



# TRAF-SYS

PEOPLE COUNTING SYSTEMS

## MIU-1000 v 2.6g

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## Introduction

The Traf-Sys MIU-1000 is a stand-alone device designed to process and log data from wireless Traf-Sys sensors. The MIU-1000 receives radio transmitted data from sensors, processes the data and makes the data available via a command/response interface or XML delivery over the web.

The Traf-Sys MIU-1000 has an on-board serial port as well as a 10baseT Ethernet interface. The serial port can be used with a null-modem serial cable to configure the settings on the MIU-1000. The Ethernet port on the MIU-1000 can be used to connect the device to your network.

The MIU-1000 contains a time of day clock, battery backed RAM, and flash programmable memory. It is fully configurable, both locally and remotely. It is recommended to use no more than 16 sensors as each sensor added to the MIU-1000 will significantly reduce the amount of available on-board storage.

The easiest way to get information from the MIU-1000 is to view the current sensor values through the HTTP interface. This can be accomplished by entering the IP address of the MIU-1000 in a web browser. The HTTP interface can show you the current status and statistics for each sensor connected to your MIU-1000.

## Setting up your MIU-1000 for the first time

Your MIU-1000 will be the point between your wireless sensors and the local area network. The purpose of the MIU-1000 is to log data and make it available at a central point on your network. Since the sensors themselves do not store traffic data, the MIU-1000 is essential to the proper operation of a pedestrian counting system.

## Connections

There are two ways you can connect to your MIU-1000 device for configuration. If you have a serial port on your computer, you can use a cross-over or “null modem” serial cable (**Connecting with a Serial Cable**) to connect to the serial port on the MIU-1000. If not, then you will need to use a cross-over Ethernet cable to connect to the Ethernet port on the MIU-1000 (use a straight through cable when connecting to a LAN; use a crossover cable when connecting directly to a PC). The serial connection is easiest since you don’t need to make any changes to your computer’s configuration to use it.

### Connecting with a Serial Cable

First, make sure you have a serial port available on your PC. The serial port is a 9-pin communication port with male connectors on the back of your PC (**Error! Reference source not found.**). Many laptops are no longer equipped with a serial port. So, consult your manufacturer’s specifications before proceeding.

The cable you use to connect between your PC and the MIU-1000 must be a cross-over or “null modem” serial cable. The difference between the null-modem and regular serial cable is that the transmit and receive lines are cross linked in a null-modem cable. If you don’t have a cross-over or “null modem” serial cable, you can order one by contacting [sales@trafsys.com](mailto:sales@trafsys.com) or you could make your own using the pin-outs supplied in **Appendix A: Null Modem Pin-Out**.



If you have everything you need in place, connect the MIU-1000 directly to your PC using the cross-over serial cable. You are now ready to use the diagnostics software to configure the MIU-1000.

### Connecting with a Cross-Over Ethernet Cable

A cross-over Ethernet cable can be used to connect between the Ethernet port on the MIU-1000 and the Ethernet port on your pc. Like the cross-over serial cable, the cross-over Ethernet cable has the send and receive wires crossed. Cross-over Ethernet cables are available in many stores that sell computer parts. You can also create your own cross-over Ethernet cable using the pin-outs supplied in **Appendix B: Ethernet Crossover Cable Pin-Out**.

Connect the cross-over Ethernet cable between the Ethernet port on your PC and the Ethernet port on the MIU-1000. You will need to unplug your computer from the local network to make this connection.

To complete the connection, you will need to change the TCP/IP settings on your PC and/or the settings in the MIU-1000. The default IP address for the MIU-1000 is 192.168.1.55, subnet mask of 255.255.255.0 and port 1000. You will need to set the computer’s address to an address on the MIU-1000’s subnet. To change the IP settings on a computer running the Windows operating system, follow these steps: select the following ‘Control Panel → Network - > TCP/IP’; select the TCP/IP service for your network card; choose ‘Properties -> IP Address’; choose ‘Specify an IP Address’ (example: 192.168.1.40 255.255.255.0); and fill in the initial values for the subnet mask and IP address. Restart the PC and run CMD from the run command, then run IPCONFIG to verify the changes.

