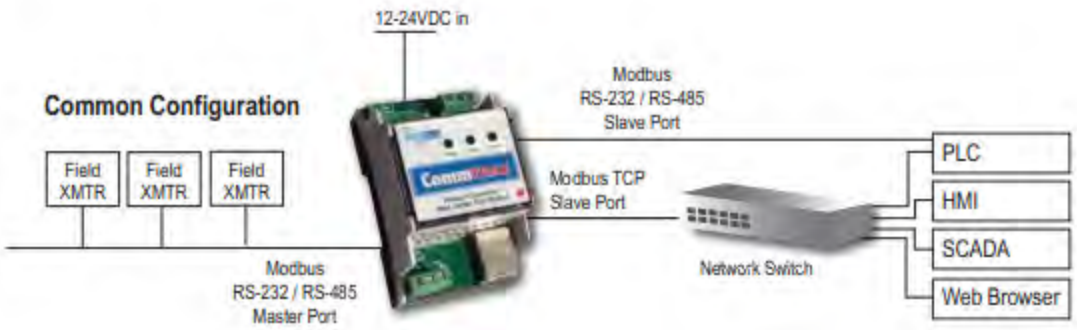
Technical/Operations Manual

V 1.1.1



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The documentation found within this manual is to provide users of our products with technical information pertaining to the installation, maintenance and setup of the CommTrax protocol converter.

It is forbidden to use any Accutron documentation for any other purpose which may be detrimental to the interests of Accutron Instruments INC.

The Manual

Refer to this manual for proper installation, operation, setup and maintenance of the Accutron CommTrax.

Special attention must be followed to warnings and notices highlighted from the rest of the text to ensure it will stand out.

Warning: Failure to oblige with the necessary precautions can result in death, serious injury, and/or considerable damage to the product.

Note: Important information about the product or that part of the manual, helpful hints, and or troubleshooting advice.

- These instructions do not claim to cover all details or variations in equipment, or to provide for every possible contingency that may ariuse during installation, operation, setup and maintenance.
- For further information or to resolve issues not covered in the manual, consult the Accutron Technical Service Team.
- The contents of the manual shall not become part of or modify any prior or existing agreement, commitment or relationship.
- The warranty contained in the contract between parties is the sole warranty of Accutron Instruments INC.

IMPORTANT: All specifications are subject to change without notice. Ensure your manual is up to date, the version number can be found on the front page of the manual. If you are unsure please consult the Accutron Technical Service Team.

Introduction

The CommTrax module was designed and manufactured by Accutron Instruments. This module is a protocol converter used to convert Modbus RS-485 to Modbus TCP. It can also convert Modbus RS-232 to Modbus TCP.

The CommTrax module was created to work in correlation with that of our airflow monitoring unit. In the past Accutron had used third party protocol converters, they worked but we didn't have the benefits of changing designs, adding in updated interfacing and designing a product to work how we wanted it to work. This module has many features, abilities and tons of potential for the future.

Unlike previous gateway and webserver combos, the CommTrax is all in one. You will only have one IP address. The same IP address is used for the gateway and the webserver.

The CommTrax doesn't have a default IP address, customers will ask what it is but there isn't one, it varies depending on your network. These devices have a MAC address pre-programmed; this allows the user to distinguish them from one another.

The CommTrax software is stored on a 2GB micro SD card easily accessible from under the lid. Storing the software on this micro SD card allows us to upgrade the software from above ground. Simply go to our website: www.accutroninstruments.com and download the latest version available. Within seconds you can flash our device underground from your office and you will be up to date with the latest and greatest version of our CommTrax.

If you have any suggestions on improvements of this product, please share it with us. We value your input. This product was designed to be user friendly and we are actively looking on how we can improve our products to satisfy our customers.

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Section 1: General Information

Safety Guidelines

This device should only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

Information about your CommTrax

When you first receive your CommTrax device ensure you record the following information shown below. If you need to contact Customer Service, this information will allow us to provide you more efficient service. This information is located under the Lid of the CommTrax.

Table: 1.0

Accutron CommTrax
Serial Number:
MAC Address:

CommTrax Specifications

Connections:	Screw terminal block type
Input Power:	12-24VDC, 65mA at 24V (1.56W)
Output Type:	Modbus TCP, Modbus RTU RS-485
	Optional: Modbus Serial RS-232
Enclosure:	Vented
Programming:	Using the ARC software
Mounting:	Din rail mounted (35mm x 7.5mm)
Temperature Range:	-40˚C to + 80˚C
Display:	Three indicating LED's
Memory:	2GB micro SD card (upgradable memory available)
Terminating Resistor:	120 ohm (jumper set on circuit board)

Basic Uses

There is two ways the CommTrax can be used with your existing SCADA system.
Scenario 1, the CommTrax is used as a simple protocol converter, converting serial Modbus to Modbus TCP/IP.
Scenario 2, the CommTrax is used to consolidate or remap the registers of multiple serial Modbus devices.
The following Scenario's we will be referring to the figure 1 as an example system setup. The Climatrax can be any other Modbus RTU Slave device.

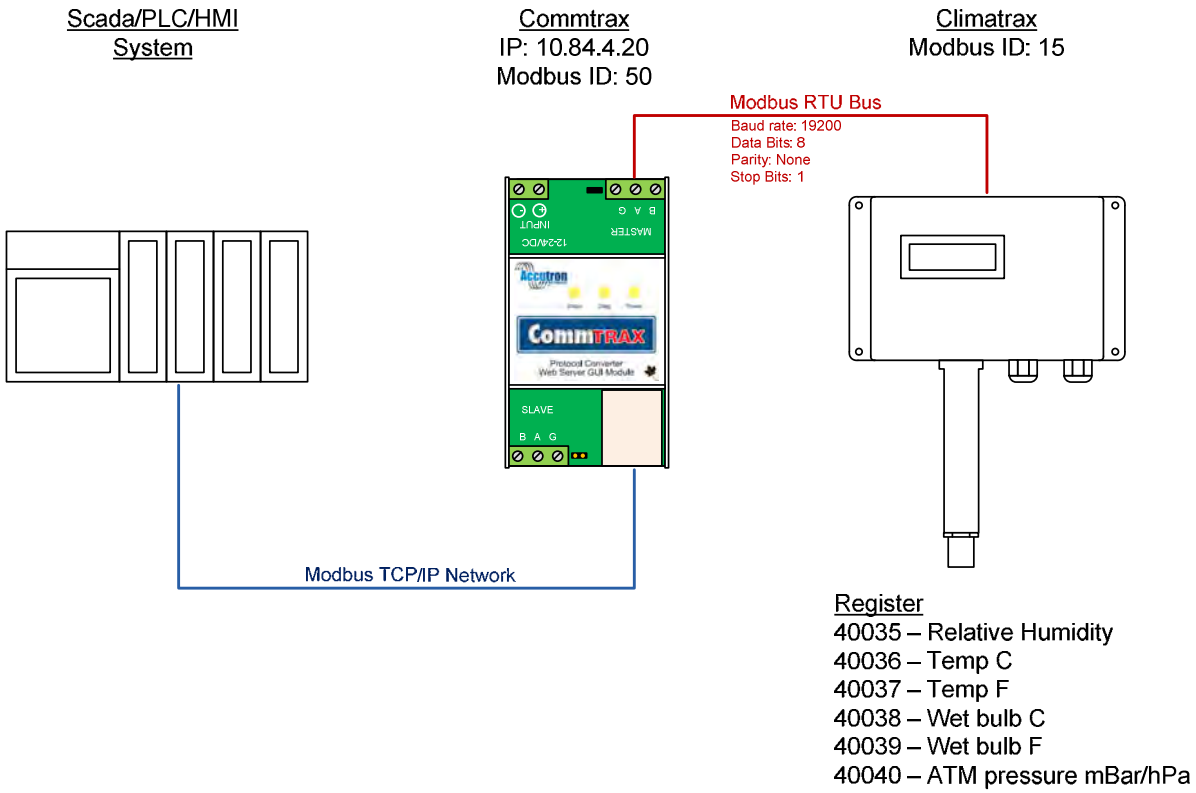


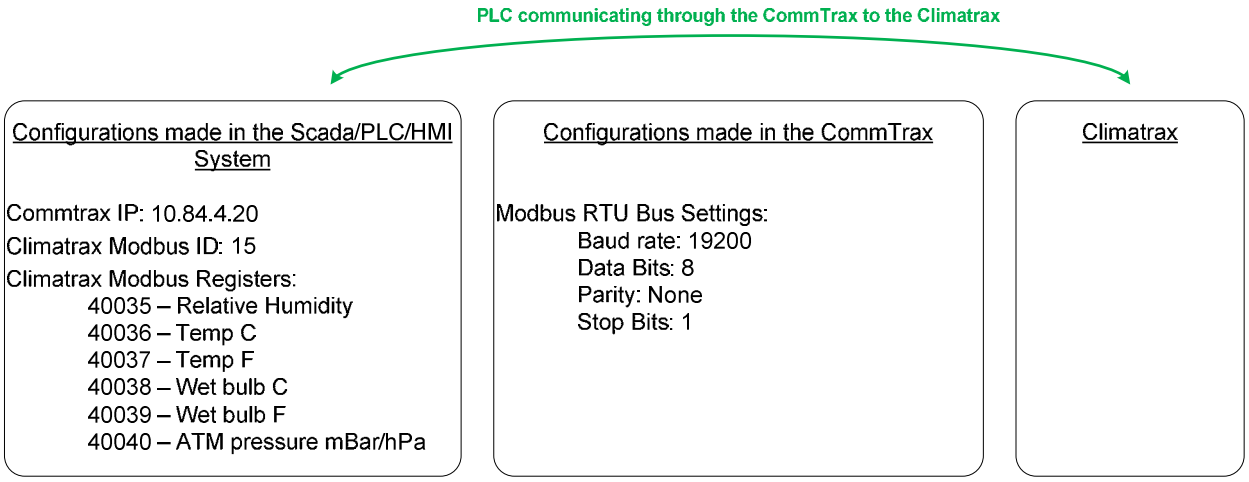
Figure 1

Scenario 1

This scenario requires the least amount of setup on the CommTrax. With this setup your PLC will be communicating directly to the Climatrax. 1) The CommTrax network settings will need to be setup to match your network, in this example we set it to 10.84.4.20. 2) Next the Modbus RTU bus settings will need to match the settings of the Modbus Slave devices connected on that bus. In this case we set the Baud rate to 19200, the Data bits to 8, parity to none and stop bits to 1. All this information will be

available in the Modbus Slave device's manual. 3) Record/ Set the Modbus Slave device's Modbus ID, this example is 15.

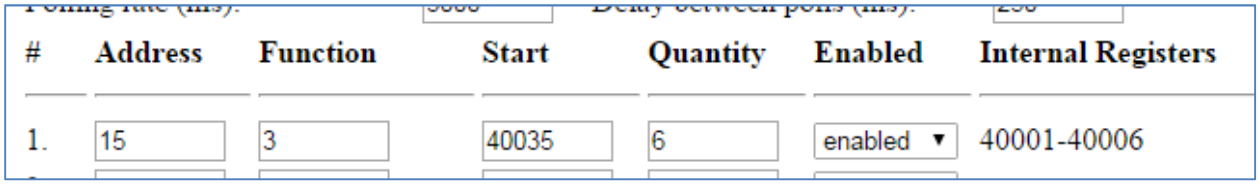
Now in your SCADA/PLC software you will be pointing it to IP Address 10.84.4.20, and then pointing the Modbus ID to the Climatrax's ID, 15. Now you will chose the desired Modbus registers you want to read from the Climatrax, in this example 40035 to 40040.



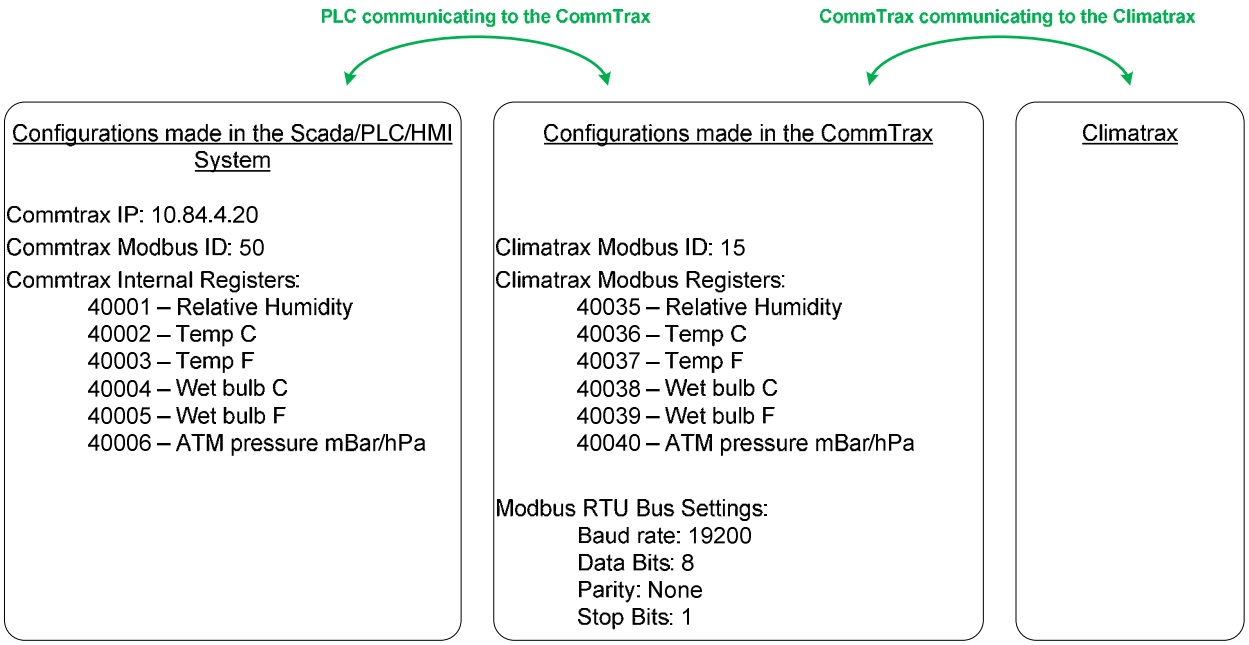
Scenario 2

With this type of setup your PLC will be communicating with the CommTrax, and then the CommTrax will be communicating to the Climatrax. 1) The CommTrax network settings will need to be setup to match your network, in this example we set it to 10.84.4.20. 2) Next the Modbus RTU bus settings will need to match the settings of the Modbus Slave devices connected on that bus. In this case we set the Baud rate to 19200, the Data bits to 8, parity to none and stop bits to 1. All this information will be available in the Modbus Slave device's manual. 3) Record/ Set the Modbus Slave device's Modbus ID, this example is 15.

Now in the CommTrax, go to the "Polling Schedule" page, you will put 15 for Address (the Modbus address of the Climatrax), function: 3, start: 40035, quantity: 6 (so we can read from 40035 to 40040). Once enabled the "Internal registers" will show 40001 to 40006.



Now in your SCADA/PLC software you will be pointing it to IP Address 10.84.4.20, and then pointing the Modbus ID to the CommTrax's ID, which is 50. Now you will read the re-mapped Modbus registers from the CommTrax, labeled "internal registers", in your PLC, in this example it is 40001 to 40006.


PLC communicating to the CommTrax
CommTrax communicating to the Climatrax
Configurations made in the Scada/PLC/HMI System
Commtrax IP: 10.84.4.20
Commtrax Modbus ID: 50
Commtrax Internal Registers:
40001 – Relative Humidity
40002 – Temp C
40003 – Temp F
40004 – Wet bulb C
40005 – Wet bulb F
40006 – ATM pressure mBar/hPa
Configurations made in the CommTrax
Climatrax Modbus ID: 15
Climatrax Modbus Registers:
40035 – Relative Humidity
40036 – Temp C
40037 – Temp F
40038 – Wet bulb C
40039 – Wet bulb F
40040 – ATM pressure mBar/hPa
Modbus RTU Bus Settings:
Baud rate: 19200
Data Bits: 8
Parity: None
Stop Bits: 1
Climatrax

Section 2: ARC Quick Start Guide

This guide is designed to quickly install and connect your Modbus devices to your network using the ARC software and the Accutron Commtrax.

For more information, please refer to the rest of this user manual.

Ensure your system is powered up and connected to the network. Run ARC software on a network PC.

Finding your device

1. Click Find to locate all your Commtrax connected to your current network.

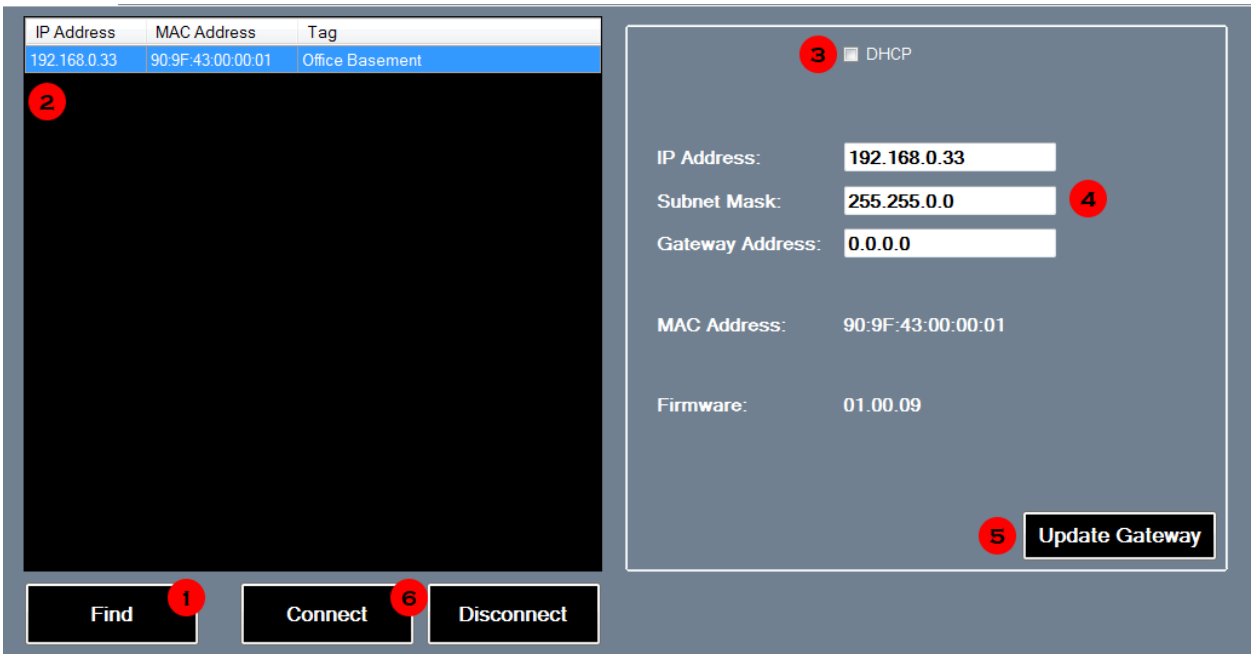
2. A list with all your devices on your network will be displayed. You can sort by IP address, MAC address, or by tag. Select the device you want to configure.

3. Enable or disable DHCP. To use a static IP (recommended), this must be unchecked.

4. Update your IP address, Subnet Mask, and Gateway address. Ask your network manager for required settings.

5. Click Update Gateway when you are done changing settings. A popup will appear to enter a password. The default password is accutron.

6. When you are ready to connect to a device, select the one you want and either click Connect or double click the row. The default password is accutron.



