RIDGID

Operator's Manual

SeekTech® ST-330

⚠ WARNING!

Read this Operator's Manual carefully before using this tool. Failure to understand and follow the contents of this manual may result in electrical shock, fire and/or serious personal injury.

SeekTech® ST-330	
Record product serial number below as it appears on the nameplate.	
Serial No.	

Table of Contents

RIDGID reserves the right to change the specifications of the hardware, software, or both as described in this manual without notice. Visit www.SeeSnake.com for current updates and supplemental information pertaining to this product. Due to product development, the photos and other presentations specified in this manual may differ from the actual product.

Safety Symbols

In this operator's manual and on the product, safety symbols and signal words are used to communicate important safety information. This section is provided to improve understanding of these signal words and symbols.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE NOTICE indicates information that relates to the protection of property.

This symbol means read the operator's manual carefully before using the equipment. The operator's manual contains important information on the safe and proper operation of the equipment.

This symbol means always wear safety glasses with side shields or goggles when handling or using this equipment to reduce the risk of eye injury.

This symbol indicates the risk of electrical shock.

General Safety Rules

⚠ WARNING

Read all safety warnings and instructions. Failure to follow the warnings and instructions may result in electric shock, fire, and/or serious injury.

SAVE THESE INSTRUCTIONS!

Work Area Safety

- **Keep your work area clean and well lit.** Cluttered or dark areas invite accidents.
- **Do not operate equipment in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Equipment can create sparks which may ignite the dust or fumes.
- **Keep children and bystanders away while operating equipment.** Distractions can cause you to lose control.

Electrical Safety

- **Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges, and refrigerators.** There is an increased risk of electrical shock if your body is earthed or grounded.
- **Do not expose equipment to rain or wet conditions.** Water entering equipment will increase the risk of electrical shock.
- **Do not abuse the cord.** Never use the cord for carrying, pulling, or unplugging the power tool. Keep cord away from heat, oil, sharp edges, and moving parts. Damaged or entangled cords increase the risk of electric shock.
- **If operating equipment in a damp location is unavoidable, use a ground fault circuit interrupter (GFCI) protected supply.** Use of a GFCI reduces the risk of electric shock.
- **Keep all electrical connections dry and off the ground.** Do not touch equipment or plugs with wet hands to reduce the risk of electrical shock.

Personal Safety

- **Stay alert, watch what you are doing, and use common sense when operating equipment.** Do not use equipment while you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating equipment may result in serious personal injury.
- **Use personal protective equipment.** Always wear eye protection. The appropriate use of protective equipment such as a dust mask, non-skid safety shoes, a hard hat, and hearing protection will reduce personal injuries.
- **Do not overreach.** Keep proper footing and balance at all times. This enables better control of the equipment in unexpected situations.
- **Dress properly.** Do not wear loose clothing or jewelry. Keep your hair, clothing, and gloves away from moving parts. Loose clothes, jewelry, and long hair can be caught in moving parts.

Equipment Use and Care

- **Do not force equipment.** Use the correct equipment for your application. The correct equipment will do the job better and safer at the rate for which it is designed.

- **Do not use equipment if the power switch does not turn it ON and OFF.** Any equipment that cannot be controlled with the power switch is dangerous and must be repaired.
- **Disconnect the plug from the power source and/or the battery pack from the equipment before making adjustments, changing accessories, or storing.** Preventive safety measures reduce the risk of injury.
- **Store idle equipment out of the reach of children and do not allow persons unfamiliar with the equipment or these instructions to operate the equipment.** Equipment can be dangerous in the hands of untrained users.
- **Maintain equipment.** Check for misalignment or binding of moving parts, missing parts, breakage of parts, and any other condition that may affect the equipment's operation. If damaged, have the equipment repaired before use. Many accidents are caused by poorly maintained equipment.
- **Use the equipment and accessories in accordance with these instructions; taking into account the working conditions and the work to be performed.** Use of the equipment for operations different from those intended could result in a hazardous situation.
- **Use only accessories that are recommended by the manufacturer for your equipment.** Accessories that may be suitable for one piece of equipment may become hazardous when used with other equipment.
- **Keep handles dry, clean, and free from oil and grease.** This allows for better control of the equipment.

Service

Ensure a qualified repair person services your equipment using only identical replacement parts to maintain the safety of the tool. Remove the batteries and refer servicing to qualified service personnel under any of the following conditions:

- If liquid has been spilled or objects have fallen into product.
- If the product does not operate normally when following the operating instructions.
- If the product has been dropped or damaged.
- When the product exhibits a distinct change in performance.

Specific Safety Information

⚠ WARNING

This section contains important safety information that is specific to the ST-33Q. Read these precautions carefully before using the ST-33Q to reduce the risk of electrical shock, fire, or other serious personal injury.

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE!

Keep this manual with the equipment for use by the operator.

ST-33Q Safety

- **An improperly grounded electrical outlet can cause electrical shock and/or severely damage equipment.** Always check work area for a properly grounded electrical outlet. Presence of a three-prong or GFCI outlet does not ensure that the outlet is properly grounded. If in doubt, have the outlet inspected by a licensed electrician.
- **Do not operate this equipment if operator or ST-33Q is standing in water.** Operating the ST-33Q while in water increases the risk of electrical shock.
- **Do not use where a danger of high voltage contact is present.** Do not attach leads to high voltage lines. The equipment is not designed to provide high voltage protection and isolation. Use high voltage precautions when disconnecting the leads.
- **Always attach leads before turning the ST-33Q ON and always turn OFF the ST-33Q before disconnecting the leads to reduce the risk of electrical shock.**
- **Follow local guidelines and call before digging.** Locating equipment uses electromagnetic fields that can be distorted and interfered with. More than one utility may be present in a given area. Follow local guidelines and service procedures. Confirm location of utilities before digging.
- **Read and understand this operator's manual, and the instructions for any other equipment in use and all warnings before operating the ST-33Q.** Failure to follow all instructions and warnings may result in property damage and/or serious personal injury.

The information supplied with this product cannot cover all possible conditions and situations that may occur, and should be used in conjunction with appropriate training, sound judgment, and good work practices. These factors cannot be built into the product, but must be supplied by the operator.

The EC Declaration of Conformity (890-011-320.10) will accompany this manual as a separate booklet when required.

If you have any question concerning this RIDGID product:

- Contact your local RIDGID distributor.
- Visit www.RIDGID.com or www.RIDGID.eu to find your local RIDGID contact point.
- Contact RIDGID Technical Services Department at rtctechservices@emerson.com, or in the U.S.A. and Canada call 800-519-3456.

Description, Specifications, and Standard Equipment

Description

The ST-33Q is a powerful, multi-frequency transmitter that can be used in conjunction with a SeekTech locator to find buried conductors such as pipes, cables, and wires.

The ST-33Q can apply an active tracing signal to target a conductor using the following three modes:

- Direct Connect — The leads on the ST-33Q connect directly to the target conductor and a suitable ground.
- Inductive Clamp — The optional inductive clamp encircles the target conductor which eliminates metal-to-metal contact.
- Inductive — The ST-33Q is placed over and in-line with a conductor. The internal antenna will induce a signal to locate the target conductor.

In addition to a series of default frequencies, the ST-33Q can also accept custom frequency settings up to 490 kHz.

NOTE: The ST-33Q complies with Part 15 of FCC rules in accordance with the following: Operation must not cause harmful interference and this device must accept any interference received, including interference that may cause undesired operation.

