

Rex Lite Pipe and Cable Locator

User guide



Important Notice

Schonstedt believes the statements contained herein to be accurate and reliable; however, their accuracy, reliability, or completeness is not guaranteed.

Schonstedt's only obligation shall be to repair or replace any instrument proven to be defective within three years of purchase. Schonstedt shall not be responsible for any injury to persons or property, direct or consequential, arising from the use of any instrument.

Table of Contents

Chapter 1: Introduction & Operating Modes	1
Introduction.....	2
Passive 50/60 Hz.....	2
Conductive	2
Inductive Clamp.....	2
Inductive.....	3
Sonde	3
Operating Recommendations	4
Chapter 2: Rex Lite Receiver	5
Automatic and Manual Gain.....	6
Directional Indication.....	6
Depth Measurement	6
Searching for a Sonde	6
Controls.....	7
Visual and Audible Indicators.....	8
Connectors and Accessories	11
Battery Replacement	11
Specifications	12
Regulatory Compliance and Declaration of Conformity.....	13
Chapter 3: Rex Lite Transmitter	14
Automatic and Manual Output Power.....	15
Output Current Measurement.....	15
Controls.....	16
Visual Indicators	17
Connectors and Accessories	18
Battery Replacement	18
Specifications	20
Regulatory Compliance and Declaration of Conformity.....	21
Chapter 4: Technical Support/ Service Information	22
Chapter 5: Warranty	24

1

INTRODUCTION & OPERATING MODES



Introduction

In general, pipe and cable locators can operate in a variety of modes and frequencies. The following is a brief description of the basic operating modes supported by the Rex Lite Pipe and Cable locator. In addition, Rex Lite offers advanced features at an affordable price, emphasizing portability, size, and simplicity. The receiver collapses for portability and expands for full functionality; the transmitter offers a main frequency (82 or 33 kHz, factory set) plus a second 512 Hz frequency, and an inductive antenna in a flat and lightweight package.

Schonstedt has incorporated more than sixty-five years of experience in producing products for aerospace, military and infrastructure applications in the design of our locators. Schonstedt manufactures all products following high standards of reliability, durability and performance.

For additional information on pipe and cable locating theory and techniques, check the training section of our website at www.schonstedt.com/training.

Passive 50/60 Hz



The transmitter is not used in passive mode. Instead, the receiver searches for an appropriate harmonic of 60 or 50 Hz signals (factory preset). These signals are typically present in energized power cables, making it possible to locate them without using a transmitter to impose a tracing signal onto them.

Conductive



In conductive mode, the transmitter imposes a signal of the selected frequency onto the pipe or cable to be traced. It does so by making direct contact with the pipe or cable at a point where the pipe/cable comes up to the surface of the ground (a transformer box, a water hydrant, a telephone switch box, a gas meter, etc.). By providing a return path, with a stake that buried in the ground near the transmitter, the circuit is closed.

Inductive Clamp



In inductive clamp mode, the transmitter imposes a signal of the selected frequency onto the pipe or cable to be traced. It does so by energizing a clamp that is placed so that it is completely encircling the pipe or cable at a point where the pipe/cable comes up to the surface of the ground (a transformer box, telephone switch box, gas meter, etc.). The clamp then induces a current onto the pipe or cable. In this mode, it is not necessary to provide a return path for the induced current to the transmitter. The induced current will travel on the pipe or cable for a certain distance, making it possible to trace it.

Inductive



In the inductive mode, the transmitter imposes a signal of the selected frequency onto the pipe or cable to be traced. It does so by energizing an inductive antenna built into the case. The transmitter is placed on the ground in a direction perpendicular to the pipe or cable being traced. The inductive antenna then induces a current onto the pipe or cable. In this mode, it is not necessary to provide a return path for the induced current to the transmitter. The induced current will travel on the pipe or cable for a certain distance, making it possible to trace it.

Sonde



In sonde mode, the transmitter is not used at all. This mode is used to trace non-metallic pipes, or metallic pipes where other modes are inapplicable or inefficient. A small beacon transmitter, or sonde, is pushed through the pipe, and the receiver searches for the signal emitted by the sonde.

