# AMPRO 2000
## LIMITED GOLD EDITION

# QUICK START GUIDE

O2
CO
CO2
NO
NO2
NOx
SO2
°F
Δ°F
ΔP
Draft
Pressure
Flow

Abgasmessung - Heizöl EL
| T-Gas [°C] | 187.2 |
| T-Luft [°C] | 20.1 |
| CO2 [%] | 13.1 |
| Verluste [%] | 6.3 |
| Zug [hPa] | 0.27 |
| CO [ppmUn] | 23 |

Stop | Speicher | Extras

F1 F2 F3
ESC i
OK

AMPRO 2000
GOLD EDITION

MRU®
AIRfair
EMISSION MONITORING SYSTEMS
since 1984
Over 30 years of innovative gas analysis!

**INDEX ANALYZER:**

**INDEX BLUETOOTH:**

**MRU Instruments, Inc.**
18838 S Memorial Drive - Suite 103
Humble, Texas 77338

Phone: (832) 230-0155 / Fax: (832) 230-1553

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1. **INTRODUCING THE AMPRO 2000.**

   - The AM**PRO** 2000 is unique in that it can analyze up to 7 gases – $O_2$, CO, $CO_2$, NO, $NO_2$, $SO_2$ and $H_2S$ in a single, compact handheld analyzer. No other analyzer that size can do more than 4 gases! In addition, the AmPro 2000 can be equipped to calculate many other parameters as listed below.

   - The AM**PRO** 2000 is very competitively priced, certainly for 7 gases, but even in the 2, 3 and 4 gas configurations, it costs less than any major competitor.

   - Measures ambient air and stack gas temperatures; stack draft; differential pressure and temperature.

   - Calculates  mg/$Nm^3$; $NO_x$ as mg/$m^3$NO; combustion calculations based on fuel type – $CO_2$, excess air, heat losses, combustion efficiency, and flue gas dew point.

2. **THE AMPRO 2000's MANY FEATURES AND BENEFITS**

   - Sleek, compact and rugged construction

   - Large, bright, 3.5" color display

   - Robust, stainless steel connectors

   - Mini-USB interface, SD card reader

   - High speed infrared printer

   - Menu guided software

   - Integrated, backlit condensate separator

   - Rechargeable Li-Ion battery – 15 hours

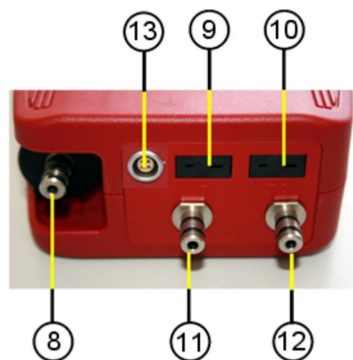   - Universal power supply with charger
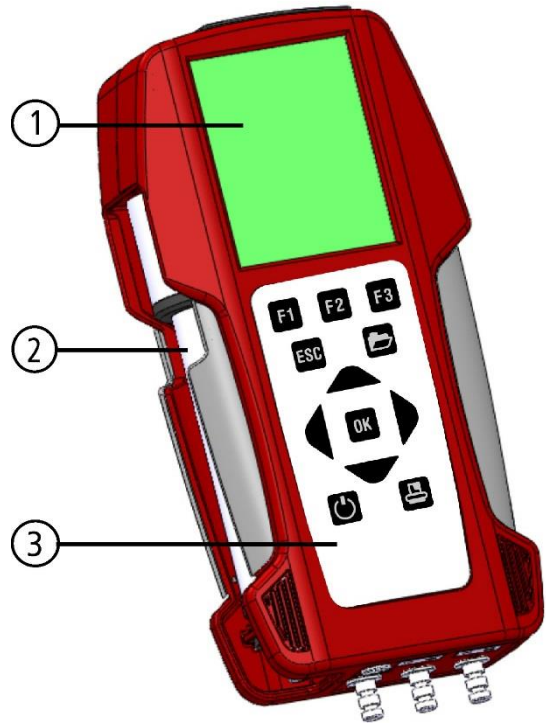
| 1 | Color display |
|---|---|
| 2 | Condensate separator |
| 3 | Key pad |
| 4 | Port cover |
| 5 | SD Card reader |
| 6 | USB port |
| 7 | IR window for printer |

**TOP View**
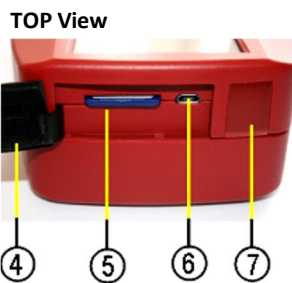
| 8 | Hose connection probe condensate trap |
|---|---|
| 9 | Connector T-Gas |
| 10 | Connector T-Ambient air |
| 11 | Connector draft |
| 12 | Connector differential pressure |
| 13 | AUX port / T-Gas |