Specifications

Table 1
ST-33Q Specifications

Weight:	
without batteries	10.65 lb [4.8 kg]
Dimensions:	
Depth	7.96 in [20.2 cm]
Width	16.06 in [40.8 cm]
Height	14.18 in [36.0 cm]
Cable length	1.4 ft – 25 ft [0.4 m – 7.6 m]
Output power:	
External power adapter	10 W
Batteries	5 W
Power settings:	
Internal batteries	5 mA – 400 mA
NIMH batteries	≤ 1,000 mA
External power supply	≤ 1,000 mA
Default settings	60 Hz, 2 hour shutoff, 100 mA, Direct connect mode
Default frequencies	129 Hz, 1 kHz, 8 kHz, 33 kHz, 93 kHz, 262 kHz
Ingress Protection (IP)	65

Standard Equipment

- ST-33Q
- Operator's Manual
- Instructional DVD
- Direct connect leads and clips
- Grounding stake

ST-33Q Components

Figure 1 – Front View Transmitter Components

Figure 2 – Back View Transmitter Components

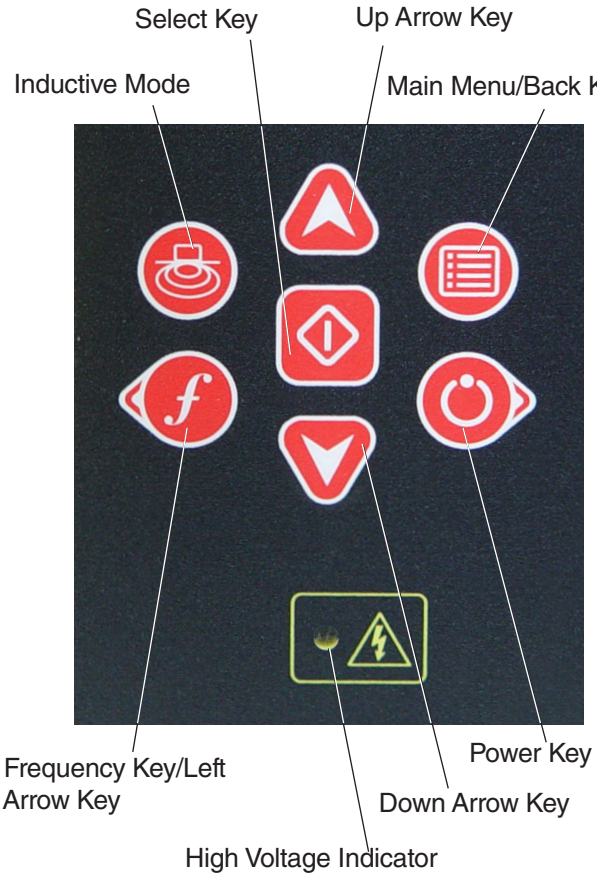
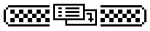
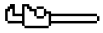
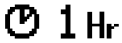
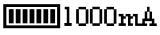
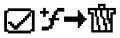


Figure 3 – Keypad

Icon Legend

Table 2
Keypad Icons

Icon	Name	Function
	Inductive Mode	Toggles between Inductive Mode and Direct Connect Mode.
	Up Arrow Key	Up Arrow
	Select Key	Activates a frequency and selects highlighted menu choices.
	Down Arrow Key	Down Arrow
	Main Menu Key	Activates the Main Menu. Moves back one level within submenus.
	Frequency Key/ Left Arrow Key	Steps through selected frequencies in the active mode. Long press displays a scrollable list of frequencies. Also acts as the Left Arrow Key within menus.
	Power Key/Right Arrow Key	Powers the ST-33Q ON and OFF. Also acts as the Right Arrow Key within menus.

Table 3 Screen Icons	
Icon	**Definition**
	Available Frequencies
	Sub Menus
	Tools Menu
	LCD Screen Brightness Adjustment
	Audio ON/OFF
	Auto Shutdown Setting
	Add Frequencies to Main Menu
	Set User-Defined Frequencies
	Standard Power Mode
	NiMH Batteries Only
	Information Screen
	Factory Reset
	Delete User-defined Frequencies
	Odometer Option
	Battery Level Symbol

Pre-Operation Inspection

⚠ WARNING

Before each use, inspect the ST-33Q and correct any problems to reduce the risk of serious injury from electrical shock or other causes and prevent machine damage.

1. Confirm that the power is OFF, that any external power and cords are disconnected, and that the battery is removed. Inspect the cords, cables, and connectors for damage or modification.
2. Clean any dirt, oil, or other contamination from the ST-33Q to aid in inspection and to prevent the unit from slipping from your grip during transport or use.
3. Inspect the ST-33Q for any broken, worn, missing, misaligned or binding parts, or any other condition which might prevent safe, normal operation.
4. Inspect any other equipment being used per its instructions to make sure it is in good, usable condition.
5. If any problems are found, do not use the equipment until the problems are corrected.

Work Area and Equipment Set Up

⚠ WARNING

Set up the ST-33Q and work area in accordance with these procedures to reduce the risk of injury from electrical shock, fire, and other causes and to prevent damage to the ST-33Q.

1. Check work area for the following:
   - Adequate lighting.
   - Flammable liquids, vapors, or dust that may ignite. If present, do not work in area until sources have been identified and corrected. The ST-33Q is not explosion proof. Electrical connections can cause sparks.
   - Clear, level, stable dry place for operator. Do not use the machine while standing in water.
   - Clear path to electrical outlet that does not contain any potential sources of damage for the power cord when using external power.
2. Inspect the line to have a signal applied to it. The line must be metal to allow the ST-33Q to locate it. If using the transmitter on insulated conductors, ground the target conductor at each end to ensure that the signal will be strong enough to locate. The ST-33Q is not designed to provide high voltage insulation or protection. Do not use where a danger of high voltage contact is present.
3. Determine the presence of chemicals. If chemicals are present, it is important to understand the specific safety measures required to work around the chemicals. Contact the chemical manufacturer for required information.
4. Determine the correct equipment for the application. The ST-33Q is made to locate conductors underground. Inspection and locating equipment for other applications can be found in the Ridge Tool Catalog or online at www.RIDGID.com or www.RIDGID.eu.
5. Make sure all equipment has been properly inspected.

6. Evaluate the work area and determine if any barriers are needed to keep bystanders away. Bystanders can distract the operator during use. If working near traffic, erect cones or other barriers to alert drivers.

Kick Stand Positioning

The kick stand on the back of the ST-33Q allows the unit to be positioned on its back which allows easy viewing of the screen and access to the controls. Positioning the ST-33Q on the kick stand also helps place the unit in a convenient position for locating when using Direct Connect Mode.

ST-33Q Magnetic Clips

The ST-33Q contains advanced connection clips that can be attached mechanically or magnetically. The front end of the clip includes a scraper tip *(See Item 1, Figure 4)* which can be used to remove rust or paint. Before connecting the ST-33Q leads to a flat, metal surface such as a steel junction box or fire hydrant, use the tip of the clip to scrape off rust and place the teeth of the clip (*See Item 2, Figure 4)* in contact with the metal. The teeth and the finger-guard *(See Item 3, Figure 4)* will support the clip and the magnet *(See Item 4, Figure 4)* will hold the clip to the metal.

NOTICE **The magnetic clips provided with the ST-33Q contain strong magnets. Do not place the clips near data storage devices, credit cards, ATM cards, or other magnetically encoded data.**

Figure 4 – ST-33Q Magnetic Clip

High Voltage Indicator

⚠ WARNING

The ST-33Q is designed to withstand up to 240 VAC between the two leads. This protection is not intended to be used continuously. If the ST-33Q encounters a target conductor voltage greater than 42 V (RMS), the High Voltage Present Indicator LED will flash red and the screen will display the safety alert symbol and the words, "HV MODE." To reduce the risk of electrical shock, do not touch the transmitter, cords, or connections during this time. Use high voltage precautions to disconnect the ST-33Q.