Configuring the Commtrax

1. Additional tabs will now appear on the top. Click on the Commtrax tab.

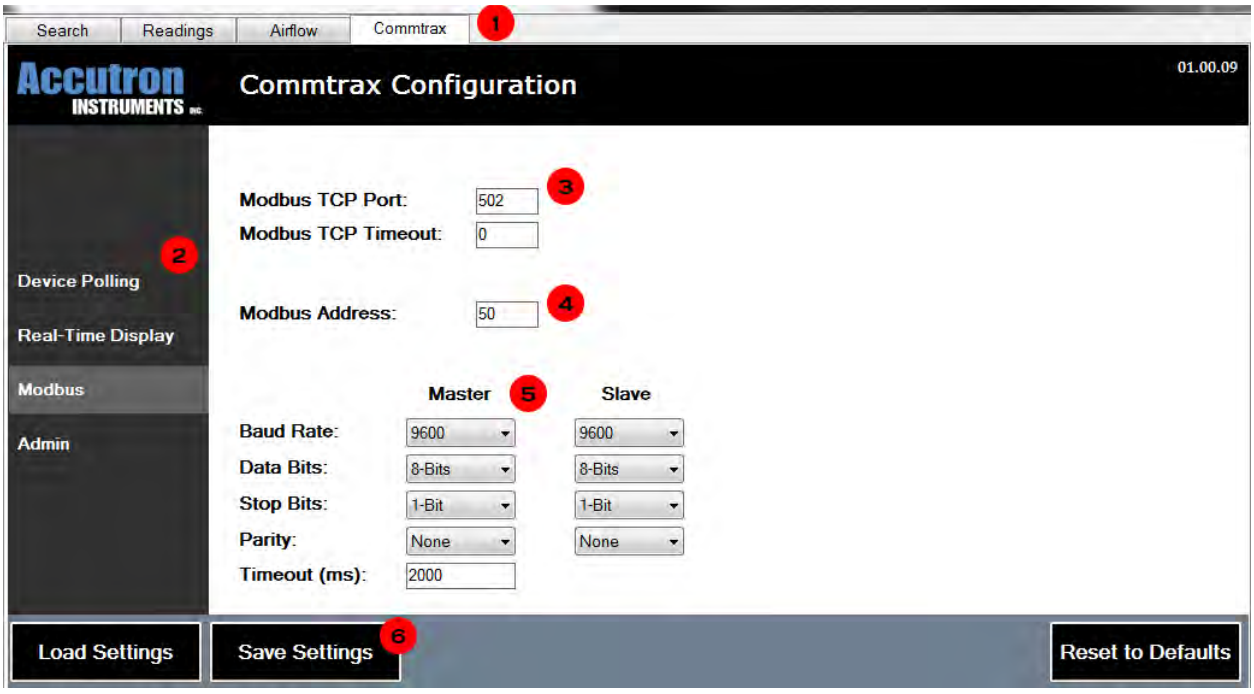
2. In the Commtrax tab, there will be sub menus. You can configure your communication settings under Modbus. Under the Admin menu, you can change your device's tag name, it's password, and do firmware upgrades.

3. The TCP port and Timeout should be left at its default settings.

4. Update your device's Modbus address. It must be a unique value in your Modbus network (1-254).

5. Update the baud rate and other serial settings to match every Modbus device on your Modbus network.

6. Once finished, click the Save Settings button.



Configuring the Modbus Server / Webpage

1. The Commtrax comes with pre-loaded registers for Accutron Modbus devices. Clicking on the Setup Wizard will allow you to select information you want to view from a list.

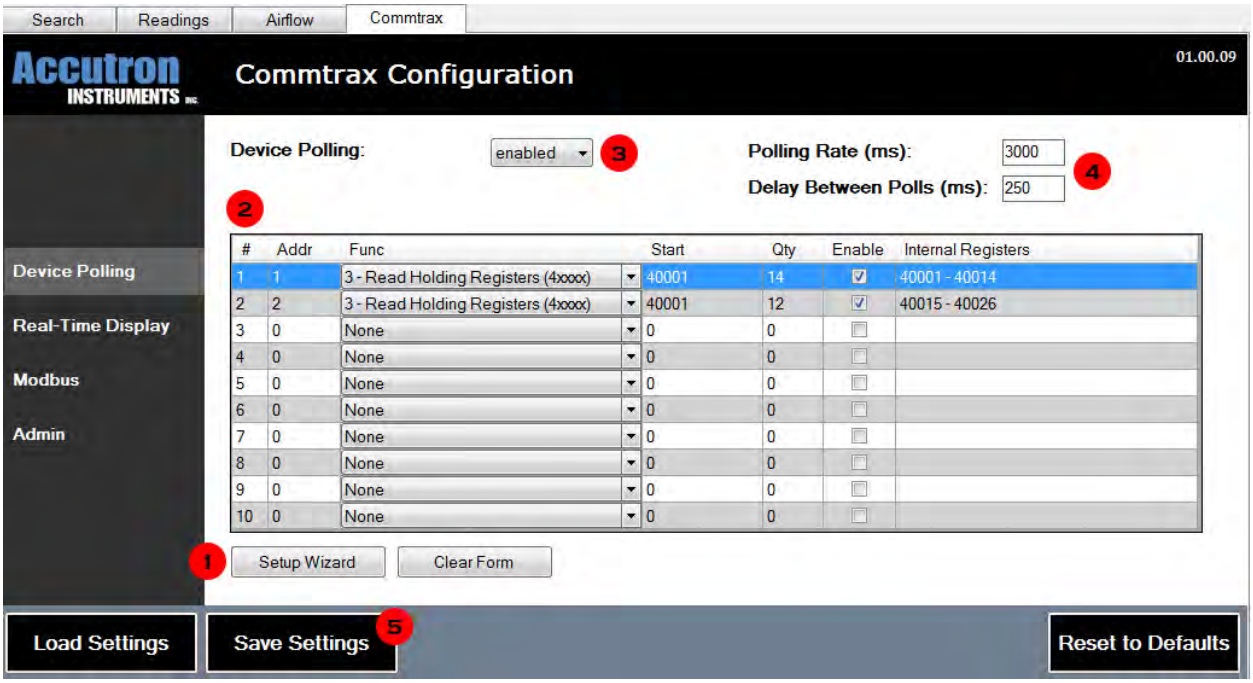
2. In the example, we have configured 2 devices. One at Modbus address 1, the starting register to read is 40001 and will read 14 registers. The second one is at Modbus address 2 and will read 12 registers starting at register 40001.

The last column contains the converted internal registers. These registers are created by the Commtrax. To read the first Modbus register of the 2nd device, the internal starting register is 40015.

3. Enable the Commtrax for polling.

4. Set the delays for the Commtrax to poll all devices on your Modbus network.

5. Once finished, click the Save Settings button.



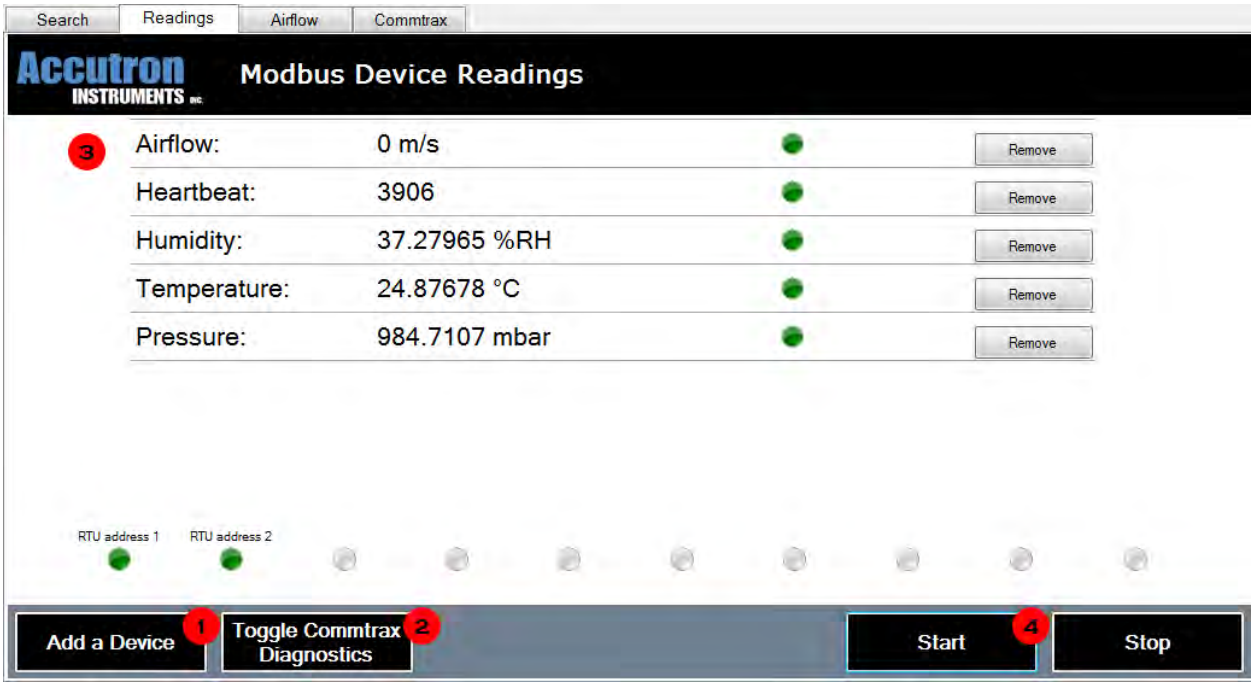
Viewing your readings

1. Click on the Readings tab up top. In this quick start guide, we will simply import the Commtrax settings done previously to the ARC. Click on Add Device, and then Import from Commtrax.

2. Toggle Commtrax Diagnostics is only used when polling the Commtrax internal registers. Up to 10 LEDs will appear on the bottom. Each one corresponds to a device your polling. Green indicates that the device is communicating, red indicates there is no response.

3. This section shows all your readings. Information here is updated every couple of seconds. To remove a reading, click the Remove button at the end.

4. Click Start to collect your readings. This action polls your Commtrax (Modbus address 50 by default) internal registers. If everything is green, then the system is working.



Section 3: Accutron Remote Configuration Software (ARC)

About the ARC

The ARC software was designed by Accutron Instruments and allows the user to easily setup the CommTrax and view real time readings

The ARC software is located on a USB flash drive, this flash drive is supplied with each CommTrax.

Installing the ARC Software

1. Locate the “Setup” file provided on the flash drive. Double click this file in order to start the installation process. Once you have selected the file Figure 3.1 will appear on your screen.

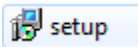
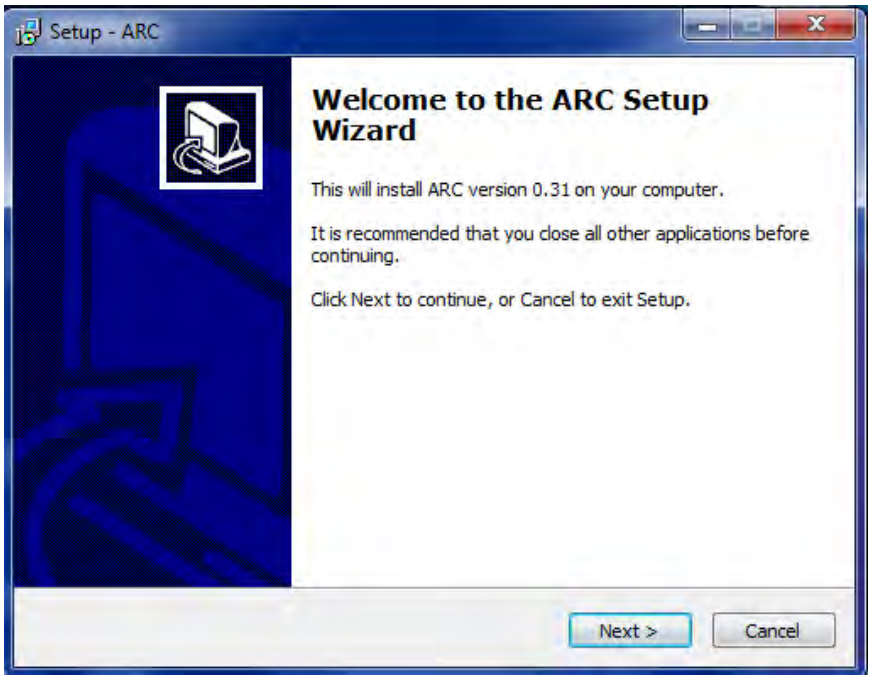
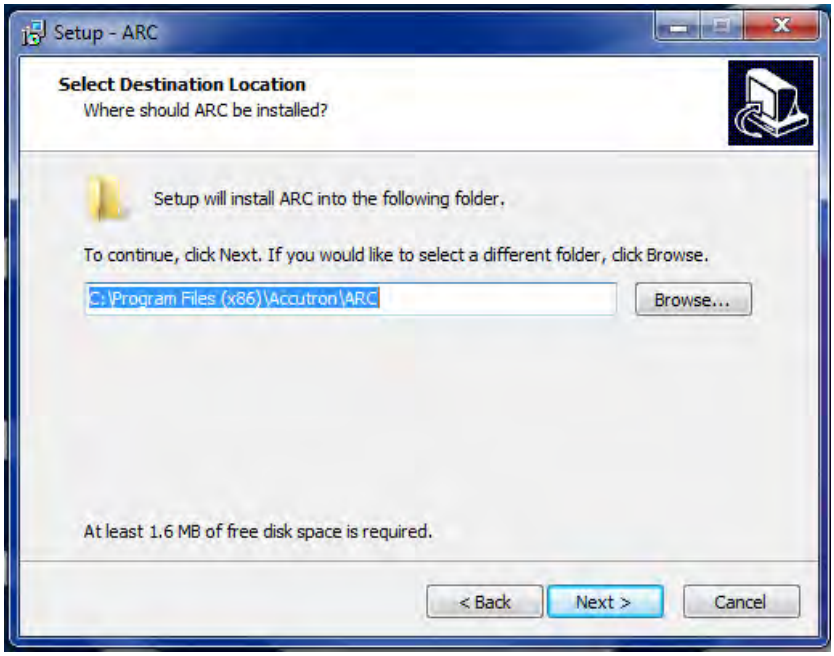


Figure 3.1



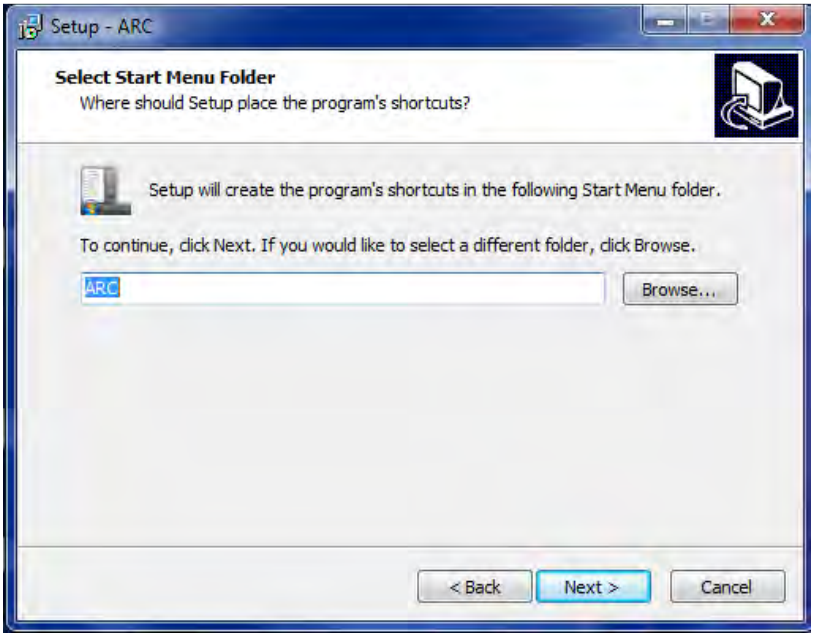
2. Select the “Next” button, Select Destination will now appear on your screen Figure 3.2

Figure 3.2



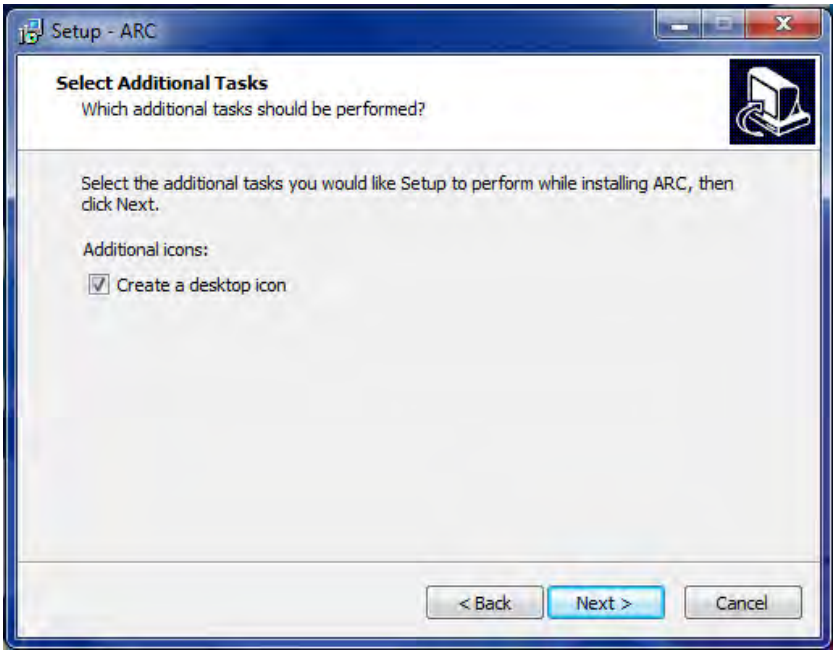
3. At least 1.6 MB of free disk space is required. To proceed select the “Next” button
4. Select Start Menu Folder will now appear on your screen Figure 3.3

Figure 3.3



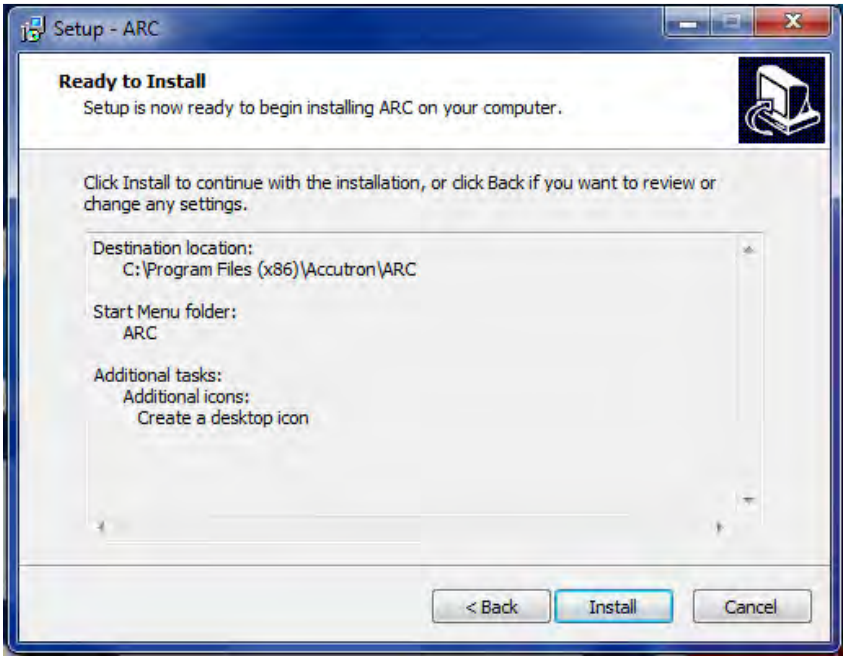
5. Select the “Next” button to proceed to Select Additional Tasks Figure 3.4

