Instruction Manual

for

HVAC Monitor

Model EM01B

Websensor

(Ethernet Port Configurable)

Version 4.2

Esensors Inc
Amherst NY

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WARRANTY

Warranty

Esensors warranties the products to be substantially free of manufacturing defects for a period of 2 years after purchase during which time the product will be replaced without charge if defective.

Limitations

Esensors provides no warranty, expressed or implied, as to the fitness of the products for any particular purpose. Esensors will not be liable for incidental or consequential damages arising from the use of its products.

Instruction Manual for the EM01B Websensor

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Instruction Manual for the EM01B Websensor

Introduction to the EM01B

Esensors, Inc. Websensor EM01B is a new electronic device *classified* as a *Smart Sensor*. Websensor is designed to utilize the Internet to transmit temperature, relative humidity, detect contact closure, power supply voltage information and illumination data from a remote acquisition point to a host computer or hosted database.

Websensor offers built-in signal conditioning and an embedded mini-webserver. Users are able to access the sensor using http: based commands.
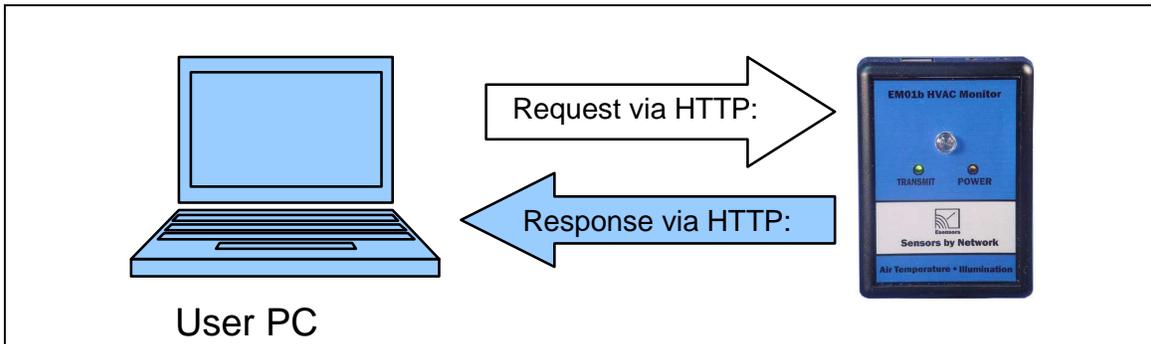

Fig 1. EM01B HTTP: Request/Response

Figure 1 (above) shows Websensor EM01B returning data via a HTTP: response.

How the Websensor EM01B Works

Simply, Websensor's function is to send a response (by a HTTP: message) upon request of a *central website* or from the *User's PC*.

The Websensor EM01B supports a user configurable *IP address.* Websensor's IP address gives it uniqueness on the Ethernet based network which it is attached. It is through the IP address, that Websensor is able to take its' place on the Internet, becoming fully accessible to query by the user.

Websensor consists of a base unit with two communication ports (Ethernet and ESbus).

The ESbus (*Ref.* www.eEsensors.com) combines a networked version of the SPI serial bus and RS232. The ESbus port is used to support a variety of options available for the Websensor while the Ethernet port is the route to the Internet and is used to configure the IP address of the Websensor.

Available options which connect via the Esbus:

- ES02 Digital Power Meter
- ES01 Two Line Display
- ES11 Flood Sensor
- ES06 Optically Isolated Contact Closure and Relay Actuator.

Periodically check www.eEsensors.com for other options as they become available.

How the Websensor EM01B Works

Within the base unit are microcomputers, which handle the Internet protocol, the communication ports, and the sensor and sensor signal conditioning. The Websensor has no switches, keyboard or display because it functions as a sensor, not as a computer.
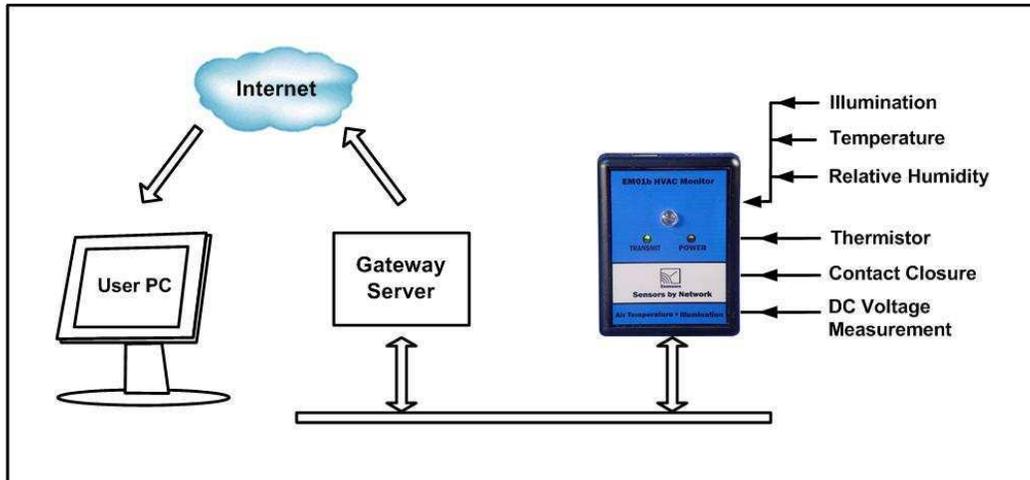

Figure 2 – How Websensor works.

Compatibility with Earlier Websensors

Compatibility with the earlier models of Websensor has been maintained. Any version of the Websensor will always return temperature, relative humidity and illumination data by sending:

http://192.168.254.102/index.html?em

Websensor Kit Inventory

Included in the Websensor EM01B Starter Kit (Model SK2) are the following items:

Quantity	Description
1	Websensor EM01B Module [See PIX1].
1	Wall Transformer which is selected for use in the country that the Websensor is [See PIX2].
1	Ethernet straight-thru cable for connection to an Ethernet Hub (Blue cable) [See PIX3].
1	Ethernet crossover cable for direct connection to a Network Interface Card on a PC (RED cable with YELLOW boots or solid GRAY) [See PIX4].
1	Connector (plug) for contact closure - thermistor port [See PIX5].
1	CD which contains the plug-in's written in PERL and C, instructions and example of configuring the plug-in's and a softcopy of the User's Manual and a hard copy of the User's Manual[See PIX6].

Reference PIX 1 through PIX 6 which show the items that are included in the Websensor Starter-Kit (SK-2).
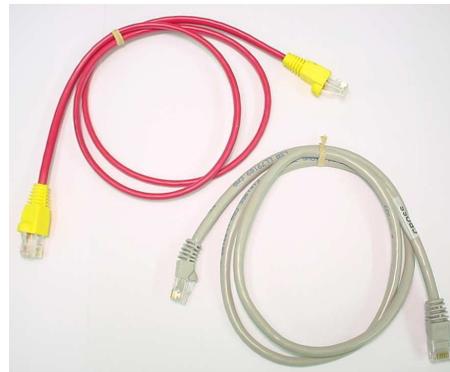
Websensor Kit Inventory

PIX 1. EM01 Websensor	PIX 2. Wall Power Supply
PIX 3. Straight Patch Cable	PIX 4. Crossover Cables
PIX 5. Plug - Contact Closure	PIX 6. Manual & CD

Websensor Hook-up

How to connect a Websensor

To configure and use a Websensor it must be connected to a PC via an Ethernet cable as shown in either figure below.