## Configuring the MIU-1000

If you plan to use the MIU-1000 with a Traf-Sys reporting system, then you must use the following guidelines to configure your MIU-1000. If you plan to customize the MIU-1000 for your own application, see the full manual for the MIU-1000 for the command dictionary and features. Contact [support@trafsys.com](mailto:support@trafsys.com) if you wish to request the MIU-1000 manual.

In order to configure the MIU-1000, we recommend you use download the MIU-1000 Config program available at <http://sw.trafsys.com/miu1000config/>. This program will provide a front-end to many of the features available in the command-line interface on the MIU-1000.

Once installed, launch the MIU-1000 Config program and select the connection type you are using to connect to the device. The connection will depend on how you are connecting to the device.

If you are connecting with a serial cable, select “Serial” as the connection type, then the number of the serial port as the port number.


If you are connecting with a crossover Ethernet cable or over a network, select “Network” as the connection type, then enter the IP address of the device (default: 192.168.1.55).

If your MIU-1000 device is connected to a network, but you are unsure of what IP address it may be using (DHCP), you can use the “Find MIU-1000” button in the MIU-1000 Config program to search your network for compatible MIU-1000 devices. The program may take a minute or two to search for MIU devices, and then it will list all available devices on the local network.

Click the connect button to connect. The status label next to the connect button will display “Connected” if the connection is successful. The toolbar menu on the left-hand side of the screen will only be enabled while you are connected to a device.

## Applying Traf-Sys Default Settings

Click the Traf-Sys Defaults button

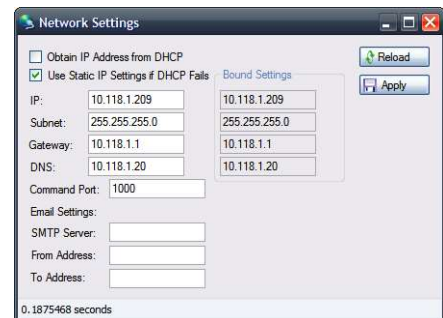
 **Traf-Sys Defaults** on the toolbar menu to open the Traf-Sys Defaults screen.

Select the correct time zone for the location where the MIU-1000 device will be installed. If the time zone uses Daylight Savings Time, make sure that option is checked.

If your MIU-1000 data is hosted by Traf-Sys, make sure the option to “Publish to Traf-Sys Hosted Servers” is checked. This will configure the MIU-1000 device with the proper settings for sending data to the Traf-Sys Data Center. **Make sure you are using a Traf-Sys Hosted solution before checking this setting.**

Click “Apply” to clear all current settings and apply the Traf-Sys default settings. This may take a few minutes to process. This action DOES NOT change the network settings of the device. So, if you are connected to the MIU-1000 over a network, you should still be able to access the device after applying defaults.

When the defaults have been applied, you will be prompted to edit the Network Settings and the Sensor Table.



## Network Settings

You will be able to setup the MIU-1000 with static network settings or use DHCP. Enter the appropriate settings for your network in the provided fields. For Traf-Sys applications, the TCPIP port will always be set to Port **1000**. If you are using DHCP, make sure you delete the gateway entry from the network settings then click “Apply” before setting DHCP.

The currently bound settings will appear to the right of the settings you entered. These are the settings the device is currently using either through DHCP or static entry. If you notice the settings are incomplete, you may have a problem with your network connection or settings. Contact your local network administrator for help with obtaining proper network settings.

If you are connected over a network to the MIU-1000 and change the network settings, you may receive an error. This is due to the connection being lost. The software will automatically close the connection and you will need to re-connect with the new settings. **When applying new network settings, it is recommended to reset the power to the MIU-1000.**

**Warning: You should not use DCHP with SiteCount or VisiCount Receiver. These programs require a static IP address for your MIU-1000 to be able to retrieve data.**

