter



Model vScan w/Accessories