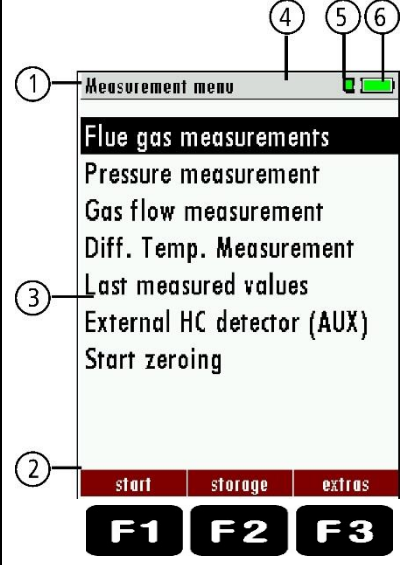**Bottom View with OPTION AUX**

**STD. Bottom View**
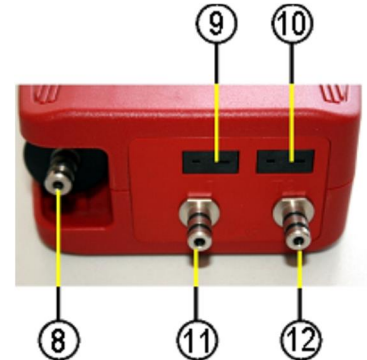
**The Display**

All information required to operate the analyzer is displayed as shown below.

| 1 | Menu bar |
|---|---|
| 2 | Function key bar |
| 3 | Display panel<br><br>- Menu<br><br>- Measurement value |
| 4 | Zeroing active |
| 5 | SD-Card in the slot<br><br>- Indication **GREEN**<br>Read- and write access<br><br>- Indication **YELLOW**<br>only Read access<br>(SD-Card write protected)<br><br>- Indication **RED**<br>Malfunction |
| 6 | Battery charge condition |

**The Key pad**

| | ON/OFF | To switch the analyzer on or off |
|---|---|---|
| | Function Keys | Activates the functions seen on the display<br><br>start    storage    extras |
| | Menu Key | Will show all available functions in the window that are currently in use – also those which have an own key on the key pad like the printer and the three function keys. |
| | ESC Key | Abort or return to the menu above |
| | Arrow Keys | Jump in between lines |
| | Arrow Keys | Change values |
| | OK Key | Confirmation key, select a marked menu point |
| | Printer Key | Activates the printer function in the measuring and service window. |
| | | |

## 3.  TURN THE AMPRO 2000 ON USING THE ⏻ BUTTON

The screens below appears, the AMPRO 2000 automatically zeros itself every time it is switched on.

| | | | | |
|---|---|---|---|---|
| YOUR LOGO HERE | The MRU Logo is displayed briefly, then the internal gas pump turns on. | Followed by this screen pointing out that the probe must be in ambient air while the analyzer zeros | The zeroing bar is activated while the analyzer zeros…. | |

then disappears when the unit is zeroed. The pump turns off.

The analyzer is now ready for measurement.

Press **OK** for **Gas Measurement** or use the arrows to jump between the lines.

## 4.  TAKING A GAS MESUREMENT

Zeroing is completed and your analyzer is ready to take a measurement.

Press **OK** for **Gas Measurement**

Select one of the 4 programs then press OK.
*(Each program can have a customized screen and different CO Limit settings)*

Select your fuel type and press OK.

*(The fuel type list can be modified using the F2 button).*

Insert the probe until you find the hottest spot in the gas stream. Then press OK (or F1).
*(this function can be activated and deactivated in the "EXTRAS MENU" "SETTINGS")*

The gas pump starts and extracts gas from the exhaust.

The values will start changing – once the measured values are stable you can store or print the results.

## 5.  CHANGING THE MEASUREMENT WINDOW – this also defines the print out if you have an external printer

You can modify the screen for your needs. In total there are 3 pages with 6 values on each page.

Press the Folder button

Scroll down to Define Measuring Window and press OK.

The top line is now highlighted black. Scroll to the line that you want to modify.

These are used to scroll up and down to the line you want to modify

These are used to modify the lines which are highlighted

Once all modifications are completed, press the folder button

Press OK to save the changes

**OK**

This procedure can be performed for each of the 4 programs.

## 6. STORING A MEASUREMENT TO THE INTERNAL MEMORY

You can save the measured value to the internal storage

Press the F2 button

**F2**

Each measurement must be save to a site. If there is no site available yet, you must first create one.

Press the F1 button

**F1**

Press the F2 button to get an AUTO number

**F2**

The analyzer will select the next available no

Press the F3 button to save the site.

**F3**

**Please note! You have saved the site you still have to save the measurement to that site.**

Press the F3 button to save the measurement.

**F3**

## 7. VIEWING AND CHANGING ANALYZER SETTINGS

Press the F3 button to get to the EXTRAS menu.

**F3**

Press OK to enter settings

**OK**

Scroll

Modify

Press the F3 button to get to the next window

**F3**

## 8. HOW TO CHARGE THE INTERNAL BATTERY

Connect the analyzer to the charger using the USB port

The MRU Logo is displayed briefly…

then the analyzer switches to charging mode

When the battery is fully charged, Trickle charge will be activated

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## 9.   HOW TO TURN THE ANALYZER OFF (power down)

The analyzer can be turned off at any time but it should be clear of gases before it is turned off.
Allow the analyzer to purge the sensors for at least one minute before shutting down.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
|  | Press the on/off button at any time |  | Press the OK button |  | Additional info will appear then the screen turns blank |  | |

## If there is still gas in the analyzer, shut down will happen as follows:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
|  | Press the on/off button at any time |  | Press the OK button |  | Once the sensors are purged, this screen appears |  | | | |