## Email Settings

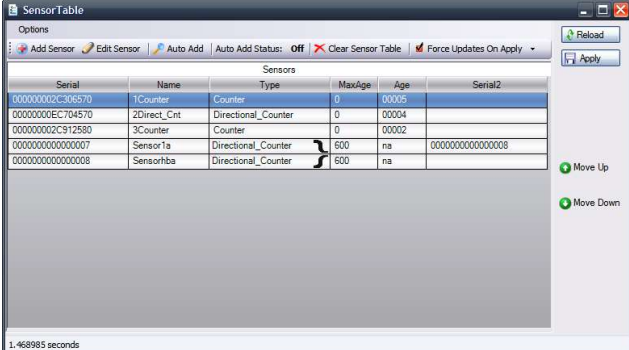
It is not necessary to configure Email settings for Traf-Sys applications. The e-mail settings are used for alert functionality built into the MIU-1000. You can configure sensors to send an e-mail alert when a sensor reaches a maximum age (offline), when a service button is pressed, or when a sensor returns to online status. or more information, see the section on “Events and Alarms”

in the MIU-1000 programmers manual.

## Sensor Table

The Sensor Table is where you can “connect” sensors to your MIU-1000. In order to record the data, the MIU-1000 needs to know where the data is coming from. Each sensor has a unique 16-character ID that can be entered in the Sensor Table. This ID is sent in each data packet from the sensors themselves. If the ID exists in the sensor table, the MIU-1000 will read the ID and record the updated data for that sensor.

Click the “Sensor Table” button on the main menu. Attached sensors will appear in the Sensor Table with the details for the currently selected sensor on the right. There are two ways you can add sensors to the sensor table, manually or auto-add.



The screenshot shows the 'SensorTable' application window. It features a toolbar with buttons for 'Add Sensor', 'Edit Sensor', 'Auto Add', 'Auto Add Status: Off', 'Clear Sensor Table', and 'Force Updates On Apply'. Below the toolbar is a table with columns: Serial, Name, Type, MaxAge, Age, and Serial2. The table contains four rows of sensor data. To the right of the table are 'Move Up' and 'Move Down' buttons. At the bottom left of the window, it displays '1.468985 seconds'.

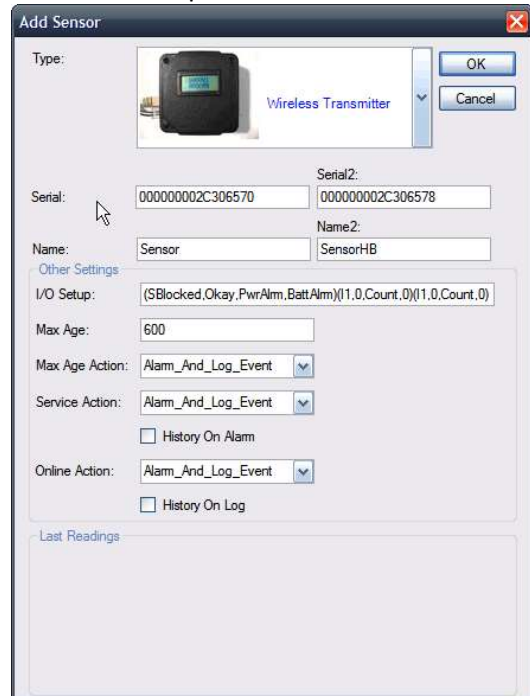
Serial	Name	Type	MaxAge	Age	Serial2
0000000003802570	1Counter	Counter	0	000253	
00000000EC704570	2Direct_Cnt	Directional_Counter	0	00004	
000000002C912580	3Counter	Counter	0	00002	
0000000000000007	Sensor1a	Directional_Counter	500	na	0000000000000008
0000000000000008	Sensor1ba	Directional_Counter	500	na	

## Manually Adding Sensors

To manually add a sensor, click the “Add a Sensor” button on the top toolbar of the sensor table window. Select the sensor type (Counter, Directional Counter, or Wireless Transmitter), from the dropdown, then enter the sensor ID and a descriptive name for the sensor. The sensor name is limited to 16 characters.

**Note for Wireless Transmitters:** When adding a Wireless Transmitter manually, you will need to enter a two serial numbers and names. Each serial number will appear as a separate entry in the sensor table. The first entry will be the sensor that contains the count information and the second contains the heartbeat (status) information. Your wireless transmitter should be labeled with two serial numbers.

There are several other properties that can be configured, IO Setup, Max Age, Max Age Action, Service Action, etc. These settings do not need to be changed from their defaults for Traf-sys applications. If you are using a custom application, each setting has a tooltip to describe what it does.