If connecting directly to a PC, a crossover type Ethernet patch cable must be used. A crossover type Ethernet cable has been included with the Websensor. It is either a solid GRAY cable or a RED cable with YELLOW boots.
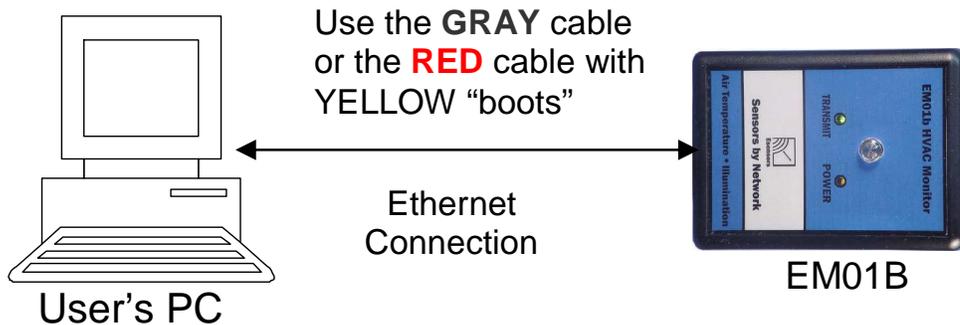

Figure 3 - Websensor connected directly to the NIC in a PC

If connecting to a PC through a HUB, a "straight" type Ethernet patch cable must be used between the HUB and the Websensor. A "straight" type Ethernet patch cable is also included with the Websensor; it is the BLUE patch cable.
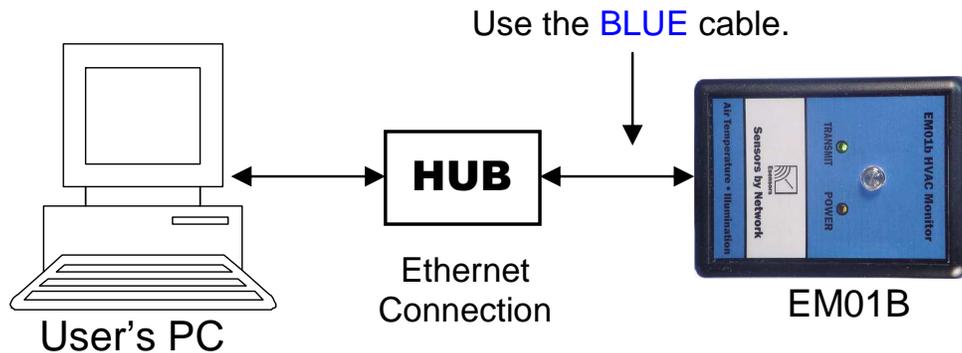
Figure 4 - Websensor connected through a HUB to the NIC in a PC.

Websensor Hook-up

Figures 1 and 2 below depict the locations of the connectors for the Ethernet, 9VDC power and Esbus connectors.
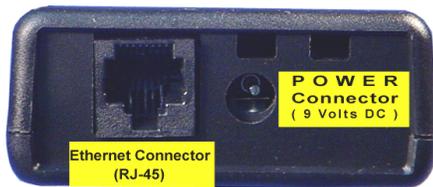
Figure 5 - Ethernet (RJ-45) & Power Connectors.

Figure 6 - Esbus Connector (RJ-11).
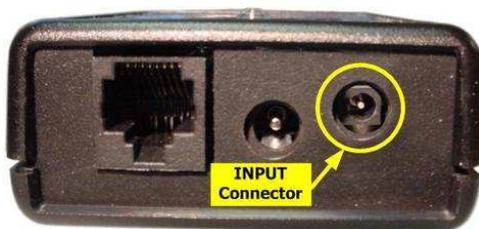
Figure 7 – Thermistor, Voltage Measurement and Contact Closure input connector.

Figure 8 – Location of RESET PUSHBUTTON.

HELPFUL HINT: Prior to assigning Websensor's IP address, it may prove useful to confirm that the IP address chosen for Websensor is not being utilized by another device on the network. This is easily checked by *pinging* the selected address on the network that the Websensor will be connected to prior to connecting the Websensor to the network.

Instructions on how to issue a *ping command* are given in the section titled: "Testing Websensor's IP Address" (Page 25).

Programming Websensor's IP Address

Programming the IP address

Programming the IP address into Websensor is performed by using a browser to issue the following command:

http://192.168.254.102/index.html?eipaaabbbcccddd , where aaabbbcccddd is the new IP address of the Websensor.

For example, suppose the new address to be assigned to the Websensor is 192.168.10.20 . The command to perform this change is:

> http://192.168.254.102/index.html?eip192168010020

As the new address is entered, each octet must have three digits.

After programming is complete, the command to access the Websensor would be:

> http://192.168.10.20/index.html?em

NOTE: Once the command to change the IP address is issued the Websensor will automatically reset itself. After the reset process completes, the new IP address will be in effect.

How to recognize a Websensor RESET

When a Websensor resets (initializes) the following LED lighting sequence will occur:

- Only the POWER LED will be on for approximately 5 seconds

- Both POWER and TRANSMIT LEDs will extinguish for approximately 5 seconds.

- Both POWER and TRANSMIT LEDs will flash two (2) times as the Websensor "resets".

- Finally, only the POWER LED will remain ON.

Programming Websensor's IP Address

FAQs Regarding IP Address Changes

Q: What if I forget what IP address is programmed into a Websensor, is there anyway to retrieve it?

A: There is no command that can be issued to a Websensor that will cause the Websensor to reveal its assigned IP address. If the assigned IP address is forgotten, the only recourse is to press the reset button for ten seconds, thus restoring the default IP address of 192.168.254.102

Q: Why can't I read the Websensor's new IP address?

A: The most likely reason is that the IP address on the NIC (network interface card) on the PC used to program the Websensor is outside the IP address Class of the new IP address programmed into the Websensor.

For example, if 192.168.254.102 (default IP address) is used to program the Websensor and the new IP address is something like 141.123.6.10, it would be necessary to change the IP address of the NIC card to the 141.123.X.X subnet. Once the IP address used by the PC is changed to the same subnet/class as the Websensor, there should be no problems communicating with the Websensor.

Selecting Units of Temperature

To establish the units which temperature is reported, either Fahrenheit or Celsius, perform the following:

For temperature in Fahrenheit use a browser to send this command,

http://192.168.254.102/index.htm?etpF

For temperature in Celsius use a browser to send this command,

http://192.168.254.102/index.htm?etpC

Note: The temperature unit selection setting applies to both the temperature sensor provided with the Websensor and the thermistor temperature readings.

Websensor Functions

Websensor's New Functions

Websensor now offers three (3) new functions to the User. At the time of purchase only one of the functions can be configured because all three functions utilize the same hardware port on the microcontroller and each one requires a specific modification to the Websensor hardware.

The Websensor will come pre-configured pending which function is selected. If no function is specified then the Websensor will come with the 'Contact Closure' option configured.

Contact Closure

The Contact Closure option was included to detect the opening of a server rack door (intrusion). However contact closure detection can be used for many applications other than security.

Connection to the Websensor is made via a small plug (3.5mm outside X 1.0 mm pin) which is inserted as show in Figure 7 (Page 7). The circuitry is such that the Websensor is looking for a 'closed loop', or completed connection (closed circuit).

CUI PP-002C
(DigiKey CP-002C-ND)

Magnetic door switches (closed loop type) are available from many sources including Radio Shack.

Websensor Functions – Contact Closure

When the loop (connection) is broken, the Websensor will 'latch' on the open condition. In the event a door is quickly opened and closed in between Websensor scans (polls), the 'open condition status' is captured (latched) so that an ALERT can be generated by the polling software (e.g. Nagios).
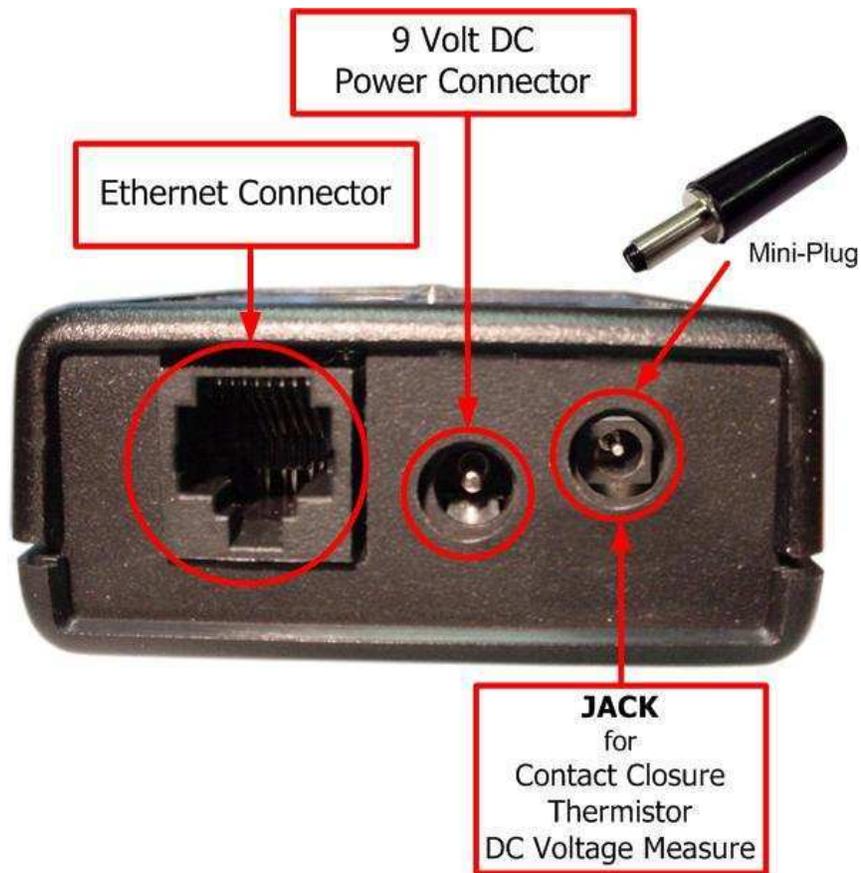