## 10.   LEAK PROOF TEST

Your AMPRO 2000 has a LEAK TEST which enables you to check the systems for leaks.
Every component – probe tube – probe hoses – condensate separator and internal hoses are checked for any leaks.
If the leak test fails the analyzer will notify you and you should check the components for any defects. Here is how to proceed:

⚠ **We suggest to perform this test on a daily basis!**

**Here is how to proceed:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
|  | Your analyzer has completed zeroing – Press F3 for extras |  | Scroll down to Leak proof test |  | then press OK |  | Install the black rubber cap on the tip of the probe tube. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
|  | The leak test will start and count down from 10 seconds to zero. |  | At the end of the test the analyzer will display the result of the test. | When the result is OK then you can make gas measurements. | When the result is LEAKAGE then you should check the system for any leakages. |  | See possible reasons for leaks on the next pages |

**Here is how it works:**
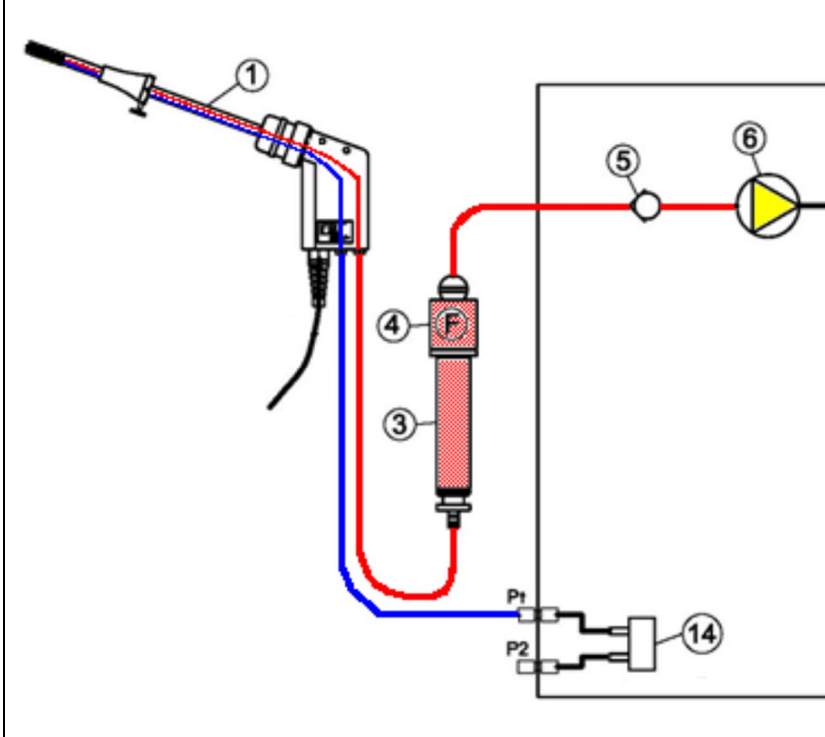


**Important!**
The probe has to be connected to the analyzer, both the gas sampling line and the draft line must be connected.

Once the test cap it connected to the probe tube tip, we have a closed system.

Phase 1
The gas pump (6) will create a vacuum and the negative pressure is measured using the draft sensor (14).

Once a defined pressure is reached the pump will stop and the test enters Phase 2 and will count down for 10 seconds.
During this time the pressure is monitored, the analyzer will detect a leak in the system should the pressure drop.
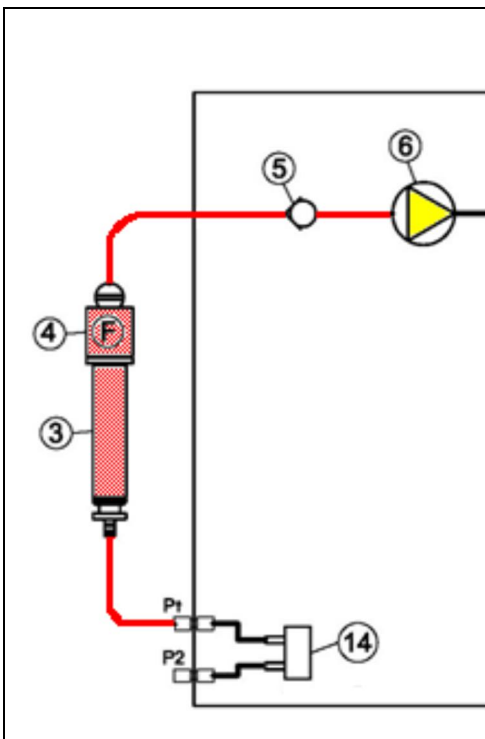


In case your analyzer has failed the test and you don't know if it is the probe, analyzer or condensate separator, then you can perform this test without the probe, you would just have to connect the condensate separator port to the draft port, using a silicone hose.

Now you can perform the LEAK TEST again -

- if the test passes, you have a leak in the probe system.
- If the test fails again, you have a leak either in your condensate separator or analyzer.

**PLEASE NOTE!!**
The connection shown on the left is for this test **ONLY.** Never use this connection in any other menus!

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## Possible reasons the test has failed.

Condensate Separator:

Defect or missing O-Rings / cracked condensate show glass

Probe handle and probe tube:

Defect or missing O-Rings.