Since the signal being traced by the receiver is produced by the sonde and not travelling along the pipes, there are some differences in the way the receiver is used. Due to the nature and strength of the sonde signal, it is necessary to have some idea of where the sonde is (in order to narrow the search area to a radius of several feet centered on the sonde).



For additional information on sonde locating and techniques, check the training section of our website at www.schonstedt.com/training.



Mini Sonde - 512 Hz



Large Sonde - 512 Hz

Operating Recommendations

When using Rex Lite, follow these tips and recommendations to improve and facilitate your locating experience:

- 1) Whenever possible, use the conductive mode. It provides the strongest and best-coupled signal.
- 2) When operating in conductive mode:
 - Try to bury the ground stake on a line perpendicular to the utility to be traced.
 - Verify that a good circuit has been established.
 - Check the output current from the transmitter.
 - Manually adjust the output power to affect the output current.
 - Adjust the conductive clips to improve the connection.
- 3) When operating in the inductive mode, place the transmitter antenna (located inside the handle) over the buried cable or pipe in the direction indicated by the label (perpendicular to the suspected direction of the pipe or cable).
- 4) If using the inductive clamp mode, place the clamp so that it completely encircles the desired cable or pipe. Make sure the clamp can fully close so that both ends touch.
- 5) When operating in the passive mode, be aware of your surroundings and possible interference from overhead power lines, other buried cables, pipes or utilities carrying 50 or 60 Hz signals, and nearby transformers or substations.
- 6) In all operating modes, always set the gain at the minimum setting that shows a clear peak over the target. You will most likely obtain optimum results with a signal strength reading between 200 and 800. A consistent reading of 995 or higher indicates the signal is too strong, and the receiver gain and/or transmitter power should be reduced.

2

REX LITE
RECEIVER



Automatic and Manual Gain

The Rex Lite receiver has the ability to operate in an automatic or manual gain mode. In the automatic gain mode, the receiver adjusts its sensitivity automatically, based on the strength of the detected signal, to produce a relatively constant and strong signal strength indication. In the manual gain mode, the user can adjust the sensitivity up or down to suit different locating scenarios.

Directional Indication

The Rex Lite receiver is equipped with directional indicators (arrows). These visual and audible indicators help the user locate the pipe or cable by showing which direction he/she should move in order to get closer to the target. These indicators are not available in the Sonde mode.

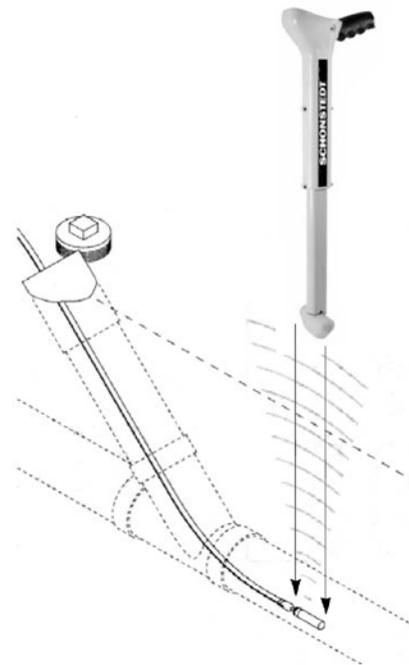
Depth Measurement

The Rex Lite receiver has the ability to measure the approximate depth of the target pipe or cable. When measuring depth, the receiver must be fully extended, and the bottom tip of the receiver must be touching the ground. Depth measurements should only be made when the directional indication says that the target is close and the receiver's signal strength is maximized (peaked) over the target. Special considerations are required for the Sonde mode.

Searching for a Sonde

Once in the surroundings of a sonde, it is important to differentiate whether you are positioned along the axis of the sonde (the direction of the pipe) or off to either side. In the sonde mode, the directional indication is not functional; the signal strength is the only indication available.

Rotate the receiver back and forth and move in the direction that produces the maximum (peak) signal strength. As the receiver gets closer to the sonde, the signal strength increases and it will hit a peak when the receiver is directly over the sonde. Slowly rotate the receiver to fine tune the peak signal strength, which will occur when the plane of the sensors is parallel to the axis of the sonde. For verification, rotate the receiver 90 degrees and see that it produces a "null" (signal strength very close to zero), and then counter-rotate 90 degrees to go back to the original position.