Figure 3.4



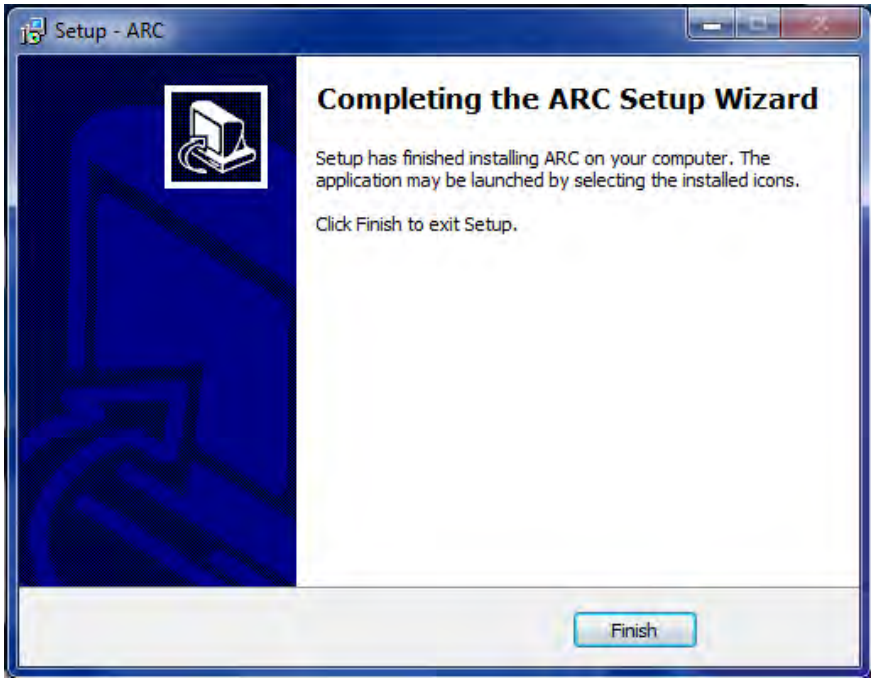
6. After the additional tasks are selected select the “Next” button
7. The software is now ready to install Figure 3.5

Figure 3.5



8. To finish the install select the “Install” button
9. You have now successfully installed the software select the “Finish” button Figure 3.6

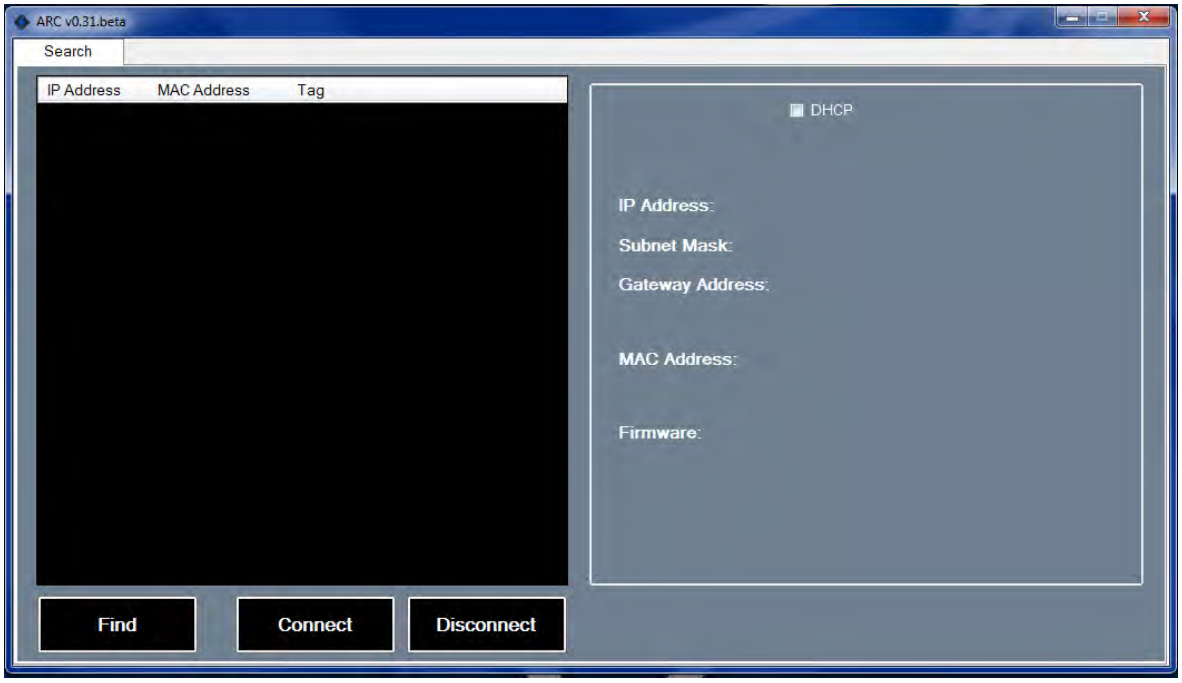
Figure 3.6



Finding a CommTrax with the ARC software

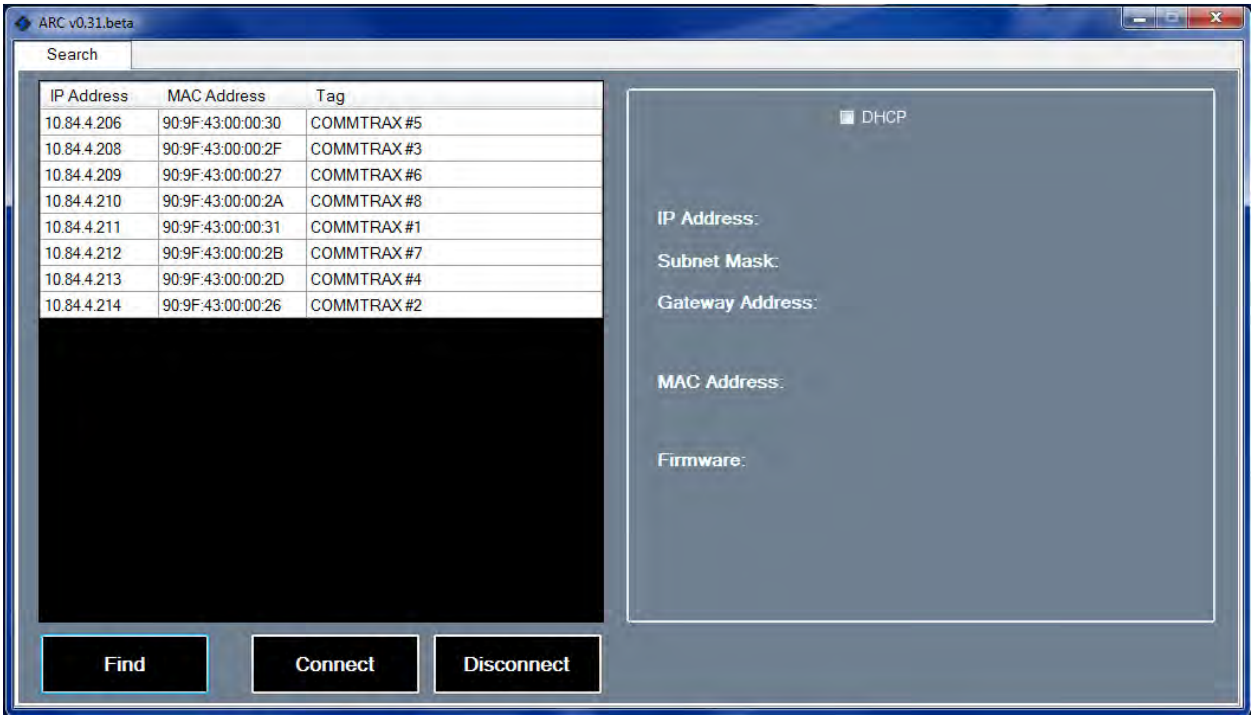
When the software is first opened the Figure 3.7 will appear on your screen.

Figure 3.7



In order to find the CommTrax connected to your computer or all the CommTrax modules on your network select “Find”.

Figure 3.8



When finding the CommTrax you don’t have to be in the same IP range as the device. No matter what the IP addresses are when you select find you will find all the CommTrax modules that are connected on your network.

Once found, the CommTrax devices will be displayed on the left hand side of the screen illustrated in Figure 3.8. By clicking on the top headers “IP Address, MAC Address and Tag” you will be able to sort the list in order of any of these headers depending on what the preference is.

Changing the IP Address

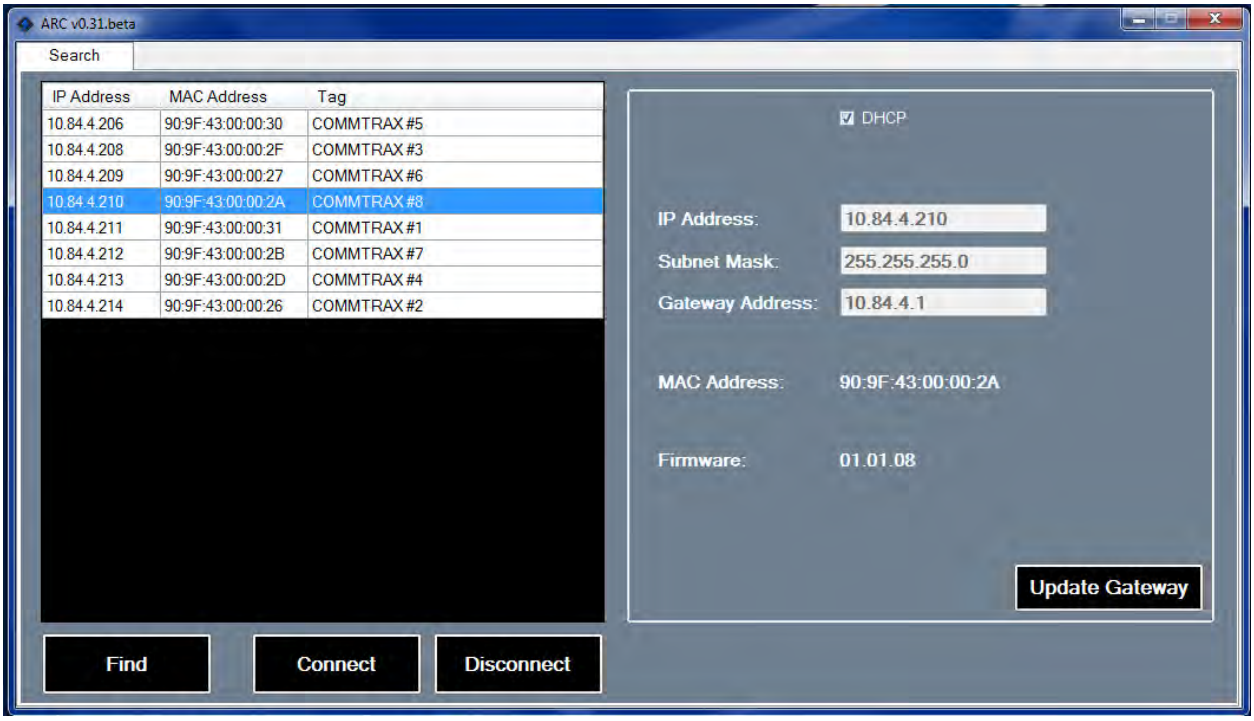
The next step is setting up the IP address of the CommTrax module. To accomplish this, select the device you want to change from the list of CommTrax modules available. As shown in Figure 3.9 the CommTrax selected will highlight in blue. The IP address, Subnet Mask, and Gateway address will be shown on the right hand side. These values can be changed to work with your specific network settings.

Note: the firmware version is indicated in this section along with the MAC address.

To disable DHCP uncheck the box at the top of the right hand side. Once the proper network settings have been set press the “Update Gateway” button in the bottom right hand corner.

You will be asked to enter a password; the default password for the CommTrax is “accutron” this can be changed while doing the Setup of the CommTrax.

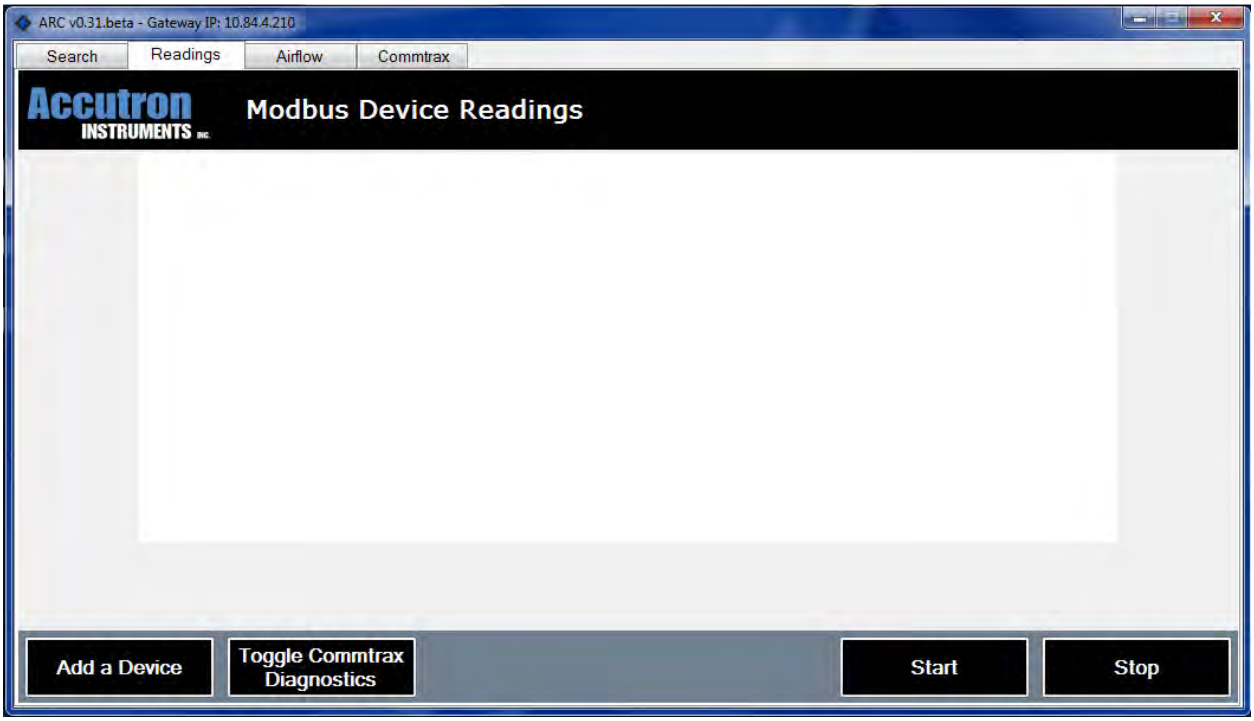
Figure 3.9



Once the password is entered the CommTrax will update the settings and reboot. You will be defaulted back to Figure 3.7. Select the find button again and connect to the CommTrax in which you have applied the previous network settings too. You will again be asked to enter the default password “accutron”.

Setting up a CommTrax using the ARC

Figure 3.10



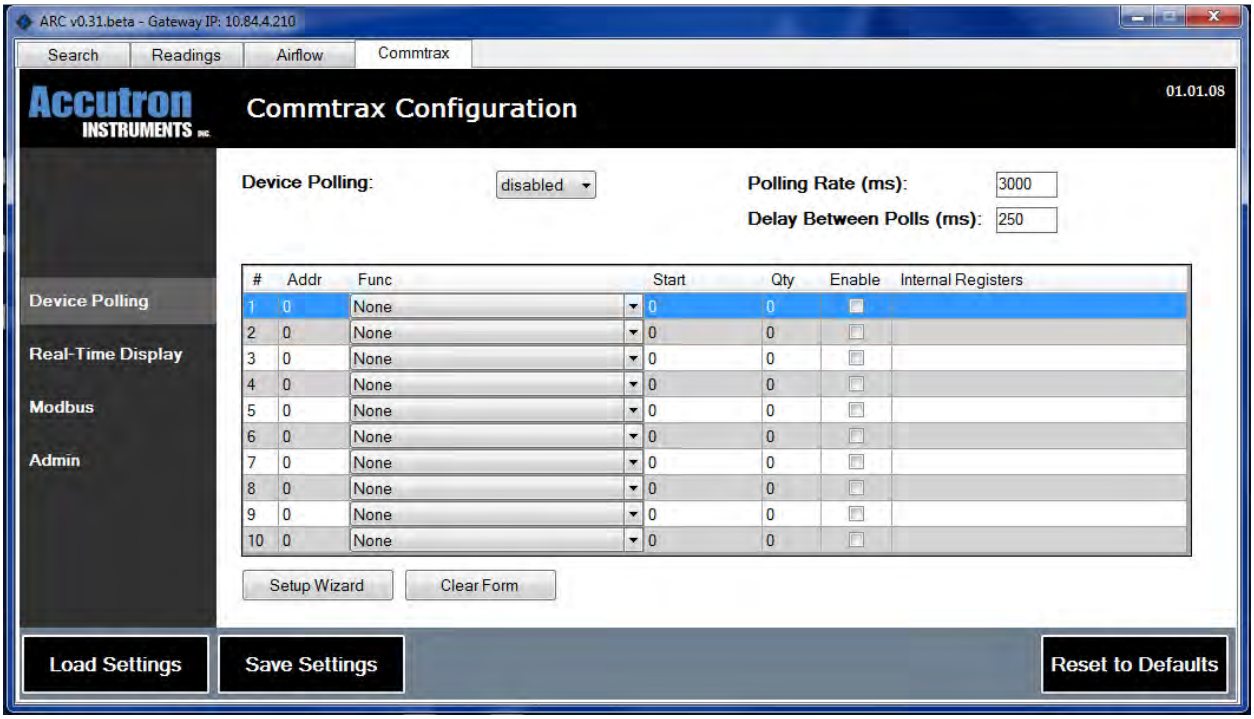
Once connected to the CommTrax you will be brought to Figure 3.10.

Note: The heading tabs on this page “Search”, “Readings”, “Airflow”, and “CommTrax”.

The “Search” tab has been dealt with in the previous illustrations. The “Readings” tab is where the real time readings will be displayed in the ARC software. The “Airflow” tab allows you to view and change settings that control any airflow monitor connected to the CommTrax. If you don’t have an airflow monitor connected to your CommTrax this tab will not apply to you. The “CommTrax” tab will be where everything happens in regards to setting up Modbus registers, polling and changing settings, along with firmware upgrades.

CommTrax Tab

Figure 3.11



When the CommTrax tab is selected you will be brought to Figure 3.11. Starting from the top:

- "Device Polling" in order to get the real time readings, you will need to enable this tab once your settings have been entered.
- "Polling Rate (ms)" How often the CommTrax will poll the Modbus registers that have been set within the module
- "Delay between polls (ms)" The delay between each poll

Working your way down the side:

- "Device Polling" Shown in Figure 3.12. This is where the Modbus address, functions and internal registers are set.
- "Real-Time Display" This is where the register, name of the variable being polled, and engineering units are set.
- "Modbus" This is where Modbus settings can be set. Modbus address of the CommTrax (Defaults at 50), TCP settings, baud rate, parity and timeouts.
- "Admin" This is where the tag name of the CommTrax can be added and or changed, the default password can be modified to your preference and the option to upload new firmware upgrades to the device.