**Note:** In SiteCount, the sensor name will become the location name in the Report Generator, so use a name that will best describe where the sensor is installed.

Click “Add Sensor” and a new sensor will show up in the Sensor Grid. If you are done adding sensors, close the “Add Sensor” window. The sensors are not saved to the MIU-1000 until you click “Apply Changes”. Click “Apply Changes” to write the sensor table to the MIU-1000.

## Auto-Add Sensors

To auto-add sensors, click “Auto Add” button on the top toolbar of the sensor table window. A dialog will appear asking how many seconds you would like to run auto add mode. The default is 10 seconds, but you can make it longer if the sensors you are adding do not show up.

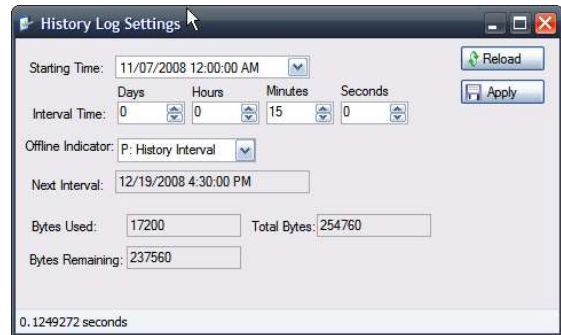


The “Use Service Mode” option will add only sensors that are sending a service packet.

Click “Begin Auto Add” to start Auto Add mode. The timer will count down the number of seconds you specified. When the time runs out, you will see any new sensors added to the end of your sensor table. If no new sensors appear, then no new sensors were detected during the time when auto add mode was active. You may need to increase the time, move your MIU-1000 closer to the sensors or use a wireless repeater.

## History Log Settings

If you've already applied the Traf-Sys Default Settings, then this section should already be setup. Click on the "History Log Settings" button in the main menu. This will show the current History Log settings. The history log is the main function of the MIU and dictates exactly how often to record data on the MIU-1000. ***If the History Log is not configured properly, you will lose data. Changing the history log settings will result in a loss of data on the MIU-1000. Only change these settings when absolutely necessary.***



The Traf-Sys default settings are as follows:

History Log Defaults	
Starting Time	The date/time when logging begins. Typically, today's date if you are setting up a new MIU-1000 device.
Interval Time	15 minutes
Offline Indicator	P: History Interval

The rest of the settings that appear in this window are read-only and cannot be changed.

## XML History Log Delivery Settings

**Note: The following functionality is only needed for Traf-Sys hosted reporting solutions.**

If you are using a Traf-Sys hosted reporting solution, you will need to configure your MIU-1000 to send data to [xml.trafnet.com](http://xml.trafnet.com) over the web. The XML History settings will allow you to configure this connection.

In the MIU-1000 Config program, click on the "XML History Log Delivery" button in the main menu. This will show the current History Log Delivery settings. The Traf-Sys default settings are as follows:

XML History Log Delivery Defaults	
Domain	xml.trafnet.com
URL Path	/Default.aspx
Port	80
Period Base	The date/time when xml deliveries should begin. Typically, the date/time when you are setting up the MIU-1000 device.
Tries	2
Retry Time	120 seconds
Position	The current position in the history log. Typically this is the current date/time.

Click "Apply" to save these settings to the MIU-1000.



You can test the ability of the MIU-1000 to send data over the web by clicking the “Force Output” button. This will force the MIU-1000 to send the most recent history log records to the remote website. Any errors will appear at the bottom of the window in red. If you receive an error, you may want to check the domain and url path settings. Also, you can check to see if the MIU-1000 can reach the target website by going back to the main menu and in the “Command Console” section, enter “**pingxml.trafnet.com**” (**Note:** there is no space between the command and the address) and click “Send”. The return message should indicate that the domain name resolved, but the ping failed. If the MIU was unable to resolve, you are experiencing a DNS error. Check the network DNS settings on the MIU-1000.

You can also view the last date/time your MIU-1000 access the Traf-Sys website at the following web address: <http://xml.trafnet.com/publishstats.aspx>. Enter the MAC address of your MIU-1000 and click submit. The information on the page will show you if the MIU has reached the website previously and the last date/time it was able to reach the site.

If you are experiencing any issues getting your MIU-1000 to reach the website, contact [support@trafsys.com](mailto:support@trafsys.com).

