RF ValProbe® II

User Manual

M4965 Rev. B
January 2018

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Wireless Thermal Validation System

User Manual

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Chapter 1. Setting Up the RF ValProbe

Chapter 2. Installing and Using RF ValProbe Software

Chapter 1. Setting Up the RF ValProbe

1.1 Introduction

1.1.1 Unpacking

Unpack the Kaye RF ValProbe Loggers and Base Station carefully and inspect them for any damage that may have occurred during shipment. If there is shipping damage, notify the carrier immediately. Verify that the following are present:

- Kaye RF ValProbe Base Station
- USB to Ethernet Cable
- Base Station Power cord and Adapter
- Cal PC USB cable
- IRTD and Bath cables
- Kaye RF ValProbe Loggers and calibration certificates
- Logger Power Adapter
- Logger USB cable
- Kaye RF ValProbe Software Package

1.1.2 Safety Information

Use this instrument only as specified in this User Manual.

- The protection provided by the equipment may be impaired if the equipment is used in a manner not specified by Kaye.
- Do not use this equipment in environments other than those listed in this User Manual.

1.1.3 Overview

The Kaye RF ValProbe II system is a wireless thermal validation system that collects temperature and humidity data. The Kaye RF ValProbe system is designed for accurate, convenient, and reliable process validation of environmental chambers and storage areas. These applications include stability chambers, freezers, refrigerators and warehouses. A 2.4-GHz RF mesh network and multiple-redundant data storage support communications and storage of critical validation data, while safeguards guarantee data integrity, storage and compliance with regulatory requirements.

The system consists of Kaye RF ValProbe II Loggers, a Kaye RF ValProbe II Base Station, and Windows-based software for programming and reading the Loggers, calibrating Loggers, verifying their calibration, and generating reports (see Figure 1 below).

Data from multiple wireless Loggers is combined in a single file from which reports are generated. These reports are designed for implementation of 21 CFR Part 11 requirements for electronic records. Users can customize the reports by defining process cycles and specifying cycle-based calculations.

Figure 1: The Kaye RF ValProbe II System

1.1.4 The Kaye RF ValProbe II Base Station

The RF ValProbe Base Station acts as the communications link between the wireless Loggers and the RF ValProbe software on the computer. When connected to the computer via Ethernet, or USB-Ethernet adapter, the Base Station programs, reads and collects data from up to 40 Loggers per study. Its design ensures reliable transfer of critical data. If the PC is not present or currently running, the Base Station can store data from up to a maximum of 40 Loggers.

Powered by a power supply rated from 100-240 VAC at 50/60 Hz, the Base Station (shown in Figure 2 below) includes an Ethernet connection.)

Figure 2: RF ValProbe II Base Station

CAUTION! **Use only the Kaye power supply (Kaye #201-3003) provided with your RF ValProbe II. The use of non-factory power supplies may damage the equipment and will void your warranty.**

1.1.5 Base Station Batteries

Kaye RF ValProbe II base station has battery backup for up to 10 minutes. The base station is powered by two 3.7V AA size rechargeable Lithium batteries. Kaye RF ValProbe base station has a built-in charger, so batteries will be charged automatically when there is a main supply available to the base station. To replace the batteries, first shut off the base station using ON-OFF switch. Then open the sliding panel on the back of the base station and replace the batteries in the compartment shown in Figure 3 below. Do not turn the base station back on until you have properly replaced the compartment cover.

Figure 3: RF ValProbe II Base Station Battery Compartment

CAUTION! **ONLY Use Kaye #200-166 3.7 V lithium secondary (rechargeable) batteries. Using any other batteries will render the stated performance void as Kaye #200-166 3.7V batteries are the only brand tested and accepted.**

{Insertion of non-rechargeable Battery might cause the over-heating and explosion}.

1.1.6 Kaye RF ValProbe II Temperature/Humidity Loggers

The wireless RF ValProbe II Loggers use an external temperature sensor.

- The humidity sensor covers a range from 25% to 85% RH, with accuracy of ±2.0% at 25°C to 40°C.
- For validation, the external temperature sensor maintains accuracy of ±0.1°C from -50°C to + 130°C; extreme lower temperature, the sensor is accurate to ±0.2°C from -80°C to -50°C (See Appendix A for full accuracy specifications).

