

GE
Sensing



Protimeter HygroTrac[®]
Remote Wireless Monitoring System

Instruction Manual



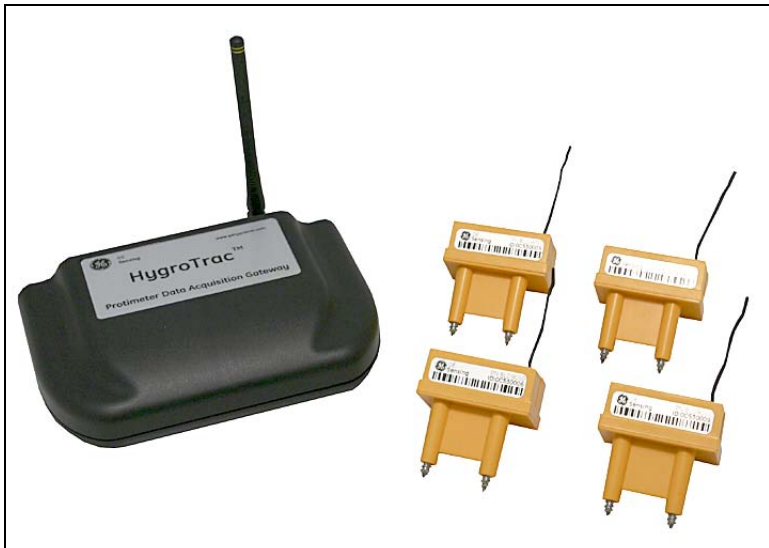
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Instruction Manual

INS9000A
June 2006

HygroTrac is a Protimeter product. Protimeter has joined other GE high-technology businesses under a new name—GE Industrial, Sensing



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Warranty

GE warrants its products against defects in material and workmanship for 12 months from the date of shipment. Products not subjected to misuse will be repaired or replaced. GE reserves the right to make changes without further notice to any products herein. GE Sensing makes no warranty, representation or guarantee regarding the suitability of its products for any particular application nor does GE assume any liability arising out of the application or use of any product or circuit and specifically disclaims all liability without limitation for consequential or incidental damages. The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied statutory warranty of merchantability or fitness for particular purpose shall apply.

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Introduction

The *Protimeter HygroTrac* is a simple and cost effective system for remotely monitoring moisture and temperature levels in buildings. The Protimeter HygroTrac system measures and logs parameters such as the following:

- GPP or g/kg
- dew point temperature
- relative humidity
- air temperature
- % moisture in wood

To set up the system, small HygroTrac *wireless sensors* are placed in the building. Sensor readings are transmitted to a *Data Acquisition Gateway*, which is connected to a dedicated and secure web server via either an Ethernet or telephone line connection. The measurements can then be viewed at www.gehygrotrac.com, using a secure password to access the data.

System Components

The *Protimeter HygroTrac* kit comprises a carry case containing the components detailed in Table 1 below. *Figure 1* on the next page shows a typical **BLD9000** kit.

Table 1: Protimeter HygroTrac Kit (BLD9000)

Description
Hard Carry Case with Custom Foam Insert
Data Acquisition Gateway*
Detachable Antenna w/RP-SMA connector
10 Wireless Sensors w/Lithium Batteries*
20 Conductive Mounting Screws
3.3v Power Supply
Ethernet Cable
Telephone Cable
Instruction Manual
*additional sensors (BLD9050) and gateways (BLD9010) are available. For European use, append “-EU” to the part numbers.

System Components (cont.)