## Checking the Current Status of Your Sensors

You can check the current status of the sensors attached to your MIU-1000 any time using the web interface available on the MIU-1000. If you know the IP address of your MIU-1000, you can type the IP address in a web browser and you will get a listing of your sensors with the current status and most recent counts.

To determine if a sensor is working properly, check the status string under the “Last Reading” column. The status should read “Closed”, “Open” or “Okay”. These are all positive status indicators. If your sensor has a “Blocked” reading, your beam sensor may be physically blocked or one of the beam sides is either turned off or the batteries have failed.

You can also see if a sensor is offline by checking the Age value for each sensor. The age value is the number of seconds since the last packet was received by a sensor. Normally, this value can be between 10 seconds and 180 seconds depending on the sensor technology (some sensors will send wireless data less frequently to conserve battery life). If you see a large age value, you should check the sensor to see if it is powered on and working correctly. If the sensor is powered on and working correctly then you may have a wireless transmission problem where the sensor is unable to reach the MIU. In this case you may need a repeater to repeat the signal to the MIU. If you already have a repeater, check the repeater to make sure it is powered on.

<b>MIU-1000</b>		
12/06/07 13:05:22 (UTC -5)		
<a href="#">I/O Status</a>	<a href="#">Events</a>	<a href="#">Control Status</a>

### I/O Status

Sensor	ID	Age Srv	Last Reading	Units
1Direct_Cnt	0000000088366544	10	Blocked 0 0	state count count
2Direct_Cnt	00000000FC803670	4	Okay 66 111	state count count
3Counter	0000000030803670	19	Closed 139 803	state count open s
4Counter	0000000098908660	2	Closed 0 4341760	state count open s
5Counter	000000001C134560	7	Closed 3229 7459072	state count open s

## Testing the Accuracy of Your Sensors

The web interface of the miu-1000 is also useful for checking the accuracy of your sensors. You will be able to see the current counts from each sensor as they are received by the MIU-1000. When checking your sensors, make sure that the age value for your sensors does not reach a high number. The age value is the number of seconds since the last packet was received by a sensor. For best results, your age values shouldn't be much higher than 10 seconds before reaching zero (age = 0 when the MIU-1000 receives a packet from that sensor).

When testing your sensors, it is best to view the MIU-1000 status page while you have a view of the entrance where your sensors are installed. This way, you can watch as people move through the detection area of your sensors and see the data that is sent to the MIU-1000. If you can't view both the status page and the entrance at the same time, have someone assist you by monitoring the entrance and letting you know how many people passed through the detection area. You can then, check the status page to see if those people were recorded correctly.

On the status page, each sensor has a last reading. The Last Reading for each sensor shows the current status and current cumulative counts for your sensors. If you are using directional sensors, the first number under your status is typically the inbound count and the second is typically the outbound count. If your sensors are single direction beams, the first number will be the total number of beam breaks and the second number is the total amount of time the beam has been broken (this number is not recorded in the reporting software). As people move through the entrance, refresh the status page in your web browser and watch for the age to reset to zero. When this happens, your last reading should increase by the same number of people that moved through the entrance since the last update.

## Network Security

When connecting your MIU-1000 to a network, you may have some security concerns. Will this device clog my network with unnecessary traffic? Will it chew up bandwidth? Is it susceptible to viruses? Will I need to change my firewall policy?

The MIU-1000 is a small embedded system with its own file system. The settings on the device can only be modified either by using a direct connection with a serial port or over TCP port 1000 over a network.

The wireless communication between the sensors and the MIU-1000 is not 802.11, but a proprietary format that is only used within this system. The MIU-1000 does not have the ability to interact with an 802.11 system or vice versa. We use a 900 MHz radio for most of our installations, but other frequencies like 2.4 GHz are available should this be a problem.

The MIU-1000 can be configured to either use a static IP address or obtain an address automatically using DHCP.

If you are using a Traf-Sys hosted system, you should not need to make any changes to your firewall policy. As long as a node on your network is able to reach [xml.trafnet.com](http://xml.trafnet.com) over http port 80, the MIU-1000 will be able to send its data. It will only try to send a small xml file (about 2 to 9 kb in size) every 5 minutes. So, it shouldn't be a strain on your sites bandwidth.