Figure 4: The RF ValProbe II Logger with External Sensor

Each Logger can record up to 10,000 readings per sensor or input; the data is sent to the Base Station and stored simultaneously in the Logger and Base Station memories. When prompted by the RF ValProbe software, the Loggers send this data to the computer via the Base Station for reading into a study, report creation and data calculation.

1.1.6 Kaye RF ValProbe II Temperature/Humidity Loggers (cont.)

Two Green LEDs —Power and the RF Link light — indicate Logger status.

- When user presses the Status button, the green Power light appears to show that the Logger is receiving sufficient power.

  The green RF Link signal indicates four stages of RF connectivity, when user Press & holds Status button:

  1. RF Link LED is in off condition before it attempts to connect to the network.

  2. The next signal is slow blink as the Logger scans the area for a network (Base Station or Logger) connection.

  3. A double blink indicates that the Logger has found the RF link and trying to establish the RF connection, either to another Logger or to a Base Station.

  4. Fast blink / solid green indicates RF connection is successfully established.

Note: *Solid green light indicates that the Logger has made two separate connections in a network, which is preferred mode of operation.*

1.1.7 Logger Buttons

Logger has three Buttons, Scroll UP, Scroll Down and Status Button at front Keypad. Logger also has reset switch and micro SD card option at bottom side of the logger as shown in the figure 6 below, different functionalities of the buttons are stated in the Table 1.

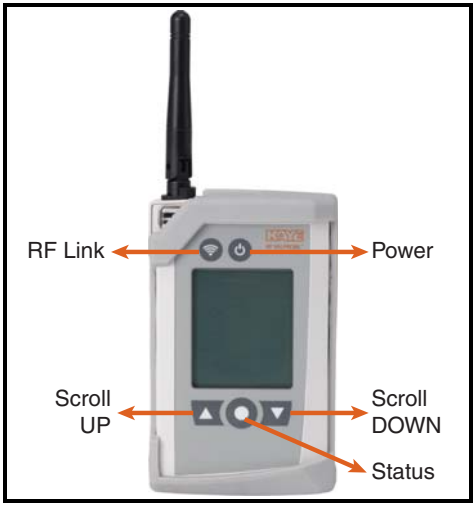

Figure 5: RF ValProbe II Logger Keypad

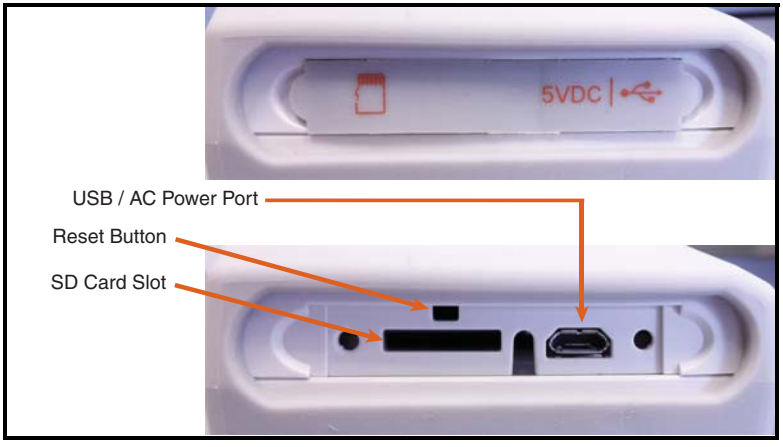

Figure 6: RF ValProbe II Logger Reset, SD Card and USB/AC Power Connections

Table 1: RF ValProbe Logger Buttons, Reset Functions

	Action	Button Usage			
		Scroll Up	Scroll Down	Status	Reset
Back light ON/OFF[1]	Hold Scroll UP + Down button for 1 second	■	■		
Dump Data [2,3] to SD Card	Hold Reset Switch for 1 Second				■
Scroll Sensor Next Channel	Click on Scroll UP Button	■			
Scroll Sensor Previous Channel	Click on Scroll DOWN Button		■		
Status[1]	Click on Status Button			■	
Reset Mode	Hold Reset Switch for 10 Seconds				■
Logger Join	Click on Status Button			■	
Change to °C	Switch off the logger, Press Scroll Down Button while switching ON logger and Hold Scroll Down Button for 10 Seconds		■		
Change to °F	Switch off the logger, Press Scroll Up Button while switching ON logger and Hold Scroll UP Button for 10 Seconds	■			
Reset Battery	Hold Status Button for 5 Seconds and Power On			■	