If connected to an energized line, the voltage on the line can cause excess current to be forced through the ST-33Q. The ST-33Q has a detection circuit that can sense excess current and disconnect output from the energized line. If the ST-33Q senses excess current, a warning message will appear on the screen, a warning beep will sound, and the High Voltage LED will turn ON (*See Item 1, Figure 5)*.

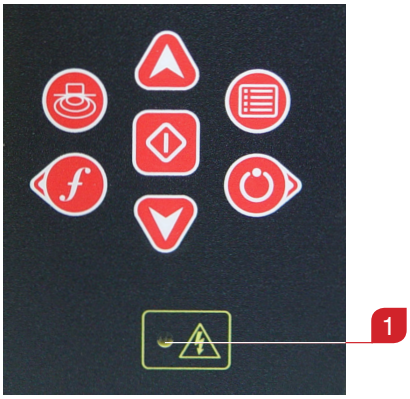


Figure 5 – High Voltage LED

High Temperature Warning

If the internal temperature of the ST-33Q reaches 167°F [67°C] or greater, a warning will appear on the screen (*See Figure 6)*.

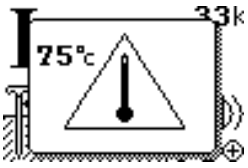


Figure 6 – High Temperature Warning

If the high temperature warning appears, the ST-33Q will automatically reduce power. If the internal temperature reaches 176°F [80°C] the ST-33Q will suspend output. If the internal temperature reaches 176°F [80°C], turn OFF the ST-33Q to avoid damage and ensure a RIDGID Independent Authorized Service Center services and repairs the unit.

Powering the ST-33Q

⚠ WARNING

Disconnect external leads from any energized utility before opening the battery compartment. To prevent overheating and leakage, do not mix battery types or used and new batteries. Always remove the batteries before shipping the ST-33Q.

Battery Power

Install batteries in the ST-33Q in accordance with the following:

1. Turn the knob on the battery compartment caps counterclockwise.
2. Insert three D-cell batteries into each battery compartment. High capacity rechargeable NiMH batteries are recommended for use with the ST-33Q. Ensure the positive end of each battery points outward.
3. Although the batteries will protrude slightly, push the caps over the battery ends and screw the caps firmly into place.

Using six new alkaline D batteries with a load of 100 Ω at a frequency of 8 kHz and a power level of 100 mA will power the ST-33Q for approximately 17.5 hours. Battery operation time will vary with battery rating and use.

Battery Check

Upon start up, the ST-33Q will check available power and will indicate the estimated battery levels in accordance with the following Table:

Table 4
Battery Status LED Indicators

Battery Icon	Charge Level
One bar	Low battery
Two bars	Partial battery
Three bars	Full battery

Alternate Power Supply

The ST-33Q can also operate by using an external 10-28VDC power source with a supply no less than 35 W.

If using an adapter, read and follow the instructions as specified by the manufacturer. To prevent electrical shock and damage, ensure the external power source is fully isolated from the ground and power mains. Do not use a non-isolated power supply with the ST-33Q.

Ensure the adapter cord has a clear, dry path and does not contain any potential source of damage. Use dry hands to plug in the cords.

Operating Instructions

⚠ WARNING

Always wear eye protection to protect your eyes against dirt and other foreign objects. Follow operating instructions to reduce the risk of injury from electrical shock and other causes.

Starting Up the ST-33Q

Power ON and start using the ST-33Q in accordance with the following:

1. Press the Power Key to start the unit. Check the battery level symbol and ensure the batteries are fully charged.
2. After turning ON the ST-33Q a splash screen will appear for 3 seconds which will show the selected frequency and an icon representing the current connection mode (*See Figure 7*). If connected to a conductor, a beep will sound in intervals.

Figure 7 – ST-33Q Splash Screen

3. Press the Main Menu Key to access a list of available frequencies, the Tools Menu, and the Information Menu.
4. Use the Up and Down Arrow Keys to scroll through the list of available frequencies. Press the Select Key to activate a highlighted frequency. The box next to each frequency will be checked when activated (*See Figure 8*).

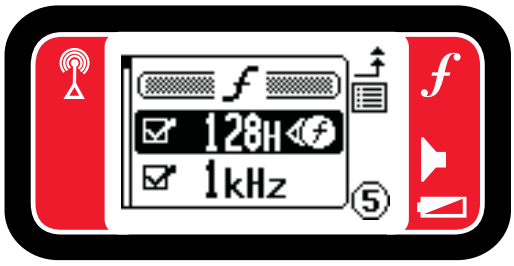


Figure 8 – Main Menu List of Available Frequencies

5. Press the Main Menu Key after activating frequencies and to return to the normal operating display. The last activated frequency will appear in the upper right hand corner of the display along with the current mode setting.

6. Press the Frequency Key to allow the ST-33Q to scroll through the set of activated frequencies for the current set mode. If the desired frequency does not appear, press the Main Menu Key to return to activate additional frequencies (*See the "Customizing the ST-33Q" section of this Operator's Manual for more information).*

7. Press the Power Key again to turn OFF the ST-33Q. After a short countdown, the ST-33Q will shut down. Press any key during the countdown to cancel the shut down.

Note that frequency lists are context sensitive which allows separate lists of frequencies for Direct Connect Mode, Inductive Clamp Mode, and Inductive Mode.

Direct Connect Mode

Direct Connect Mode is most commonly used when the target utility is readily accessible. Do not use Direct Connect Mode on energized conductors.

When using Direct Connect Mode, the Direct Connect Icon will appear in the top of the screen (*See Item 1, Figure 9)*.

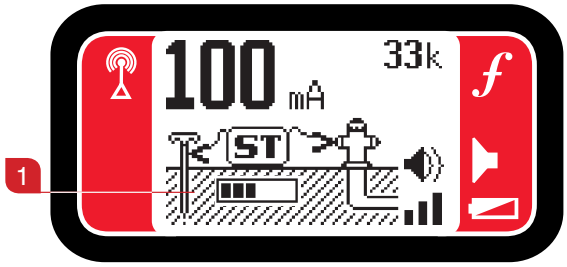


Figure 9 – Direct Connect Screen

Use the ST-33Q in Direct Connect Mode in accordance with the following:

1. Ensure that the target conductor is not live. The ST-33Q is not designed to connect to live conductors.

2. Chose connection locations for the ground spike and the target conductor. The ST-33Q leads will extend up to 25 ft [7.6 m]. The further the leads are extended, the more incidental the signal and the further the receiver should be used from the transmitter to avoid confusing the signals with the cable leads. If performing a location close to the transmitter, keep the leads as short as possible and store excess lead cable in the side pockets of the transmitter.

3. Remove the ground spike from the bottom of the ST-33Q and insert it into the earth. To enable a good ground, insert the ground spike as far as possible into the earth. If desired, wet the earth around the ground spike to improve grounding and to lower the resistance of the ground. With the ST-33Q powered OFF, attach the ST-33Q lead to the ground stake (*See Figure 10)*. In lieu of using the grounding stake provided with the ST-33Q, attach the cable lead to other things like a shovel blade or a larger rod sunk into the earth. Using other grounding equipment may also improve grounding by increasing the area in contact with the earth.