Device Polling

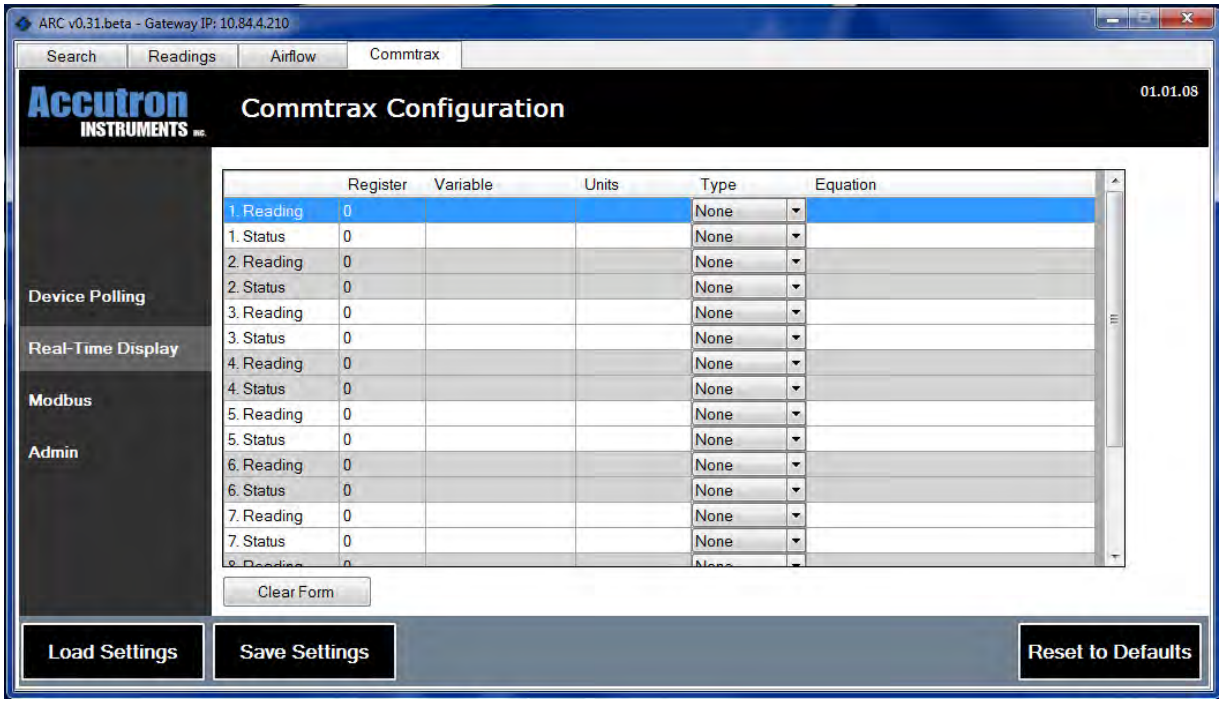
- Device Polling: Enables or disables polling of Modbus RTU devices.
- Polling rate: The time it waits before starting poll # 1
- Delay between polls: Time it waits from poll #1 to poll #2. Then poll #2 to #3, etc
- Addr: Modbus address.
- Function: Modbus function (4xxxx or 3xxxx).
- Start: Starting register you want to read. Generally is 40001.
- Qty: How many registers to read after your start register.
- Enable: Enable polling for this set
- Internal registers: New registers re-mapped by the CommTrax (read-only). Internal registers are created automatically by the CommTrax.

Device Polling is where all the settings will be entered. Once you have entered in your proper Modbus Addresses, Functions, Starting Register, Qty, polling rate and delay between polls. Select the "Save Settings" button to save your Polling settings.

Note: Ensure Deceive polling is enabled

Real-Time Display

Figure 3.12



When the Real Time Display menu is selected Figure 3.12 will be displayed.

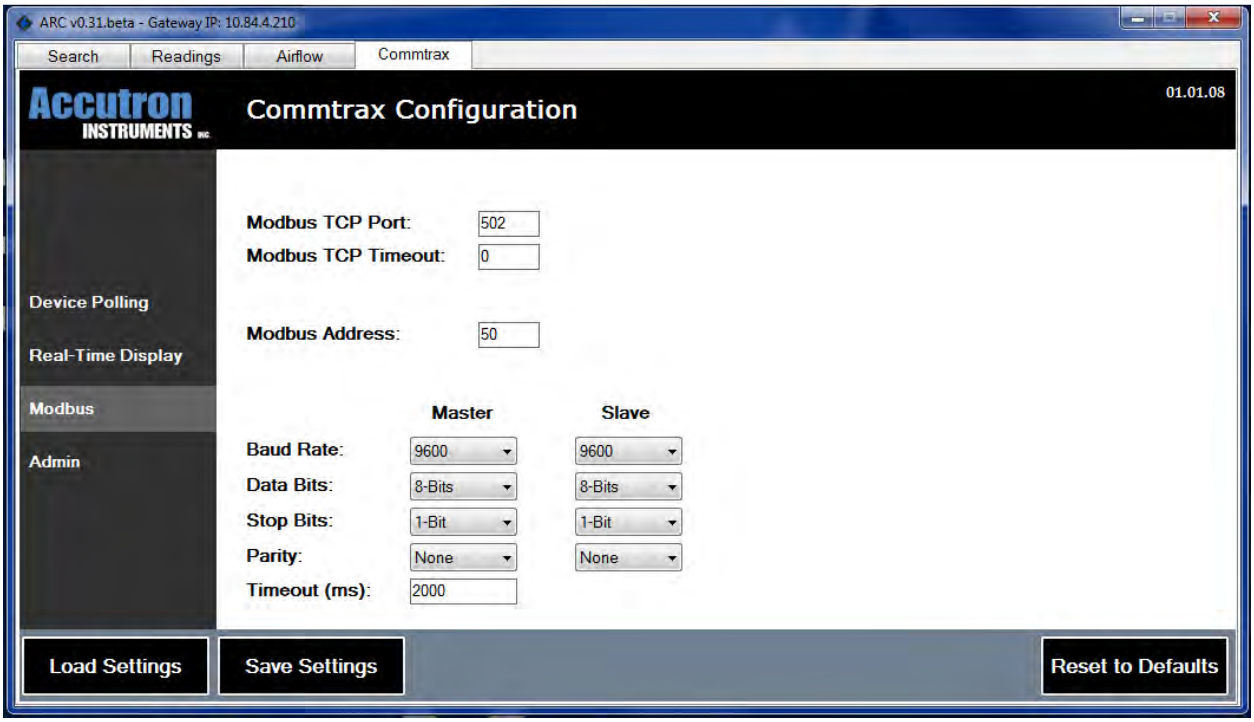
- Register = the internal register created by the Commtrax you want to have displayed
- Variable = Tag name. Ex: airflow, CO2

- Units: the tag placed at the end of the data. Ex: m/s, ppm, °C.
- Type: Data type. Is the number an integer, floating number or string?
- Equation: A place where you can do math equations to alter your data. Multiply, subtract, etc.

The Real-Time Display will automatically set the registers depending on the values that were set in the Device polling section. This is the location where you can name what the register is for example: airflow, temperature, CO, CO2 and so on. You can also select your units, m/s, ˚C, and ppm. You can input a mathematical equation here; this will allow you to manipulate the data into the correct values.

Modbus

Figure 3.13



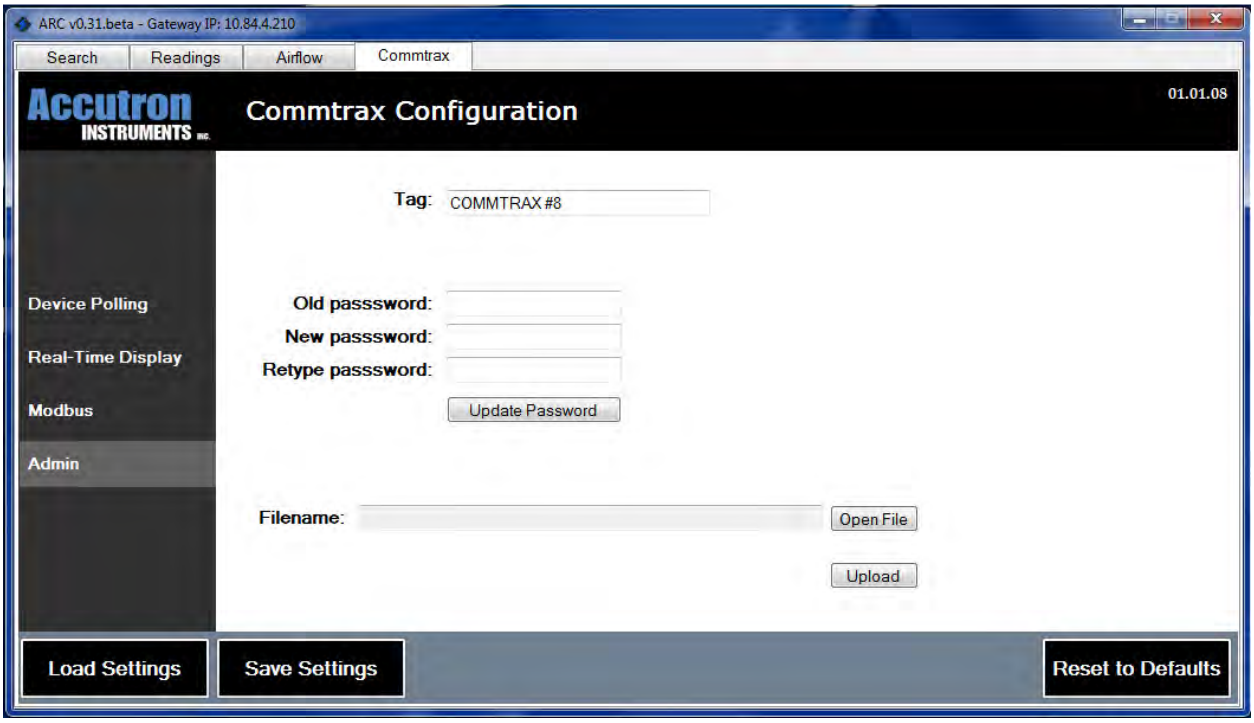
When the Modbus menu is selected Figure 3.13 will be displayed.

- Modbus TCP port = the port on when the communication takes place. The standard is 502
- Modbus TCP timeout = The length of time in seconds before the CommTrax will disconnect the TCP communication session after no activity. (0 means it will never disconnect the session).
- Modbus address = the Commtrax modbus address. Will be used to poll the Commtrax
- Timeout = how much time the Commtrax has to wait for a reply from the modbus device.

By default the CommTrax has a Modbus address of 50.

Admin

Figure 3.14



Insert or change a tag:

- The tag entered will be displayed when the device is searched refer to figure 3.8 for an example.
- Once the Tag name has been set ensure you press the “Save Settings” button. If this button is not selected the tag name will not be saved.

Changing the default password:

- Enter the default password “accutron”
- Enter the new password you’d like to use
- Re-enter that password
- Select the “Update Password” button to update the new password

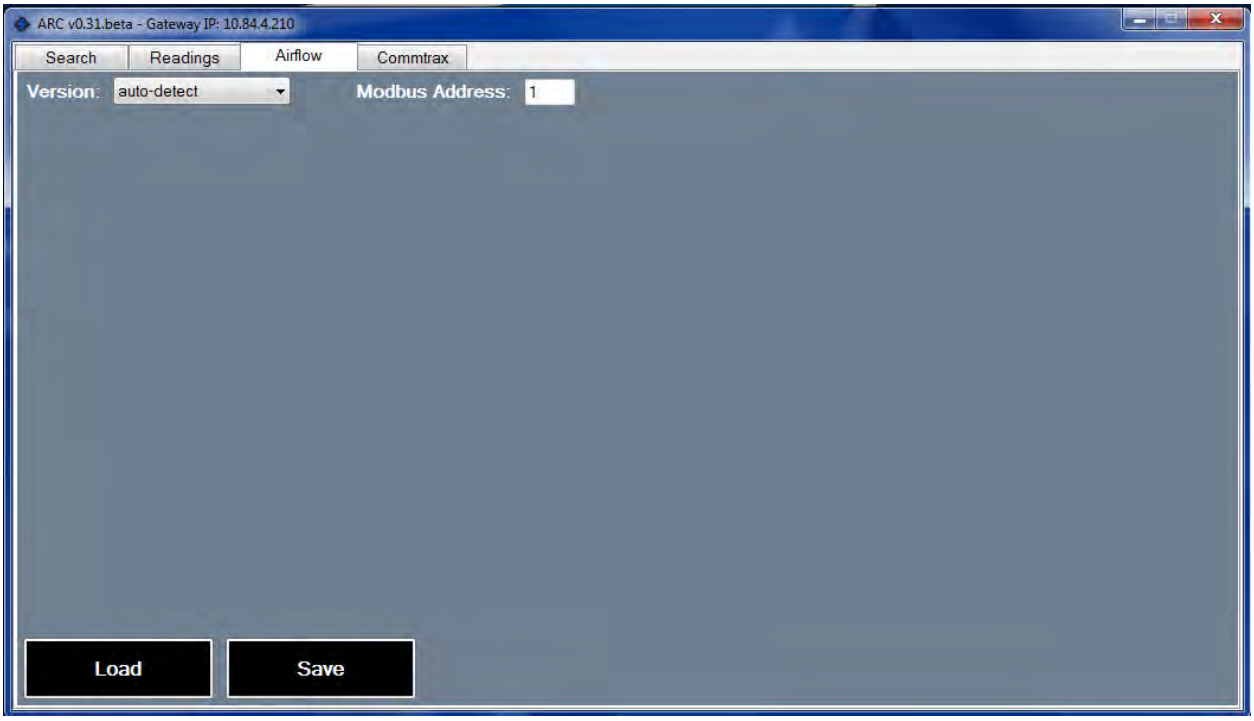
Upgrading the firmware of the CommTrax:

- All new future fixes to the CommTrax will be made available via our website www.accutroninstruments.com.
- In order to install the new firmware, you must first visit the website and download the latest version from our website. Do not rename the file. It should be similar to cmtrx130.bin
- Once downloaded, select the “Open File” and find the downloaded version of software.
- Once selected it will appear in the blank bar shown above “Filename”. Select the upload file to flash the device with the firmware upgrade.

- The device will now be flashed with the latest update
- The device will then reboot and you must find the device again using the search tab of the ARC

Airflow Tab

Figure 3.15



If you have an Accutron airflow unit connected to the CommTrax this is where you can access the settings of the unit and modify the settings from either underground or above. If you do not have an Accutron airflow unit this tab will not apply to you.

Version:

- Refers to the version of code within the Accutron Airflow unit
- If auto-detect is left on the CommTrax will automatically detect what the code version of the Airflow unit is

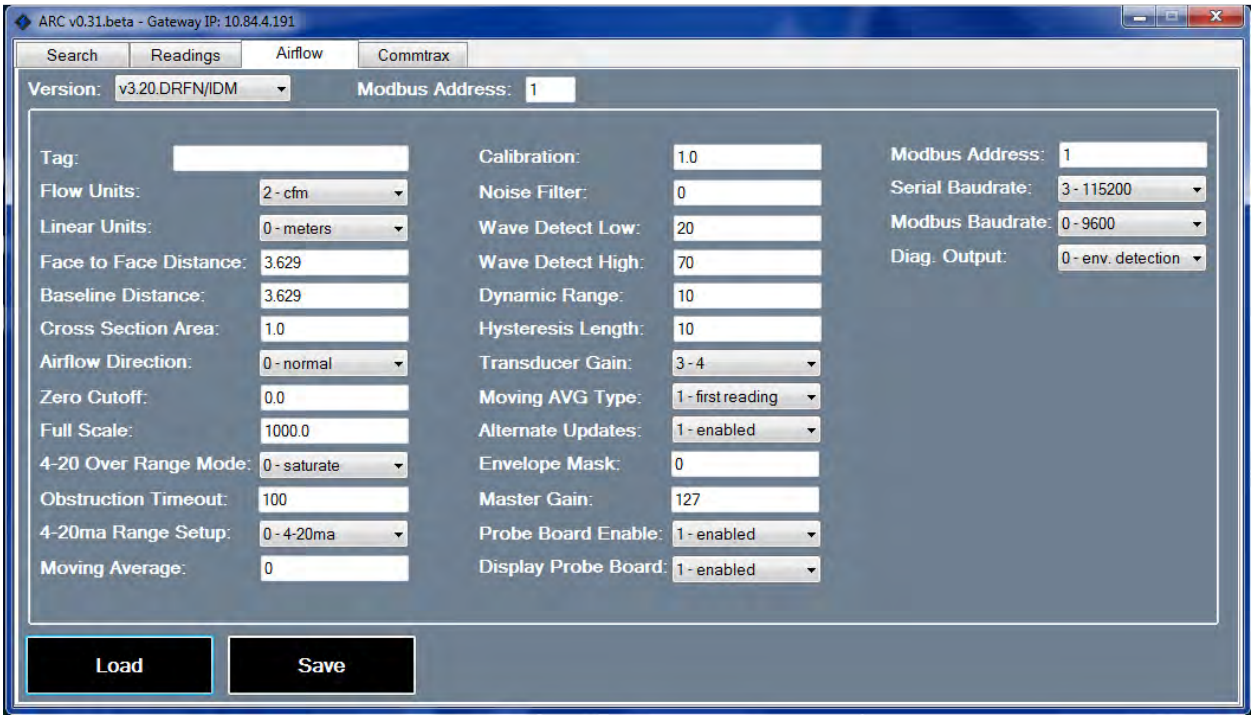
Modbus Address:

- Ensure the Modbus address of the Airflow unit is correct. The default address of our airflow units is Modbus Address 1.

Note: If this Modbus address and the airflow Modbus address don't match you will not be able to view the settings.

To view the readings select the load button, see figure 3.16

Figure 3.16



Once the settings are loaded the above screen will appear. Settings can be changed on this page, in order to save the changes made here the “Save” button needs to be selected. For setting definitions please refer to the Accutron Airflow Manual.

Note: The Tag name here is of the Accutron airflow transmitter and not that of the CommTrax Module.

Readings Tab

Figure 3.17

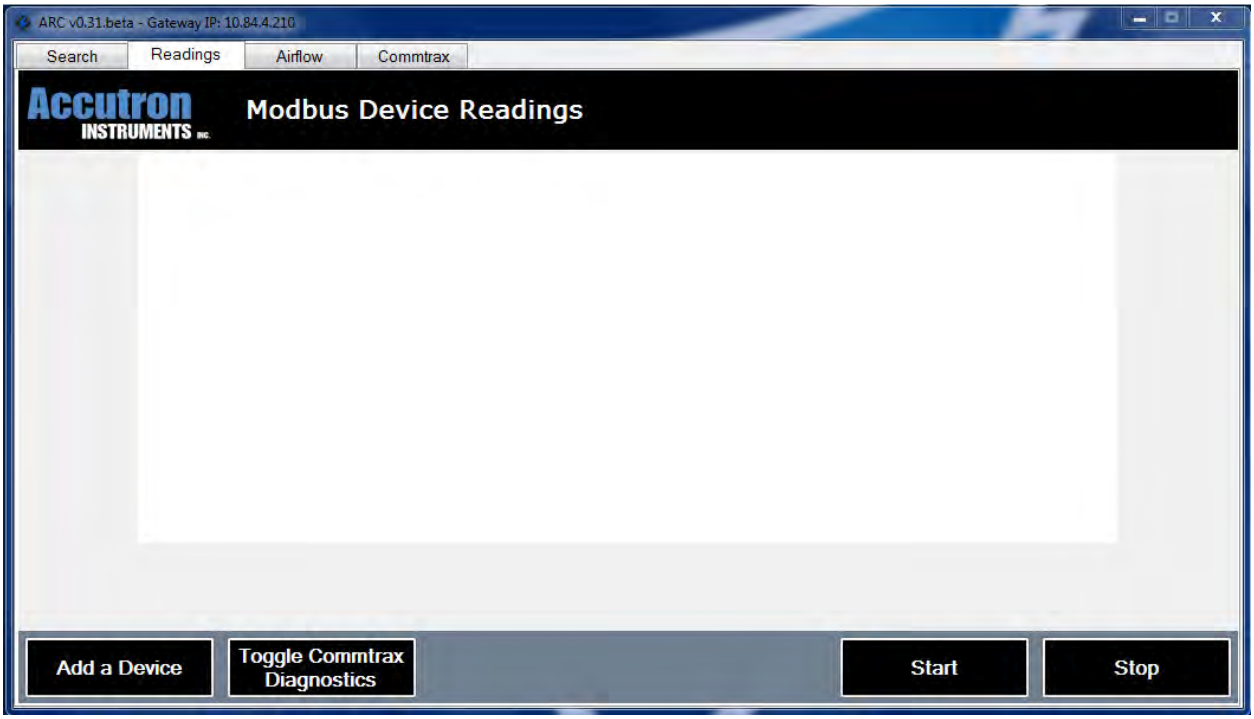


Figure 3.17 illustrates the Readings tab, this is where the real time reading s that the CommTrax is polling will be displayed within the software. In order to set up this page select the “Add a Device” button.