Or the connection is not tight enough.

Hoses:

Defect hose - very common at the probe handle.

If you have this PRE-Filter (# 56356) installed, check the show glass for cracks and check the O-Rings

Also possible:

Internal pump is not working or doesn't have enough suction.

Hoses:

Defect hose - very common at the condensate separator port.

### Spare parts.

| POS. | Parts for Condensate Separator | Part # |
|------|-------------------------------|--------|
| 12 | Filter housing with O-Ring | 63919 |
| 4 | O-Ring 22 x 1.5 | 64120 |
| 6 | Show glass | 62627 |
| 9 | O-Ring 5 x 1.5 | 61464 |

| POS. | Parts for Probe | Part # |
|------|----------------|--------|
| 9 | O-Ring 8 x 2.4 (probe) | 61065 |
| 10 | O-Ring 3.7 x 1.9 (probe) | 59582 |
| NA | O-Ring 24 x 1.5 (PRE-Filter #56356) | 51516 |
| NA | Show glass (PRE-Filter #56356) | 52648 |
| NA | Viton sampling line | 55641 |

| POS. | Parts for Analyzer | Part # |
|------|-------------------|--------|
| NA | O-Ring 4 x 1.5 (draft port) | 61463 |

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## BLUETOOTH
**Make sure your analyzer has the correct Bluetooth settings!**
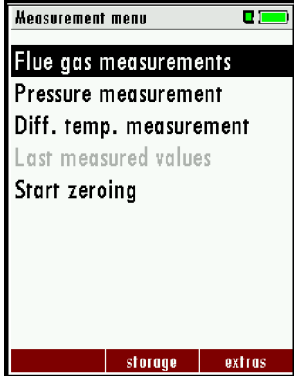
*Measurement menu*
Press F3 (extras)

*Extras menu*
Press OK for settings
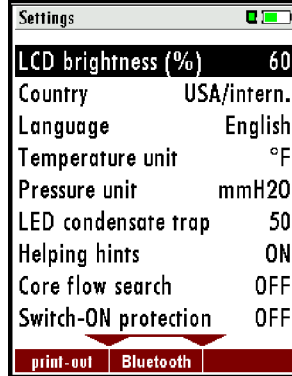
*Settings screen*
Press F2 for Bluetooth
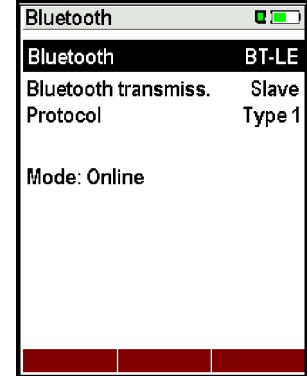
*BT-LE for iOS*
Modify with arrow left/right
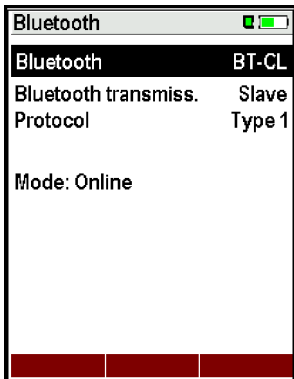
*BT-CL for Android*
Modify with arrow left/right

**The following steps have been performed by us already, but have been repeated once you change any settings!**

*Scroll down to device info*
Press OK
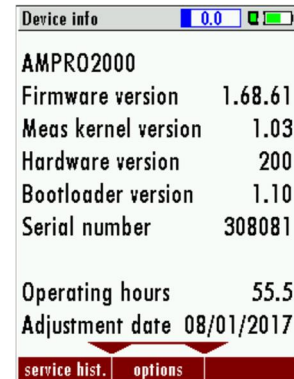
*Press the folder button*

*Select Bluetooth*
and press OK

*Press the folder button*
(this can look different depending on analyzer firmware)
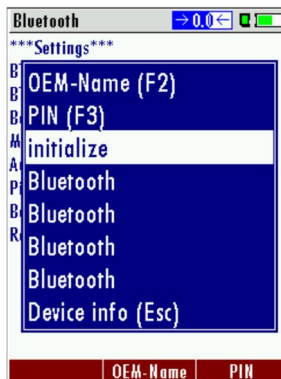
*Select initialize*
and press OK
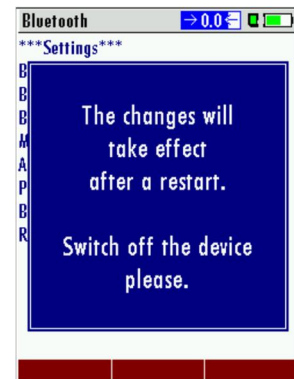
*Restart the analyzer*

**You must restart the analyzer once you have modified any of these parameters!**

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**ANDROID**

Pairing your analyzer with your Smartphone - Activate Bluetooth in your phone
**You can't connect your phone to the analyzer if another phone is already paired with the analyzer!**
**You have to disconnect any other devices that are paired with your phone (e.g. Bluetooth headset)!**
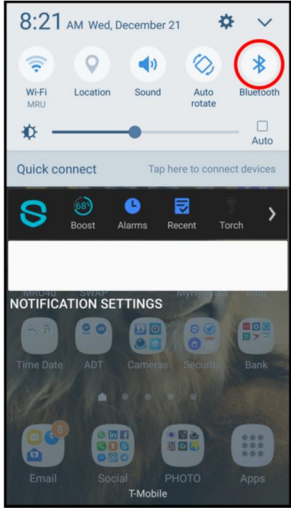


