



**GREASEwatch® 2 Wireless
Oil, Grease and Solids
Radio Frequency Remote Monitoring System
OWNER'S MANUAL**

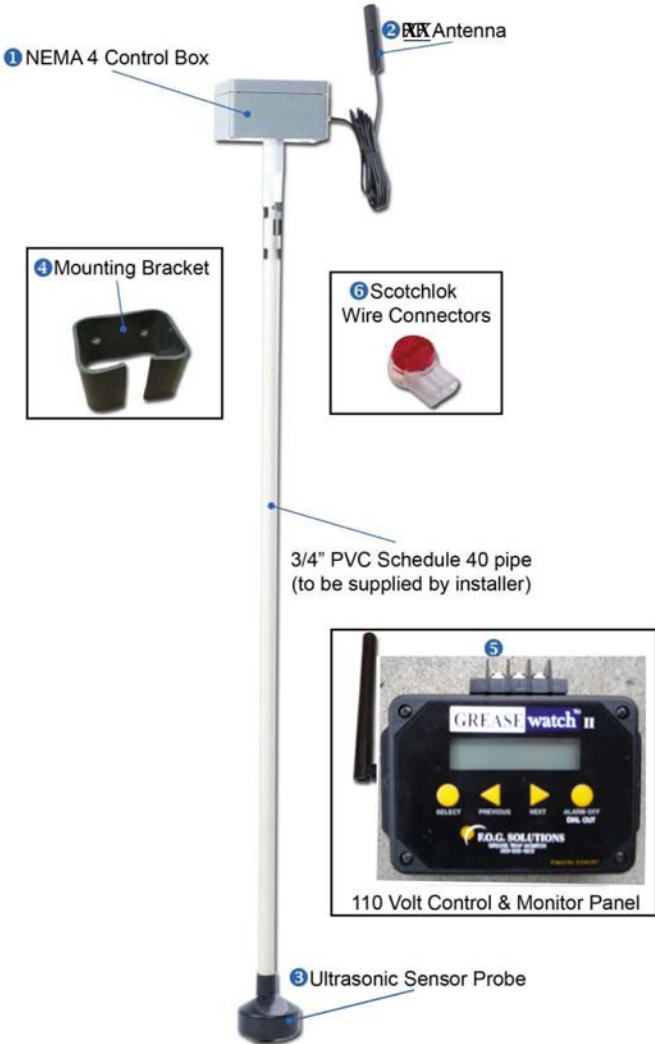
(Version 1.0)

Description

The GREASEwatch® 2 Wireless is a unique radio frequency monitor and alarm system that assists in managing oil, grease and sediment levels inside commercial oil and grease interceptors. The battery operated sensor mounted inside the interceptor detects oil, grease and solids levels and communicates wirelessly to the control panel mounted in the facility manager's office or work area.

Components and Operation

The GREASEwatch 2 Wireless is a stand-alone radio frequency remote monitoring system. It is supplied with: ① NEMA 4 control box with 3.6V lithium battery ② antenna with waterproof wire ③ ultrasonic sensor probe ④ mounting bracket ⑤ 110 volt control and monitoring panel with plug-in adapter ⑥ waterproof Scotchlok wire connectors



The Sensor and Control Box:

- A) Control box mounts inside the interceptor extension collar (riser) with provided mounting bracket and mounting bolts.
- B) The sensor is attached to the control box with ¾" PVC pipe supplied by installer.
- C) The control box antenna is attached to the control box and secured into ground surface near the manway cover with clear silicone supplied by installer.

The Control Panel:

- A) Typically installed inside the facility building
- B) Mounted inside supervisor's or Manager's office for easy access
- C) Connects to 110 V outlet with supplied power supply

Operation:

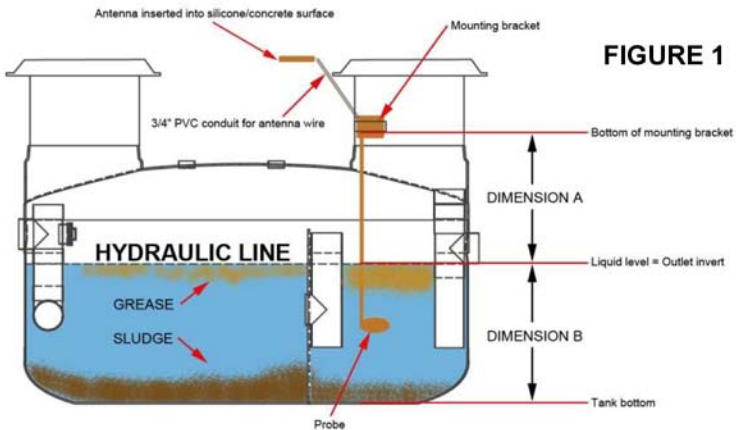
Oil or grease level as well as bottom solids level is monitored throughout the day. Levels are transmitted wirelessly via a radio frequency signal to the control panel inside the building.

The control panel can be programmed to read and report levels in inches or as percent of interceptor capacity.

When a predetermined level of oil, grease, and solids is reached, the control panel is programmed to visually alarm and notify facility manager that it is time to pump out the interceptor.

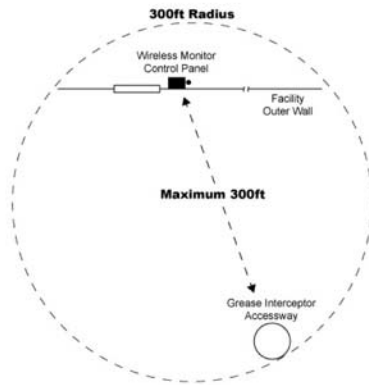
Installation Overview - Components

1. Install control panel on office wall as close to grease interceptor as possible, plug power connector into standard 110V outlet
2. Attach mounting bracket to extension collar with mounting bolts (provided) – drill mounting holes approximately 15" from top of riser
3. Cut $\frac{3}{4}$ " SCH40 PVC pipe to length (A + $\frac{1}{2}$ B) – see Figure 1



4. Thread probe wire through PVC pipe
5. Solvent weld probe to bottom of PVC pipe with primer and PVC cement to make waterproof seal
6. Connect probe wires to control box with waterproof connectors provided
7. Secure pipe to control box with silicon rubber and screw provided
8. Drill 1" conduit hole for antenna at 45 degree angle from concrete surface to top of mounting bracket area inside extension collar and run conduit through hole
9. Run antenna from mounting bracket area through conduit to surface
10. Create 1" wide x 9" long x 1" deep groove in concrete surface for antenna
11. Insert antenna in groove and fill to cover and seal with clear silicone caulk
12. Proceed to calibration procedure

Step-By-Step Installation Instructions



Install wireless monitor control panel inside facility, keeping it (1) near enough to 110V outlet to plug it in and (2) on or near an outside wall closest to the grease interceptor (3) within a 300ft radius in relation to the grease interceptor.

Identify the location of grease interceptor, remove the manway access cover to reveal the **OUTLET** side of the interceptor.



Install U-bracket level in manway riser with 2 mounting bolts provided. Bolt holes should be drilled into the riser approximately 15" from grade in a position where underwater probe does not have obstructions and the manway cover will not interfere or damage the control box.



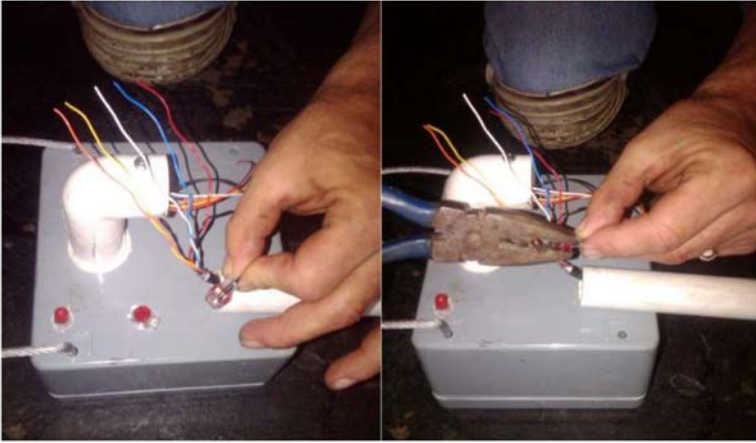
Insert control box into the U-bracket as shown. Measure the distance from the $\frac{3}{4}$ " PVC elbow (with 6 wires) to the top of the grease layer/liquid level (Dimension **A**). Then measure the liquid level to the bottom of the tank (Dimension **B**) [See Figure 1]. Tank bottom must have no sediment build-up to insure accurate measurement.