Figure 9 - Location of Contact Closure Jack & Plug

If your Websensor is purchased with the Contact Closure feature configured the following step was already performed during testing. To assure that the correct firmware is enabled type the following command:

http://192.168.254.102.index.html?eFC

Websensor Functions – Contact Closure
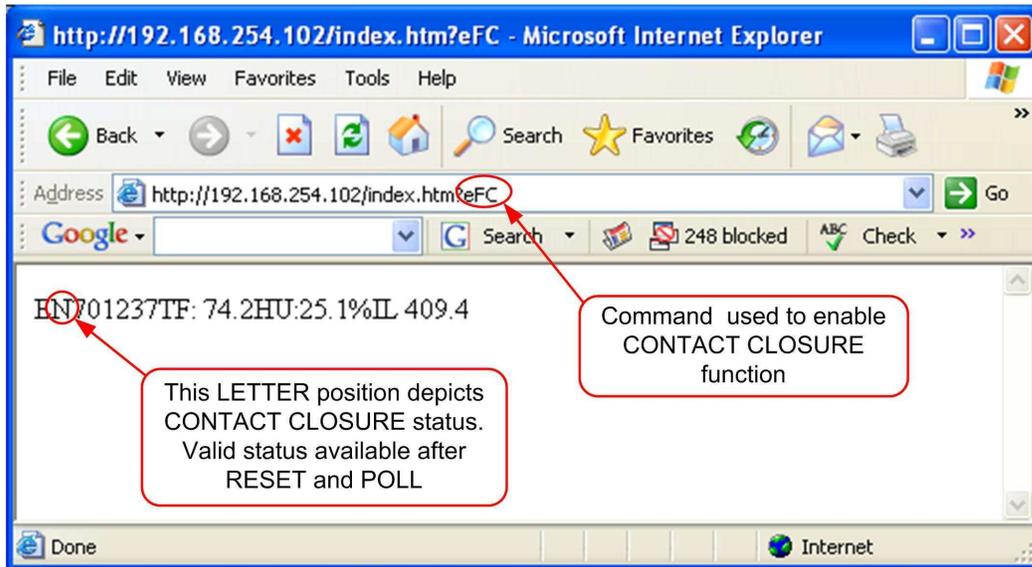
Figure 10 - Command enabling Contact Closure

Once this command is entered the Websensor will go through a RESET sequence.

Note that the 'second character' in the command string indicates whether the Websensor detects the contact (switch) as being open or closed.

'W' indicates the contact/switch is closed – see Figure 12.

'N' indicates that the contact/switch has been opened – see Figure 13.

Note: The initial 'contact closure' information returned is not valid at the time the ENABLE command is sent. Any requests sent AFTER the function ENABLE and Contact Closure RESET commands will contain valid contact closure status.

In Figure 12, the string returned indicates contact closure (switch closed / loop unbroken) as well as temperature in Fahrenheit, relative humidity and illumination information.

Websensor Functions – Contact Closure
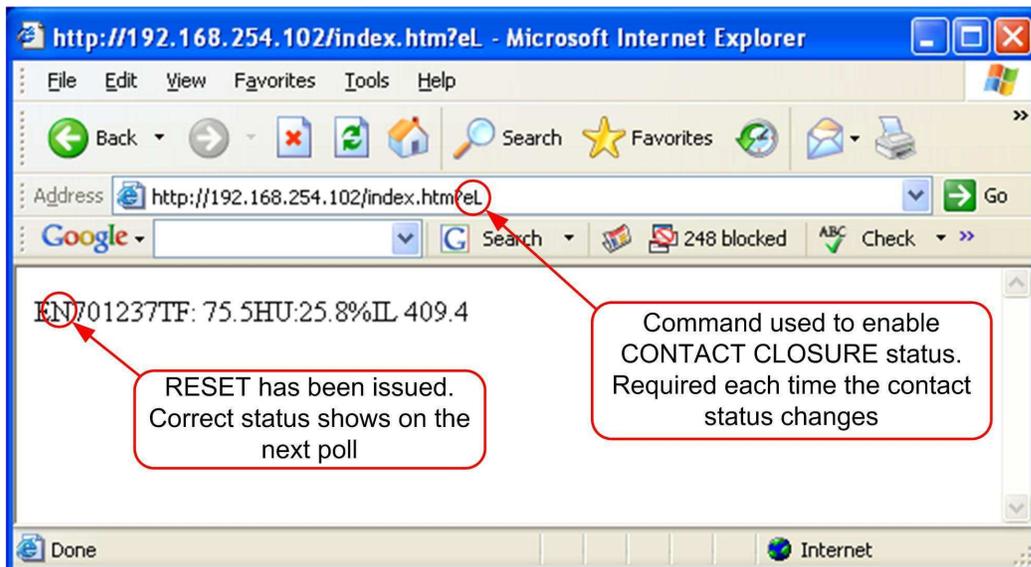
Figure 11 Contact Closure RESET command issued
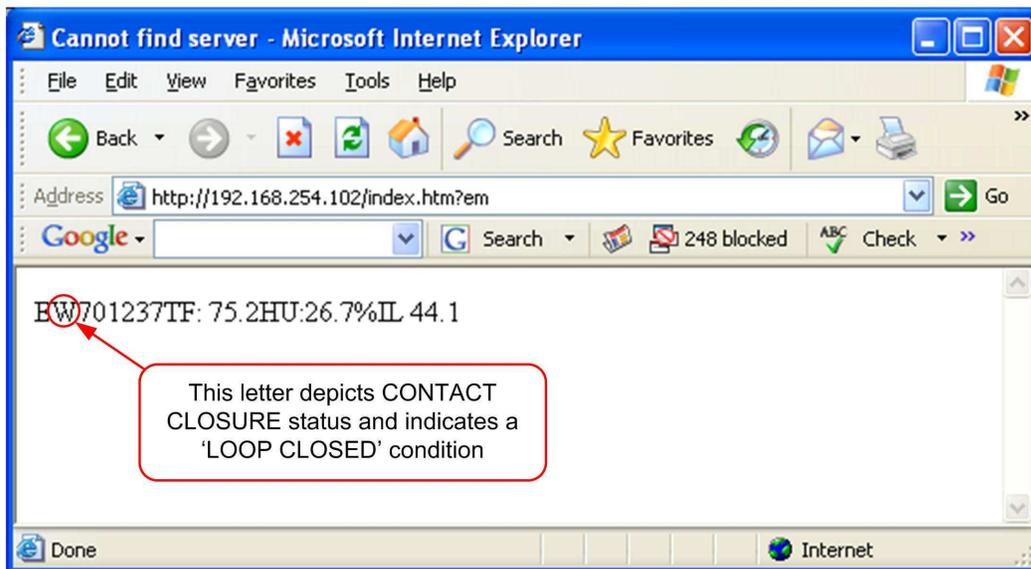
Figure 12 Valid Contact Closure status showing switch closed after resetting.