Table 1: RF ValProbe Logger Buttons, Reset Functions

LCD Display Refresh [1,4]	Click on Status Button			■	

Notes:

1. Frequent pressing of the status button / use of LCD will impact battery life.
2. Data will not be read from SD card if sampling rate is <30 sec.
3. Insert SD card in Logger only during data recovery and remove upon copy of data, SD card operation will impact battery life.
4. LCD will not refresh sensor values if sampling rate is <10 sec

1.1.8 Logger Display

The LCD is turned off if no activity is performed for predefined duration (30 seconds on Battery and 15 Minutes on USB Power). When a button combination (ScrollUp +ScrollDown) is pressed on the logger keypad for 1 sec the beep indicates that buttons could be released and the LCD Backlight glows and same combination is used to turn OFF the Backlight. Pressing the STATUS button turns ON the LCD and the previous data displayed is resumed. Logger LCD view is shown in Figure 7 below. LCD display refresh rate follows the sampling time set by validation software. Logger follows 1 minute display refresh rate when logger is not in study. Alternatively logger display updates upon pressing status button.

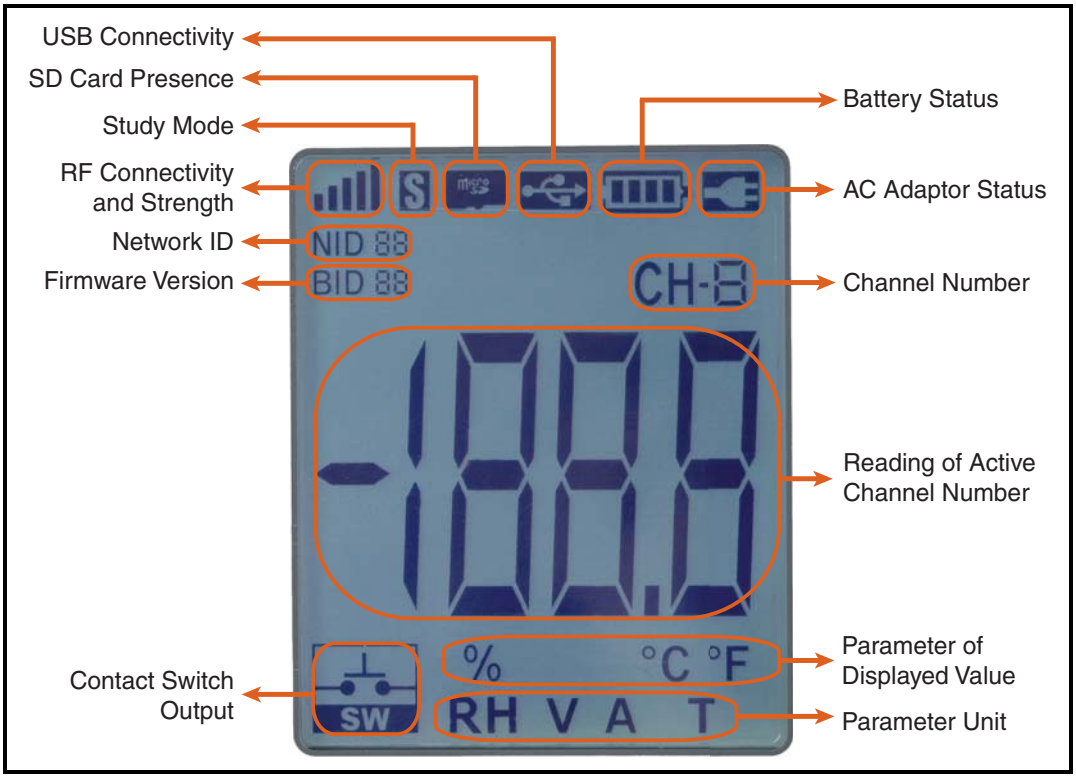

Figure 7: RF ValProbe II Logger Display

1.1.9 Logger Power

The Logger can be powered by two 3.6 V, AA lithium non-rechargeable batteries (Kaye #200-165) or a power supply (Kaye #201-3002) rated from 100-240 VAC at 50/60 Hz, shipped with the Logger. To replace the batteries, first shut off the Logger by sliding the power switch (shown in Figure 8 below) to OFF position. Then open the sliding panel on the back of the Logger and replace the batteries in the compartment shown in Figure 8 below. Do not turn ON the Logger (sliding the power switch to ON position) until you have replaced the compartment cover.