To measure depth, simply place the tip of the unit on the ground and press the DEPTH button when the signal strength is at a peak. The achievable depth depends on a number of factors, but typically, it is possible to read depth up to 5 to 15 feet (1.5 to 4.2 m).

Controls

Designed to be intuitive, the Rex Lite Receiver controls require minimum training for effective use. The receiver can be operated with one hand.



- 1 **ON/VOLUME** - This switch powers on the receiver and automatically sets the volume to High. Additional depressions of this switch will cycle the volume through Mute, Medium, and High settings.
- 2 **OFF** - This switch removes power from the receiver.
- 3 **UP/DOWN ARROWS** - When the receiver is operating in manual gain mode, pressing the UP or DOWN arrows will increase or decrease the gain from its current setting. When the receiver is operating in the automatic gain mode, the first press of the UP or DOWN arrow will switch the receiver to the manual gain mode.
- 4 **AUTO** - When the receiver is operating in the manual gain mode, pressing the AUTO button will switch the receiver to operate in the Automatic gain mode. In this mode, the receiver adjusts its sensitivity as a function of the strength of the detected signal.

- 5 **DEPTH** - When the proper conditions to measure depth are present, pressing this switch will display the target's depth on the LCD (after a delay of 2 seconds). The LCD will continue to display the depth, along with the "depth symbol", as long as the switch remains depressed. If the switch is pressed and quickly released, the depth will show on the LCD. Rex Lite is factory set to display depth in feet and inches, or in meters. If the depth cannot be determined, due to a weak signal or interference signal by other nearby utilities (congested underground), the LCD will show three dashes "---". 
- 6 **SONDE** - If the sonde mode is available, pressing this switch will cause the receiver to go to the sonde mode of operation. If the receiver is already operating in sonde mode, pressing this switch will cause the receiver to stop the sonde mode of operation.
- 7 **FREQ** - An operating frequency can be selected by depressing this switch consecutively until the desired frequency is indicated on the display of the receiver. Some frequencies are uniquely associated with the mode of operation selected (conductive, inductive or inductive clamp); therefore the user should ensure that the same frequency is selected on both the receiver and the transmitter.

Visual and Audible Indicators

The information display areas for the receiver are easy to understand. In addition, the receiver has audible indicators to facilitate operation in heavy traffic or noisy areas. All visual indicators for the receiver are on the LCD display, which has six general areas to display information to the user: a Battery Indicator, a Gain Indicator, a Frequency/Mode Indicator, a Direction Indicator, an Alphanumeric Display and a Volume Indicator.

- **BATTERY INDICATOR** - The battery symbol indicates the receiver's battery status. When all three segments inside the battery symbol are present, the battery is fully charged. When only the two bottom segments are present, the battery has a medium charge. When only the bottom segment is present, the battery has a low charge and needs replaced. If there are no segments present, the battery is extremely low and you should replace it immediately. 
- **GAIN INDICATOR** - The "A" indicates that the gain is in the automatic mode. In this mode, the receiver adjusts its sensitivity as a function of the strength of the detected signal. In auto mode, no bar graph is shown. 

If the "A" is not visible, the receiver is operating in the manual gain mode; therefore, a means to show the user the relative gain setting is necessary. The bar graph indicates the relative strength of the gain.

Each time the UP or the DOWN arrow is pressed, the gain is adjusted by 1/30th of the full-scale range and the gain level, preceded with an “L”, is shown temporarily to the user on the main signal display. The bar graph will change with approximately six presses of the UP or DOWN arrow. The user may press and hold the UP and DOWN button to change the gain rapidly.

- **FREQUENCY/MODE INDICATOR** – The upper left of the LCD consists of four icons: "512 Hz", "33 kHz", "82 kHz", and "Passive Arrow". The lower center of the LCD contains the "SONDE" icon.

These icons are used by themselves, or in various combinations to indicate different operating modes, as shown in the following table, where (C) is conductive mode, (IC) is inductive clamp mode, and (I) is inductive mode. See CHAPTER I: REX LITE OPERATING MODES for a description of these modes.