Figure 1: BLD9000 Kit

HygroTrac Applications

Permanent Installations

The Protimeter HygroTrac system provides warnings of potential moisture-related problems that can lead to property damage or health risks. This makes it ideal for locations such as:

- heritage and historic buildings
- museums
- food storage
- apartment buildings

Temporary Installations

The Protimeter HygroTrac system can be used in restoration projects to reduce costly regular visits to take moisture and humidity measurements when drying a building after water damage. HygroTrac may be used to:

- automatically produce detailed professional reports
- get output readings from dehumidifiers
- provide early warnings of targets reached and potential problems through e-mail alerts and cellular text messages

Installation

A complete installation of your Protimeter HygroTrac system includes the *data acquisition gateway* and the *wireless sensors* (up to 600 per gateway).

IMPORTANT: *The external power supply included in your HygroTrac BLD9000 kit is fitted with an AC plug suitable for the country of destination. If you require a different plug, please contact GE Sensing for assistance.*

IMPORTANT: *See the Declaration of Conformity at the end of this manual for HygroTrac certification information.*

Wireless Sensors

A photograph of a HygroTrac wireless sensor is shown at the right. To install your wireless sensors, complete the following steps:



1. To help determine the best locations for the sensors, use a standard moisture meter such as the *Protimeter SurveyMaster*[®] to establish the existing moisture conditions within the building.
2. Select up to 600 sensor locations that are within 150 ft (46 m) of the planned location of the Data Acquisition Gateway.

Note: *The maximum sensor transmission distance varies with the building construction materials. Also, if more than 600 sensors are required, additional gateways will be needed. You may also need additional gateways if your sensors are out of the sensor RF transmission range due to distance or building construction materials.*

Caution!

If it becomes necessary to replace a sensor battery, use only a LISUN #ER14505 lithium battery and be sure to install it with the correct polarity. Use of any other battery or installation of the battery with the incorrect polarity will void your sensor warranty.

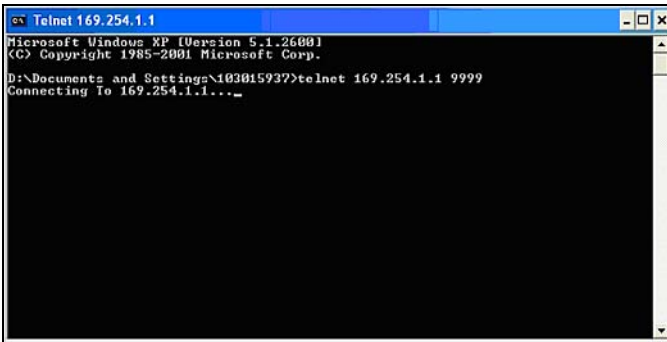
3. When mounting the sensors, observe the following precautions:
 - a. If you use a powered screwdriver, be careful not to overtighten the screws. The screws should be just tight enough to ensure good contact between the material and the sensor.
 - b. Avoid placing sensors in locations where they could be stepped on or in locations where they might interfere with working machinery.
 - c. Do not mount sensors in areas where water could enter the electronic components.

Configuring the Gateway

When using your gateway in *dial-up mode*, you must configure the gateway with your internet service provider (ISP) information. To do this, you must connect the gateway to a personal computer (PC) via either the *RS232 port* or the *ethernet port* on the back of the gateway. After deciding which port you wish to use, proceed to the appropriate section for instructions.

Using the Ethernet Port:

1. Using a standard Ethernet cable (supplied in your BLD9000 kit), connect the gateway to an open ethernet port on your PC.
2. Ensure that all network interfaces, except for the one being used with the gateway, are disabled.
3. Open a *Command Prompt* window on your PC (“*Start>Run>cmd*”) and enter “*ipconfig /release all*”.
4. Connect one end of the *power supply* to the rear of the gateway and the other end to an appropriate AC outlet to power **ON** the gateway.
5. Type “*telnet 169.254.1.1 9999*” (without the quotes)



```
Telnet 169.254.1.1
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
D:\Documents and Settings\103015937>telnet 169.254.1.1 9999
Connecting To 169.254.1.1..._
```