Figure 10 – Attaching the ST-33Q Lead to the Ground Stake

4. Scrape away any dirt, paint, corrosion, or other coatings on the target conductor to ensure good contact with the cable lead, to lower the resistance of the circuit, and to produce a stronger tracing signal. Connect the other cable lead to the target conductor (*See Figure 11)*. Non-conductive pipes, such as those made of clay or plastic, cannot carry a tracing current without a trace wire. Plastic pipes typically have a trace wire installed with the pipe for tracing purposes. Clip the cable lead to the trace wire to enable tracing.

Figure 11 – Connecting the ST-33Q Cable Lead to the Target Conductor

NOTE: Always connect the lead to the ground stake before connecting another lead to the target line to direct any current within the target conductor away from the user.

5. After attaching both leads, press the Power Key to turn ON the ST-33Q. After powering ON, the ST-33Q will emit ascending beeps and will then pause to measure the current flowing through the target conductor. Faster beeps will indicate a higher detected current. To turn OFF the sound, press the Main Menu Key, highlight the Audio Icon, and press the Select Key to toggle between "OFF" and "ON."

6. Select a frequency, check the circuit, and adjust the current in accordance with the "Selecting a Frequency" section of this Operator's Manual.

7. Turn on the receiver or locator and follow the instructions specified in the operator's manual. Ensure the frequency on the receiver or locator matches the ST-33Q. If the receiver signal increases when the receiver or locator is held near the ST-33Q, it is correctly picking up the transmitted frequency.

8. After completing the location, press the Power Key to turn OFF the ST-33Q. To reduce the risk of electrical shock, turn the unit OFF before disconnecting the leads and remove the lead from the target conductor before disconnecting the lead from the ground spike.

NOTE: When the ST-33Q is ON and in Direct Connect Mode do not come in contact with the scraper tip and only hold leads by its plastic sheathing.

Selecting a Frequency

The following frequencies are available for use on the ST-33Q using Direct Connect Mode:

- 128 Hz
- 1 kHz [1,024 Hz]
- 8 kHz [8,192 Hz]
- 33 kHz [32,768 Hz]
- 93 kHz [93,623 Hz]
- 262 kHz [262,144 Hz]

To select an active frequency, press the Frequency Key until the desired frequency appears.

Push and hold the Frequency Key to bring up a pop-up list of available frequencies (*See Figure 12)*. Use the Up and Down Arrow Keys to scroll through the pop-up list. When the desired frequency is highlighted, press the Select Key to activate it.

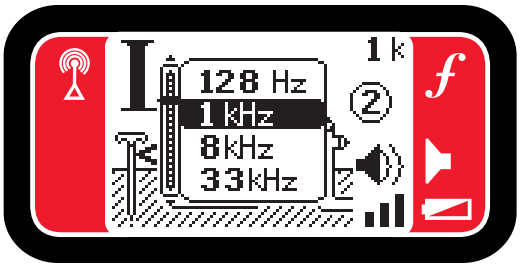


Figure 12 – Frequency Pop-up List

The ST-33Q also allows the addition of custom, user defined frequencies.

See the section on adding user defined frequencies in this Operator's Manual for more details.

Adjusting the Current

Use the Up and Down Arrow Keys to adjust the current. In Direct Connect Mode, the ST-33Q will increase the current as close to the following levels as possible:

- 25 mA
- 50 mA
- 100 mA (default)
- 200 mA
- 400 mA

High Output Mode

Under normal operating conditions, the output in Direct Connect Mode is limited to 400 mA to extend battery life. For higher output, adjust the ST-33Q to one of the following frequencies:

- 600 mA
- 800 mA
- 1,000 mA

To adjust the ST-33Q to a higher output perform the following:

1. Press the Main Menu Key.

2. Use the Down Arrow Key to scroll down to the Tools Menu and then press the Select Key.

3. Use the Down Arrow Key to scroll down to "Output Mode." Press the Select Key to toggle the output mode between 400 mA 400mA and 1,000 mA 1000mA.

The ST-33Q will display a number of box icons next to the current (*See Item 1, Figure 13)*. Hollow boxes represent selected power levels. Solid boxes represent actual output current levels. If the display screen shows "Lo" the

circuit is open or the current has a very high resistance and may require improvements in order to accurately locate.

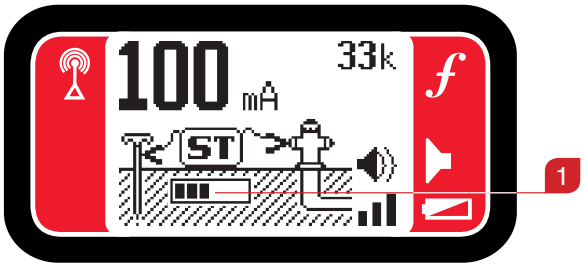


Figure 13 – Box Icons

NOTE: Using a higher power setting will produce a stronger signal on the receiver, but will reduce battery life. Only use 1,000 mA High Output Mode if using high capacity NiMH D cell batteries or external power. Do not use the ST-33Q in high output mode with standard alkaline batteries.

Checking the Receiver

To ensure that the ST-33Q and the receiver are set to the same frequency, hold the receiver near the ST-33Q cables and confirm that the signal is being received.

Inductive Clamp Mode

Figure 14 – ST-33Q with an Inductive Clamp

NOTE: Ensure the inductive clamp contains the symbol ST-33Q which indicates that the clamp is rated for the higher output of the ST-33Q. Use an inductive clamp rated for the higher output of the ST-33Q as specified by in the accessory section located in the end of the this Operator's Manual.

Use the ST-33Q with an inductive clamp in accordance with the following:

1. Confirm that the target conductor is not live. The ST-33Q is not designed to be connected to live conductors.
2. If the ST-33Q is ON, press the Power Key to turn the ST-33Q OFF. Do not turn ON the ST-33Q until the inductive clamp has been attached.
3. Insert the inductive clamp plug into the port on the ST-33Q located underneath the keypad. After plugging in the inductive clamp, the ST-33Q will automatically switch to Inductive Clamp Mode, disable the cables, and display the word "Clamp" on the screen.
4. Place the jaws of the inductive clamp around the target conductor. Ensure the jaws of the inductive clamp fully close (*See Figure 15)*.

Figure 15 – Inductive Clamp Connected to a Cable

5. Press the Power Key to turn ON the ST-33Q and select a frequency for locating. Check the circuit and adjust the current. The ST-33Q will automatically set the frequency to 33 kHz the first time Inductive Clamp Mode is used. After the first use, the ST-33Q will automatically use the frequency last used in Inductive Clamp Mode. The ST-33Q will also default to 50 percent power level to conserve battery power while in Inductive Clamp Mode.
6. After completing the location, press the Power Key to turn OFF the ST-33Q before disconnecting the inductive clamp.

Inductive Mode

Disconnect the lead clips from any external conductors before switching the ST-33Q to Inductive Mode. If the lead clips are connected to an external conductor and the ST-33Q is switched to Inductive Mode, a warning will appear and an operator override will be required.

When using Inductive Mode, only 8 kHz and 33 kHz frequencies will be available for use on the ST-33Q.

NOTICE **Do not place two ST-33Qs in inductive Mode with the power ON within 10 ft [3 m] of each other. The inductive output of each ST-33Q can reinforce the load of another ST-33Q and can possibly damage one or both of the units.**

To use the ST-33Q in Inductive Mode, perform the following:

1. Place the ST-33Q so the orientation mark located on top of the ST-33Q aligns with the target conductor (*See Item 1, Figure 16)*.