OPERATING MODE	SONDE	33 kHz	82 kHz	512 Hz	PASSIVE ARROW
C, IC, I at 33 kHz (*)	Off	On	Off	Off	Off
C, IC, I at 82 kHz (**)	Off	Off	On	Off	Off
C at 512 Hz	Off	Off	Off	On	Off
Sonde (***)	On	Off	Off	On	Off
Passive 50/60 (****)	Off	Off	Off	Off	On

(*) 33 kHz model only

(**) 82 kHz model only

(***) The default sonde frequency is 512Hz.

(****) The number 50 or 60 shows briefly on the numeric display upon entering this mode, indicating which line frequency the unit is programmed to locate in passive mode.

- **DIRECTION INDICATOR** - The arrows and center bar in this indicator tell the operator in which direction to move the receiver in order to be directly over the target. The direction indicator does NOT work in the Sonde operating mode.



- **Right Arrow** – Move receiver to the right to get closer to the target.
- **Left Arrow** – Move receiver to the left to get closer to the target.
- **Both Arrows and Center Bar** - Receiver is placed close to or directly over the target. This is also accompanied by a beeping sound.

When all three elements of this indicator are OFF, the signal strength is not adequate to make a directional determination or you are not close to the pipe or cable being traced. Keep searching based on the signal strength indication and the audio feedback, until one of the arrows comes ON.

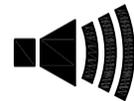
- **ALPHANUMERIC DISPLAY** - The alphanumeric display shows signal strength and depth. The numeric display is also used for temporary indications of certain operating modes, frequencies, and other brief information messages, as noted throughout this manual.
 - **Signal Strength** - This is an indication of the relative signal level detected by the receiver and is a function of the gain setting. Good signal strength will typically be between 200 and 800.

The display range for signal strength is 0 to 999; however, very high signal strength is not necessarily better. If readings of 995 or higher are consistent, the signal is too strong and steps should be taken to reduce it. If a reading of “OL” is observed, a signal is present which interferes with the signal the receiver is set to detect. Take steps to identify the source of interference or to change the locating mode.

- **Depth Reading** – When measuring depth, the “depth” icon lights up in the lower right of the display, and the depth of the target is displayed (in feet and inches, or meters - depending on the factory setting). The display range for depth in feet and inches is 0" to 19' 9" and in meters is 0.00 m to 5.99 m.



- **VOLUME INDICATOR** - The volume indicator consists of a speaker symbol with three sound wave bars. If the volume is off, the speaker symbol with NO bars is shown. For medium volume, the speaker symbol with two bars is shown. For maximum volume, the speaker symbol with three bars is shown.



The speaker produces an audible indication of signal strength. The pitch of the sound will increase with increasing signal strength. However, the volume is determined only by the VOLUME control, as explained above.

Connectors and Accessories

The receiver has a standard 3.5mm headphone jack that accepts any mono or stereo earphones or headphones. Schonstedt also supplies headphones as an optional accessory. The receiver automatically detects the insertion of the headphones or earphones and routes the audio signals to them, silencing the internal speaker.



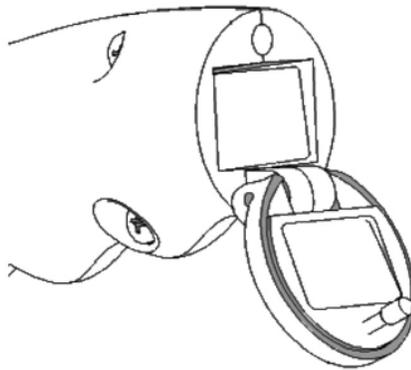
The receiver comes fitted with a rubber plug to protect it from water and dust ingress. It is recommended to keep the rubber plug inserted in the earphone jack when earphones are not being used. The receiver also comes standard with a belt holster for hands-free carrying.



The receiver is shipped factory ready to detect sondes or other devices, such as inspection cameras, that transmit at 512 Hz; however, the sondes themselves are optional accessories also available through Schonstedt.