Figure 3.18

Figure 3.18 will then open. You have three options to add in devices into the readings section.

- Use the setup wizard
- Add manually
- Import from Commtrax

Setup wizard:

Select the Accutron line of products which have pre set registers that will be polled.

To use the setup wizard refer to section page for detailed instructions on this feature.

Add Manually:

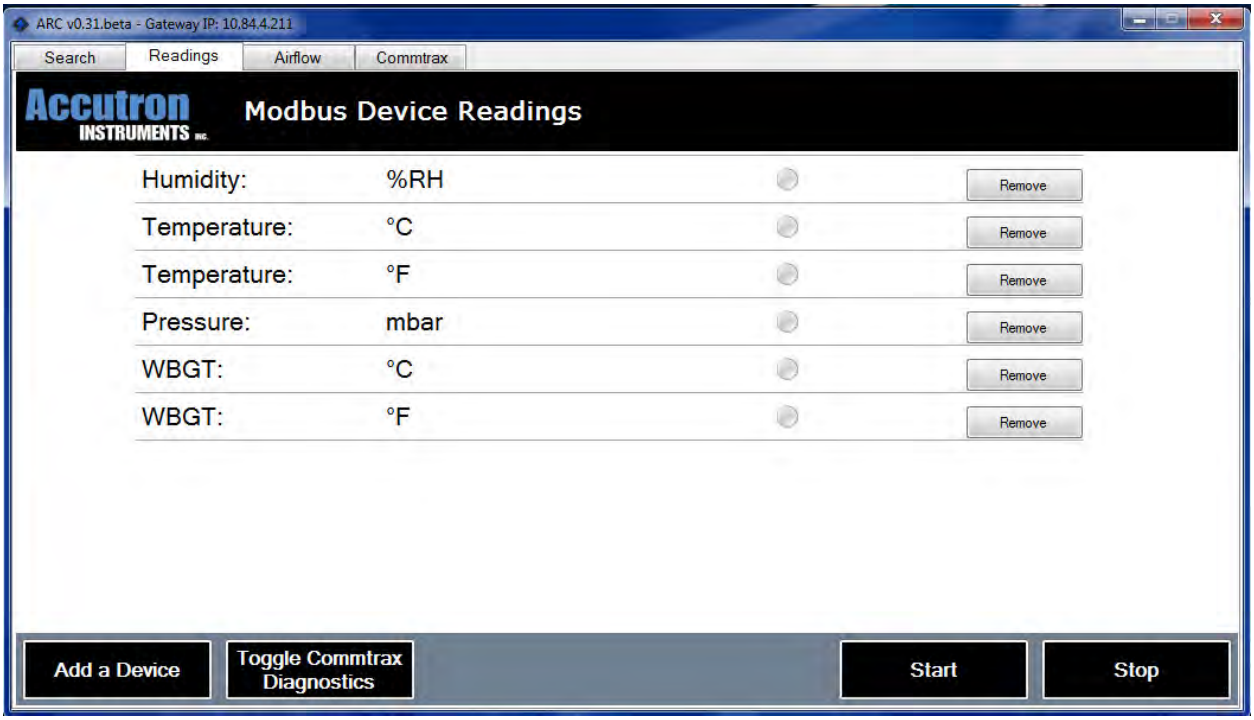
Manually add in Modbus addresses and registers to poll

Import from CommTrax:

The easiest way to get your real time readings. As long as the settings have been entered into the CommTrax (doing so in the CommTrax Tab previously talked about) you can simply select “import from CommTrax” and all the registers will be taken from the CommTrax section and displayed on this page.

Once the readings are setup through any of the three options above your page will now display readings see Figure 3.19

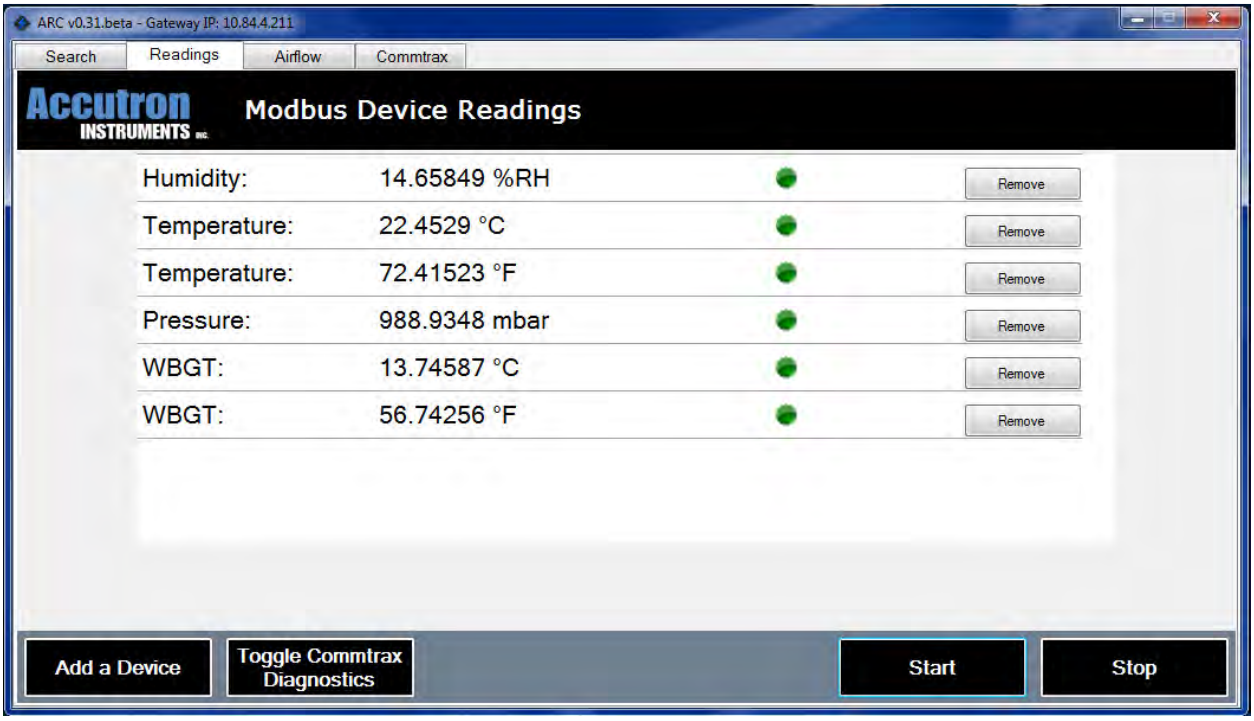
Figure 3.19



To view the readings select the “Start” button.

Note: if you select the start button and nothing happens ensure “Device Polling” is enabled in the CommTrax tab.

Figure 3.20

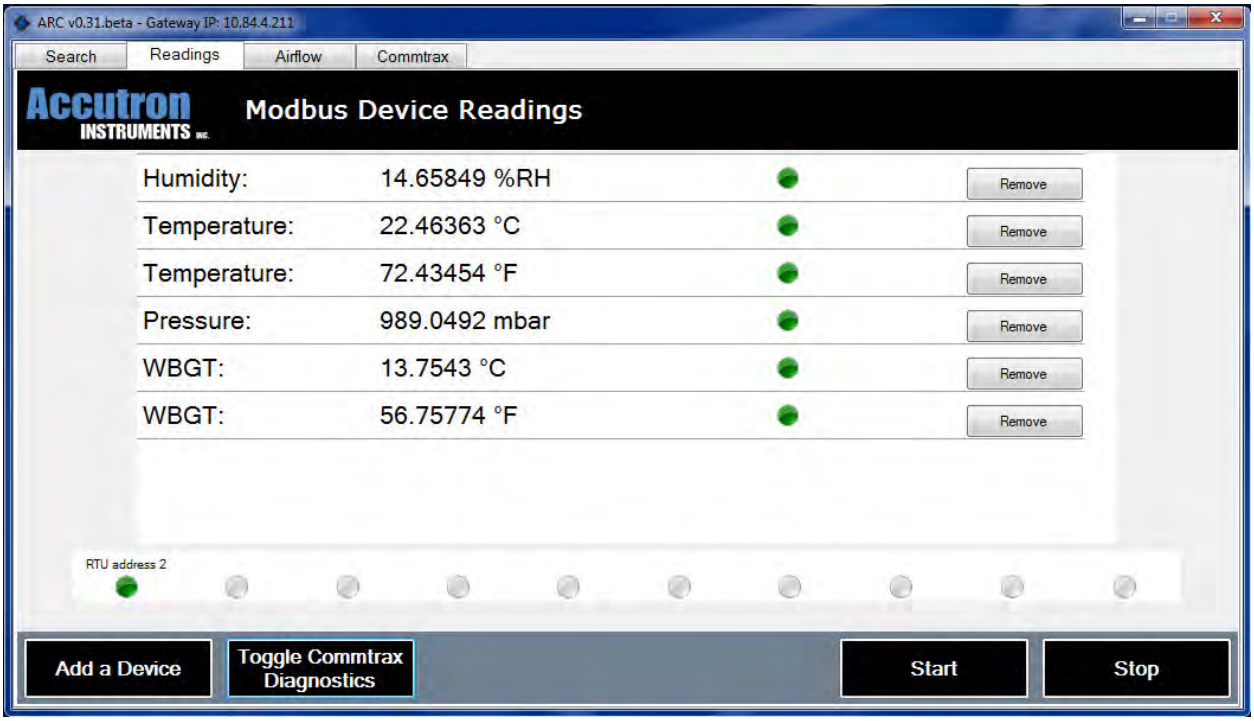


Once start is selected the readings will now be displayed as shown in Figure 3.20

The green status lights on the right side indicate the registers are valid.

Toggle CommTrax Diagnostics will display the status of each Modbus RTU device being polled. The lights will appear at the bottom of the page. If one of the Modbus RTU devices times out, the LED will change to red to indicate a problem.

Figure 3.21



In order to stop the real time readings simply select the “Stop” button.

Section 4: Setup Wizard

About the Setup Wizard

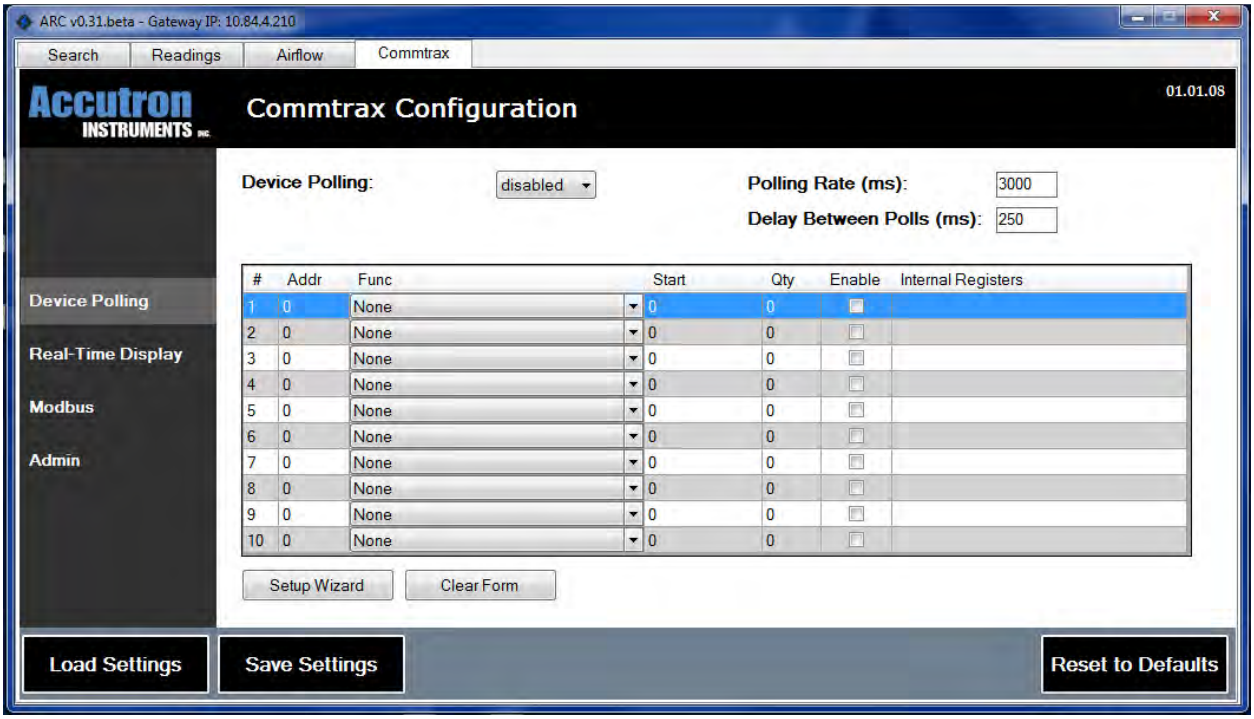
The setup wizard allows the user to select what Modbus device they are connecting too. Once the device is selected the user will select which variables they would like to read. Once the user has completed this task, the CommTrax will automatically input the Modbus registers and assign those registers internal registers which the CommTrax will use.

This tool eliminates the hassle of having to look up each individual register in separate manuals for each different device being connected. This tool allows for seamless setup of Modbus devices.

Note: Only products supplied by Accutron Instruments are incorporated within the setup wizard. Any other devices the Modbus information will have to be entered manually.

Locating the Setup Wizard

Figure 4.1

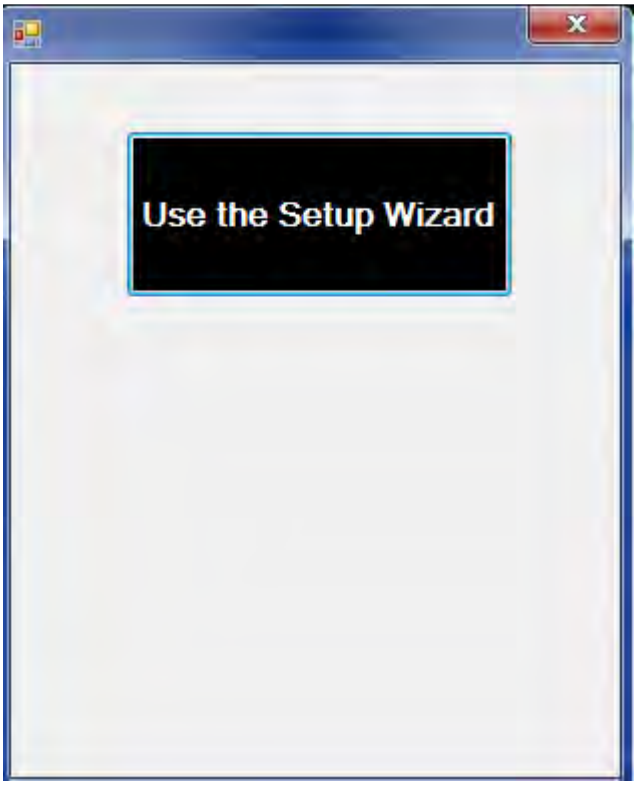


Under the Commtrax tab the setup wizard can be located on the bottom of the page on the left hand side see Figure 4.1.

Using the Setup Wizard

Select the “Setup Wizard” tab, Figure4.2 will now appear.

Figure 4.2



Select the “Use the Setup Wizard” button shown in Figure 4.2

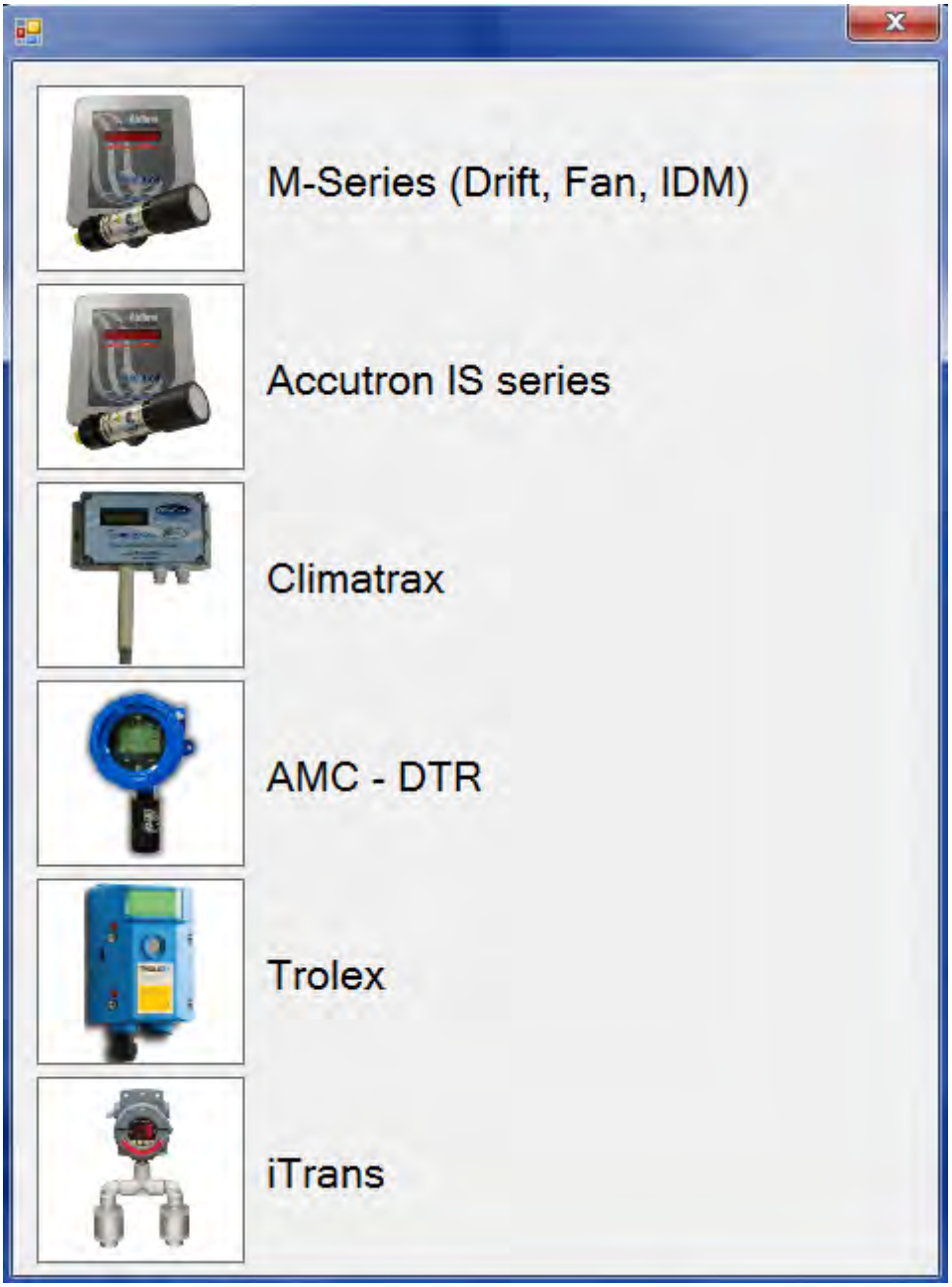
Once selected a list of current Accutron Products will appear see Figure 4.3.

Products that will work with the CommTrax are the products supplied by Accutron Instruments, these products include:

- Any airflow monitor manufactured by Accutron Instruments that has Modbus.
- The stand-alone Climatrax
- Armstrong Gas sensors equipped with Modbus
- iTrans Gas sensors equipped with Modbus
- Trolex Gas sensors equipped with Modbus

Note: If your device is not in the above list you will not be able to use the setup wizard.

Figure 4.3



To proceed to the next step, select the device you wish to configure. If you have multiple devices you will have to set them up individual, select one of your devices and enter the setup wizard once completed to setup another device.