Figure 16 – Orientation Marks Aligning with the Target Conductor

2. Place the ST-33Q over the line to be traced (*See Figure 17)*.

Figure 17 – Inductive Mode Alignment

3. Press the Power Key to turn ON the ST-33Q. Press the Inductive Mode Key to toggle the ST-33Q between Direct Connect Mode and Inductive Mode *(See Figure 18)*.

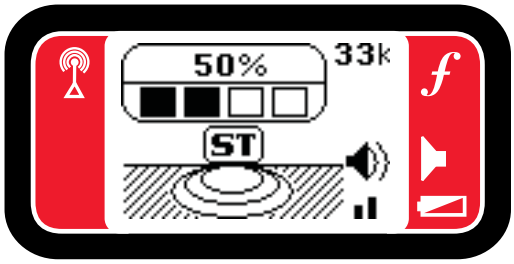


Figure 18 – Inductive Mode Screen

Do not use clips and leads in Inductive Mode. The ST-33Q will automatically set the frequency to 33 kHz the first time Inductive Mode is used. After the first use, the ST-33Q will automatically use the frequency last used in Inductive Mode.

NOTE: Ground both ends of the utility for the best signal induction.

The ST-33Q will also default to 50 percent power level to conserve battery power while in Inductive Mode. If higher power is required for a clear signal, use the Up and Down Arrow Keys and select either 25 percent, 50 percent, or 100 percent. In High Output Mode, a power of 200 percent can also be selected. Using a power level of 100 percent or greater will drain the batteries rapidly. The power-setting boxes will blink if set at 100 mA or higher to indicate the higher rate of battery consumption (*See Figure 19).*

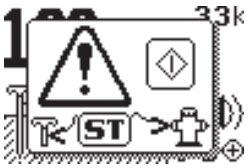


Figure 19 – High Power Level Warning

Self-Tuning Transmitter

In Inductive Mode, the ST-33Q self-tunes by modifying its own circuit to resonant at a frequency that matches the frequency selected by the operator.

In rare situations, if using Induction Mode near a mass of metal or next to a transformer for example, the ST-33Q may not be able to tune to a desired frequency. The ST-33Q will attempt to tune to a desired frequency for up to 6 seconds. If the ST-33Q cannot tune to a desired frequency after 6 seconds, the ST-33Q will suspend output, display a warning, and emit a low beep (*See Figure 20)*.

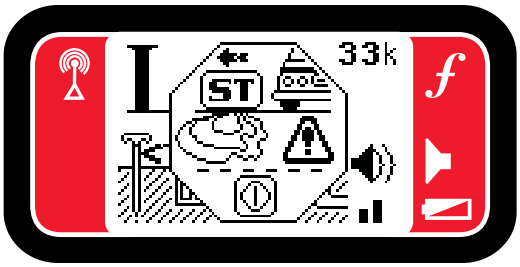


Figure 20 – Self-Tuning Warning

If the ST-33Q cannot tune to a desired frequency perform one of the following:

1. Press the Select Key to attempt to retune at the current frequency.
2. Press the Inductive Mode Key to return to Direct Connect Mode.
3. Move the ST-33Q to a different location to perform the locate.
4. Press the Frequency Key and select a different frequency to try in Inductive Mode.

Air-Coupling

In Inductive Mode, the ST-33Q will generate a field through the air around it; including the ground underneath. If within air-coupling range of the ST-33Q, the receiver will measure this field instead of the target conductor. Air-coupling may distort readings and misconstrue the location of the target conductor.

Air-coupling can occur over a wide range; greater than 70 ft [20 m] if the induced utility is deep and poorly grounded. Very weak induction and deep utilities will result in greater air-coupling distances. Always confirm the detection of utilities and the readings of depth measurements.

Air-coupling does not depend on the output power of the transmitter and cannot be reduced by turning down the power. Air-coupling only depends on the ratio of the field from the transmitter compared to the induced field in the target utility.

Note that air-coupling can vary continuously. Be aware of the difference between the transmitter's field and the induced field of the utility being traced. While both will have the same frequency, the transmitter's field is limited to the region around the transmitter itself. Be sure to look overhead for power lines that could also confuse the locate.

Testing for Air-Coupling

To test for air-coupling, tilt the locator at a 45 degree angle towards the ST-33Q and ensure the lower antenna of the locator touches the ground. Afterwards, tilt the locator 45 degrees away from the ST-33Q and observe the depth reading. If the depth reading changes significantly, air-coupling may be occurring (*See Figure 21)*.

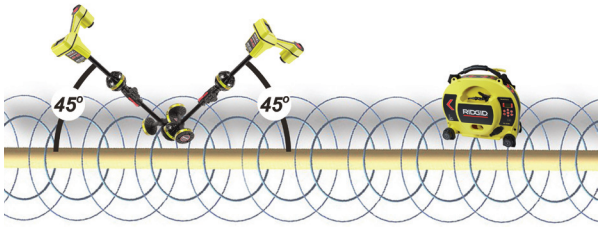


Figure 21 – Testing for Air-Coupling

Alternatively, test for air-coupling by standing 20 ft [6 m] away from the ST-33Q. With the lower antenna on the ground, take note of the indicated depth measurement on the locator. Raise the locator vertically 18 in [45 cm] and observe the change in the depth indication. If the locator only reads the conductor, the depth should increase accordingly. If the locator is air-coupling, the depth indication will not change by 18 in [45 cm], but will change disproportionately.

Using the Kick Stand in Inductive Mode

In Inductive Mode, the kick stand allows the aiming of the output field to maximize the intersection with the conductor of interest while also reducing the field's intersection with a nearby known conductor (*See Figure 22).*

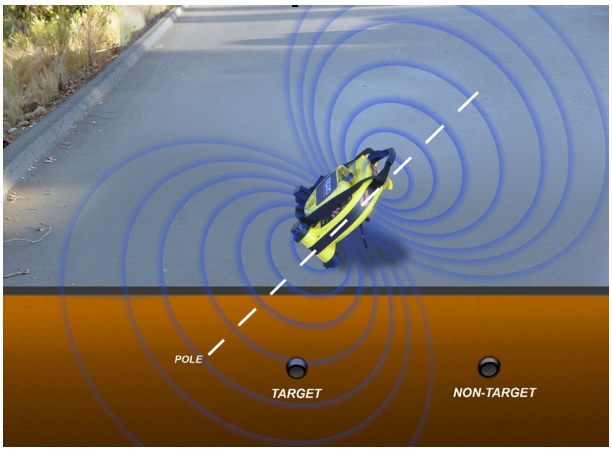


Figure 22 – Using the Kickstand

Customizing the ST-33Q

Tools Menu

Access the Tools Menu from the Main Menu to perform the following:

- Adjust the LCD screen contrast
- Modify the list of Main Menu frequencies
- Turn ON or OFF the current-indication beep
- Restore the default settings
- Create and store user-defined frequencies

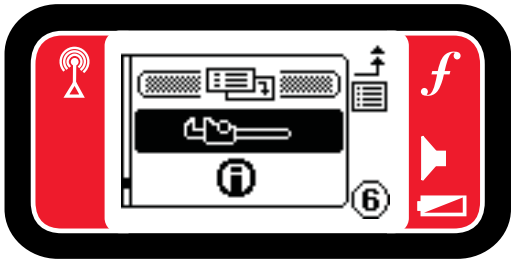


Figure 23 – Selecting the Tools Menu

Use the Up and Down Arrow Keys to highlight an option and press the Select Key to make changes within the selection.