Note: Contact Closure status is VALID after the command is issued

Websensor Functions – Contact Closure

Figure 13 shows a regular command being issued, but this time the 'N' indicates that the switch has opened (loop broken) even if only momentarily.
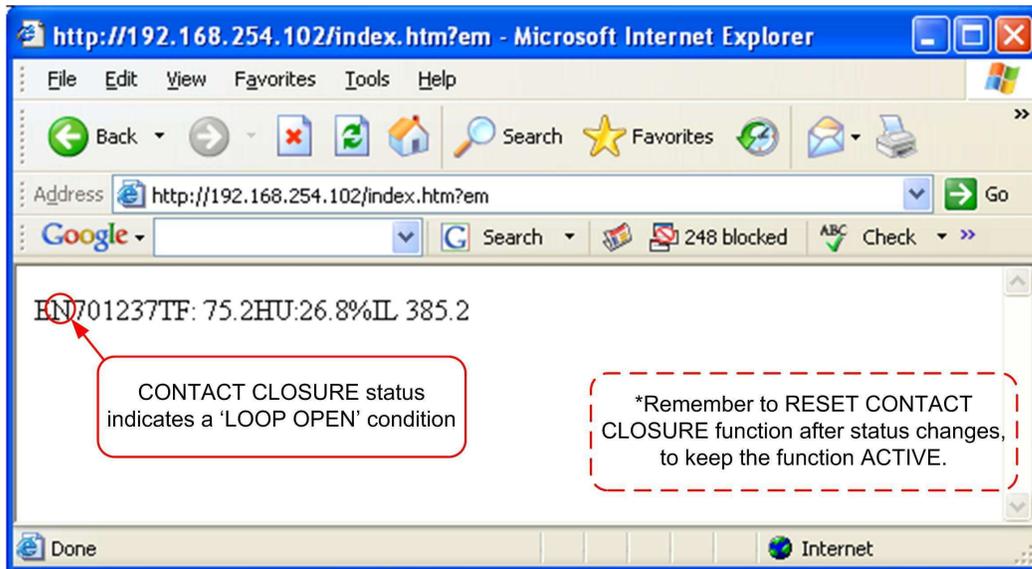
Figure 13 Open switch or open loop indication.

Note: Contact closure can only be reset after the switch (loop) has been restored to a closed condition.

Note: Should the Websensor lose power or have its power recycled, the Websensor will report an open switch/loop condition and will need to be reset by using the 'eL' command.

Thermistor Interface

The Thermistor Interface permits the User to utilize an additional external temperature sensor with Websensor. An example might be to use a thermistor sensor suitable for immersion in liquids.

If the thermistor interface feature is desired it must be indicated at the time the Websensor is ordered so that the correct hardware options are enabled prior to shipment.

Prior to using the Websensor Thermistor Interface for the first time, the following command should be issued to assure the correct firmware is selected for operation.

http://192.168.254.102/index.html?eFR
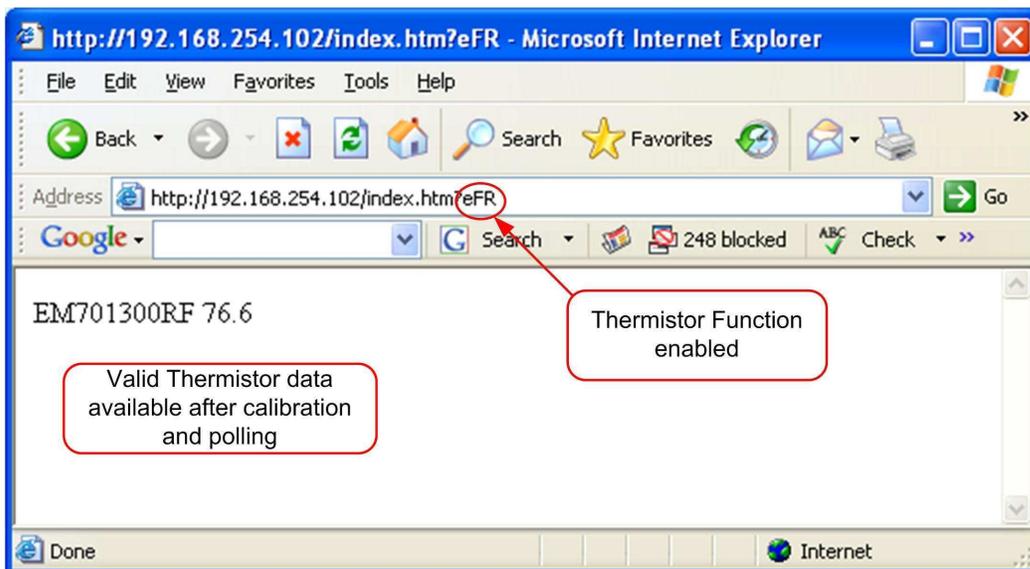
Figure 14 Command used to enable Thermistor function.

Websensor Functions – Thermistor Interface

Once this command is entered the Websensor will go through a RESET sequence.

Before accurate thermistor readings can be taken, it will be necessary to calibrate the Websensor by accurately measuring the temperature which the thermistor sensor is reading. If the thermistor sensor is measuring liquid, either a thermometer or other electronic temperature reading device must be used to capture the temperature being read by the thermistor.
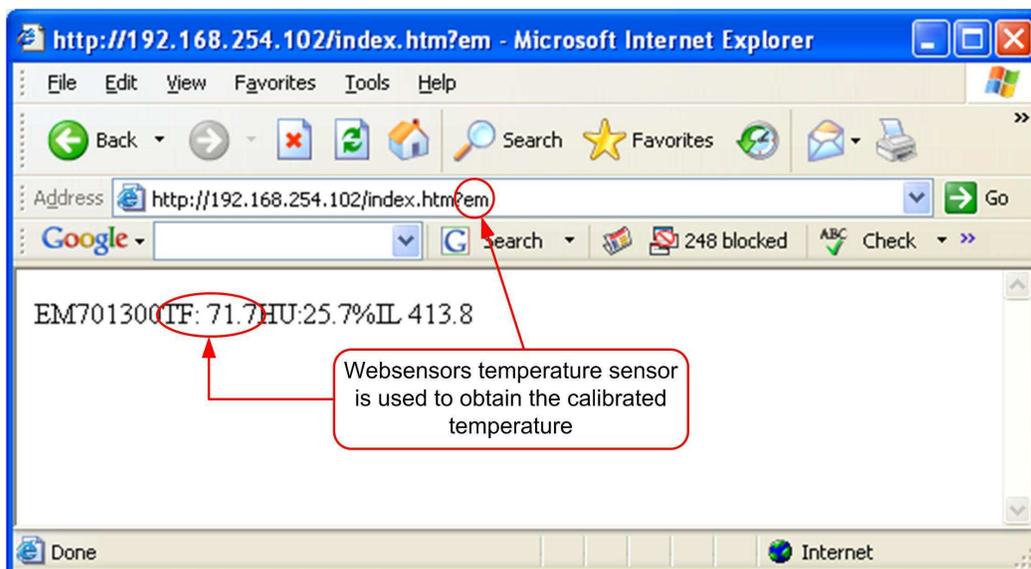
Figure 15 - Using Websensors own temperature for calibration.

Once the calibration value is known, enter it into the Websensor using the following command:

In this example, the value 70.500 degrees Fahrenheit will be entered,

http://192.168.254.102/index.html?er70.500

Note: All temperatures entered must be of the format **.***

Figure 16 - Calibration temperature is entered.