Battery Replacement

The Rex Lite receiver is powered by one 9-volt alkaline battery. The battery is located in the handle of the instrument. It is accessible by turning the screw counterclockwise. To remove the battery, simply tilt the unit so that the handle is pointing down, and the battery will slide out. When replacing the battery, look at the outside of the battery door for the proper battery orientation. As a safety measure, the unit will not turn on if the battery is inserted incorrectly. You should never have to force the battery door closed. If the battery does not seem to be going in all the way, remove the battery, reverse its orientation and then replace it.



Receiver Specifications

Operating Frequency:	Active:	33 kHz and 512 Hz (33 kHz model) 82 kHz and 512 Hz (82 kHz model)
	Passive:	50 or 60 Hz
	Sonde:	512 Hz
Battery:		One 9V Alkaline Battery
Battery Life:		12 hours (intermittent use)
Audio Output:		10 - 1500 Hz (determined by signal strength) 0 - 70 db SPL (volume controlled)
Weight (incl. battery):		2.8 lbs. (1.25 kg)
Operating Temperature:		-4°F to 140°F (-20°C to 70°C)
Water and Dust Resistance		Rated IP54
Overall Dimensions:		Closed: 17.5" x 3" x 8.5" (44 cm x 7.6 cm x 21.5 cm) Extended: 27.7" x 3" x 8.5" (70 cm x 7.6 cm x 21.5 cm)
Max. Depth Capability:		Approximately 19' (5.8 m) Sonde Mode: approximately 5'- 15' (1.5 m – 4.2 m)

Regulatory Compliance and Declaration of Conformity

FCC:

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Industry Canada:

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CAN ICES-3 (B)/NMB-3(B)

Schonstedt's Supplier Declaration of Conformity can be found at

www.schonstedt.com

3

REX LITE TRANSMITTER



Automatic and Manual Output Power

The Rex Lite transmitter delivers power to the "load" to which it is connected. In the conductive mode, the load is the circuit formed by the cable or pipe underground, the soil return path, and the ground stake. In the inductive clamp and inductive modes, the loads are the clamp and the antenna, respectively. The inductive clamp and inductive modes require the maximum power that the transmitter can deliver. Therefore, the transmitter automatically operates at maximum power output, and there is no need for manual power adjustment.

In the conductive mode, the power delivered to the load is highly dependent on the external elements (soil, type of conductor, stake placement, etc.). In some cases, you need more power to achieve more distance or depth; in other cases, you need less power to avoid bleeding to nearby conductors. Therefore, while in the conductive mode, you have the ability to adjust the output power manually, using the front panel controls and visual indicators described further down in this manual.

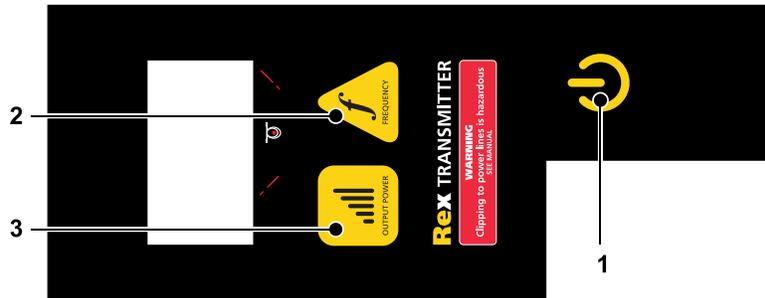
Transmitter Current Measurement

When operating in the conductive mode, the Rex Lite transmitter displays the amount of current flowing out of the transmitter and into the underground utility. This is very useful in determining if you have established a good circuit. You can improve the circuit by relocating the ground stake or enhancing the metal-to-metal contact of the conductive clips. A low current reading indicates a poor trace conductor, poor soil conductivity, or poor ground stake contact/placement. Higher current readings indicate a better circuit and a better chance at tracing long distances and deep conductors.

If the current reading is low, try to improve the circuit as suggested above, to see if the current increases. You can also check the cables and clips, wet the ground, and clean rust or dirt from the places where you are making contact, to improve the connection. Often, the reason for the low current is the soil itself (sandy or very dry) and/or the conductive quality and integrity of the pipe or cable underground (cast iron pipes, rusted or broken wires, heavy insulation to ground, etc.). If you cannot improve the circuit, there may be a small amount of current still circulating in the circuit. Try increasing the output power manually and/or increase the gain on the receiver.