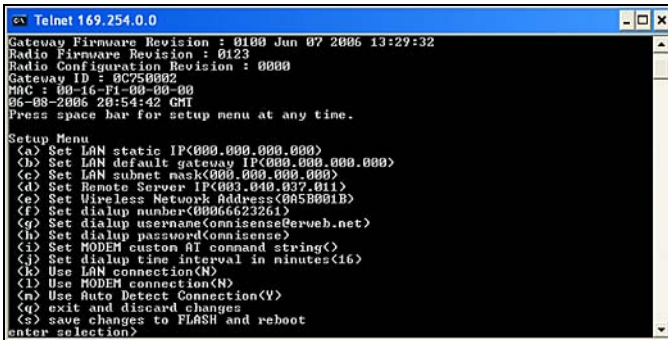
6. Press [Enter].



```
Telnet 169.254.0.0
Welcome to the GE Sensing HygroTrac(TM) Gateway
For product support please visit www.gehygrotrac.com
Gateway Firmware Revision : 0100 Jun 07 2006 13:29:32
Radio Firmware Revision : 0123
Radio Configuration Revision : 0000
Gateway ID = 00750032
MAC : 00-16-F1-00-00-00
06-08-2006 20:54:42 GMT
Press space bar for setup menu at any time.
```

Using the Ethernet Port (cont.):

7. Press the [Space] bar on your keyboard to access the setup menu.



```
Telnet 169.254.0.0
Gateway Firmware Revision : 0100 Jun 07 2006 13:29:32
Radio Firmware Revision : 0123
Radio Configuration Revision : 0000
Gateway ID : 0C750002
MAC : 00-16-00-00-00-00
06-08-2006 20:51:42 GMT
Press space bar for setup menu at any time.

Setup Menu
(a) Set LAN static IP<000.000.000.000>
(b) Set LAN default gateway IP<000.000.000.000>
(c) Set LAN subnet mask<000.000.000.000>
(d) Set Remote Server IP<003.040.037.011>
(e) Set Wireless Network Address<0050001D>
(f) Set dialup number<00066623261>
(g) Set dialup username<omnisense@erweb.net>
(h) Set dialup password<omnisense>
(i) Set MODEM custom AT command string<>
(j) Set dialup time interval in minutes<6>
(k) Use LAN connection(N)
(l) Use MODEM connection(N)
(m) Use Auto Detect Connection(Y)
(n) exit and discard changes
(o) save changes to FLASH and reboot
enter selection>
```

8. When the setup menu appears, enter the information for your dial-up internet account as provided by your ISP. This will include items such as: dial-up telephone number (be sure to include any prefix required by your telephone system), user name, password, etc.
9. Press [s] to save your changes and reboot the PC.

Using the RS232 Port:

1. Using a standard RS232 serial port cable with DB-9 connectors, connect the gateway to an open COM port on your PC.
2. Open the terminal communications program on your PC.

Note: *The program included with recent versions of the MS Windows operating system is called HyperTerminal. Consult your PC documentation for detailed instructions on its use.*

3. Configure the COM port with the following settings:

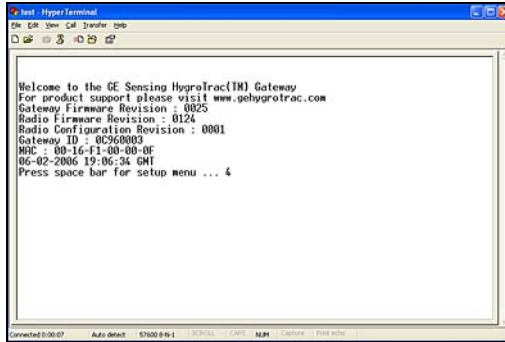
- Bits per second: 57600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None



Using the RS232 Port (cont.):

Using the RS232 Port (cont.):

4. Connect one end of the *power supply* to the rear of the gateway and the other end to an appropriate AC outlet to power **ON** the gateway. Within 5 seconds, press **[Space]** on your keyboard to enter configuration mode.