An example of entering a Celsius temperature of 25.5 degrees would be:

http://192.168.254.102/index.html?er25.500

Note: Websensor Temperature Units should be selected prior to temperature calibrations.
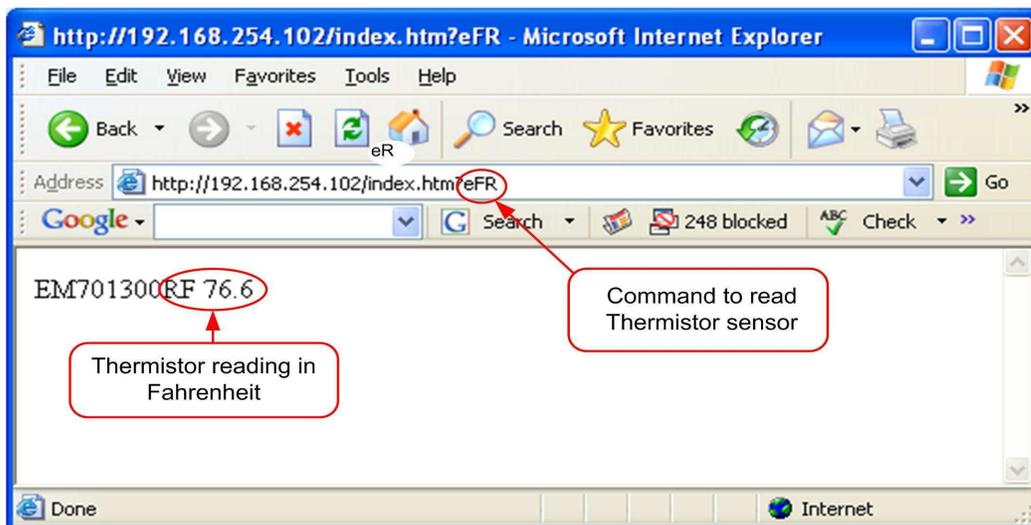
Figure 17 - How to obtain a Thermistor reading.

Measure Voltage (DC) with Websensor

The Measure Voltage feature permits the User to read a DC voltage with Websensor. The range of DC voltage that can be measured is 0.0 VDC to +18 VDC.

This feature can been used to monitor the Websensor's supply voltage in applications where the Websensor located remotely and is being powered by a battery.

Note: The Websensor is normally configured to measure its own supply voltage. However the Websensor can be ordered and configured so that an external DC voltage source can be measured.

Prior to using the Websensor Measure Voltage feature for the first time, the following command should be issued to assure the correct firmware is selected for proper operation.

http://192.168.254.102/index.html?eFV
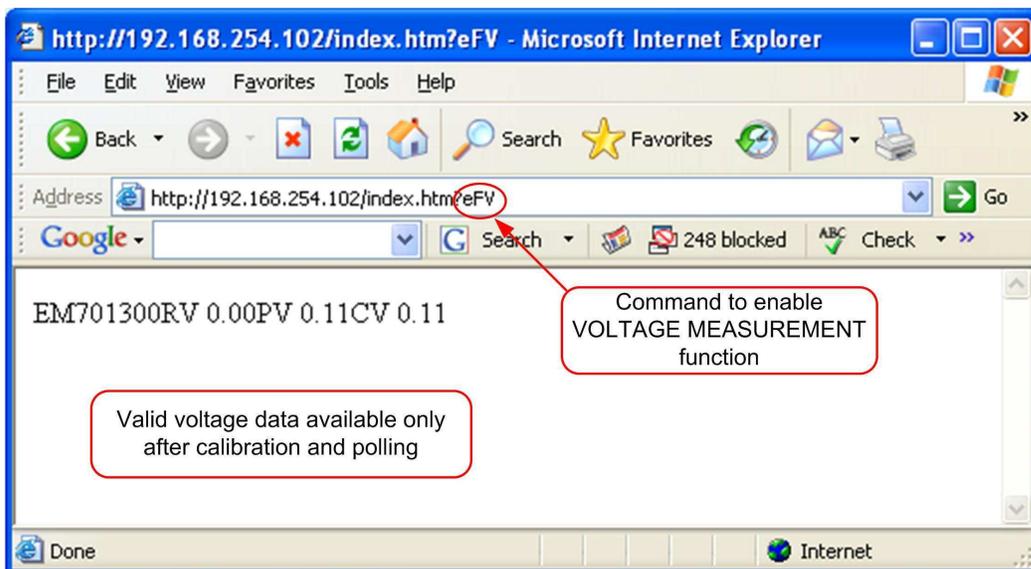
Figure 18 - Command to enable DC Voltage Measurement.

Websensor Functions – Measure Voltage

Similar to the other features, it is necessary to specify the 'Measure Voltage' feature at the time the Websensor order is placed. Each Websensor feature requires that the hardware and firmware be correctly configured.

Before accurate DC Voltage readings can be taken, it will be necessary to calibrate the Websensor by using a DVM (digital volt meter) to accurately measure the DC Voltage which the Websensor will be reading.
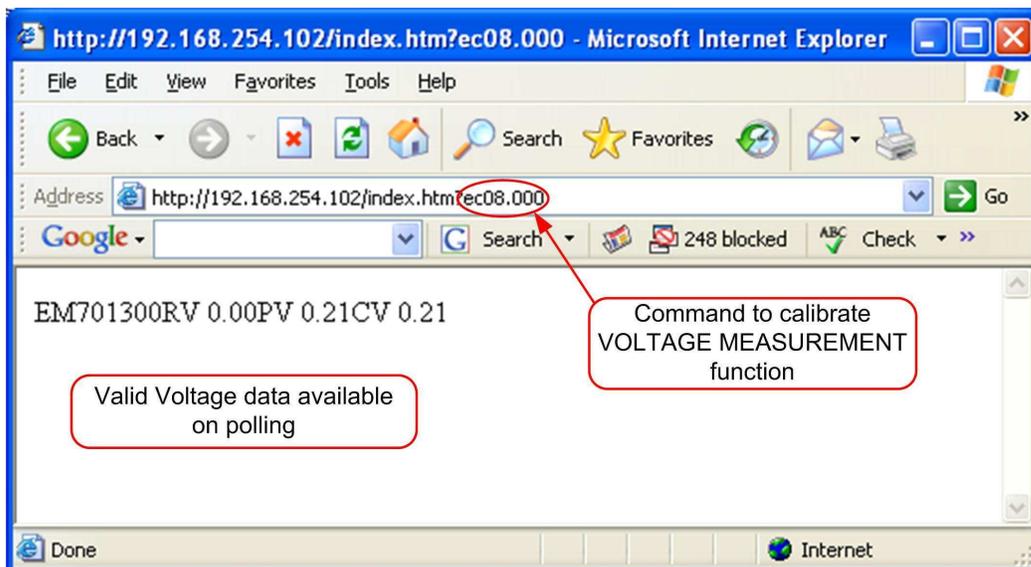
Figure 19 - Command to calibrate DC Voltage Measurement.

Once the calibration value is known, enter it into the Websensor using the following command:

In this example, the value 8.00 volts DC will be entered. The voltage must be entered in the format **.***

http://192.168.254.102/index.html?ec08.000

Websensor Functions – Measure Voltage

Once calibrated the Websensor command to read DC voltage is:
http://192.168.254.102/index.html?ev
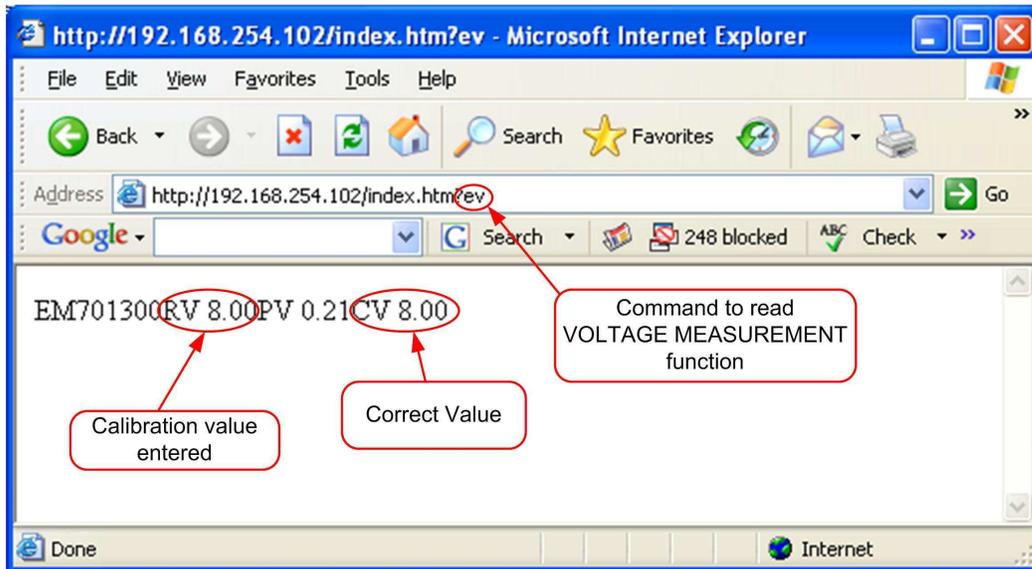
Figure 20 - Command to Measure DC Voltage.