LCD Setting

From the Tools Menu select the LCD Setting option LCD to adjust the brightness of the LCD screen. Use the Up and Down Arrow Keys or use the Frequency Key and the Power Key as left and right arrow keys to adjust the brightness (*See Figure 24)*.

Figure 24 – Adjusting LCD Screen Brightness

If the Frequency Key is pressed while the LCD Setting option LCD is highlighted in the Tools Menu, a diagnostic screen showing the current frequency, power level, and output voltage will appear after a countdown. Press the Main Menu Key to return to the Main Menu.

Audio Setting

Turn the beeping current signal ON or OFF from the Audio option found in the Tools Menu. Press the Select Key to toggle between ON and OFF. The audio setting will default to ON after the ST-33Q is turned OFF.

Auto-shutdown Setting

The ST-33Q has an auto-shutdown feature that will shut off the device if a key is not pressed within a set time. The ST-33Q can be set to auto-shutdown in 1 hour, 2 hours, 4 hours, or never (*See Figure 25)*.

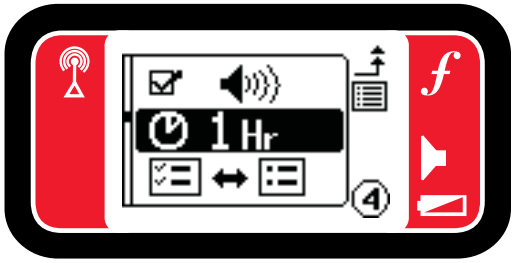


Figure 25 – Setting Auto-shutdown Intervals

After selecting auto-shutdown from the Tools Menu, the ST-33Q will cycle through the auto-shutdown intervals. Press the Main Menu Key to exit and to save the selection. During auto-shutdown, press any key on the keypad to restart the countdown.

Frequencies

Select the Frequencies option from the Tools Menu to exclude default frequencies from the active frequency list. The ST-33Q lists active frequencies in the Main Menu for frequencies used most often and for frequencies that may require quick access. The ST-33Q also lists frequencies in the Frequencies Menu which contains all default and user-defined frequencies.

Select frequencies within the Frequencies Menu to appear in the Main Menu list. Deselect frequencies in the Main Menu list to appear in the Frequencies Menu. Use the Up and Down Arrow Keys to highlight a frequency and press the Select Key to turn it ON or OFF. When enabled, a frequency will show an arrow icon and will appear in the top level list of the Main Menu. When disabled, the frequency will show an "X".

User-defined Frequencies

The ST-33Q can accept 40 custom, user-defined frequencies that can be used in either Direct Connect Mode or Inductive Clamp Mode. A user-defined frequency can be unselected on either list within a mode without affecting the other mode.

Select the User-defined Frequency option after selecting the Frequencies option from the Tools Menu to add custom user-defined or factory-installed frequencies (*See Figure 26)*.

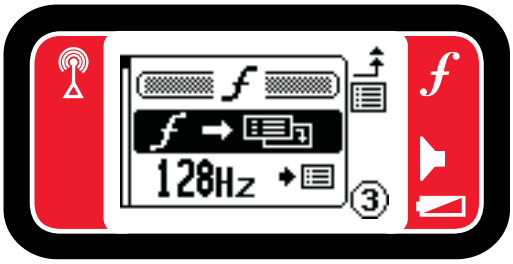


Figure 26 – User-defined Frequency Option

The ST-33Q will accept user-defined frequencies from 10 Hz to 490 kHz for North America models. For European models, the ST-33Q will accept user-defined frequencies from 10 Hz to 95 kHz. See the last page of this Operator's Manual for a list of frequencies used by common manufacturers.

Adding a User-defined Frequency

To add a user-defined frequency, select the User-defined Frequency option f → ▤ after selecting the Frequencies option ☑▤ ↔ ▤ from the Tools Menu 🔧. After selecting a the User-defined frequency option, a screen with six digit placeholders will appear (*See Figure 27)*.

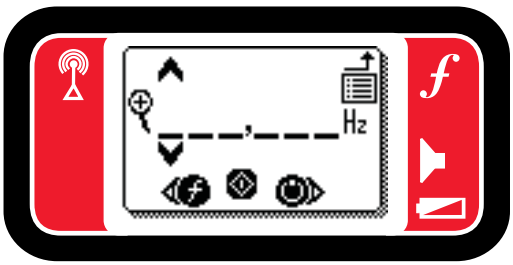


Figure 27 – User-defined Frequency Screen

Use the Frequency Key as a Left Arrow Key to move all the way to the left of the screen to access a drop-down list of pre-stored 3-digit and 4-digit frequencies. Use the Up and Down Arrow Keys △▽ to scroll through the list. When highlighted, press the Select Key ◇ to confirm the selection *(See Figure 28)*.

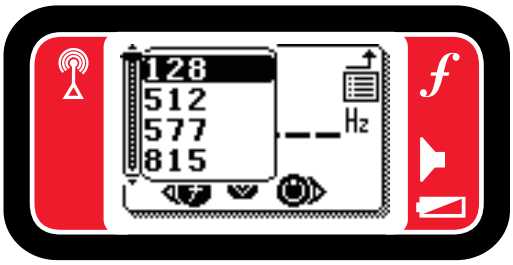


Figure 28 – Stored User-defined Frequencies

Use the Frequency Key and the Power Key as left and right arrow keys to move through each digit placeholder. Use the Up and Down Arrow Keys △▽ to increase and decrease the value of each digit. The ST-33Q will adjust the output frequency as each digit is entered. This auto-adjustment allows the tuning of the target frequency for maximum signal at the receiver. Press the Select Key ◇ to confirm the frequency once entered.

After pressing the Select Key ◇, the ST-33Q will add the user-defined frequency to the user-defined frequency list and the frequency will automatically appear, selected for use, in the Main Menu. If enabled, user-defined frequencies will show a "+ " sign next to it in the Main Menu (*See Figure 29)*.

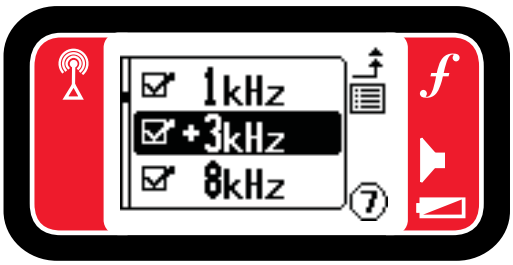


Figure 29 – Enabled User-defined Frequency

Editing a User-defined Frequency

To edit a user-defined frequency, press the Main Menu Key ▤ to access the top-level menu. Use the Up and Down Arrow Keys △▽ to scroll to the user defined frequency that requires editing. When highlighted, press the Frequency Key f.

If the frequency that requires editing does not appear in the top-level menu, select the Frequencies option ☑▤ ↔ ▤ from the Tools Menu 🔧. Select the User-defined Frequency option f → ▤ and use the Up and Down Arrow Keys △▽ to scroll to the frequency that requires editing. When highlighted, press the Frequency Key f.

When the editing screen appears, use the Up and Down Arrow Keys △▽ to edit each digit. When a user-defined frequency has been edited, it will also appear as edited in the mode enabled.

Deleting a User-defined Frequency

To delete a user-defined frequency, press the Main Menu Key ▤ to access the top-level menu. Use the Up and Down Arrow Keys △▽ to scroll to the user defined frequency that requires editing. When highlighted, press the Frequency Key f.

If the frequency that requires deleting does not appear in the top-level menu, select the Frequencies option ☑▤ ↔ ▤ from the Tools Menu 🔧. Select the User-defined frequency option f → ▤ and use the Up and Down Arrow Keys △▽ to scroll to the frequency that requires deleting. When highlighted, press the Frequency Key f.