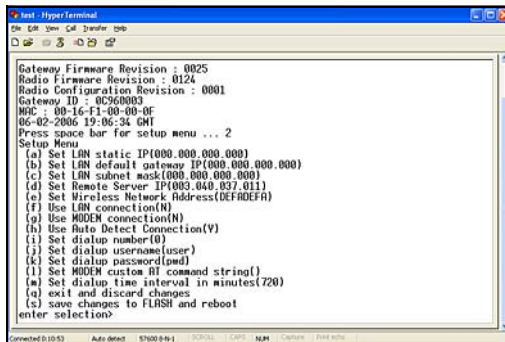


```
test - HyperTerminal
File Edit View Call Transfer Help

Welcome to the GE Sensing HydroTrac(TM) Gateway
For product support please visit www.gehydrotrac.com
Gateway Firmware Revision : 0025
Radio Firmware Revision : 0124
Radio Configuration Revision : 0001
Gateway ID : 0C560003
MAC : 00-16-F1-00-00-0F
06-02-2006 19:06:34 GMT
Press space bar for setup menu ... 4

Connected 0:00:07 Auto detect 57600 Bps 1 232/24 115.2 NRM Carrier Port 255C
```

5. When the configuration menu appears on the computer screen, enter the information for your dial-up internet account as provided by your ISP. This will include items such as: dial-up telephone number (be sure to include any prefix required by your telephone system), user name, password, etc.



```
test - HyperTerminal
File Edit View Call Transfer Help

Gateway Firmware Revision : 0025
Radio Firmware Revision : 0124
Radio Configuration Revision : 0001
Gateway ID : 0C560003
MAC : 00-16-F1-00-00-0F
06-02-2006 19:06:34 GMT
Press space bar for setup menu ... 2
Setup Menu
(a) Set LAN static IP(000.000.000.000)
(b) Set LAN default gateway IP(000.000.000.000)
(c) Set LAN subnet mask(000.000.000.000)
(d) Set Remote Server IP(003.040.037.011)
(e) Set Wireless Network Address(DEFDEF)
(f) Use LAN connection(N)
(g) Use MODEM connection(N)
(h) Use Auto Detect Connection(V)
(i) Set dialup number(0)
(j) Set dialup username(user)
(k) Set dialup password(pwd)
(l) Set MODEM custom AT command string()
(m) Set dialup time interval in minutes(720)
(n) exit and discard changes
(o) save changes to FLASH and reboot
enter selection>

Connected 0:00:53 Auto detect 57600 Bps 1 232/24 115.2 NRM Carrier Port 255C
```

6. Press **[s]** to save your changes and then quit the communications program.

Installing the Gateway

After configuring the gateway as described in the previous section, install it in your system by completing the following steps:

1. Select a location for the Data Acquisition Gateway that meets the following requirements:
 - All wireless sensors are installed within 150 ft (46 m) of the location.
 - A connection to the dial-up internet account configured in the previous section must be accessible from the chosen location via either the ethernet port or the telephone port on the back of the gateway.
2. Make one (1) of the following data connections to use your gateway with the dial-up internet account configured in the previous section:
 - **Ethernet Connection:** Using the standard RJ45 ethernet cable supplied in your BLD9000 kit, connect the ethernet port on your PC to the *LAN port* on the back of the gateway (see *Figure 2* on page 5 and the photo below).



- **Telephone Connection:** Using the standard RJ11 telephone cable supplied in your BLD9000 kit, connect the telephone line port on your PC to the *Modem port* on the back of the gateway (see *Figure 2* on page 5 and the photo below).



- **Internal Backup:** If neither of the above data connections is possible, your data can be logged to the internal flash memory of the gateway (see page 10 for more details). This data would then be uploaded to the HygroTrac web site by bringing the gateway to a location where a connection to your internet account can be made.

Installing the Gateway (cont.)