Setting up an Airflow Device

In Figure 4.3 select the M-Series Tab to setup an airflow monitor

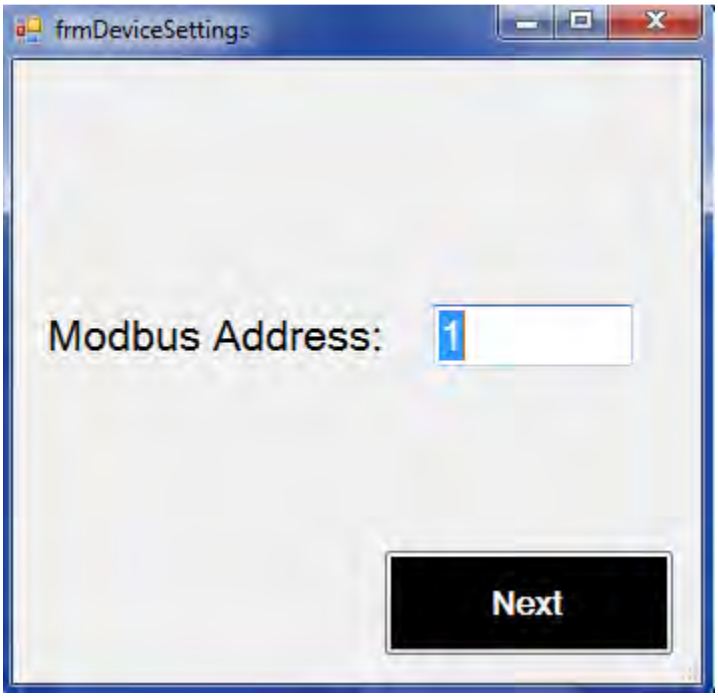
Note: M-series tab will work with the current FlowTrax model

Once the tab has been selected, you will be asked to enter the Modbus Address of the device. Shown in Figure 4.4.

Note: The default Modbus Address for our airflow products is 1.

Once the Modbus Address is entered press the “Next” button.

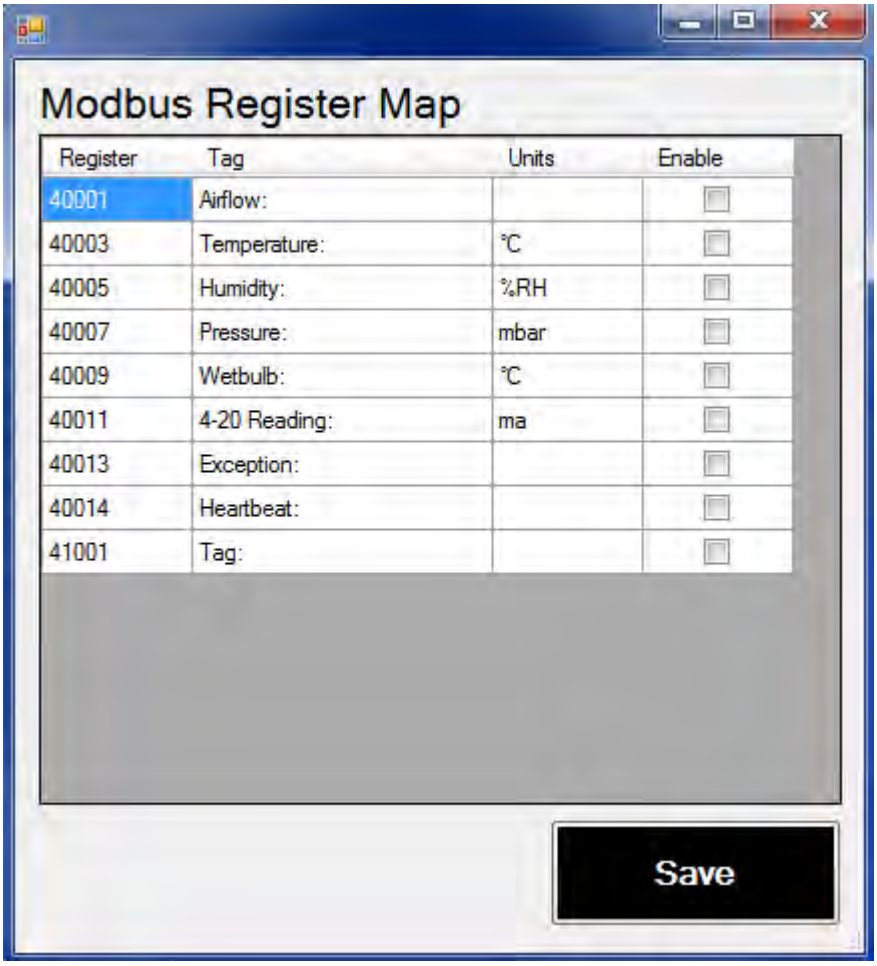
Figure 4.4



The Modbus Register Map will now appear refer to Figure 4.5. On this page the user must select what variables they’d like to read. In order to select a variable from the list check the enable button. The user may also change the engineering units in this section as well.

Once complete press the “Save” button.

Figure 4.5



In our example only “Airflow” has been enabled.

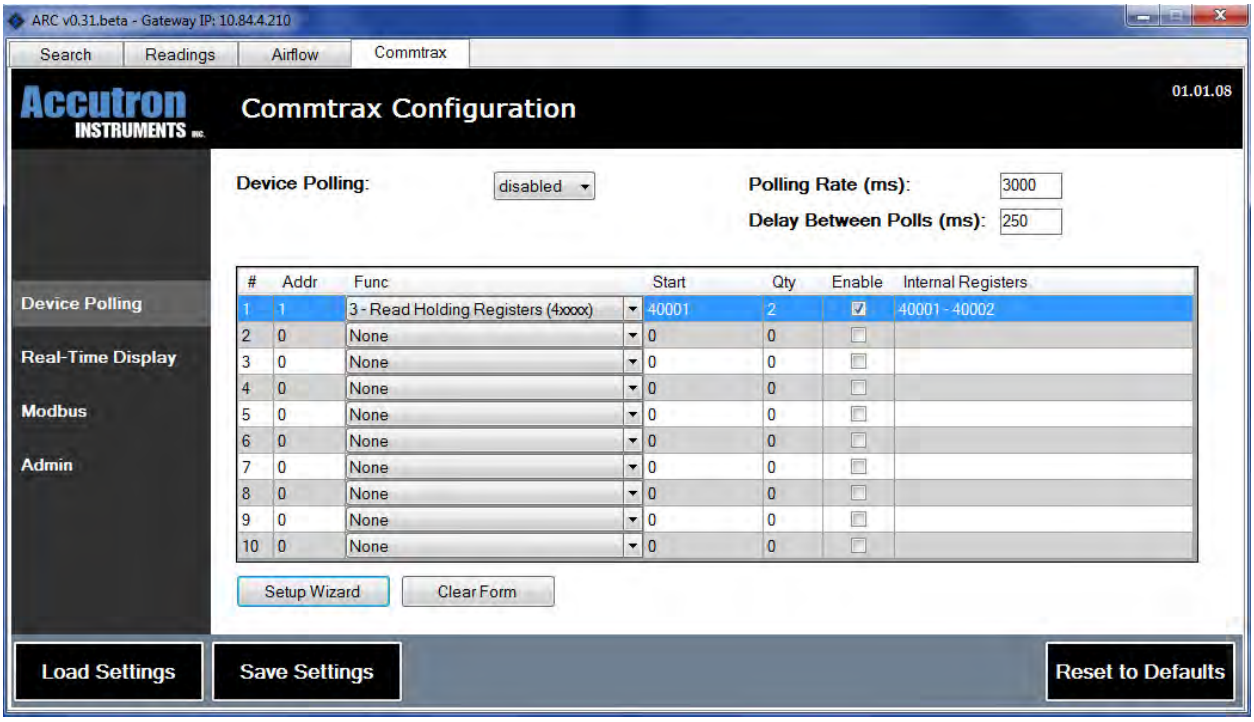
Once the setup wizard settings have been saved Figure 4.6 will be displayed, Ensure “Device Polling” is enabled at the top of the page. Select the “Save Settings” on the bottom of the page.

Note: For our example, only airflow was selected to read.

Once this is complete the CommTrax will reboot.

To get your live time readings on the ARC software refer to the “Readings Tab” section of this manual on page 15.

Figure 4.6



Note: The setup wizard is also found in the readings tab. In most cases “Import from CommTRAX” is selected. However if selected the setup is the same as described above.

Section 5.0.: The Webserver

About the Webserver

The webserver works in conjunction with the ARC Software. Any device that is properly set up with the ARC software will be displayed automatically when the Webserver is loaded. You don't need the ARC software installed to use the webserver.

Connecting to the Webserver

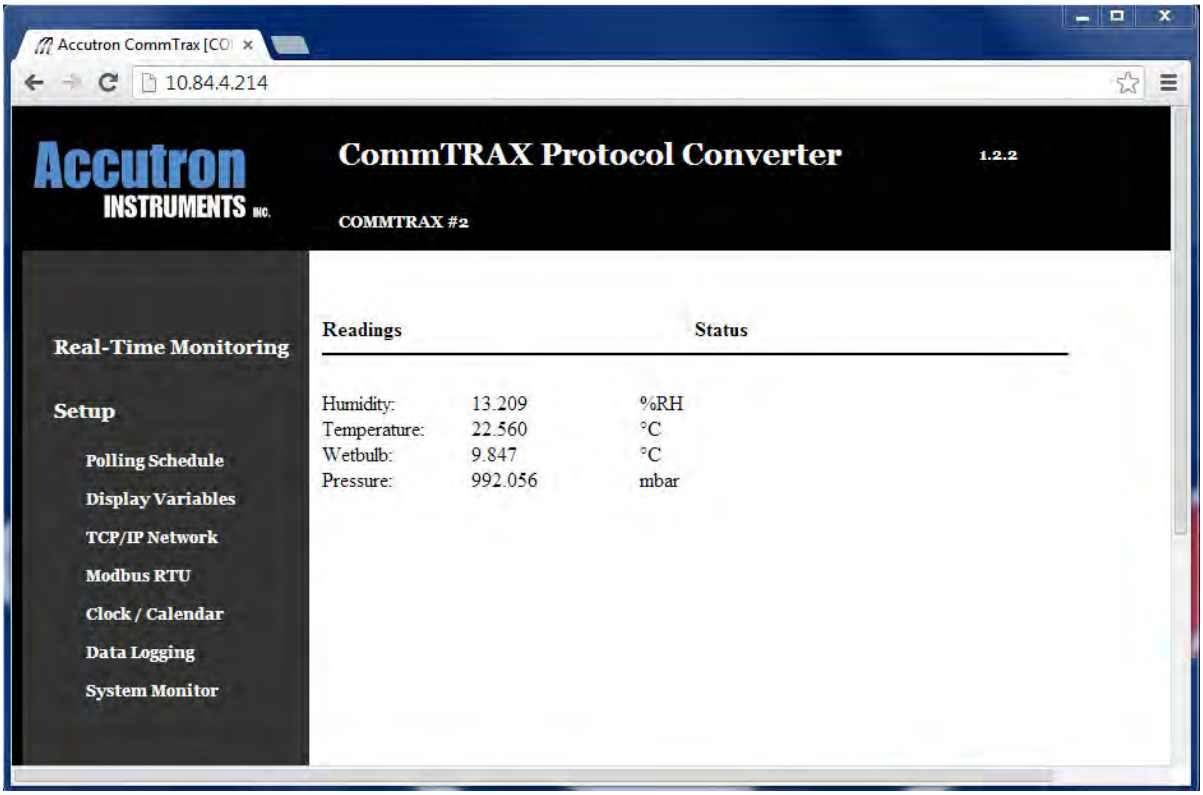
In order to connect to the Webserver simply open your internet browser and type in the IP address associated with the CommTrax.

Note: The webserver will work with any internet browser.

Webserver Layout

Once connected to the webserver Figure 5.1 will be displayed. The tag name of the CommTrax is displayed on this page to distinguish between different locations, and its firmware version. All active readings are displayed under the Readings heading on the white area of the screen.

Figure 5.1



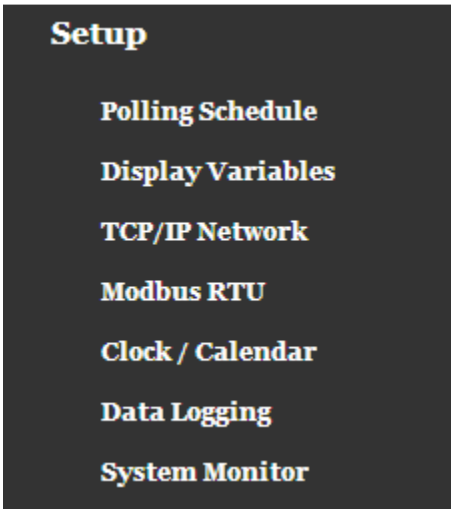
Real-Time Monitoring

By default the webserver will display the Real-Time Monitoring information once the webserver has been accessed. The user does not need a password to view these readings. Any information set up in the

“Display Variables” tab will automatically be displayed here. The name, reading and engineering units will be displayed under the Readings header. Under the Status header is where any errors with the readings are reported.

Setup Tab

Figure 5.3



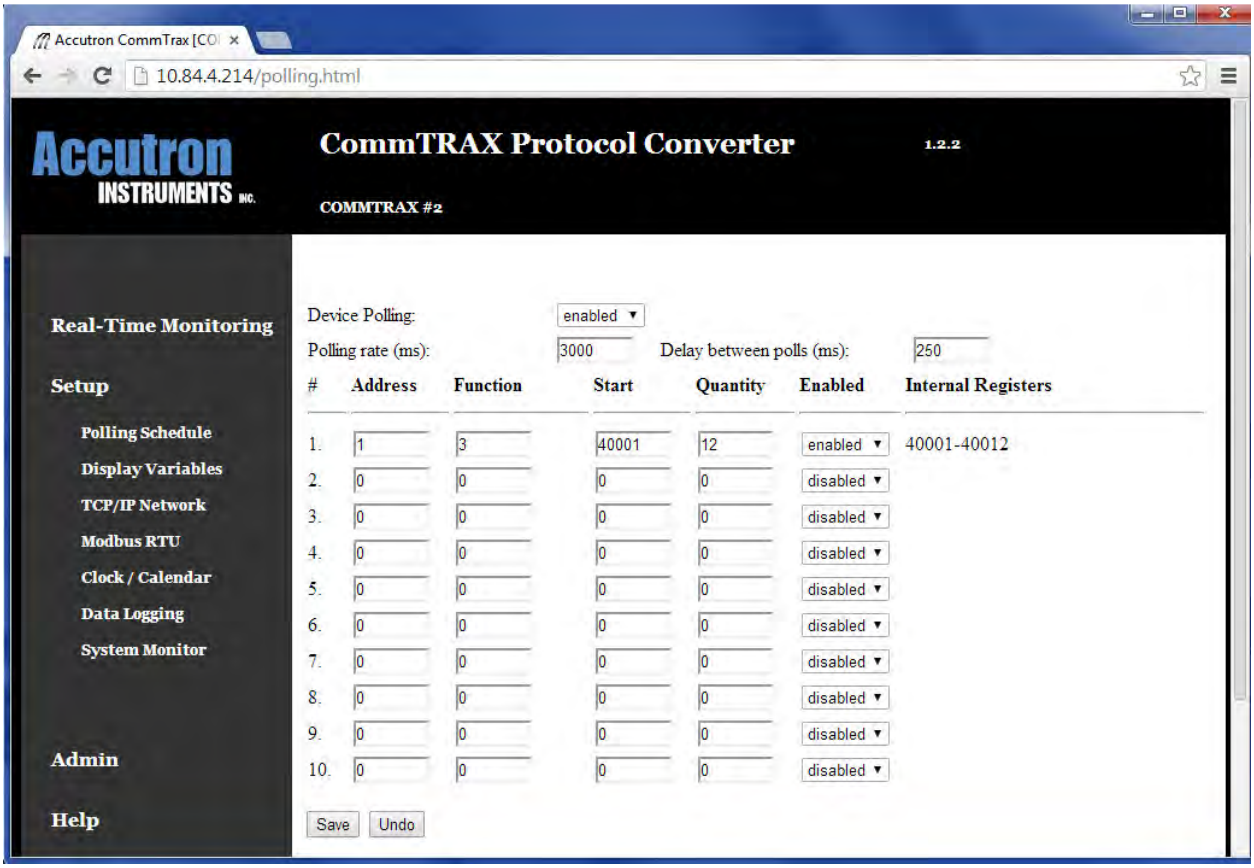
In order to change any options in the setup menu, a user name and password will be needed, before access can be gained.

The default user name is: admin

The default password is: Accutron

Polling Schedule

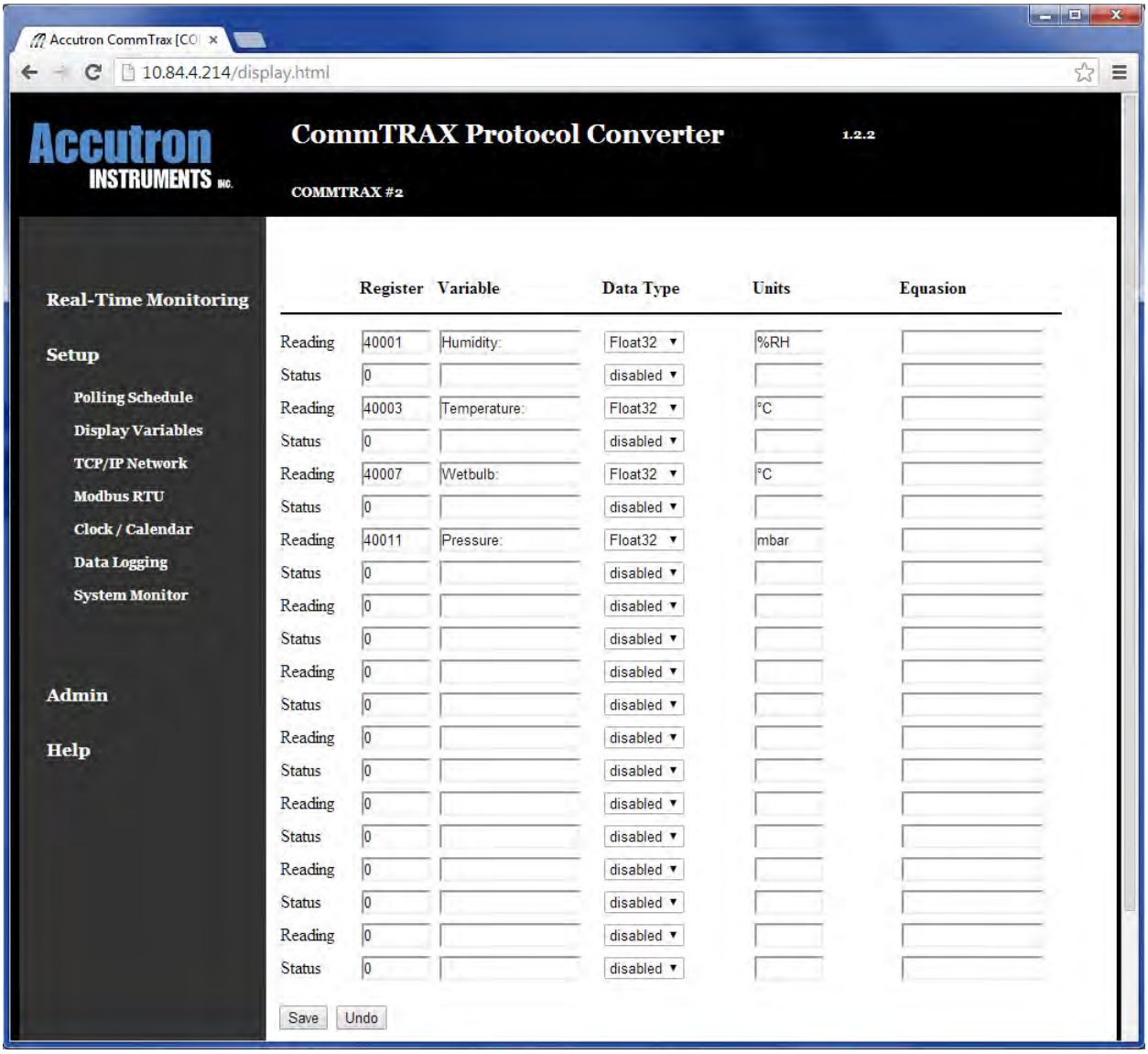
Figure 5.4



- Address: the Modbus address of the device you are connecting to.
- Function: 3 = read holding registers (4xxxx), 4 = read input registers (3xxxx).
- Start: the first Modbus register you want to read.
- Quantity: the amount of registers after the first one, that you want to read.
- Enable: enable of disable reading these registers
- Internal Registers: the new internally re-mapped registers.