Activate Bluetooth on your phone
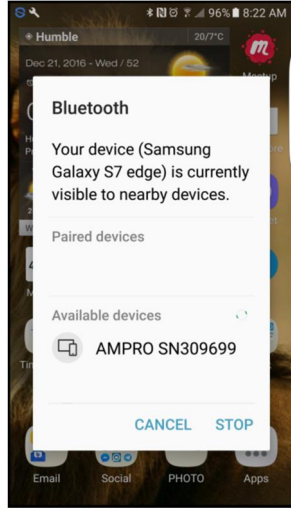


Search for available devices
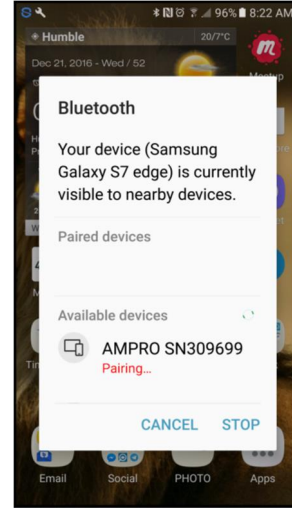


Pair with the MRU analyzer
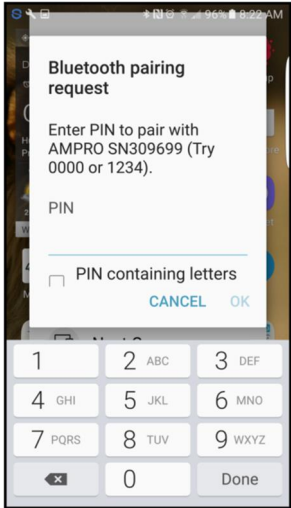


Pin will be requested for older units
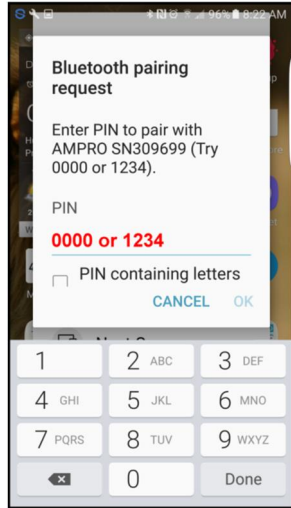


Enter PIN **0000** or **1234**
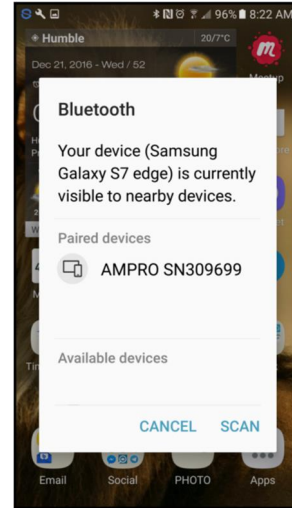


Analyzer and phone are paired



Start the MRU4u on your phone
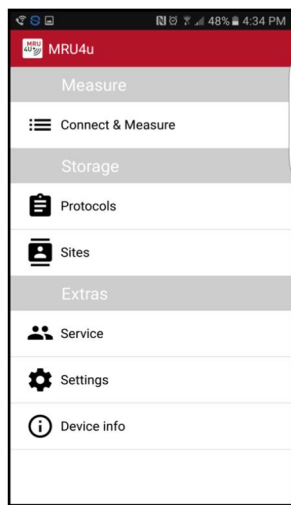


Press connect and measure
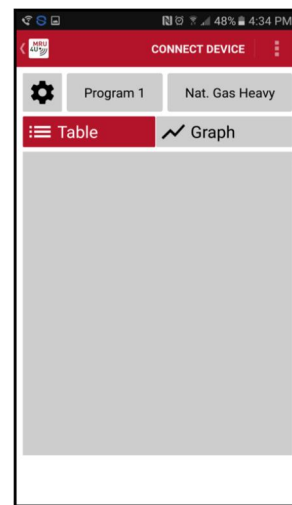


Press connect device

Select your device
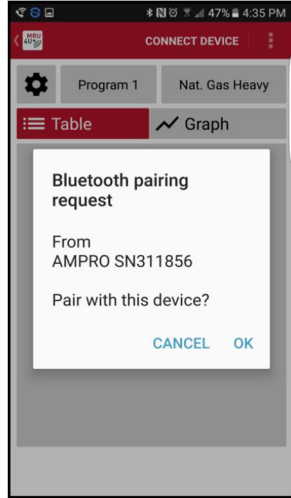
Confirm with OK

**If this screen stays empty, another phone might already be paired. Disconnect the other phone first!**

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**iPHONE**

Pairing your analyzer with your Smartphone - Activate Bluetooth in your phone
**You can't connect your phone to the analyzer if another phone is already paired with the analyzer!**
**You have to disconnect any other devices that are paired with your phone (e.g. Bluetooth headset)!**
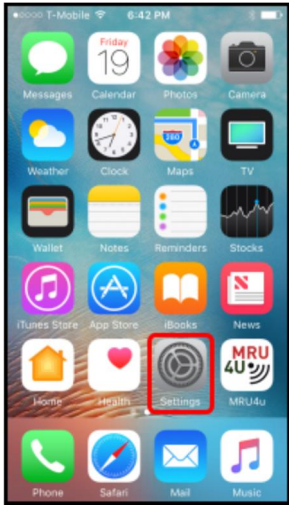