Caution!

Use only the GE Sensing power supply provided with your HygroTrac kit. The use of non-factory power supplies may damage the equipment and will void your warranty.

3. Connect one end of the *power supply* to your Data Acquisition Gateway (see the photograph below), and plug the other end of the power supply into a suitable AC outlet. As the gateway does not have an ON/OFF switch, this will immediately power up the gateway.



4. If you have made an ethernet connection to the Data Acquisition Gateway, when power is applied to the unit the status LED on the back of the gateway will light to indicate that a connection has been established with the HygroTrac Database Server (HDS).

Note: *If a connection to the remote server is not established, contact your local IT support team for help. There may be an issue with a network firewall or with the IP address of the Data Acquisition Gateway. If so, your local IT team will need to add the www.gehygrotrac.com IP address of the gateway to their list of trusted servers.*

Secure Digital (SD) Card

It is preferred that the Protimeter HygroTrac system be operated via one of the direct internet connections. This permits immediate access to any automated warnings that may be generated by the system. However, if such a connection is not possible, the optional *Secure Digital (SD) Card* may be used to collect and store the data from the system.

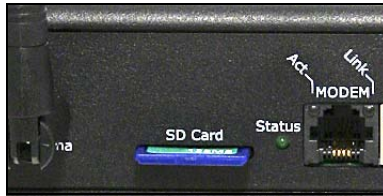
To set up your HygroTrac system with an SD card, proceed as follows:

1. Purchase an SD card from a local supplier.

Secure Digital (SD) Card (cont.)

Note: A 128 MB SD card will support 10 sensors reporting every five minutes for 728 days.

2. Use a computer with an SD card reader to format the new SD card with an MS Windows *FAT* file system.
3. Insert the SD card into the slot on the back of the Data Acquisition Gateway (see the photograph below).



Caution!

Use only the GE Sensing power supply provided with your HygroTrac kit. The use of non-factory power supplies may damage the equipment and will void your warranty.

4. Connect one end of the *power supply* to your Data Acquisition Gateway (see the photograph on the previous page), and plug the other end into a suitable AC outlet. As the gateway does not have an ON/OFF switch, this will immediately power up the gateway.
5. To upload your SD card data to the HygroTrac web site, bring the gateway to a location where a connection to your ethernet/dial-up internet account can be made. Upload time depends on the amount of data, but a few minutes is typical.

Note: *The gateway includes onboard flash data storage that is sufficient for one year of data with ten sensors each reporting every hour. To upload data from the internal flash storage, use Step 5 above. GE Sensing recommends the use of an SD Card only if your data storage needs exceed the capacity of the onboard flash storage.*

Operation

As soon as the Protimeter HygroTrac system is installed and powered up, as described in the previous section, it begins collecting data. In order to access this data, follow the instructions in this section.

Web Data Service

The HygroTrac data is stored on a dedicated and secure web server. To access your data, complete the following steps:

Note: *There is a monthly fee for the HygroTrac service account.*

1. Using your existing internet connection, go to the following URL:

www.gehygrotrac.com



2. Choose one of the following options:

- a. If you already have an account, *simply log in.*
- b. View the online “*Web Site User Guide*” for any required help.
- c. If you do not already have an account, create a *new user account* and accept the *terms and conditions.*

3. Follow the online instructions to view your data.

Viewing the Data

After you access your HygroTrac account, the following data is available for each data point from each sensor, by sensor ID and description:

- Time and date
- Relative Humidity
- Temperature
- Wood Moisture Equivalent (WME) %
- GPP (grains per pound) or g/kg
- Dewpoint temperature (°C and °F)

From your HygroTrac account, you can perform the following functions:

- Name the individual sensors to indicate their locations
- View and graph near-live data
- View dewpoint, GPP, temperature, % RH, and WME% data
- Set alarms and thresholds that automatically send e-mails or mobile phone text messages.
- Produce automatically generated reports
- Set up multiple users with different access levels
- Download data in a text file format for importing into spreadsheet and other applications