If you are using VisiCount Receiver to retrieve data over a WAN, you will need to make sure that your server can reach each MIU over port 1000. This is the communication port used to actively retrieve data from the MIU-1000. The transmission size is only a few kilobytes and the VisiCount receiver program can be configured to retrieve data as often as possible or once every hour. The choice is yours.

## Troubleshooting

Here are some solutions to common problems you may experience with the MIU-1000.

### **My MIU-1000 has stopped sending data to the Traf-Sys website.**

If you are using a static IP address, try to ping the address of the MIU-1000. See if you can view the status page for the MIU-1000 in a web browser. Type the IP address into the address bar of your web browser and hit enter.

- If you can't reach the MIU-1000 over your network:
  - Check with your network administrator to see if there have been any changes to the network. If so, the static IP assigned to the MIU-1000 may no longer be valid. You will need to change the network settings using the diagnostics program and a serial null-modem cable.
  - If using DHCP, try resetting the MIU-1000 by disconnecting the power and re-applying the power.
- If you are able to reach the MIU-1000 on your network:
  - Check the status page and make sure your sensors are listed. If they are not listed, the memory on your MIU-1000 may have been cleared. Contact [support@trafsys.com](mailto:support@trafsys.com) for a replacement unit.
  - See if you are able reach [xml.trafnet.com](http://xml.trafnet.com) on your network.
  - Download the MIU-1000Config software at <http://sw.trafsys.com/miu1000config/> make sure your settings are okay. (See Configuring the MIU-1000)

## VisiCount Receiver or SiteCount Import is not able to download data from the MIU

Try to ping the IP address of your MIU-1000 on the network. See if you can view the status page for the MIU-1000 in a web browser. Type the IP address into the address bar of your web browser and hit enter.

- If you can't reach the MIU-1000 over your network:
  - Check with your network administrator to see if there have been any changes to the network. If so, the static IP assigned to the MIU-1000 may no longer be valid. You will need to change the network settings using the diagnostics program and a serial null-modem cable.
  - Check with your network administrator to see if you can communicate over TCP port 1000 between the MIU and your software. The software needs to communicate over this port to retrieve data.
- If you are able to reach the MIU-1000 on your network:
  - If using VisiCount Receiver, Open the Data Entry program and check the IP address for the specific MIU entry. It may be incorrect.
  - Check the status page and make sure your sensors are listed. If they are not listed, the memory on your MIU-1000 may have been cleared. Contact [support@trafsys.com](mailto:support@trafsys.com) for a replacement unit.
  - Download the diagnostics software at <http://sw.trafsys.com/miu1000config/> make sure your settings are okay. (See Configuring the MIU-1000)

## The data from the MIU-1000 appears in my database with a time stamp that is slower/faster than my pc.

The VisiCount software will synchronize the date/time on your MIU-1000 devices nightly. However, if you feel this is not enough, you can use the Time Update Server feature in the MIU-1000 to allow the device to update with a common time server on your network.

Download the diagnostics software at <http://sw.trafsys.com/miu1000config/> make sure your settings are okay. (See Configuring the MIU-1000)

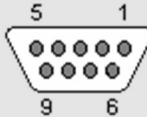
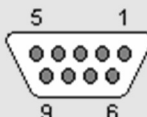


Use the MIU-1000Config program to view the date/time settings for your devices. In the Time Update Server field, enter the name or IP Address of a time update server. For best results use the same time update server settings as your VisiCount server. For more information on configuring a Time Update Server in Windows, see the following knowledgebase article: <http://support.microsoft.com/kb/816042>

**Note:** Just because your MIU-1000 and VisiCount Server are synchronized, this does not necessarily mean your client PC is as well. Check with your local network administrator to see if the time on your client can be synchronized with your server.



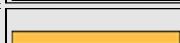
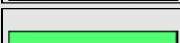
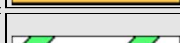
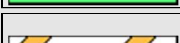


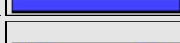
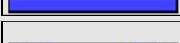


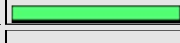



## Appendix A: Null Modem Pin-Out

Use this cable between two DTE devices (for instance two computers).