**Open Settings**
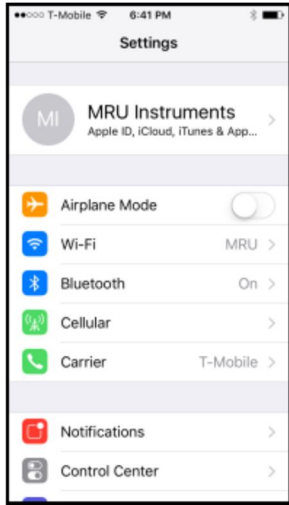
**Select Bluetooth**
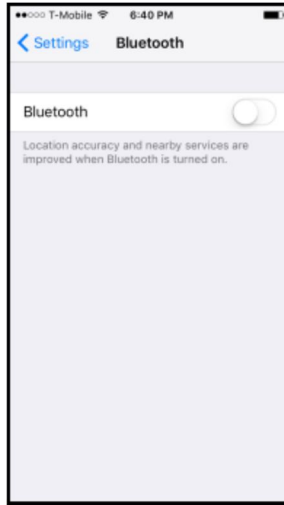
**Activate Bluetooth**
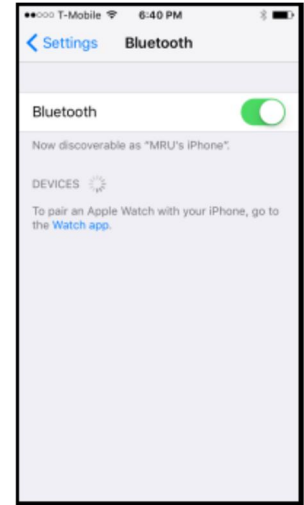
**Bluetooth activated**
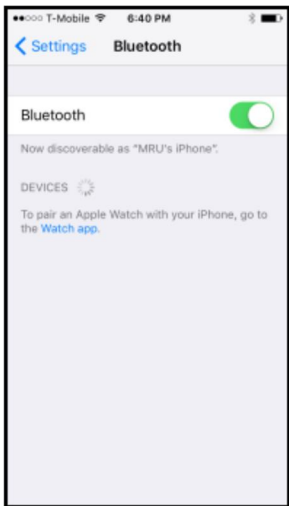
**If your phone doesn't find any devices**
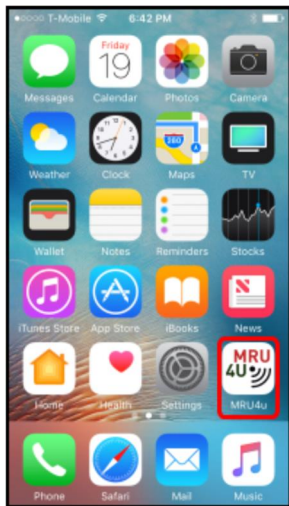
**Then open the MRU4u app (make sure you have the latest version!!)**
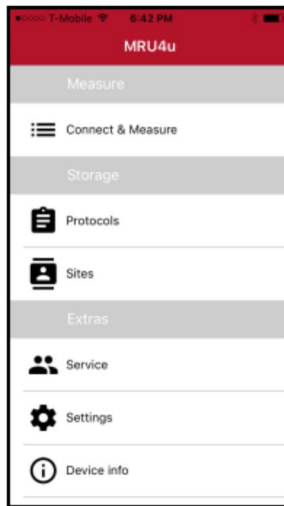
**Select "Connect & Measure"**

**Select "Connect device"**

**Select NEW device**

Sometimes you will see more than one new device (if you have multiple new devices in iOS range).
You can either turn off other devices in range or select "New device" until you have the right one.
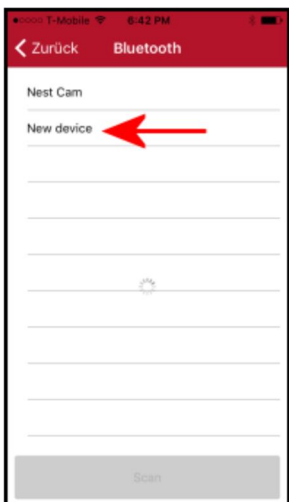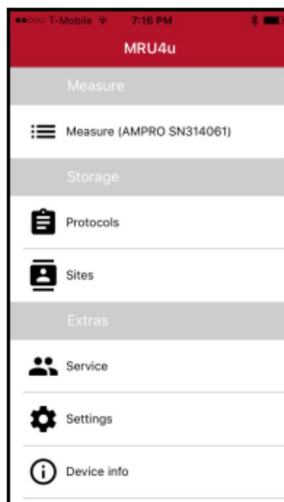
**Once the correct device has been connected, the iOS will display the analyzer name and serial number**