Technical Specifications

Wireless Sensor

*Transmission Distance**: 150 ft (46 m) nominal

Transmission Frequency: 902.2 - 907.8 MHz;
868.2, 868.4, 869 MHz (EU)

Size (l x w x h): 2.25 x 1.5 x 2.25 in. (60 x 30 x 60 mm)

Weight: 2.42 oz (68 g)

*Transmission distance varies with many factors, including the presence of obstacles such as concrete walls and interference from other electronic equipment.

%RH/Temperature Sensor

Range: 0 to 100% (non-condensing)

Accuracy: 10 to 90% $\pm 2.5\%$

Temperature Range: -40 to 185°F (-40 to 85°C)

Temperature Accuracy: $\pm 1^\circ\text{F}$ ($\pm 0.5^\circ\text{C}$) at 77°F (25°C)

Battery Life: 15 years nominal, when reporting hourly

Moisture Sensor

Resistance: pin type

Range: 0 to 40%

Accuracy: $\pm 1\%$ in wood, 10 to 25% subject to adjustments for species and temperature

Calibration Temperature: 68°F (20°C)

Technical Specifications (cont.)

Data Acquisition Gateway

Maximum Inputs: 600 sensors

Data Transmission: to secure internet via
10 Mb/s ethernet output or
dial on -demand telephone modem

Onboard Data Storage: approximately 1 year of data
with 10 sensors each reporting hourly

Additional Data Storage: up to 2 GB on SD card (not supplied)

Size (l x w x h): 7.5 x 4.9 x 1.6 in. (190 x 125 x 40 mm)

Weight: 10.8 oz (305 g)

Power Input: 3.3 VDC external power supply (included)

Certification

See the *Declaration of Conformity* at the end of this manual.

The information contained in this manual is given in good faith. As the method of use of the instrument (and its accessories) and the interpretation of the readings are beyond the control of the manufacturers, they cannot accept responsibility for any loss, consequential or otherwise, resulting from its use.

Protimeter HygroTrac[®] and Surveymaster[®] are registered trademarks of GE

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We,

GE Sensing
1100 Technology Park Drive
Billerica, MA 01821

declare under our sole responsibility that the

Protimeter HygroTrac Monitoring System

to which this declaration relates, is in conformity with the following standards:

[For US and Canada Models Only](#)

• **FCC Part 15**

This Product Contains Transmitter Module FCC ID: RY20002.

This equipment complies with Parts 15 of the Federal Communications Commission (FCC) rules for the United States. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The equipment has been tested and found to comply with part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet or on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Part 15 Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



- **Industry Canada (IC)**

This Product Contains Transmitter Module IC ID:6474A-0002.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference causing equipment standard entitled Digital Apparatus, ICES-003 of Industry Canada. This device complies with Canadian RSS-210 regulations.

NOTICE: The Industry Canada (IC) label identifies certified equipment. The Department does not guarantee the equipment will operate to the user's satisfaction.

[For EU Models Only](#)

- **Data Acquisition Gateway**

The *Data Acquisition Gateway* is in conformity with the following standards:

- EN55022: 1998 + A1: 2000 + A2: 2003
- EN55024: 1998 + A1: 2001 + A2: 2003
- EN60950-1: 2001

following the provisions of the 89/336/EEC Electromagnetic Compatibility (as amended) and 73/23/EEC Low Voltage Directive (as amended).

- **Sensor Module**

The *Sensor Module* is in conformity with the following standards:

- EN300 220-3 V1.1.1 (2000-09)
- EN301 489-3 V1.4.1 (2002-08)

following the provisions of the Radio Equipment and Telecommunications Terminal Equipment. (R&TTE) directive: Directive 1999/5/EC.

Billerica - June 9, 2006



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INS9000, Rev. A

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