Cut $\frac{3}{4}$ " PVC pipe to length ($A + \frac{1}{2} B$) so probe end is positioned in the middle of the interceptor liquid level. Run the black wire from the probe through the PVC pipe. Secure probe to the PVC pipe with PVC cement to create a waterproof seal.



At top end of PVC pipe, cut black wire approximately 6" longer than PVC pipe. Strip black wire shielding to expose wires but do not strip individual wire jacketing.



Pair the 6 wires from the control box with similar colored wires from probe. Use waterproof connectors to splice and connect both sets of wires. **DO NOT STRIP** the colored wires – the connectors pierce the colored wire shielding to make adequate connections.

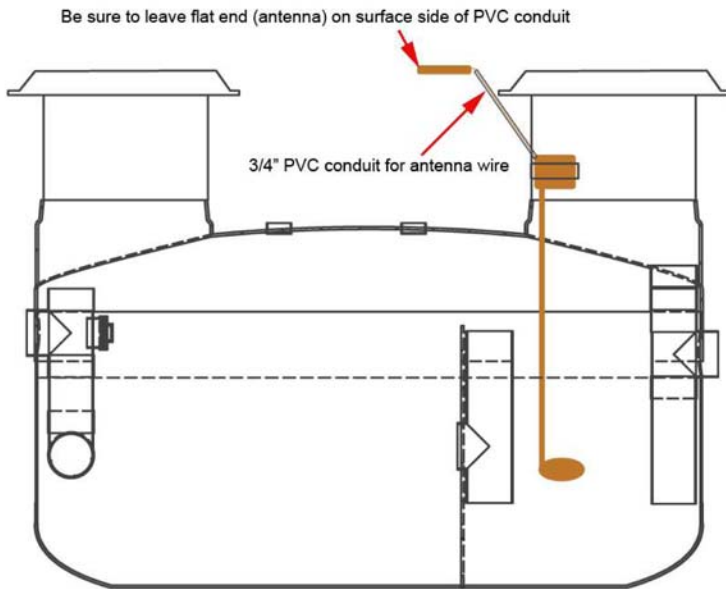


Remove the set screw from the control box elbow and push the connectors down into the $\frac{3}{4}$ " pipe and up into the $\frac{3}{4}$ " elbow. Put a bead of **100% silicone rubber** on the outside end of $\frac{3}{4}$ " pipe and push pipe into the elbow until seated. Rotate the probe end so that when the control box is inserted into the bracket and the probe end is in the tank, the probe end is not facing a wall, pipe or any other obstruction and then install the set screw into the $\frac{3}{4}$ " elbow.

Installing Antenna Into Surface Material

Antenna Installation Part 1

Drill a 1" hole at 45 degree angle from surface to area in the riser/extension collar above the mounting bracket and insert 3/4" PVC pipe conduit from hole to surface. Thread antenna wire through PVC pipe with gold female end protruding from pipe nearest control box and mounting bracket. Remove the red cover from the control box and screw the gold female connector from the antenna onto the gold male connector on the control box. Seal the connection with **100% silicone rubber** to provide waterproof seal.



Carry out **Signal Connectivity Check** on next page, and then return to this step to complete antenna installation.

Antenna Installation Part 2 (to be done after Signal Connectivity Check)

Cut a 9" long X 1" wide X 1" deep groove into the surface (concrete or asphalt) to accommodate the antenna. Place antenna in groove and cover and fill groove completely with **100% silicone rubber** to seal. Antenna should be completely encased in silicone. There must be no antenna wire exposed at the surface which could be damaged by traffic.