Controls

The Rex Lite Transmitter controls are designed to be intuitive and require a minimum of training for effective use. The transmitter controls are also large for ease of use when wearing gloves.



1. **ON/OFF** - This is a momentary push-button switch that toggles the power to the transmitter on and off. When the transmitter power is off, press this switch until the LCD indicators come, and then release it. When the transmitter power is on, press the switch until the LCD indicators go off, and then release it.
2. **FREQUENCY** – Select an operating frequency by depressing this switch consecutively until the desired frequency that matches the receiver’s frequency is indicated on the display of the transmitter. Different frequencies are available for the different operating modes (conductive, inductive clamp or inductive); see Specifications below for specific frequencies in each mode.
3. **OUTPUT POWER** - Used to select the output power in the conductive mode only, this control has no use in the inductive and inductive clamp modes, where the output power is internally fixed. Each press changes the output power as follows:
 - A Symbol = Auto Mode
 - 1 bar = Low Power
 - 2 bars = Medium Low Power
 - 3 bars = Medium Power
 - 4 bars = Medium High
 - 5 bars = High Power

At the 82 kHz operating frequency, only the Auto, Low, Medium Low and Medium Power settings are available; this is due to FCC regulations. If the transmitter is operating at a higher output power and the frequency is changed to 82 kHz, the transmitter automatically defaults to Auto Power.

Visual Indicator

The information display areas for the transmitter are easy to understand. All visual indicators for the transmitter are on the LCD display, which has five general areas to display information to the user: a Battery Indicator, an Output Power Indicator, a Frequency Indicator, a Mode Indicator, and an Alphanumeric Display.

- **MODE INDICATOR** – This area consists of arrow indicators on the bottom of the screen, which point to an icon on the label that indicates whether the transmitter is in conductive, clamp, or inductive mode.
- **ALPHANUMERIC DISPLAY**- In conductive mode, when the transmitter is delivering current to the load, the current is displayed as a numeric value, followed by the “mA” units indicator (milliampere = 1/1000 ampere). The Alphanumeric Display is also used for error messages and to complement the information provided by the Mode Indicator with easy to understand messages, such as “Ind”, to indicate the transmitter is operating in the Inductive mode.

- **BATTERY INDICATOR** - The battery symbol indicates the transmitter's battery status. When all three segments inside the battery symbol are present, the battery is fully charged. When only the two bottom segments are present, the battery has a medium charge. When only the bottom segment is present, the battery has a low charge and needs replaced. If there are no segments present, the battery is extremely low and you should replace it immediately.



- **OUTPUT POWER INDICATOR** - The "Ⓐ" indicates that the transmitter is operating in automatic power mode. In this mode, the transmitter adjusts its output power to match load conditions. There is no bar graph in this mode.

- If the "Ⓐ" is not visible, the transmitter is operating in the manual output power mode. The bar graph indicates the output power level as explained in the Controls/OUTPUT POWER section of this manual.



- **FREQUENCY INDICATOR** – The upper left of the LCD consists of three icons: "512 Hz", "33 kHz", and "82 kHz". These icons indicate the operating frequency.

NOTE: 82 kHz models will only show 512 Hz and 82 kHz, and 33 kHz models will only show 512 Hz and 33 kHz.

Connectors and Accessories



OUTPUT CONNECTOR - Connect the conductive clips or the optional inductive clamp to this 1/4" phone jack. The transmitter automatically detects what accessory is plugged in and adjusts its operation and indicators accordingly. We recommend that you turn the transmitter's power OFF before removing or inserting accessories from/into this connector or connecting to a utility. The connector is covered with a spring-loaded plastic cap to prevent water and dust from damaging the transmitter.



CAUTION

Do not connect conductive clips to live power lines. This is a Hazardous practice and can permanently damage the transmitter. If you are connecting to dead power lines, make provisions to avoid accidental activation of power to the lines. Hazardous live voltage may be present at output terminals in conductive mode.

ACCESSORIES - The standard accessories provided with the Rex Lite transmitter are conductive clips, ground stake, and a soft carryall bag with space for additional accessories.