Display Variables

Figure 5.5

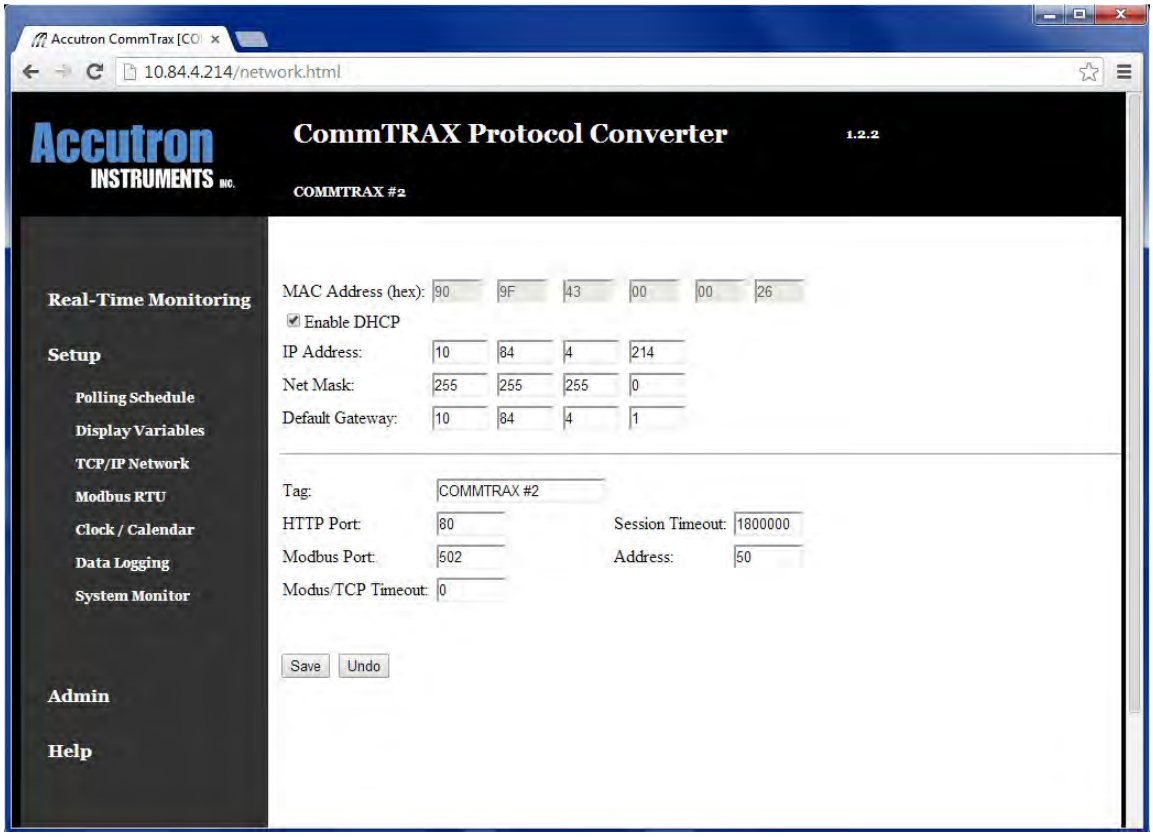


When the Display Variable menu is selected.

- Register: the internal register created by the Commtrax you want to have displayed
- Variable: Tag name. Ex: airflow, CO2
- Type: Is the number an integer, floating number, string
- Units: the tag placed at the end of the data. Ex: m/s, ppm
- Equation: A place where you can do math equations to alter your data. Multiply, subtract, etc.

TCP/IP Network

Figure 5.6



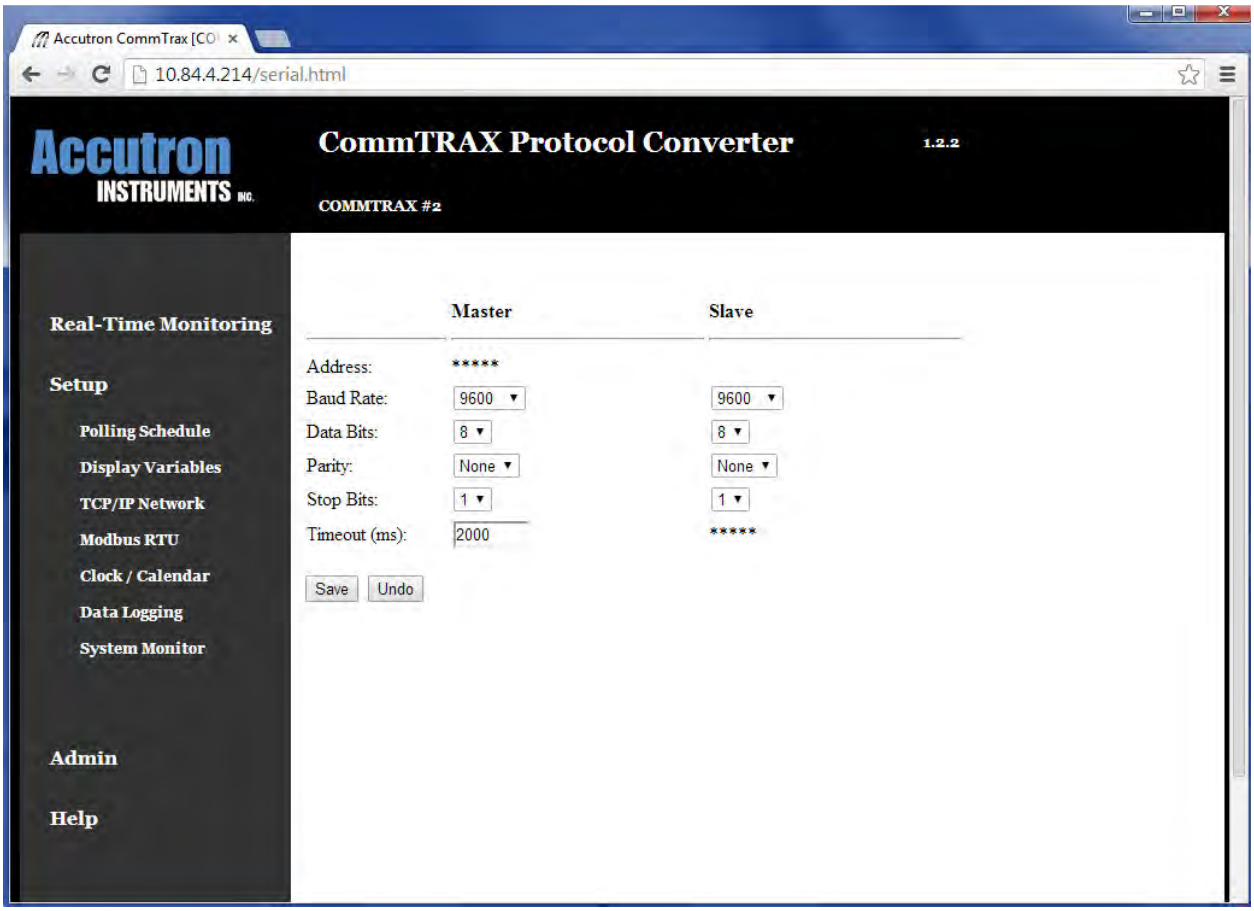
In this window you can configure all the network related settings.

- MAC Address: Each CommTrax has its own unique mac address hard written in the software, this address cannot be changed.
- Enable DHCP: When connected to a network, the CommTrax will receive network configuration parameters, such as an IP address, subnet mask and default gateway automatically.
- Tag: The tag name entered to specify a certain CommTrax
- HTTP Port: port 80 is the default
- Modbus Port: the port where the communication takes place. The standard is 502
- Modbus TCP timeout: The length of time in seconds before the CommTrax will disconnect the TCP communication session after no activity. (0 means it will never disconnect the session).
- Session Timeout: The length of time, in seconds, before the CommTrax will end the webpage session after no activity.
- Address: the CommTrax Slave port Modbus address. Will be used to poll the CommTrax

By default the CommTrax has a Modbus address of 50.

Modbus RTU

Figure 5.7

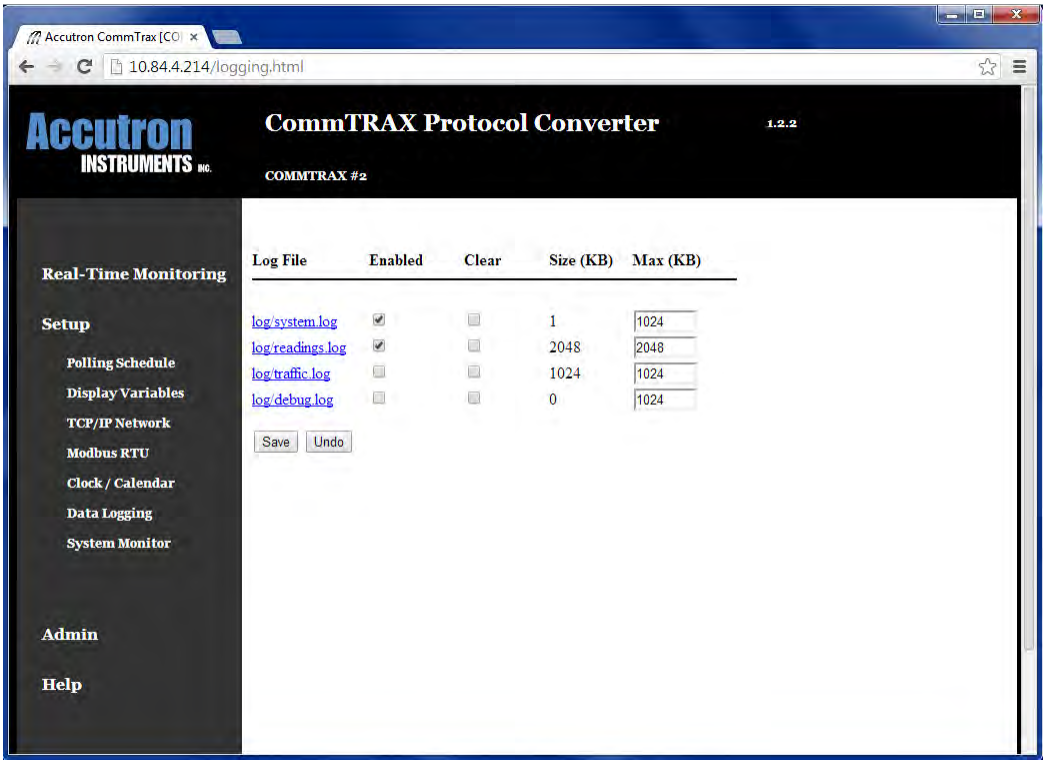


Clock/Calendar

Not functional at the moment. This displays the Up-time of the device.

Data Logging

Figure 5.8



Any troubleshooting of the CommTrax can be done through this menu. Simply check the boxes you wish to monitor.

Webserver Data Logging Diagnostic Tools:

The following diagnostic tools listed below must be enabled first before data logging will occur. Data will only be logged if there is a device polling the CommTRAX.

log/system log

Logs system reboots.

log/readings.log

Logs all the readings being polled by the CommTRAX webseever.

log/traffic.log

Logs the Modbus RTU and Modbus TCP traffic information.

log/debug.log

.

System Monitor

Gives information about the current state of the CommTrax, running threads and available memory.

Admin Tab

Under this tab the user can change the default password. There is an option to reboot the CommTrax as well.

Help Tab

Simply displays the firmware version number of the CommTrax

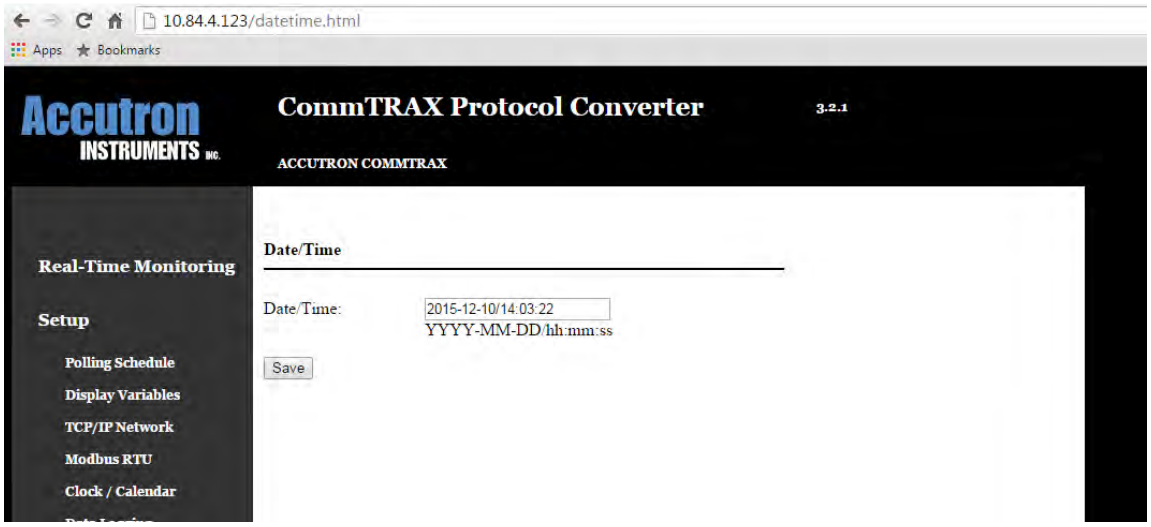
Section 5.1.: Data Logging Option

If you have the Datalogging version of the CommTrax (pn: ACC-COMMTRAX-01-DL), you will have 2 slightly different webpages.

The Clock/Calendar page: Adds the ability to set the date and time. The CommTrax contains a small rechargeable battery intended to keep time when no power is applied to the unit. This battery will keep the time for up to 60 days. The battery requires 48 hours to be fully charged.

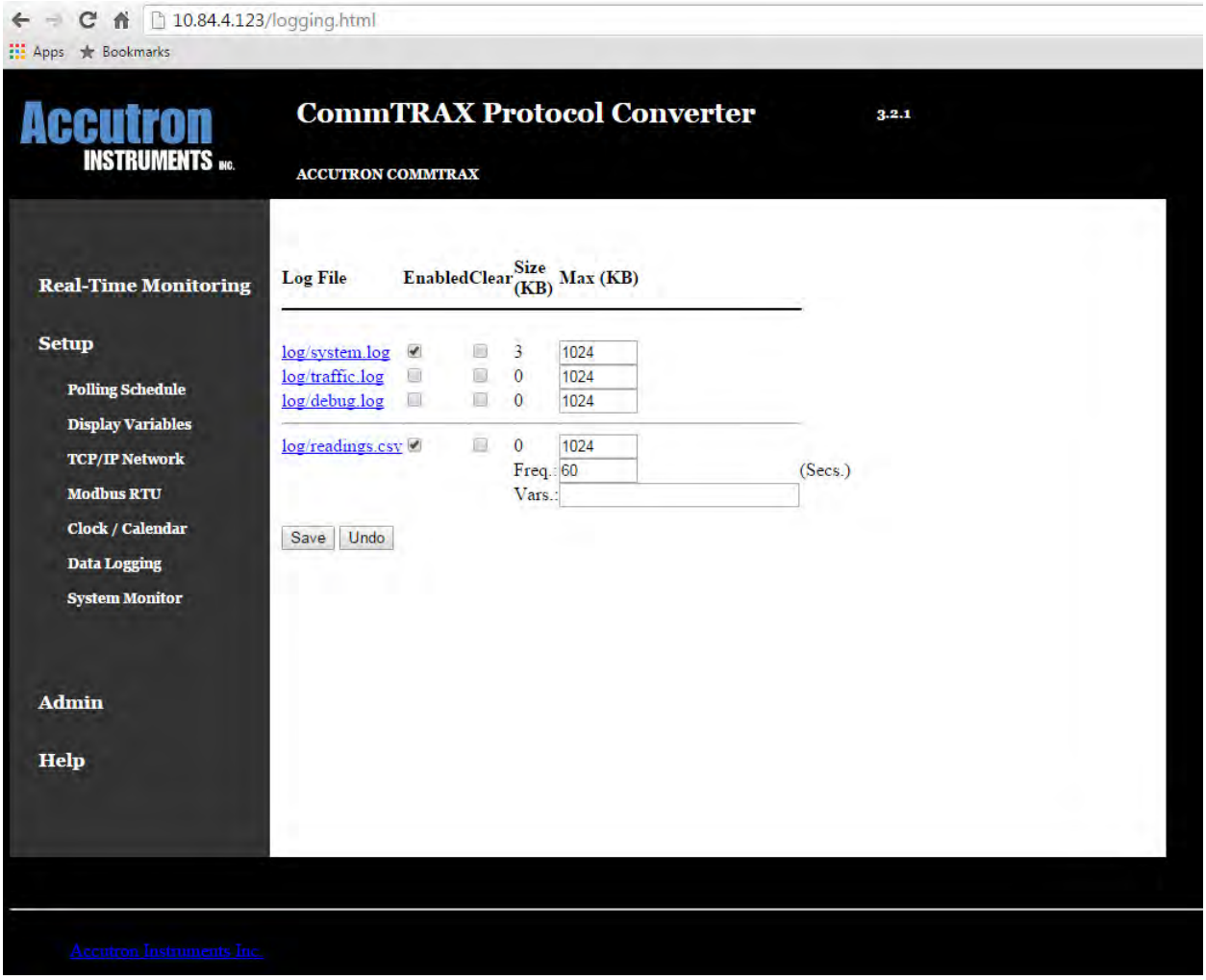
Data Logging page: Adds the ability to log readings at different intervals, and saves a CSV file to the SD card.

Clock/Calendar page



Enter the date and time in “YYYY-MM-DD/hh:mm:ss” format, where the hours “hh” are in 24 hour time. Click save to set the time.

Data Logging page



There are three important input boxes on this page.

1) The max file size “Max (KB)” input box. Once the log file reaches this size, logging will stop.
2) “Freq:” input Box: input how often you want the CommTrax to log the readings, in second. Make sure this value is bigger than the polling rate on the Polling Schedule page.
3) “Vars:” input box: input the name of the variables you would like to log. Separate multiple variables by commas “,”. These variables must be input as they are written on the Display Variables page. Example: “Humidity:,Temperature:,Wetbulb:” Maximum of 10 Variables can be logged.

Retrieving Log file

Clicking “Log/reading.csv” will download the log file to your computer. You can also retrieve the log file from the SD card. It can be found in the “log” folder. Power down the Commtrax before removing the SD card. An SD card with the proper files on it needs to be inserted in the CommTrax for it to function.

Log Time

	Logging 1 variable	Logging 2 variables	Logging 4 variables	Logging 8 variables	Logging 10 variables
1KB File Size =	~38 data points logged	~30 data points logged	~21 data points logged	~13 data points logged	~11 data points logged
5 sec logging rate	~75 Days	~59 Days	~41 Days	~25 Days	~21 Days
60 sec logging rate	~909 Days	~717 Days	~502 Days	~311 Days	~263 Days
Note: Max File Size set to 34463 KB					

Formula

$$\text{Max Data Points} = \text{Max file size (KB)} \times \text{Data Points per 1 KB}$$

$$\text{Hours of Logging} = \frac{\text{Max Data Points} \times \text{Polling interval}}{3600}$$

$$\text{Days of Logging} = \frac{\text{Hours of Logging}}{24}$$

Section 6: Troubleshooting

Status LED's

Status LED:

When this light is on it means that there is data being sent on the Modbus lines. The LED will flash on and off multiple times a second. If the status light is not blinking a couple times a second you do not have data being sent out on the Modbus Lines.