Signal Connectivity Check

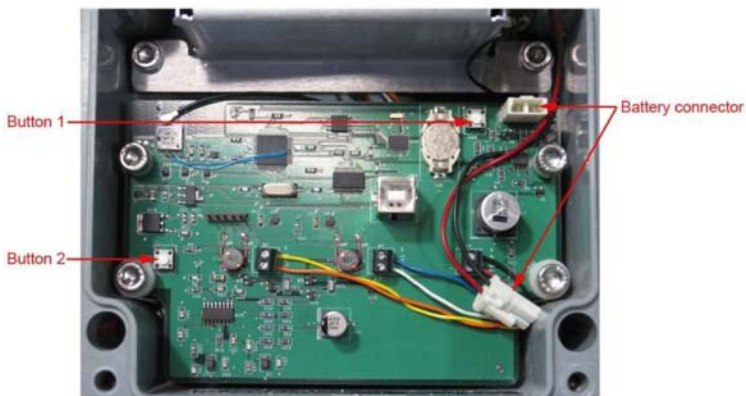


Remove cover from back of control box with 4 screws. Place probe through U-bracket and into interceptor until control box elbow rests on bracket (this is actually inserting the probe backwards at this point).

Plug battery into connector.

Press **Button 1** on circuit board next to battery to initiate liquid level reading and connectivity to control panel. Replace cover. Return to previous page to complete **Antenna Installation Part 2**. View monitor panel to ensure connectivity is established. Normal user mode screen should appear.

NOTE: Press **Button 2** at same time as **Button 1** **only** in the event you need to reset the system or as instructed by technical support personnel.



Control box with back cover removed

Calibration Procedure

The GREASEwatch 2 Control Panel has two hidden buttons that are used for initial set-up to instruct the control panel regarding the dimensions of the interceptor and to set up the alarm parameters. The two hidden buttons are found under the letters **G** and **h** in **GREASEwatch**.

Press and hold the **G** button for 5 seconds to enter calibration mode.

Press and hold the **h** button for 5 seconds to determine status of probe, such as battery life and signal strength.

Press the **G** button any time to return to normal or user mode.

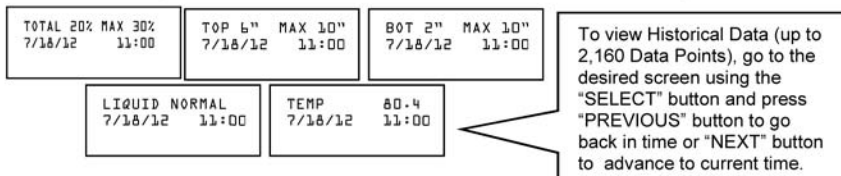
Main Screen



The remaining buttons on the control panel are as follows:

- **SELECT** Scroll through different screens
 In Calibration, acknowledges setting value and advances through various menu items
- ◀ **PREVIOUS** Go back in time to view historical settings
 In Calibration, changes setting to lower value
- ▶ **NEXT** Go forward to view historical settings
 In Calibration, change setting to higher value
- **ALARM OFF** Resets alarm, stops alarm flashing

Once Control panel is calibrated, simply press the SELECT button to scroll through various screens to “view” contents of interceptor.



Control Panel Settings

<p>Press and hold the G button for 5 seconds to enter calibration mode. Press SELECT button to begin setting date and clock.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;">ENTERING SET-UP</div>
<p>Press NEXT or PREVIOUS buttons to change value. Once correct Month is entered, press SELECT to advance to next screen setting.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;">CHANGE MONTH? 7</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">MONTH 11</div>
<p>Press NEXT or PREVIOUS buttons to change value. Once correct Date is entered, press SELECT to advance to next setting.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;">CHANGE DATE? 20</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">DATE 17</div>
<p>Press NEXT or PREVIOUS buttons to change value. Once correct Year is entered, press SELECT to advance to next setting.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;">CHANGE YEAR? 2000</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">YEAR 2012</div>
<p>Press NEXT or PREVIOUS buttons to change value. Once correct hour is entered, press SELECT to advance to next setting.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;">CHANGE HOUR? 11</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">HOUR 23</div>
<p>Press NEXT or PREVIOUS buttons to change value. Once correct minute is entered, press SELECT to advance to next setting.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;">CHANGE MINUTES? 25</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">MINUTES 39</div>
<p>Interceptor Tank Calibration. Use PREVIOUS and NEXT buttons to enter the values measured per the "Installation Overview Components Diagram" [Figure 1]</p>	

