



ENDURO
PIPELINE SERVICES, INC.

The RX-102 Tracking Receiver



The RX-102 Tracking Receiver is a complete 22 Hz and acoustic tracking solution with built in geophone.

INSTRUCTION MANUAL

Receiver Model: RX-102
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NOTICE

Only those persons who are fully aware of the potential hazards of working with pressurized pipelines, and trained in the procedures stated in this manual, should use this equipment. The end user of this equipment is responsible for the training, assessing the competence of the operator(s), and the manner in which it is used.



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I. OPERATION

- 1. Install batteries or replace if low:** Open the battery compartments (twist open and close) and install 5 C Cell Alkaline batteries. Never mix old and new batteries, as this can cause batteries to leak and damage the Receiver.
- 2. Turn on the Receiver:**
 - Hold the power button down until the Receiver turns on.
 - The Receiver display will initialize and start the signal display graphs, and you may hear the buzzer briefly. This is normal.
 - If the batteries are low, the display will give a low battery message. If the batteries are completely discharged, the Receiver may not turn on.
- 3. Connect a geophone if desired for acoustic tracking:**
 - If desired, plug in a geophone probe for acoustic tracking. Use the input from Geophone jack. Any geophone (with or without extension cable) with a 3.5mm (1/8") mono jack will work.
 - Connect headphones to the sound output jack, or use a 3.5 mm 1/8" cable to connect the output of the geophone amplifier to an audio input in a vehicle, an FM transmitter, or other device.
- 4. Connect an external wand antenna if desired:**
 - This will disable the onboard internal antenna.
 - An external wand antenna has greater range, and sensitivity to both signal and some noise. It is often used when waiting at a passage point for a pig with a transmitter to pass.
 - It can also be used to detect a weak transmitter through heavy cover or thick walled pipe (for example, in a heavy walled trap).
 - The internal antenna is often used when walking the pipeline to locate a stuck pig, or locating its exact position when stopped in the pipeline or in a trap.
- 5. Adjust gains as needed:**
 - Use the geophone and signal gain knobs to adjust the gain of the geophone amplifier and the received transmitter signals independantly.
 - Adjusting the gains so that the background noise is just visible on the meters or audible gives good results.

Continued on the next page



I. OPERATION:

6. Turn Buzzer on and off as desired:

- The buzzer sounds when a 22 Hz signal is detected.
- Hold the buzzer on/off button to turn it on or off. The light above the button will be lit if the buzzer is on.

7. Adjusting the Display and Settings :

- Rotate the menu knob to change the length of time the detected signals (transmitter & geophone) are displayed on the graph.
- Press the menu knob to cycle through the menu (brightness, time, etc.).
- Rotate the knob to change the settings.



II. TRACKING

22 Hz Pulse, Continuous, and Coded Transmitters:

- Pulsed transmitters will show a pulsing signal on the display.
- Continuous signals will show a steady signal on the display.
- Ambient noise will at times be picked up by the receiver.
- When the receiver detects a 22 Hz signal, or a coded transmitter signal, it will show a 22 icon or the corresponding code (A, B or C) at the top of the display.

Pig Passing by Stationary Receiver / Antenna:

- If the antenna is parallel and above the pipeline, the transmitter signal should peak when it is directly below the antenna.
- A rising and then falling pulsing or continuous signal indicates the transmitter has passed.
- The peak signal indicates the exact passage time.

Locating a Stationary Pig:

- If walking, use either the internal antenna, or if needed for more depth of cover, use the wand antenna.
- Moving the antenna can create noise. Holding the antenna by the cable and letting it hang gently can reduce this noise.
- Move along the pipeline or trap, looking for an increasing signal. This indicates the transmitter is nearby.
- At this point, make sure the receiver or antenna is perpendicular and pointing directly at the pipeline. This helps pinpoint the exact location of the pig.
- Move the antenna or receiver slowly along the pipeline.
 - The exact location of the transmitter is shown by a sharp decrease (null) in signal, with a peak on either side. This only works if the receiver or antenna is perpendicular to the transmitter.
 - If the antenna or receiver is parallel, the point when the signal is strongest (peak) is close to the exact point. Holding the antenna or receiver perpendicular and looking for the null (see above) can pinpoint the position more accurately peak when it is directly below the antenna.