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## Taking a measurement / adding parameters
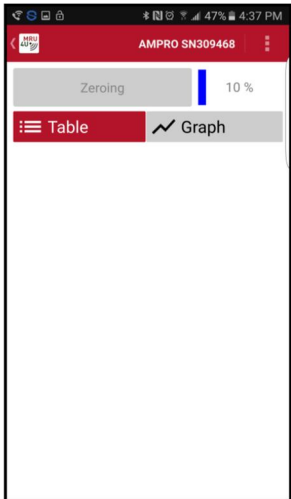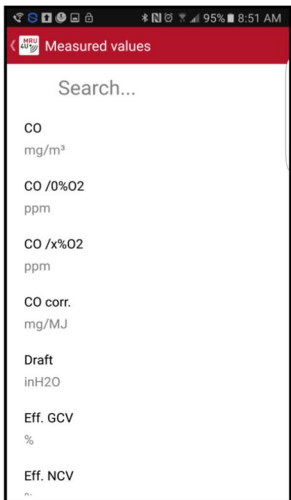


Screen while analyzer is zeroing
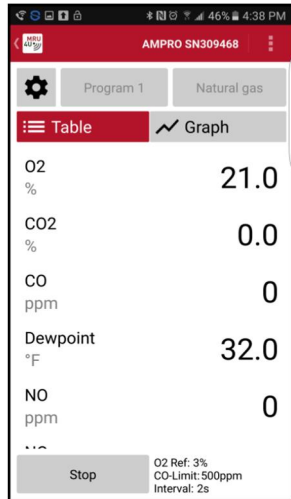


Screen zeroing completed
Press ⚙ to modify screen contents
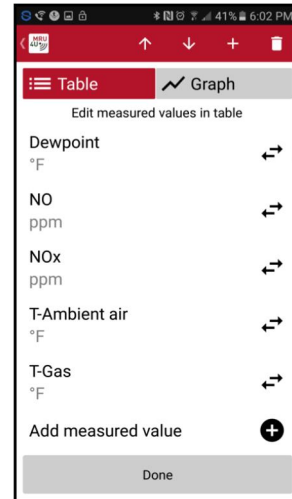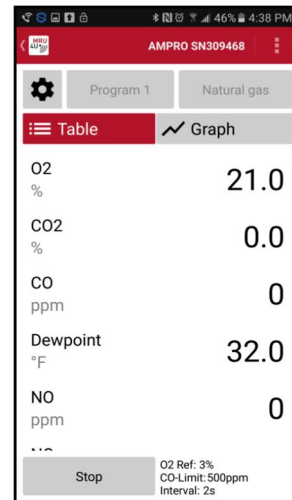


Select and then press Done
Press **+** for additional parameters



Select the parameter you wish to add. Repeat this step for each additional parameter



Press "Done" to return to measurement screen



Press "Stop" to stop the measurement



Analyzers pump stops
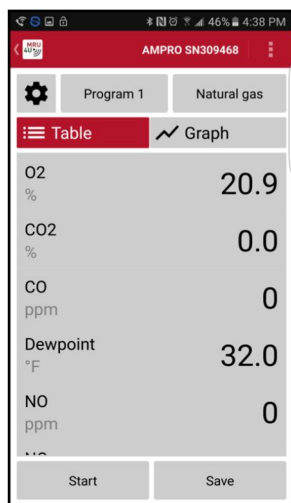


Screen turns grey
Press save to save measurement to the phone
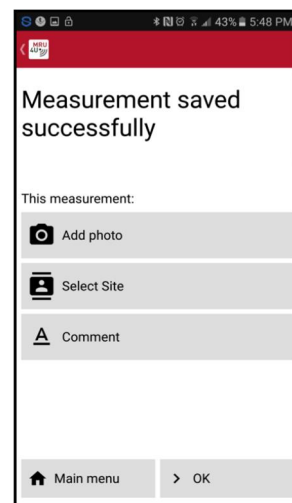


You can add a photo
you can add comments
Save the measurement to a site to view it

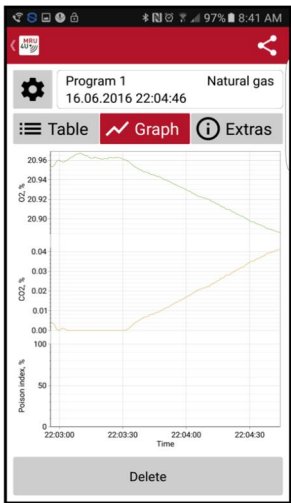## Additional Information
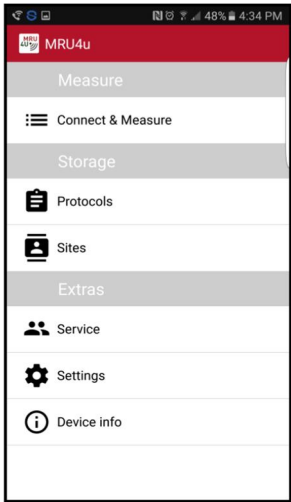