CAUTION! **1. If it becomes necessary to replace a Logger battery, use only a Kaye #200-165 3.6 V lithium Primary (Non-rechargeable) battery. Use of any other battery will void your Logger warranty and Battery Life.**

2. Use only the Kaye power supply (Kaye #201-3002) provided with your RF ValProbe. The use of non-factory power supplies may damage the equipment and will void your warranty

Figure 8: Logger Battery Compartment / Network ID and ON/Off Switch

1.1.9 Logger Power (cont.)

Battery life is affected by number of factors, including sampling rate, Environmental temperature, Logger position in the network, and hours of use. In addition, individual battery characteristics and capacity vary inherently from one battery to another by up to 10%. The RF ValProbe software tracks each Logger's battery life to within 10% of a potential low-voltage occurrence to help prevent interrupted or incomplete studies. When determining the battery life remaining, the software bases its calculations on the assumption that the battery can supply a predictable amount of energy (mAh) over the temperature range.

The battery life calculation is accurate when a Logger is used exclusively for studies at or above room temperature, or exclusively for studies below room temperature. Kaye therefore recommends that you change the battery when switching between temperature ranges above room temperature and those below room temperature.

A low battery warning is issued when the remaining battery life is below the warning percentage specified in the RF ValProbe software. The low battery warning is issued until you replace the Logger battery and reset its battery life to 100%. If you do not specify a percentage, the low battery warning is set to 10%. Kaye recommends that you replace the battery when there is 10% battery life remaining.

- If the battery is used up or is removed, the study setup and data, as well as the calibration information, are maintained in non-volatile memory inside the Logger

1.1.9a Resetting the Battery Capacity Setting

You can reset the battery capacity from the Logger itself. Once you have installed the new batteries, press and hold the Status button on the front of the logger *while* you turn the logger power switch on. Wait for the Power (green) light to blink five times, and then release the button. The battery capacity has been reset.

1.2 Calibration

1.2.1 Calibration Data Storage

Calibration data, including calibration offsets, and when the calibration was performed and by whom, are stored in the Logger in non-volatile memory. The data remains intact even if the battery is exchanged.

1.2.2 Verifying Calibration

The Kaye RF ValProbe software allows you to verify Logger calibration at one or two set points. For Humidity/Temperature Loggers, each sensor type must be verified independently. You may want to verify that the Loggers are within their specification before running a study; however, you do not need to recalibrate them. Since the RF ValProbe is a self-contained instrument, the sensor and instrument errors are accounted for during factory calibration.

The following section provides an overview of verifying Logger calibration. The online Help that comes with the Kaye RF ValProbe software provides step-by-step instructions on calibration procedures.

Note: *In the RF ValProbe software, you can select either manual or automatic calibration verification. If you select automatic calibration verification, you will not need to enter stability or deviation criteria; however, you will still need to connect your computer to a Kaye IRTD temperature probe and to a temperature bath via the Kaye RF ValProbe base station (included with the IRTD). You will also need to enter set points, and to click the Start Calibration button.*

1.2.3 Required Equipment

When verifying sensor calibration, you must consider the measurement uncertainty of the equipment you are using in combination with the uncertainty of the equipment used by Kaye to calibrate the Loggers at the factory.

For example, if you verify calibration for a Logger's humidity sensor using a calibration chamber with a measurement uncertainty of ±1.5% RH, and the Kaye chamber has a measurement uncertainty of ±1.0% RH, you may obtain a deviation greater than the 2.0% RH specified by the factory as the accuracy of the sensor.

The Certificate of Calibration that was shipped with each Logger provides detailed information about the equipment used by the factory to calibrate the Loggers, including the measurement uncertainty. (Auxiliary inputs are shipped with additional certification documents.) The equipment required to accurately verify calibration for each sensor type is listed on the next page.

1.2.3a Temperature Sensors

In order to verify that the temperature sensors in the Loggers are within the ±0.1°C calibration accuracy for -50°C to + 130°C; ±0.2°C from -80°C to -50°C (See Appendix A for full accuracy specifications). The total system measurement uncertainty for the calibration equipment must be better than 33mK (0.033°C) in order to achieve a 3:1 measurement uncertainty ratio. The following equipment is required to perform calibration verification:

- IRTD model 400 (25mK). The IRTD 400 (M2801) temperature measurement standard is a self-contained measurement system providing temperature data directly to the Kaye RF ValProbe software during temperature sensor calibration and calibration verification. The measurement accuracy is NIST-traceable to 0.025ºC, with a range of –196ºC to 420ºC.The IRTD provides a traceable standard that is used to calibrate Kaye RF ValProbe Loggers and to verify Logger calibration. During the calibration and calibration verification process, the Kaye RF ValProbe software automatically reads and monitors the value of the IRTD probe.