When the editing screen appears, use the Up and Down Arrow Keys to change each digit to zero. When each digit has been changed to zero, press the Select Key to delete the frequency from both the Direct Connect Mode and the Inductive Clamp Mode.

Odometer

Select the Odometer option from the Tools Menu to make changes used for system diagnosis or to access operations data (*See Figure 30)*.

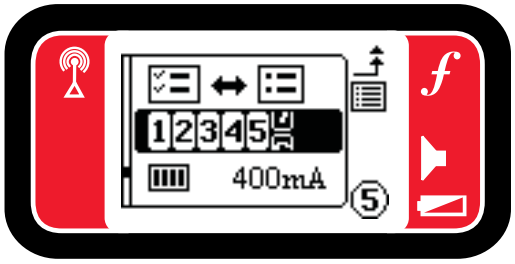


Figure 30 – Odometer Option

When selected, the Odometer option will show the number of hours each frequency has been used or the number of times each frequency has been selected for actual use. The Odometer option will also display the total time spent in each mode, minimum and maximum voltages encountered, and the amount of time spent at various power levels.

NOTE: The Factory Reset will not reset the Odometer stored values.

Use the Frequency Key and the Power Key as left and right arrow keys to toggle the Odometer between a list of system values and a list of frequencies showing the amount of time the ST-33Q has logged on each frequency and in various mode. Press the Main Menu Key to exit the Odometer option.

Information Menu

Access the Information Menu from the Main Menu (*See Figure 31).*

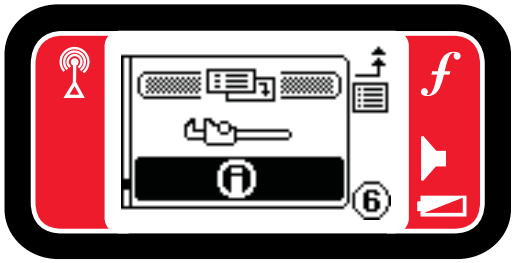


Figure 31 – Information Menu

Select the Information Menu to view the following:

- The version of software included in the ST-33Q
- The boot-load version
- Maximum frequency set

Reset to Factory Default

From the Information screen, press the Select Key to bring up the option to restore the ST-33Q to the default, factory settings (*See Figure 32).*

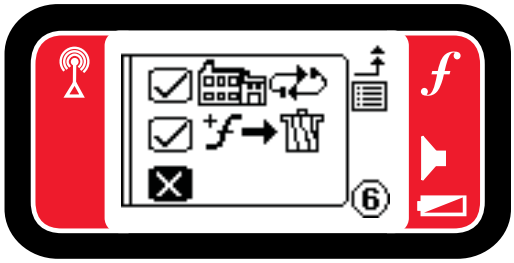


Figure 32 – Reset to Factory Default Screen

To reset the ST-33Q to the factory default settings, use the Up and Down Arrow Keys to highlight the Factory Reset option and press the Select Key. Note that restoring the factory default settings will not erase user-defined frequencies created and stored on the ST-33Q.

To erase all user-defined frequencies, highlight the second option in the Factory Reset Menu and press the Select Key.

To exit the Factory Reset Screen without making changes, use the Up and Down Arrow Keys to highlight the icon and press the Select Key or press the Main Menu Key.

Helpful Hints

- As a general guideline, using lower frequencies with the least amount of current and a clear signal will produce best locating results. Start with a low frequency if tracing long distances or when receiving too much bleed-over onto other utilities.
- The ST-33Q will generate frequencies as low as 128 Hz in Direct Connect Mode. The ST-33Q will allow custom frequencies as low as 10 Hz.
- In general, 8 kHz offers a good starting point when using the ST-33Q in Direct Connect Mode. When using Inductive Mode, 33 kHz will likely be the best starting frequency.
- The ST-33Q will generate frequencies as high as 490 kHz (95 kHz in the European version). High frequency signals are especially valuable when tracing a line with interruption (such as a gasket or damaged insulation). Unlike low frequency signals, high frequency signals can “jump” some barriers and continue without appreciable dissipation.
- When using Inductive Clamp Mode, use higher frequencies since the signal must overcome additional resistance.

Maintenance Instructions

Cleaning

⚠ WARNING

Disconnect all cords and cables and remove batteries prior to cleaning the ST-33Q to reduce the risk of electrical shock.

Do not use liquid or abrasive cleaners on the ST-33Q. Clean the ST-33Q with damp cloth. Only clean screen with cleaners approved for use on LCD screens. Do not allow any liquid to enter the ST-33Q.

Accessories

⚠ WARNING

The following accessories have been designed for use with the ST-33Q. Other accessories may become hazardous when used with the ST-33Q. To reduce the risk of serious injury, only use accessories specifically designed and recommended for use with the ST-33Q.

Table 5
SeekTech ST-33Q Accessories

Catalog # U.S.A.	Catalog # E.U.	Description
21893	21893	RIDGID SeekTech SR-20
22163	30123	RIDGID SeekTech SR-60
20973	20973	Inductive Clamp

Transport and Storage

Keep the equipment indoors or well-covered in wet weather. Store the ST-33Q in a locked area, out of the reach of children and people unfamiliar with its operation. This equipment could cause serious injury in the hands of untrained users. Do not expose to heavy shocks or impacts during transport.

Remove batteries before shipping and before storing for extended periods.

Store electrical devices in a dry place to reduce risk of electrical shock. Store in temperatures from 14°F to 158°F [–10°C to 70°C]. Store the unit away from heat sources such as radiators, heat registers, stoves, and other products (including amplifiers) that produce heat.

Service and Repair

⚠ WARNING

Improper service or repair can make the ST-33Q unsafe to operate.

Service and repair of the SeekTech ST-33Q must be performed by a RIDGID Independent Authorized Service Center.

For information on your nearest RIDGID Independent Service Center or any service or repair questions:

- Contact your local RIDGID distributor.
- Visit www.RIDGID.com or www.RIDGID.eu to find your local Ridge Tool contact point.
- Contact Ridge Tool Technical Service Department at rtctechservices@emerson.com or, in the U.S. and Canada, call 800-519-3456.

Disposal

Parts of the unit contain valuable materials that can be recycled. There are companies that specialize in recycling that may be found locally. Dispose of the components in compliance with all applicable regulations. Contact your local waste management authority for more information.

For EC countries: Do not dispose of electrical equipment with household waste!

According to the European Guideline 2002/96/EC for Waste Electrical and Electronic Equipment and its implementation into national legislation, electrical equipment that is no longer usable must be collected separately and disposed of in an environmentally-correct manner.

Table 6 Troubleshooting	
Problem	**Solution**
ST-33Q will not turn ON	Check orientation of batteries.
	Check that batteries are charged.
	Check that the battery contacts are clean and unbent.
Receiver will not pick up the line transmitter's signal	Check that the circuit is complete.
	Check that the transmitter is in the correct mode. See the descriptions for Direct Connect Mode, Inductive Mode, and Inductive Clamp Mode.
	Check that the receiver and the ST-33Q are set to the same frequency (for example, some receivers will use 93,622.9 Hz or 93,696 Hz instead of 93 kHz). Create custom frequencies to exactly match the receiver.
	Ensure the proper functions are activated on the receiver.
	Press up the Up Arrow Key to increase the power output.
	Ensure adequate grounding and improve if possible.
LCD screen completely dark or light when the ST-33Q is ON	Power the ST-33Q OFF and ON.
	Check and adjust LCD brightness from the Tools Menu.
	If exposed to excessive heat or sunlight, allow the ST-33Q to cool.
ST-33Q appears stuck in one mode and will not reset	Remove and replace or recharge batteries.
	Apply external power source.