Several optional accessories are available. The following list includes the most common ones. Please contact Schonstedt or your local dealer for details.

- Inductive clamp (3" ID, 5" ID and 7" ID)
- Sondes (512 Hz)
- Medium size conductive clips
- Large size conductive clips

Battery Replacement

A user-serviceable 10-x AA battery pack powers the Rex Lite transmitter. When depleted, the ten (10) AA batteries need to be replaced.

To replace the batteries, turn the transmitter off, remove the four thumbscrews on the front panel's battery compartment, and expose the battery pack by removing the cover. As shown in the image below, gently lift the battery pack out of the compartment by pulling up from the front. If needed, flip the transmitter upside down to allow the battery pack to fall into your hand. During this step, do not unplug the battery pack.



Once the battery pack has been removed, replace all 10 AA batteries with a new, matching set. Do not mix new and old batteries or batteries from different manufacturers. After replacing the AA batteries in the battery pack, place the battery back into the compartment, allowing the wire to stick out of the compartment, then tuck the excess wire into the cavity around the connector. Finally, replace the cover and the screws.

Please note that should the battery pack become unplugged at any point during this procedure, it will need to be plugged back in before the pack is placed back into the compartment. To do this, locate the plug inside of the battery compartment, and re-insert the connector. This is shown in the image below. The ramp side of the connector should be facing towards the bottom of the battery compartment.



Transmitter Specifications

Operating Frequency:	33 kHz and 512 Hz (33 kHz model) 82 kHz and 512 Hz (82 kHz model)
Operating Modes:	Conductive, all frequencies Inductive, 33 kHz or 82 kHz only Inductive Clamp (optional), 33 kHz or 82 kHz only
Max. Output Power: (Conductive mode, @ 1000 Ω load)	33 kHz and 512 Hz - 1 W Max 82 kHz - 1/2 or 1 (FCC limited)
Max. Output Voltage:	100 V RMS
Battery Type:	Ten (10) AA Alkaline (1.5 V nominal)
Battery Life:	8 Hours (intermittent usage @ 70° F)
Outputs/Inputs:	1/4" Phone Jack Output: -Inductive clamp -Conductive clips
Dimensions:	10" W x 10.25" D x 1.75" H (25.4 cm x 26 cm x 4.5 cm)
Weight:	3.44 Lbs. (1.56 kg)
Operating Temp.:	-4°F to 140°F (-20°C to 70°C)
Water and Dust Resistance	Rated IP54

Regulatory Compliance and Declaration of Conformity

FCC:

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Industry Canada:

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CAN ICES-3 (B)/NMB-3(B)

Schonstedt's Supplier Declaration of Conformity can be found at
www.schonstedt.com

4

TECHNICAL SUPPORT & SERVICE INFORMATION



Schonstedt offers technical support and sales support. For any reason regarding usage and application, please contact our technical support team at 888-32-TRACE (888-328-7223).

FOR SERVICE OR REPAIR

Please ship unit to

Schonstedt Instrument Company
100 Edmond Road
Kameysville, WV 25430
Attn: Customer Service Dept.

Return instructions and return form are located online at
<https://www.schonstedt.com/support/repair-department/>

5

WARRANTY



Schonstedt Instrument Company (Schonstedt) warrants each product of its manufacture to be free from defects in material and workmanship subject to the following terms and conditions. The warranty is effective for 3 years after the shipment by Schonstedt to the original purchaser. Please complete the warranty registration card online at www.schonstedt.com/welcome.

Schonstedt's obligation under the warranty is limited to servicing or adjusting any product returned to the factory for this purpose and to replacing any defective part thereof. Such product must be returned by the original purchaser, transportation charges prepaid, with a description of the defect in writing. If the fault has been caused by misuse or abnormal conditions of operation, repairs will be billed. Specifically, this warranty does not cover product that has been subject to inundation by fire, water or other liquid intrusion, or units that have been damaged or compromised due to repair, alteration or modification by anyone other than an authorized repair representative. Prior to a repair being performed by Schonstedt, a cost estimate will be submitted and no work will be completed until authorized by the customer. Batteries are specifically excluded under the warranty and should be addressed to the manufacturer of batteries in question.

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