Connector Connections

The connections to the connector should be made such that the center pin goes to the positive (+) polarity.
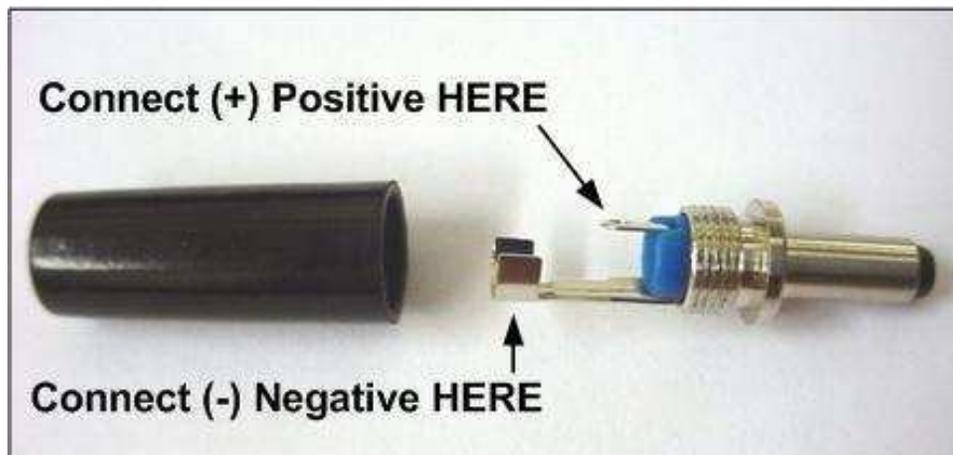
Websensor Command Summary

Function	Command	Description
Change IP Address (Page 8)	e**ip**aaabbbcccddd	Change Websensor IP to: aaa.bbb.ccc.ddd Example: 192.168.1.10 would be entered as: e**ip**192168001010
Select UNITS of Temperature (Page 10)	e**tpX** where: **X**=C **X**=F **Note:** **All commands are case sensitive.**	Format for selecting the units which the Websensor uses to report temperature.
	e**tpC** e**tpF**	Temp Unit is °C Temp Unit is °F
Read Data from the Websensor	**em**123456 or simply **em**	HTTP: query to obtain temperature relative humidity and illumination

Websensor Command Summary (cont'd)

Function	Command	Description
Change Function (Page 11)	eF**x** where: **x**=V (voltage) **x**=R (Thermistor) **x**=C (Contact Closure) **Note:** **All commands are case sensitive.**	Format for the different commands issued to Websensor
Thermistor temperature (Page 16)		
Reading	e**R**	Read Thermistor
Calibrate	e**r****.***	Calibrate Thermistor value Where **.*** is the format which the temperature is entered
Voltage Measurement (Page 19)		
Reading	e**v**	Read Voltage
Calibrate	e**c****.***	Calibrate Voltage Where **.*** is the format calibration voltage which is entered.
Contact Closure (Page 11)	e**L**	Reset Contact Closure latch

RESETTING the Websensor's Settings to default

To reset the Websensor settings to the default value perform the following steps:

1. Locate the small hole on the side of the Websensor (see PIX below).

2. Use a small object like the end of a straightened paper clip to gently press the reset button only until both LEDs on the Websensor start to flash.

Once the reset is completed the Websensor should be set to a default IP address of 192.168.254.102. From this address the User can configure the IP address of the Websensor to the desired value.

Figure 21 – Location of the RESET button on the Websensor.

Testing the Websensor's IP ADDRESS

Once the Websensor has been configured, it is a good idea to confirm the IP address selected during the configuration process has been properly entered. One way to do this is to "ping" it.

Connect the Websensor to a PC via an Ethernet cable as shown on Page 6.

Open a Window with a "Command Prompt".

START > ACCESSORIES > COMMAND PROMPT

In the "Command Window" type the IP address you entered in configuration Step 1. In this example we are using 192.168.0.10

        ping 192.168.0.10

The IP address shown in the example is only for example. The IP address entered during configuration should be used for this test. See the Command Window.
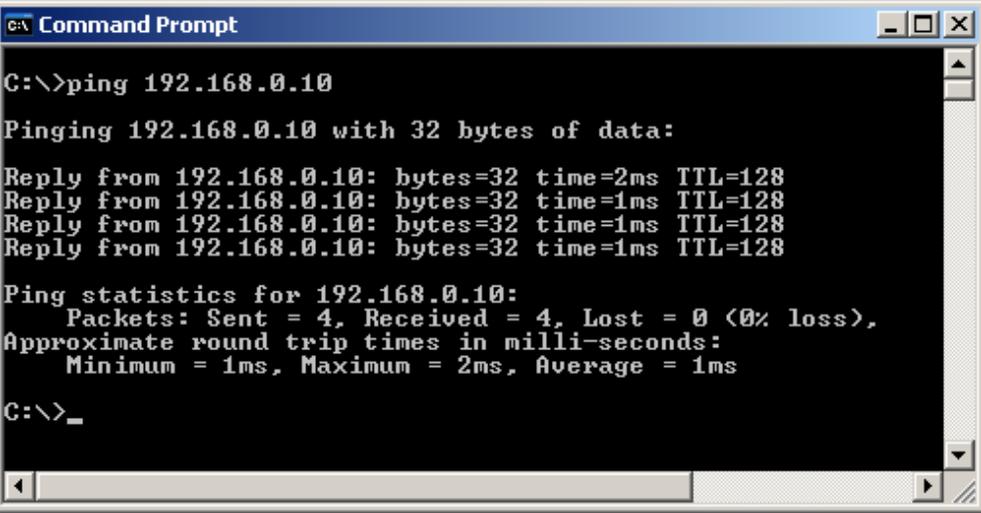

```
Command Prompt                                              _ □ X

C:\>ping 192.168.0.10

Pinging 192.168.0.10 with 32 bytes of data:

Reply from 192.168.0.10: bytes=32 time=2ms TTL=128
Reply from 192.168.0.10: bytes=32 time=1ms TTL=128
Reply from 192.168.0.10: bytes=32 time=1ms TTL=128
Reply from 192.168.0.10: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>_
```

Figure 22 - Command Window.

Testing the Websensor's IP ADDRESS

If the IP address has been configured and is working properly, the replies received should look like those shown in the "Command Prompt Window".

If the response shown in the command prompt screen is "not received", please refer to the "Troubleshooting Websensor" section in the appendices.

MAKING A HTTP: REQUEST FOR DATA

Once you are able to successfully "ping" Websensor, it is time to try a http: request for some "live" data. To issue a request, start your favorite internet browser (Internet Explorer / Netscape). In the URL address field enter the following address:

http://192.168.0.10/index.html?em345678

Note: For purposes of explanation the IP address 192.168.0.10 is being used. However, the USER should enter the IP address that was programmed into Websensor during the configuration step.

Once the URL is entered, press the "ENTER" key and the Websensor should acknowledge with a response. The response you see will be similar to what is shown on the browser screen depending on which features are enabled (see below). The information returned starts with "E01" signifying that the response is from an EM01B Websensor. The next several bytes have to do with "check-sum". "TC:" begins the temperature reading, "HU" is the humidity reading and "IL" is the illumination value.
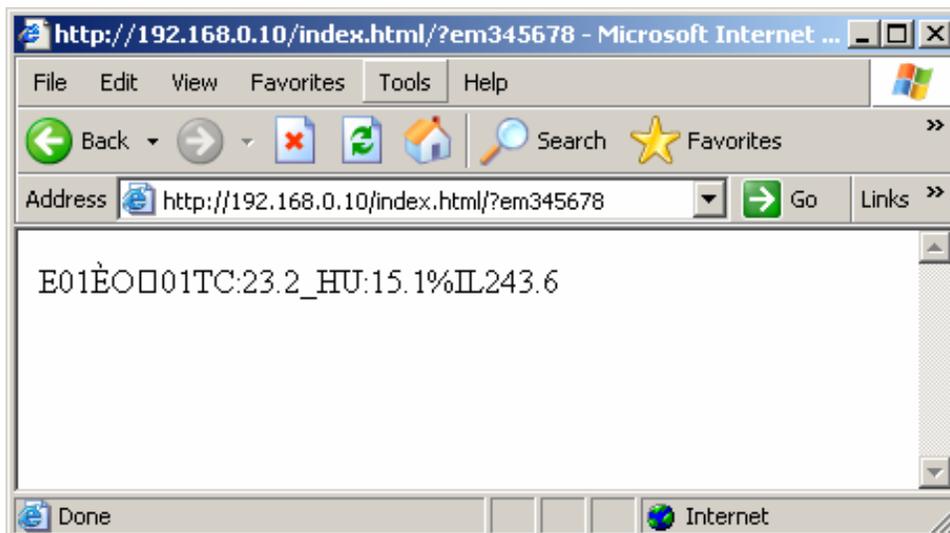
Figure 23 - BROWSER SCREEN response from the HTTP: request.