Geophone Use:

- The geophone can be used to hear the pig move through the pipeline at large distances.
- If the distance between welds is known, and the cups on the pig can be heard hitting the welds, pig speed can even be estimated.



III. TROUBLESHOOTING:

The Receiver will not turn on:

- Check that the batteries are seated well inside, touching each other and the battery holder contacts.
- Are the batteries fresh? Install 5 new C Cell Alkaline batteries.

The Receiver turns on but displays odd signals:

- Check batteries. With very low batteries, the Receiver will not function correctly.
- Is the gain too high? In noisy areas, it might be necessary to lower the gain.

The Receiver does not show a Signal Detect with a transmitter:

- Check transmitter specs. Some manufacturer's transmitters use a non-standard frequency, such as 21 Hz.
- Contact us for more information and for custom sizes, runtimes and signal types. Move along the pipeline or trap, looking for an increasing signal. This indicates the transmitter is nearby.

The buzzer sounds for a few more seconds when it is turned off:

- This is normal. After a few seconds, the buzzer will go silent.

There is no signal when an external antenna is plugged in:

- Check the position of the signal gain knob. Is it off?
- Check the condition of the antenna and cables used. Are they are plugged in all the way?

There is no signal when the geophone is plugged in:

- Check the position of the geophone gain knob. Is it off?
- Check the condition of the cables used. Are they are plugged in all the way?
- Is this an Enduro supplied geophone? Some geophones could be wired incorrectly.

Headphones work when plugged in, but when the Sound Output is plugged into speakers or other devices it is silent:

- Check the audio cable. Is it a stereo cable? Some cables (mono) can short the output.

The Receiver got wet:

- The Receiver is weather resistant. In very heavy rain, a clear plastic bag can be used to protect it.
- If it was not submerged, dry off Receiver, and check operation.
- If submerged, immediately remove batteries. Make sure Receiver is completely dry (internally as well) before using. If needed contact Enduro Pipeline Services 918.446.1934 for additional support.



CONTROLS:

Geophone Amp Output
1/8" (3.5mm) Stereo

Geophone Amp Input
1/8" (3.5mm) Mono



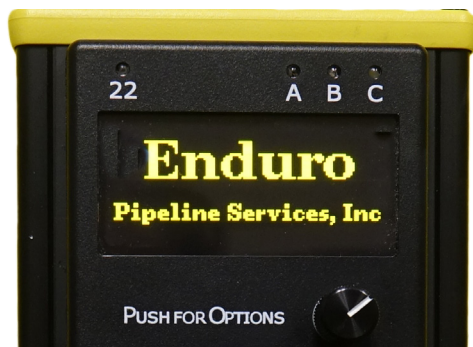
External Wand Antenna Input

(Disables Internal Antenna when Plugged In)

Signal Display
Displays the 22Hz and Geophone Signals over time. Also displays menu to change settings

Transmitter Signal Gain Knob
Use to Adjust Receiver Gain (Both Internal and Wand Antenna)

Power Button
Hold to Turn Receiver Power On or Off (Light Above Shows On or Off)



Menu Knob
Rotate to change length of time that signal graph displays.
Press to adjust Brightness and other settings

Geophone Gain Knob
Use to Adjust Geophone Volume

Buzzer Button
Hold to Turn 22 Hz Signal Detect Buzzer On or Off (Light Above Shows On or Off)

Battery Holders
Twist Caps to Replace Batteries Left — 2 x C Cell Alkaline Right — 3 x C Cell Alkaline
replace at same time



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For more tracking information, please visit enduropls.com.