Note: *During calibration, the IRTD remains connected (via a Cal PC USB port shown in figure) to the PC running RF ValProbe software, and to the temperature chamber or bath. Connect both IRTD and BATH via the ports on RF ValProbe base station shown in the figure 9 below.*

Figure 9: RF ValProbe Base Station

Temperature bath or chamber with the following stability and uniformity specifications:

Table 2: Temperature Bath (Chamber) Specifications

Bath Stability	Bath Uniformity
7mK	7mK

Kaye recommends using the CTR-40 or CTR-80 liquid calibration baths.

1.2.3b Humidity Sensors

In order to verify the RH sensors meet the calibration accuracy specification, the RH Humidity Calibrator must have an error equal to or better than ±1%. To perform calibration verification, Kaye recommends a Humidity Calibrator with ±1% accuracy or better, such as the Kaye Humilab. Or any Salt Bath.

1.3 Setting Up the RF ValProbe System

Setting up an RF ValProbe system for operation involves five steps:

1. Installing the RF ValProbe software for validation
2. Setting up the Base Station
3. Connecting any External Sensors or Auxiliary Inputs
4. Setting up and positioning the Loggers
5. Starting the RF ValProbe software

1.3.1 Setting Up the Base Station

Starting the Base Station requires plugging in the power supply and establishing Ethernet connection. The rear of the Base Station appears similar to Figure 10 below. The newer Base Stations do not have the USB port, but a high-speed USB-Ethernet cable, included in your RF ValProbe, will connect the Ethernet port on the Base Station to the USB port on the PC.

Figure 10: Base Station Connections

1.3.1 Setting Up the Base Station (cont.)

- To power the Base Station, insert the round barrel connector into the power input jack of the Base Station (the input at the left shown in Figure 10 on the previous page). Attach the power supply to the power cord.Then insert the power cord into a standard 100-240 VAC outlet and switch on the base station using ON-OFF switch on the unit. A green light on the Base Station keypad indicates that the station is powered up.

IMPORTANT:*The external power supply included with your RF ValProbe is fitted with an AC power cord suitable for the country of destination.*

- To establish an Ethernet connection, plug one end of your Ethernet cable into the outlet left to the power outlet shown in Figure 10. Then plug the other end into your Ethernet connection.
- To establish a connection using the adapter, connect the crossover cable to the USB-Ethernet adapter. Plug the crossover cable to the outlet left to the power outlet shown in Figure 10. Then plug the adapter to the USB port on your PC.

  Once you have established the connection and set up the loggers (see section 1.3.3), start the RF ValProbe software.

  Base Station will restore all its factory settings after pressing RESET switch shown in Figure 10 for 5 seconds.

CAUTION! **This switch is intended only for service. Pressing of RESET switch will restore the Base station to factory settings, loss of join key and Network ID, restore to default IP. Also base station warranty. This is covered with a sticker for unauthorized use.**

1.3.2 Connecting an External Sensor and Auxiliary Inputs

If any of your Loggers are designed for use with an external sensor, that sensor will have been shipped with the Logger.

To connect the sensor to the Logger, simply remove the sensor cover, retaining bar, remove the terminal block for the existing sensor, and attach the terminal block of the new sensor, and replace the retaining bar and cover.

CAUTION! **When handling external sensors, avoid bending the sensor near either the tip or connector ends. Repeated bending will damage the sensor.**

User can connect auxiliary inputs (4-20 mA, 0-10V or contact closure) at the connectors of the Logger shown in Figure 11 below.