Solution: Ensure the wiring for the Modbus on both the slave device and CommTRAX is connected properly. A to A , B to B.

Diagnostic LED: This LED represents the software is functioning properly. The LED will blink once a second to indicate this state. If this LED is not blinking the CommTRAX will not work because for some reason the software is not operating correctly.

Solution: Reset the CommTRAX by pressing the reset button. If this does not fix the issue, you can try a factory reset. If the issue continues Contact Accutron Instruments technical support team.

Power LED:

When this light is on the CommTRAX is powered. If this light is not on, the device is not powered and is not functioning.

If all LED's are frozen, restart the CommTRAX. If the issue persists please contact the Accutron Instruments technical support team.

Reset to Factory Defaults:

Completing this function will remove any current settings in the CommTRAX. Before proceeding ensure you have the proper information recorded to make the set up easier. To reset to factory defaults hold the F1 button while pressing the Reset button at the same time. Hold both buttons for one to two seconds. Then release the Reset button while still pressing down on the F1 button. Release the F1 button after the Reset button has been released. Give the module a few seconds to boot up before trying to reconnect to it.

Modbus Poll:

To troubleshoot Modbus Timeouts and connections use Modbus poll. Modbus Poll has been built into the ARC software. While on the readings page illustrated in Section 2 Figure 2.19 (after the Modbus devices have been set up in the CommTRAX) Press the following buttons to display Modbus Poll on the bottom of the page:

CTR+SHIFT+D

Error Messages with the ARC Software:

Can Not find Target IP:

While using the ARC software if you ever come across the message box "Cannot find Target IP" this means that the network cannot find the IP address you are trying to connect to.

Reason: Two things are the cause for this:

1. The network connection to the device is no longer connected.
2. DHCP is Enabled

If DHCP is enabled and you are not on a network and just connecting to your laptop or computer you will run into the "Cannot find Target IP" message when trying to add and remove settings in the CommTRAX.

This is because every time a setting is saved the CommTRAX reboots itself. When the CommTRAX reboots itself it reconnects to the computer and is given an IP address. The previous IP address has not yet released the old IP address that was used to connect and make changes to the CommTRAX. The CommTRAX is then given the next IP address in line. When you try to connect to the CommTRAX you will get the "Cannot find Target IP" as the computer is looking under the old IP and the CommTRAX now has a different IP address.

To solve this issue disable DHCP when connecting to your laptop or desktop computer and manually put in an IP address that has the same range as the computer you are using.

Using DHCP on a Network:

If you are connected to a network and have DHCP connected you will not run into the above issues.

Error Updating Gateway:

This error is a communication error. The CommTRAX sent settings out and received settings that did not match what it was expecting to receive. For some reason the CommTRAX failed to write these settings properly. Retry inputting the settings.

Invalid Password:

The password entered to access the ARC or webserver did not match the correct password. Re-enter the password. If you forget your password, please contact the Accutron Instruments technical support team.

No Gateway Selected:
No CommTRAX has been specified when pressing “Connect” on the search screen or when importing and exporting settings.

Failed to Reset to Defaults:
The CommTRAX failed to reset to defaults. Retry resetting to defaults.

Setup Wizard Failed:
The setup wizard has pre-determined values if these values are changed and are inputted incorrectly this error will appear. If an equation is entered in to manipulate the final value but the equation is entered incorrectly this message will also be displayed.

Unable to write to device:
Check the connection to your network

New passwords do not match:
This occurs when changing your password. Retype the passwords again.

Error with Image File:
When doing a firmware upgrade this error message may occur. Retry the firmware upgrade.

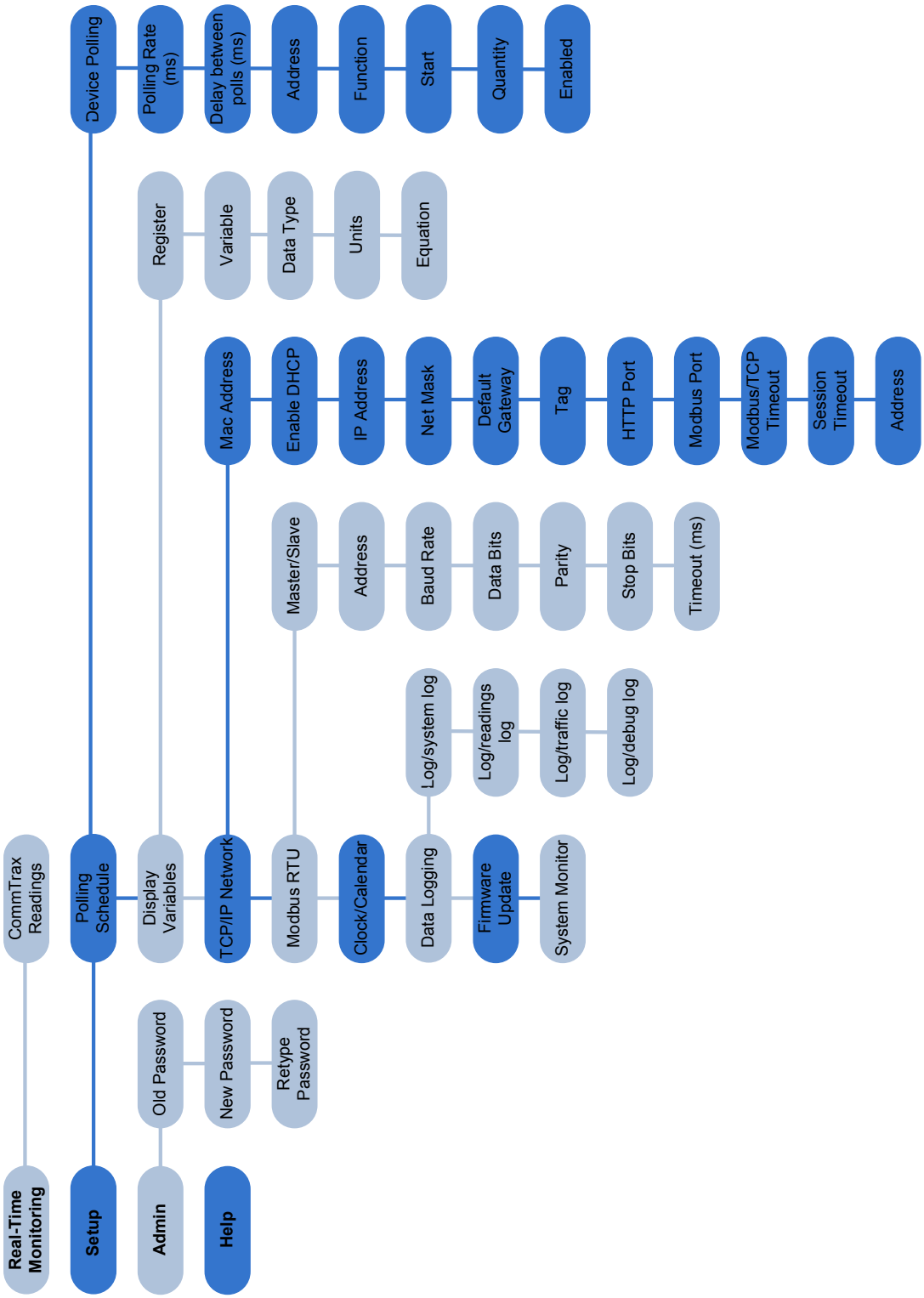
Can Not Find Target Device:
This error only deals with the Airflow tab of the CommTRAX. When the CommTRAX tried to get the data from the airflow unit it was unsuccessful. Ensure that the Modbus Address is correct and that the device you are trying to poll is powered.

Unable to Load Data:
This error only deals with the Airflow tab of the CommTRAX. Connected to the airflow unit but received bad data back.

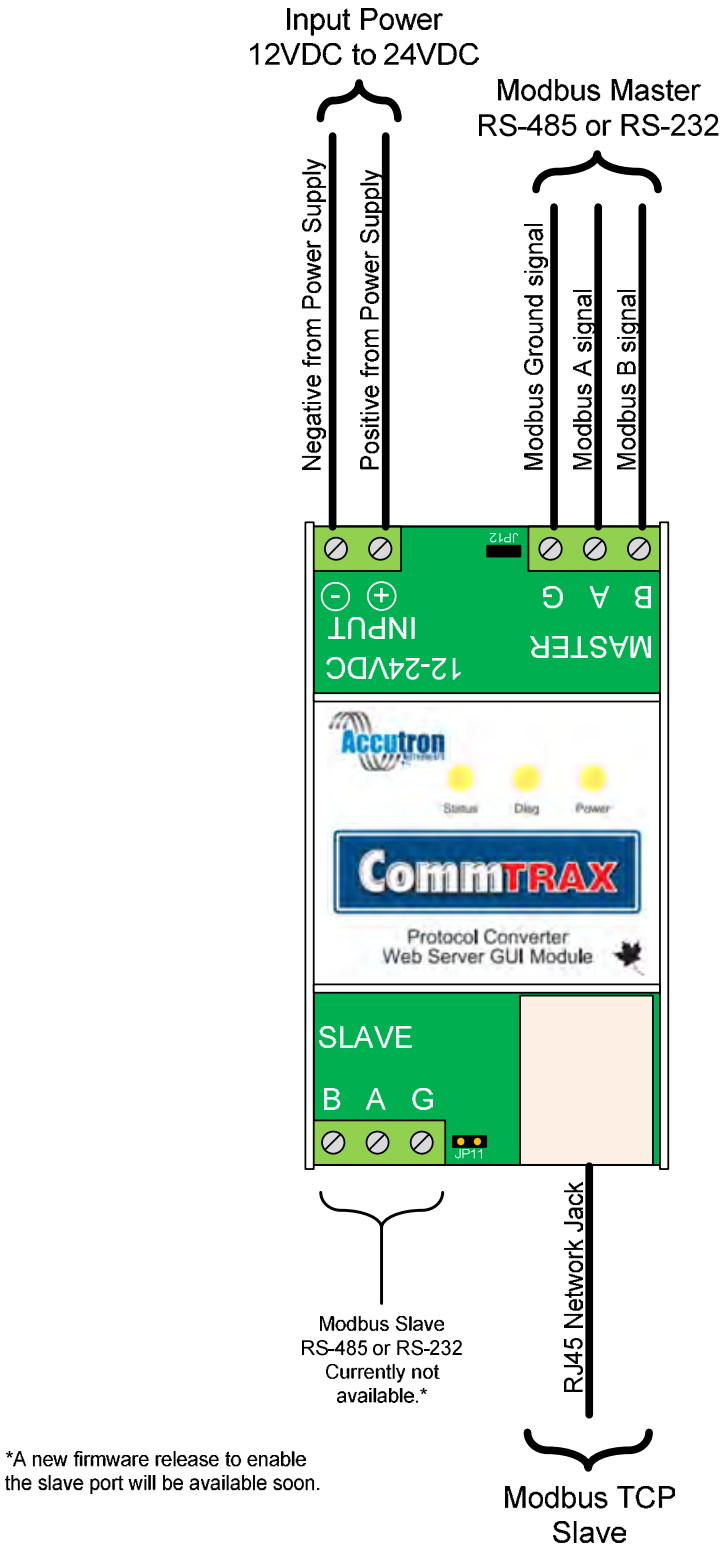
Error Loading Data:
This error means there was an error loading the data on the Readings tab. Result of a corrupted file or a setting that hasn’t been saved or entered correctly.

Lost Connection:
Check the network connection.

Menu Flow Chart



Section 7 Communication & Power Wiring Diagram



Section 8: Modbus General Overview

Communication Options

The CommTRAX can communicate different ways over Modbus:

-Modbus RS-485 master to Modbus TCP

-Modbus RS-232 master to Modbus TCP

-Modbus TCP to Modbus RS-485 slave*

-Modbus RS-485 master to Modbus RS-485 slave (re-map registers)*

Default Modbus Address

The default Modbus Address of the CommTrax is 50. This value can be changed by the user in under the CommTrax tab located under Modbus.

Default Baud Rate

The default baud rate of the CommTRAX and Slave devices is 9600

Terminating Resistor

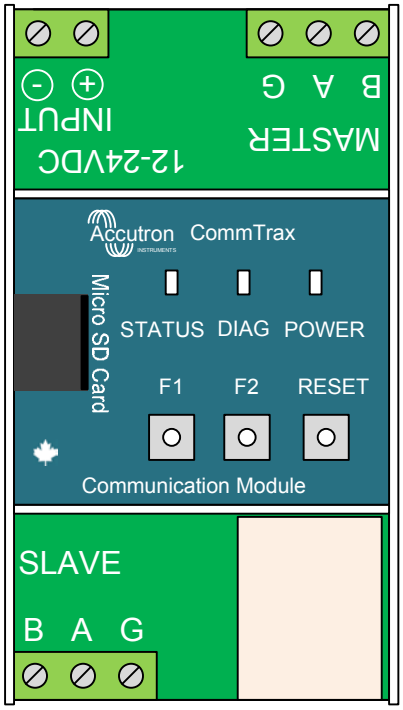
Each Modbus port has a 120ohm terminating resistor jumper. When the jumper is in the terminating resistor is active.

RS485 version p/n: ACC-COMMTRAX-01

RS232 version p/n: ACC-COMMTRAX-02

*Slave port functions currently not available. A new firmware release will enable this feature.

Section 9: Inside the Enclosure



LED Indicators: Status, Diagnostics and Power

Micro SD card: 2GB flash memory standard, customized memory available. The Micro SD card can be inserted and removed from underneath the lid of the enclosure.

Function Buttons:

F1: Holding F1 down during a reboot (pressing reset) will reset all the settings in CommTrax to default.

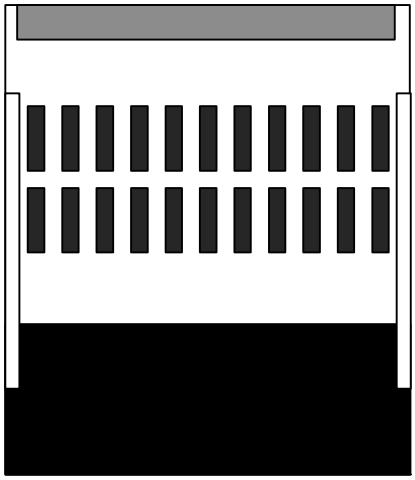
F1+F2: Holding F1 & F2 down during a reboot (pressing reset) will re-flash the firmware of the CommTrax with one on the SD card. It will be looking for a file placed on the root of the SD card named "commtrax.bin".

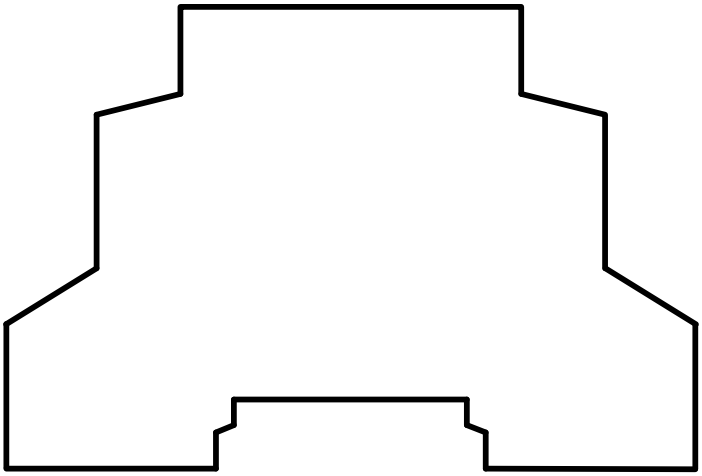
Reset: Reboots device

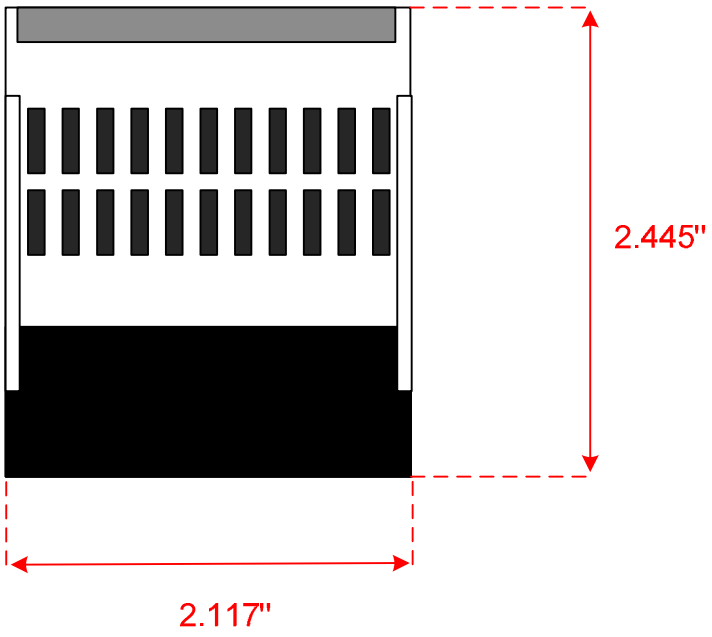
Reset settings to default:

Press and hold the **F1** button while pressing the **Reset** button. Hold both buttons for one to two seconds. Then release the **Reset** button while still pressing down on the **F1** button. Release the **F1** button after the Reset button has been released.

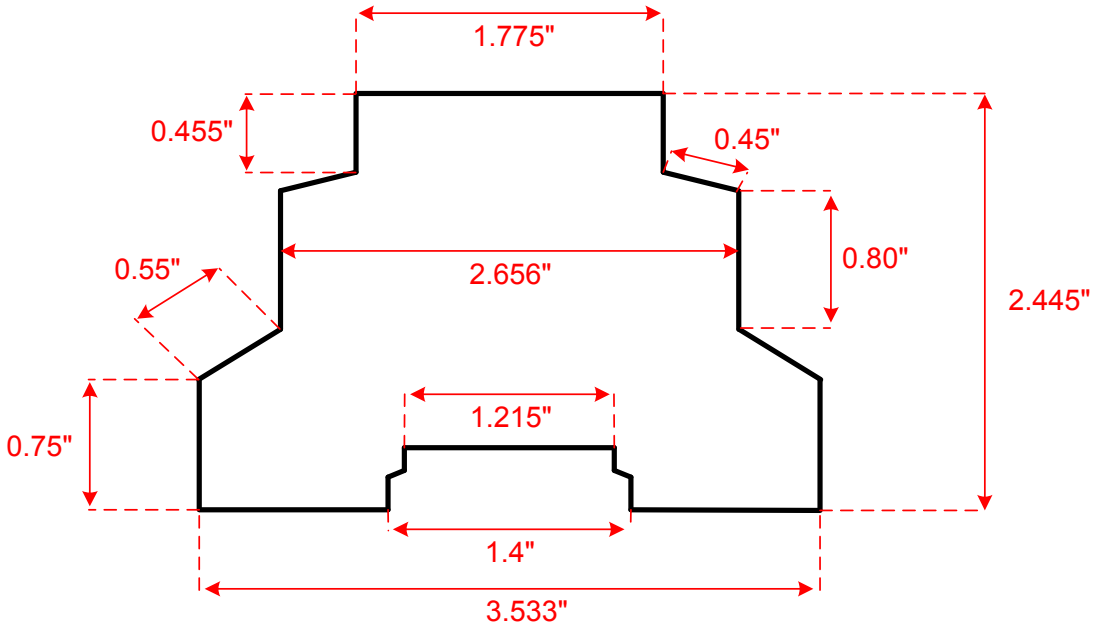
Section 10: Drawings & Dimensions







Front View



Side View