Interceptor Tank Settings

<p>Press PREVIOUS or NEXT buttons to enter DIMENSION B per diagram on page 4. Press SELECT to save and advance.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> LIQUID LEVEL HEIGHT 50" </div>
<p>Use NEXT or PREVIOUS buttons to input previously calculated DIMENSION = 1/2B from Page 4. This is the Transducer Height. Press SELECT to save and advance.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> LL TO XDR DISTANCE 25" </div>
<p>This setting is for COMBINED Grease and Solids that will alarm. eg: for 30% pump rule, setting would be 30%. Use NEXT or PREVIOUS buttons to input Alarm Levels. <i>Set to 0 if no alarm is desired.</i> Press SELECT to save and advance.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> TANK PUMPED AT 30% OF SOLIDS </div>
<p>Use NEXT or PREVIOUS buttons to input desired Grease Level that will alarm. If interceptor DIMENSION B from pg. 4 was 50 inches, a typical top grease level for pumping could be 20% of DIMENSION B = 10" Press SELECT to save advance.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> TANK PUMPED WHEN 10" ON TOP </div>
<p>Use NEXT or PREVIOUS buttons to input desired Bottom Solids Level that will alarm. EXAMPLE: If interceptor DIMENSION B from pg. 4 was 50 inches, a typical sediment level for pumping could be 10% of DIMENSION B = 5" Press SELECT to save and advance.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> TANK PUMPED WHEN 5" ON BOT </div>
<p>The LIQUID LEVEL DELTA SCREEN sets sensor to alarm in case a back up on the outlet of the interceptor or other extraordinary occurrence causes the "normal" liquid level (DIMENSION B from Pg. 4) to rise above normal operating level. 6" is a typical setting. Use NEXT or PREVIOUS buttons to change value. Press SELECT to save and advance.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> LIQUID LEVEL DELTA 6" </div>
<p>THIS COMPLETES THE CALIBRATION.</p>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 11/27/00 10:33 TANK 1 </div>

Press the "G" button on the "GREASEwatch" logo at any time to return to "User Mode" without saving settings.

The GREASEwatch 2 Control Panel also allows user to view the Raw Data for the GREASEwatch 2 sensor probe.

To view the Raw Data, press and hold the button hidden under the "h" in the GREASEwatch logo for 5 seconds, until the following screen appears.

```
LL/SC/SL
50.0/25.0/25.0"
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- LL – The total Liquid Level in the interceptor is 50 inches
- SC – The SCum or Grease Layer is measured 25 inches above the sensor
- SL – The Sludge Layer or bottom solids layer is measured 25 inches below the sensor

The next screen shows the GREASEwatch 2 battery charge or Voltage which must be between 3.0 and 3.6V for proper operation. A full strength battery is between 3.5 and 3.6 V.

```
BATTERY VOLTS
3.5 V
```

The next screen shows the Signal Strength communication between the GREASEwatch 2 sensor antenna and the Control Panel.

```
RSSI -2
LQI -78
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RSSI – Range is from -50=BAD to 105=GOOD (this example -2 is OK)

LQI – Range is from -45=BAD to -80=GOOD (this example -78 is OK)

Press the "G" button on the "GREASEwatch" logo at any time to return to "User Mode" without saving settings.

GREASEwatch 2 Wireless Specifications

Materials of Construction:	Corrosion resistant polymers
Control Box:	NEMA 4 rated, waterproof and corrosion resistant
Sensor:	Ultrasonic fully potted transducers
Measurement Accuracy:	+/-1" immersed in minimum 20" of water (10" above and 10" below sensor)
Power Supply:	Sensor – 5 year long-life 3.6V Lithium Battery Control Panel – 110 V AC power converter
Antenna:	antenna with 8 ft. cable connection
Signal Range:	Maximum 300 ft. from antenna to control panel
Control Panel Display:	LCD

Troubleshooting

In case of sensor or control panel malfunction, complete the following steps:

1. Check control panel to confirm that it is plugged in and has power. Main Screen should display.



2. Press the **h** button hidden under the GREASEwatch logo for 5 seconds to access the system settings.
3. Scroll through the system settings using the **SELECT** button to view the following:
 - **SIGNAL STRENGTH** – two values **RSSI** and **LQI**
 - **RSSI** – range **-50:BAD** to **105:GOOD**
 - **LQI** – range **-45:BAD** to **-80:GOOD**
 - Check antenna to confirm that it is not loose or damaged – tighten or replace if necessary
 - **BATTERY** - 3.6 Volt
 - if less than 3.0 Volt, replace