Websensor EM01B has a tail. Functionally, the tail is the sensor which measures temperature and relative humidity. The reason for the tail is to move the temperature sensor outboard of the EM01B enclosure so that any heat emitted by the EM01B electronics, will not skew the temperature/relative humidity measurements.

Note: Websensor was designed to measure "air temperature". Websensor's tail should not be immersed in any liquid.

Figure 24 - Websensor's tail (temp/RH sensor).

Figure 25 - Close-UP of the temperature/RH sensor.

APPENDIX A – Troubleshooting the Websensor

This section describes some common problems associated with the initial set-up and configuration of Websensor.

COMMON PROBLEMS

Not able to "PING" the Websensor.

If you are not able to "PING" the Websensor follow these steps:

1. Confirm that there is power to the Websensor. The Websensor is powered by the 9 volt DC wall transformer included in the "Starter Kit".

2. Confirm that the NIC (network interface card) is working in the PC being used to configure and test the Websensor. Proper operation can be verified by opening a "Command Prompt" window and issuing a "PING" command to the IP address of the NIC card. For example: ping 192.168.254.1. A reply should be received almost immediately. If no reply is received, confirm that the NIC card is configured with the desired IP address through the "Control Panel" in Windows.

3. Confirm that the correct "Ethernet patch cable" is being used. When properly connected, the LEDS on the NIC card should "light".

   "No LEDs lit", may indicate some hardware issue like an incorrect, or a faulty cable is being used. Connecting the Websensor directly to the NIC of a PC requires a crossover type of patch cable. The crossover cable included in the Websensor "Starter Kit" is either solid GRAY or RED in color with YELLOW boots covering the connectors.

   Connecting the Websensor to an Ethernet HUB requires a "straight" type of patch cable. The "straight" type of patch cable included in the Websensor "Starter Kit" is BLUE.

4. It is important that the Websensor and the PC being used to "ping" the Websensor are in the same sub-network.

What this means is if you using a sub-network mask of 255.255.255.0 the first three (3) octets of the PC's IP address and the Websensor's IP address must match.

Example of *invalid* IP addresses:

PC's IP address: 155.6.20.1
Websensor's IP address: 192.168.254.102

Example of *valid* IP addresses:

PC/Server IP address: 192.168.254.1
Websensor's IP address: 192.168.254.25

5. Confirm with the IT Systems Administrator that the IP address being used by the Websensor has not been previously assigned. Using the PING command to test the availability of a specific IP address could result in a false indication if the device using the IP address has its PING RESPOND disabled.

Appendix B - SPECIFICATIONS

Ranges

    Temperature: -40 °C (-40°F) to +123.8 °C (254.9 °F)
    Illumination: 0 to 1000 Lux
    Relative Humidity: 0 to 100% RH

Accuracy

    Temperature: +/- 0.2 °C @ 25 °C
    Illumination: Uncalibrated
    Relative Humidity: +/- 3%

DC Voltage Measurement

    0 to +18 VDC (Center pin of connector is (+)positive.)

Thermistor Interface

    Customer supplied specifications – resistance at 25 °C
    required to determine correct components.

Appendix C – Websensor Plug-in's

The Websensor Plug-in is written in the C language and the source code is provided on the CD shipped with the Websensor. The plug-in is compatible with Nagios and is easily adapted to many other Network Monitoring Servers.

The latest version can always be obtained by contacting Esensors, Inc. via email at:
TechHelp@eEsensors.com

Or by visiting our website at:
http://www.eEsensors.com

Works With:

Appendix D – Default Gateways & Subnet Masks

Q1: Why doesn't the Websensor need a subnet mask and default gateway?

A: Neither a subnet mask nor default gateway is needed because the Websensor only responds to HTTP requests. The incoming packet contains the necessary information needed for the Websensor to return data. As in Q4, we know that incoming TCP/IP packets include the source IP/MAC addresses. Websensor will never initiate any TCP/IP communication.

Q2: How can I retrieve data from a Websensor?

A: The Websensor has a WWW service built in (mini web-server). You can use any web browser to access the Websensor.

Q3: Will a Websensor initialize any kind of TCP/IP communication?

A: No. The Websensor will not initialize any TCP/IP communication. It only listens on port 80, waiting for other computers to send a HTTP request.

Q4: How does the Websensor return data to the computer which sends the HTTP request?

A: Every TCP/IP packet will include the destination IP/MAC, and source IP/MAC addresses. When the Websensor responds to a request (within the same subnet), it simply swaps the source and destination IP/MAC addresses. (During the very first transmission when the PC knows the Websensor IP address, but not the Websensor MAC address, it will issue an ARP request which contains the Websensor's IP address and use 'FF's' to fill-in the Websensor's MAC address. The Websensor performs an 'ARP respond' to broadcast its IP address and associated MAC address.)

Appendix D – Default Gateways & Subnet Masks

Q5. How does the Websensor return data between subnets?

A: In the case where a packet passes through a router, the router will substitute its own MAC address in place of the originating source MAC address. The source IP/MAC addresses can be retrieved from any incoming TCP/IP packet. The Websensor will use the modified IP/MAC address to return its data. This is further explained in the examples following the Q & A section.
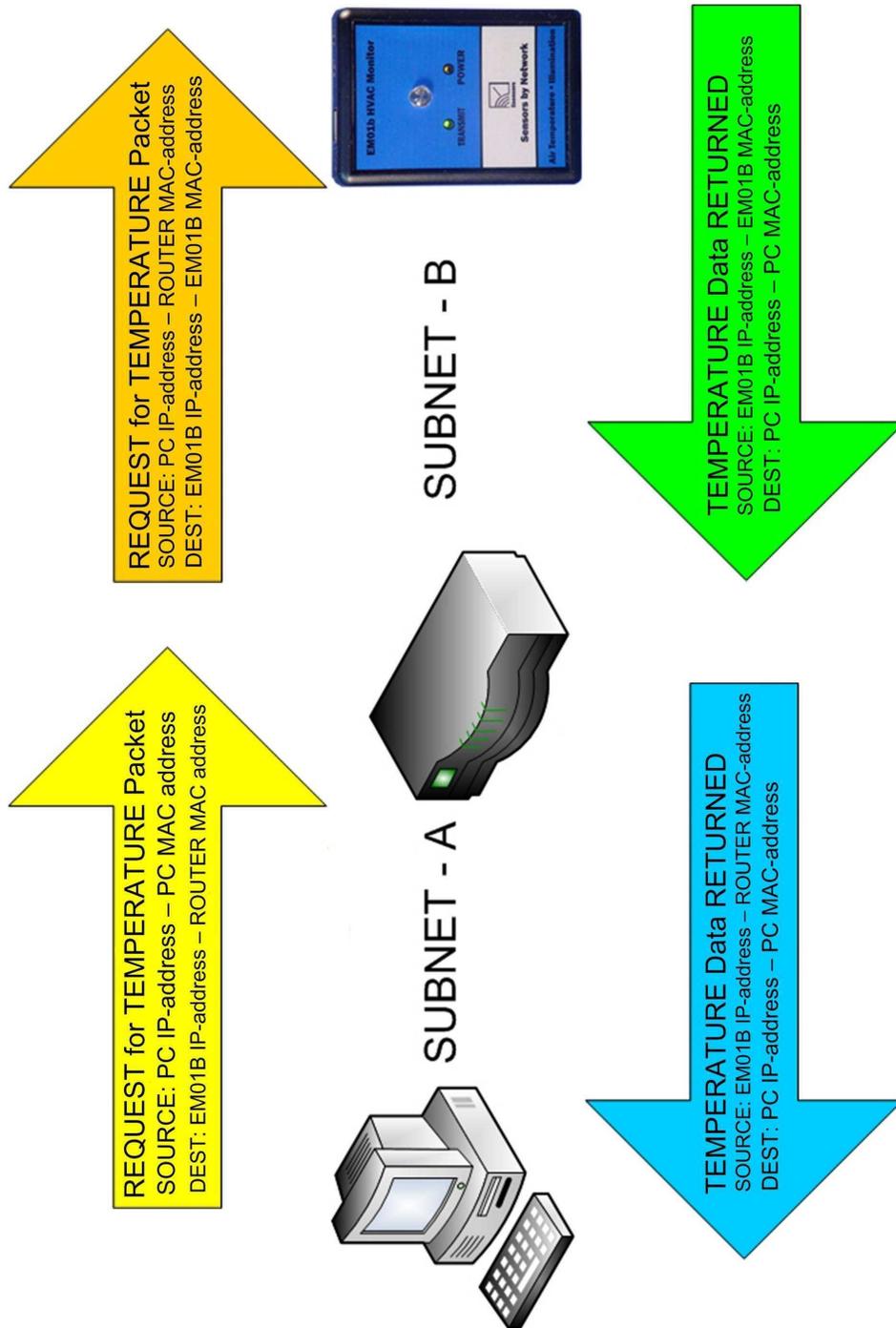
Please Reference the Figure on page D 3.