Table 7 Frequencies Used by Various Manufacturers		
Company	**Named Frequencies**	**Exact Measured Frequency**
3M Dynatel®	577 Hz	577 Hz
	8 kHz	8,192 Hz
	33 kHz	32,768 Hz
	200 kHz	200,000 Hz
Fisher Labs®	820 Hz	821 Hz
	8.2 kHz	8,217 Hz
	82 kHz	82,488 Hz
Goldak	117.5 kHz	11,750 Hz
Health Consultants Incorporated	8.1 kHz	8,128 Hz
	81 kHz	81,326 Hz
	480 kHz	480,323 Hz
McLaughlin®	9.5 kHz	9,499 Hz
	38 kHz	37,997 Hz
Metrotech®	982 Hz	982 Hz
	9.8 kHz	9,820 Hz
	82 kHz	82,488 Hz
	83 kHz	83,080 Hz
PipeHorn®	480 kHz	479,956 Hz
	512 Hz	512 Hz
	8 kHz	8,192 Hz
Radio Detection	33 kHz	32,768 Hz
	65 kHz	65,538 Hz
	82 kHz	81,865 Hz
	200 kHz	200,000 Hz
Rycom Instruments®	815 Hz	815 Hz
	82 kHz	82,318 Hz
Schonstedt® Instrument Company	575 Hz	575 Hz
SubSurface®	8 kHz	8,055 Hz
	27 kHz	26,721 Hz
Subsite® Electronics Ditch Witch®	1 kHz	1,170 Hz
	8 kHz	8,009 Hz
	29 kHz	29,430 Hz
	30 kHz (150 R/T)	30,303 Hz
	80 kHz	80,429 Hz

Notes

Notes

Notes

What is covered
RIDGID® tools are warranted to be free of defects in workmanship and material.

How long coverage lasts
This warranty lasts for the lifetime of the RIDGID® tool. Warranty coverage ends when the product becomes unusable for reasons other than defects in workmanship or material.

How you can get service
To obtain the benefit of this warranty, deliver via prepaid transportation the complete product to RIDGE TOOL COMPANY, Elyria, Ohio, or any authorized RIDGID® INDEPENDENT SERVICE CENTER. Pipe wrenches and other hand tools should be returned to the place of purchase.

What we will do to correct problems
Warranted products will be repaired or replaced, at RIDGE TOOL'S option, and returned at no charge; or, if after three attempts to repair or replace during the warranty period the product is still defective, you can elect to receive a full refund of your purchase price.

What is not covered
Failures due to misuse, abuse or normal wear and tear are not covered by this warranty. RIDGE TOOL shall not be responsible for any incidental or consequential damages.

How local law relates to the warranty
Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights, and you may also have other rights, which vary, from state to state, province to province, or country to country.

No other express warranty applies
This FULL LIFETIME WARRANTY is the sole and exclusive warranty for RIDGID® products. No employee, agent, dealer, or other person is authorized to alter this warranty or make any other warranty on behalf of the RIDGE TOOL COMPANY.

Ce qui est couvert
Les outils RIDGID® sont garantis contre tous vices de matériaux et de main d'oeuvre.

Durée de couverture
Cette garantie est applicable durant la vie entière de l'outil RIDGID®. La couverture cesse dès lors que le produit devient inutilisable pour raisons autres que des vices de matériaux ou de main d'oeuvre.

Pour invoquer la garantie
Pour toutes réparations au titre de la garantie, il convient d'expédier le produit complet en port payé à la RIDGE TOOL COMPANY, Elyria, Ohio, ou bien le remettre à un réparateur RIDGID® agréé. Les clés à pipe et autres outils à main doivent être ramenés au lieu d'achat.

Ce que nous ferons pour résoudre le problème
Les produits sous garantie seront à la discrétion de RIDGE TOOL, soit réparés ou remplacés, puis réexpédiés gratuitement ; ou si, après trois tentatives de réparation ou de remplacement durant la période de validité de la garantie le produit s'avère toujours défectueux, vous aurez l'option de demander le remboursement intégral de son prix d'achat.

Ce qui n'est pas couvert
Les défaillances dues au mauvais emploi, à l'abus ou à l'usure normale ne sont pas couvertes par cette garantie. RIDGE TOOL ne sera tenue responsable d'aucuns dommages directs ou indirects.

L'influence de la législation locale sur la garantie
Puisque certaines législations locales interdisent l'exclusion des dommages directs ou indirects, il se peut que la limitation ou exclusion ci-dessus ne vous soit pas applicable. Cette garantie vous donne des droits spécifiques qui peuvent être éventuellement complétés par d'autres droits prévus par votre législation locale.

Il n'existe aucune autre garantie expresse
Cette GARANTIE PERPETUELLE INTEGRALE est la seule et unique garantie couvrant les produits RIDGID®. Aucun employé, agent, distributeur ou tiers n'est autorisé à modifier cette garantie ou à offrir une garantie supplémentaire au nom de la RIDGE TOOL COMPANY.

RIDGID
FULL LIFETIME WARRANTY
Against Material Defects & Workmanship

Parts are available online at RIDGIDParts.com

RIDGID Parts

Ridge Tool Company
400 Clark Street
Elyria, Ohio 44035-6001
U.S.A.

Qué cubre
Las herramientas RIDGID® están garantizadas contra defectos de la mano de obra y de los materiales empleados en su fabricación.

Duración de la cobertura
Esta garantía cubre a la herramienta RIDGID® durante toda su vida útil. La cobertura de la garantía caduca cuando el producto se torna inservible por razones distintas a las de defectos en la mano de obra o en los materiales.

Cómo obtener servicio
Para obtener los beneficios de esta garantía, envíe mediante porte pagado, la totalidad del producto a RIDGE TOOL COMPANY, en Elyria, Ohio, o a cualquier Servicentro Independiente RIDGID®. Las llaves para tubos y demás herramientas de mano deben devolverse a la tienda donde se adquirieron.

Lo que hacemos para corregir el problema
El producto bajo garantía será reparado o reemplazado por otro, a discreción de RIDGE TOOL, y devuelto sin costo; o, si aún resulta defectuoso después de haber sido reparado o sustituido tres veces durante el período de su garantía, Ud. puede optar por recibir un reembolso por el valor total de su compra.

Lo que no está cubierto
Esta garantía no cubre fallas debido al mal uso, abuso o desgaste normal. RIDGE TOOL no se hace responsable de daño incidental o consiguiente alguno.

Relación entre la garantía y las leyes locales
Algunos estados de los EE.UU. no permiten la exclusión o restricción referente a daños incidentales o consiguientes. Por lo tanto, puede que la limitación o restricción mencionada anteriormente no rija para Ud. Esta garantía le otorga derechos específicos, y puede que, además, Ud tenga otros derechos, los cuales varían de estado a estado, provincia a provincia o país a país.

No rige ninguna otra garantía expresa
Esta GARANTIA VITALICIA es la única y exclusiva garantía para los productos RIDGID®. Ningún empleado, agente, distribuidor u otra persona está autorizado para modificar esta garantía u ofrecer cualquier otra garantía en nombre de RIDGE TOOL COMPANY.

We Build Reputations™

RIDGID®

EMERSON™
Professional Tools

EMERSON. CONSIDER IT SOLVED.™

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