**Main page**
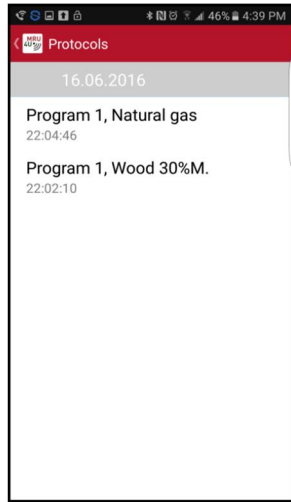


**Protocols**
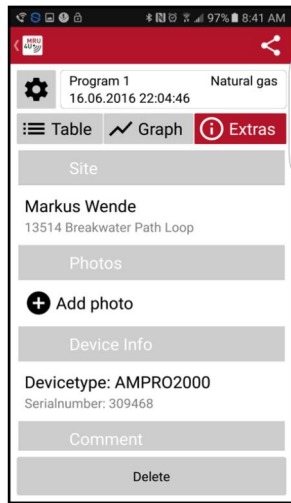Shows saved measurements
Click on any saved measurement
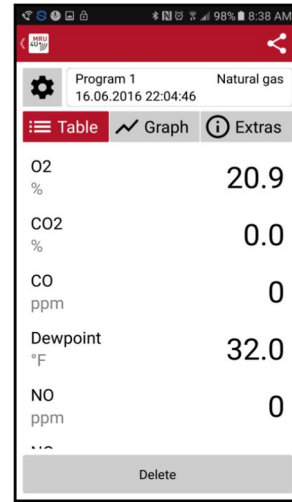


**Protocols**
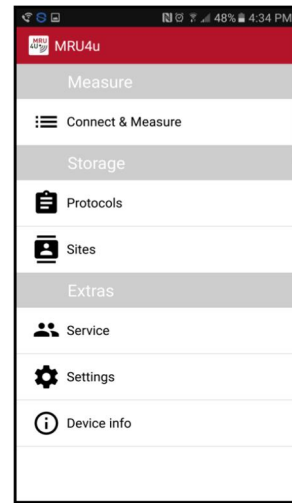**Saved measurement**
Displayed as "Table"



**Protocols**
**Saved measurement**
Displayed as "Graph"



**Protocols**
**Saved measurement /** EXTRAS

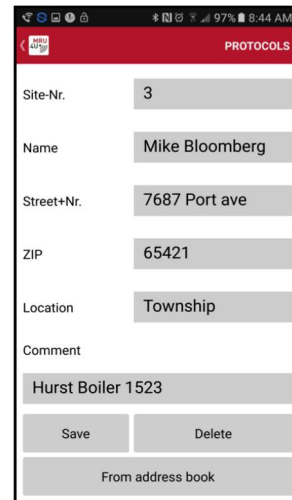 Use this button to send the measurements per email



**Main page**



**Sites**
Select a site to view it
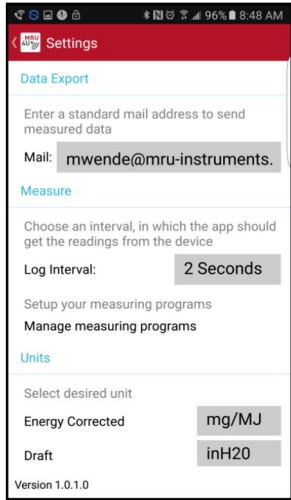Press "New site" to add one
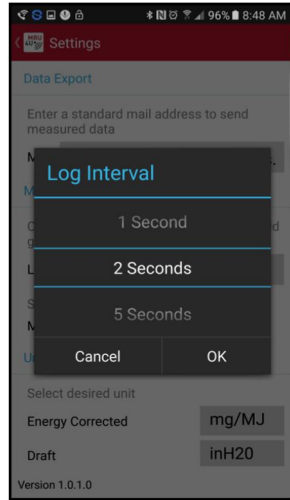


**Sites**
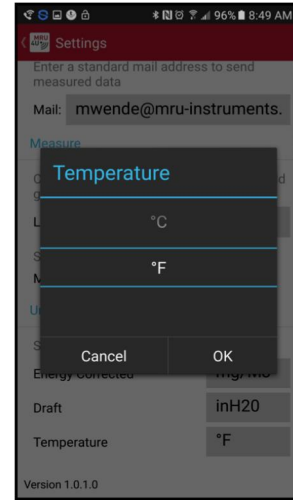New site, enter information



**Sites**
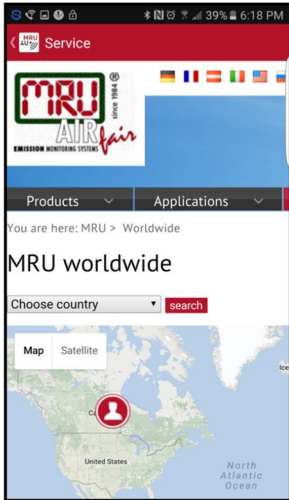Enter information then "Save"

Settings
Insert email address
Change log intervals
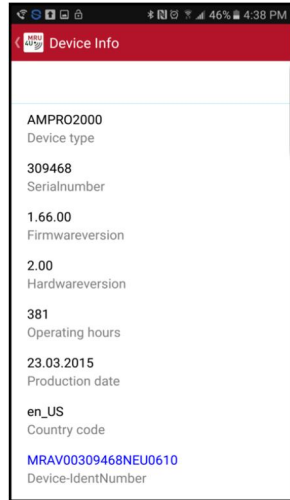Modify measuring units



Settings
Change log intervals



Settings
Modify measuring units



Service
Find a MRU service location



Device info
Shows details about the connected analyzer