		DB9 pin D-SUB female to PC1	
		DB9 pin D-SUB female to PC2	
Pin	DB9-1	Pin	DB9-2
2	Receive Data	3	Transmit Data
3	Transmit Data	2	Receive Data
4	Data Terminal Ready	6+1	Data Set Ready + Carrier Detect
5	System Ground	5	System Ground
6+1	Data Set Ready + Carrier Detect	4	Data Terminal Ready
7	Request to Send	8	Clear to Send
8	Clear to Send	7	Request to Send

## Appendix B: Ethernet Crossover Cable Pin-Out

*Cross Over Cable (T568B):*

RJ45 Pin # (END 1)	Wire Color	Diagram End #1	RJ45 Pin # (END 2)	Wire Color	Diagram End #2
1	White/Orange		1	White/Green	
2	Orange		2	Green	
3	White/Green		3	White/Orange	
4	Blue		4	Blue	
5	White/Blue		5	White/Blue	
6	Green		6	Orange	
7	White/Brown		7	White/Brown	
8	Brown		8	Brown	

## Appendix C: MIU-1000 Configuration Requirements

The MIU-1000 Config software requires the following:

- Operating System: Windows 2000/XP Vista
- Microsoft .Net Framework version 2.0
- An available network connection
- An available serial port or serial port adapter (recommended)
- A null modem or crossover serial cable (recommended)

## Appendix C: Resetting the MIU-1000 to Factory Defaults

**Warning: this procedure will clear any data stored on the MIU-1000.**

On each MIU-1000, there is a reset button you can use to reset the memory back to the factory defaults. You should use a paperclip to reach the reset button from the outside of the case.

Depending on the version of your MIU-1000, the reset switch can be located in different locations on your MIU-1000. The reset switch will be a small hole just large enough for a paperclip located near the antenna. Here are some photo examples.

Insert the paperclip into the reset switch access. You should be able to depress a button under the access hole. On some versions, the switch may be difficult to access. The switch in **Error! Reference source not found.** is particularly difficult to reach as the switch is deep beneath the case. You will need to feel around with the paperclip until you reach a button, or remove the top of the case.

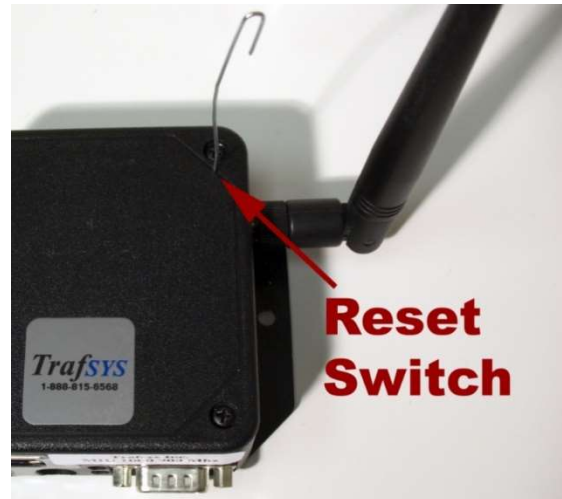
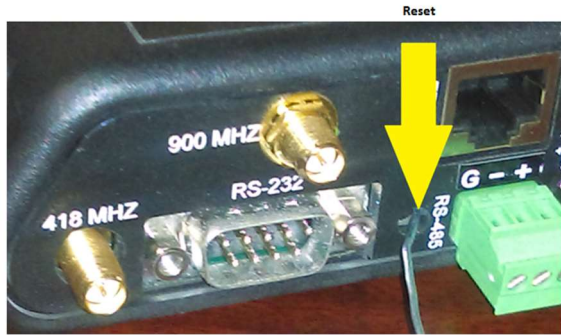
With the paperclip inserted, you should be able to depress a button inside the case. Hold the button down with the paperclip, while plugging in the power adapter to the MIU-1000. When you plug in the power adapter, the red Power indicator should flash on and off. If the power indicator does not flash on and off, remove the power adapter and make sure you are depressing the reset button.

Release the button and the red power indicator should turn off for a few seconds, and then appear on. The MIU-1000 is now set to the factory default settings and should have the following network settings:

IP Address: 192.168.1.55

Subnet Mask: 255.255.255.0





## Contact Information

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