Q6: How do computers know the Websensor's MAC Address?

A: Websensor has a portion of the ARP protocol built in. It will only do ARP responds (RFC1180).

For further information and details on IP kindly reference RFC791 INTERNET PROTOCOL, DARPA INTERNET PROGRAM PROTOCOL SPECIFICATION and other related documents.

Appendix D – Default Gateways & Subnet Masks

SUBNET - B

REQUEST for TEMPERATURE Packet
SOURCE: PC IP-address – ROUTER MAC-address
DEST: EM01B IP-address – EM01B MAC-address

TEMPERATURE Data RETURNED
SOURCE: EM01B IP-address – EM01B MAC-address
DEST: PC IP-address – PC MAC-address

SUBNET - A

REQUEST for TEMPERATURE Packet
SOURCE: PC IP-address – PC MAC address
DEST: EM01B IP-address – ROUTER MAC address

TEMPERATURE Data RETURNED
SOURCE: EM01B IP-address – ROUTER MAC-address
DEST: PC IP-address – PC MAC-address

EM01b HVAC Monitor

Sensors by Network
Air Temperature • Illumination

TRANSMIT   POWER

Addressing Examples

Please Reference the Figure on page D 5.

Example A. Server A tries to access Websensor A

The Websensor can retrieve exactly the IP/MAC addresses of Server A from the HTTP request that is sent from Server A.

Example B. Server A tries to access Websensor B

The HTTP request will be forwarded by Router A first. Router A replaces the Websensor B MAC address with the Router A MAC address, and then sends the request to Router B. Router B does the same thing, replaces the Router A MAC address with the Router B MAC address, and then sends the request to Websensor B. Websensor B uses the IP (of Server A) and MAC (of Router B) to return the TCP/IP packet back to Router B. Router B knows how to forward these packets back to Router A (Server A IP address), Router A forwards the Websensor data packet back to Server A.

Example C. Computer B tries to access Websensor C

The HTTP request will be forwarded by Router B (with Router B MAC) to Router A. Router A then forwards it (with Router A MAC) to Router C. Router C sends it (with Router C MAC) to Websensor C. Websensor C uses the IP(Computer B) and MAC (Router C) and basically reverses the sequence in order to return the requested data back through the routers to Computer B.

Appendix D – Default Gateways & Subnet Masks
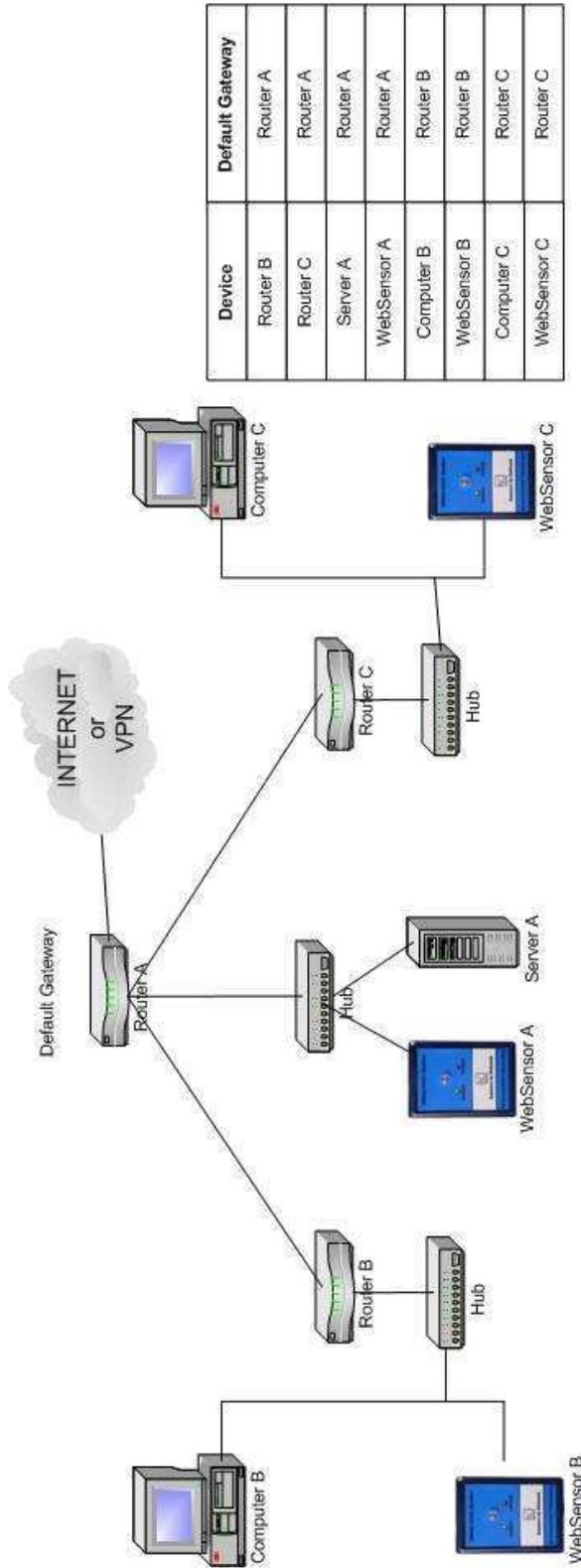
Device	Default Gateway
Router B	Router A
Router C	Router A
Server A	Router A
WebSensor A	Router A
Computer B	Router B
WebSensor B	Router B
Computer C	Router C
WebSensor C	Router C

ES02 Digital Power Meter

- Monitors voltage & current
- Measures power
- Connects to EM01 via Esbus

ES06 High Level – Input/Output Interface

Esbus Cable

EM01B

ES06

Websensor EM01B shown connected to ES06

- 2 Dry relay contacts
- 120 VAC detect
- Contact closure detection

ES11 Flood Sensor

- Detects Moisture/accumulation of water
- Plug-in's for Nagios available
- Connects to EM01B via Esbus

For configuration support contact:

TechHelp@eEsensors.com,

or call 716-837-8719
(from 9 AM to 4 PM Eastern time.)

Also, reference the Esensors website:

http://www.eEsensors.com.

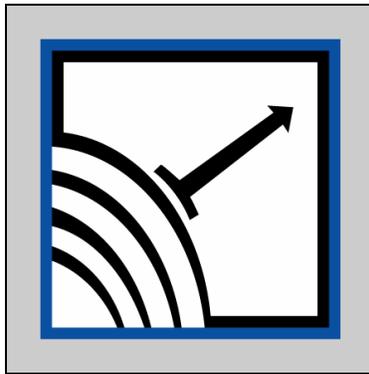An FAQ section is currently being developed for the Esensors, Inc. website.

Please check the Esensors website periodically for posting of the FAQs and application note information.

Configuration Notes

Configuration Notes

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