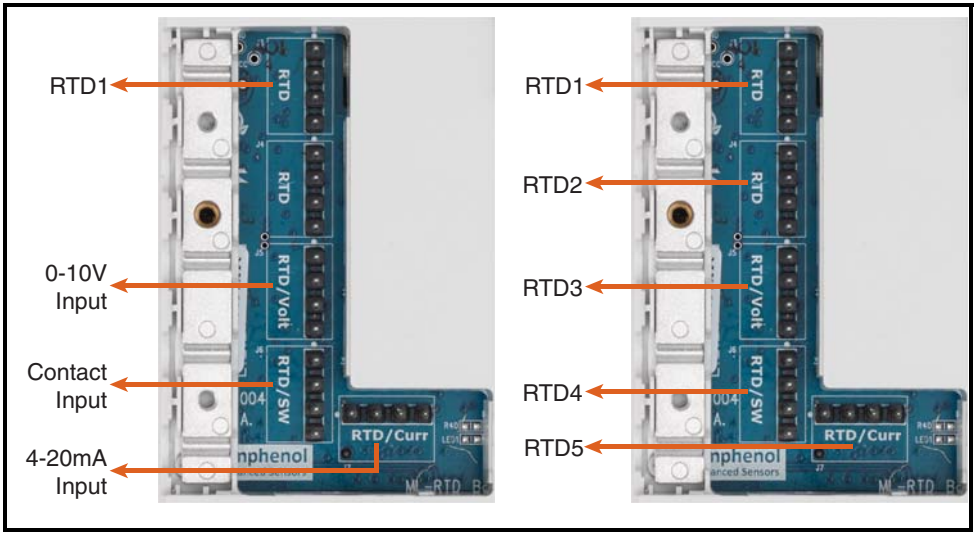

Figure 11: Inputs Description for Auxiliary Input and 5CH RTD Loggers

Note: *For a 2 or 5-channel Logger, the sensors are pre-wired to terminal blocks inside the Logger. To replace or reattach a sensor, you must remove the cover and retaining bar, remove the terminal block for the existing sensor, and attach the terminal block of the new sensor, and replace the retaining bar and cover.*

1.3.2 Connecting an External Sensor and Auxiliary Inputs (cont.)

Logger has detachable RH sensor module, push RH sensor towards left to remove from the Logger. RH sensors can also be connected via 3.3 ft. (1m) / 10 ft. (3m) extendable RH cable. (Accessory with RFVP ValProbe system).

Figure 12: Detachable RH Sensor

Note: *Each RH sensor is calibrated with respective logger. Any interchange of RH sensor will void the calibration data stored inside the logger.*

1.3.3 Setting Up the Loggers

When you are setting up the Loggers, you must first be sure that they are switched on, and that they have the same network ID (from 0 to 9 or A to F) as the Base Station. (For example, all Loggers must have the network ID “5” if the Base Station has the ID “5”.)

To switch the Logger ON, see the back of the Logger above the battery panel, as shown in Figure 5 on page 7. Slide the switch below the network ID wheel to the right to turn ON the logger.

Note: *All Base Stations and Loggers are shipped with an initial Network ID of 0. To change the Base Station Network ID, install the RF ValProbe software and refer to "Selecting a Communications Option and Establishing Preferences" on page 36.*

If you need to adjust the Logger's network ID, use a small screwdriver to turn the arrow in the middle of the network ID wheel in Figure 5 on page 7. Be sure the arrow points to the appropriate ID number. (You can choose from numbers 0 through 9, and letters A through F.)

Note: *You must change the Logger network ID before you switch on the Logger. If you have already switched the Logger on, switch it off and then turn it back on so the Logger can read the correct ID.*

1.3.4 Logger Installation Guidelines

You can now position the Loggers. Each Logger must be no more than 150ft (45m) distant from the Base Station and the other Loggers, there should not be more than three interconnections of logger to base station (hops, see below). Kaye offers several recommendations for logger placement:

- Install the Loggers at least two meters and Base station at least one meter above the ground or floor. For better RF transmission, place them as high as possible. If possible, raise or lower the Base Station and Loggers above or below walls or any separation.
- Point the Logger antenna upwards for best results.
- Do not position the Loggers directly above or below each other. Stagger their positions for better transmission.
- If Loggers are placed at different heights, make sure that they are within antenna range (within 150ft (45m) from the Base Station or another logger). The RF signal is transmitted in an arc, with maximum signal strength occurring in the area 45° above and below the tip of the antenna.
- Be aware that metal surroundings can interfere with RF transmission; the Logger may transmit, but the signal will be weaker. Shorten the transmission distance accordingly.
- Do not install Loggers next to a cordless phone base or other 2.4 GHz transmission device.
- Do not install Loggers on a vibrating surface.
- Do not place Loggers where the temperature is outside their rated operating range.

IMPORTANT: Maximum number of hops in typical network shall not exceed four. In a typical network, maximum interconnections of logger to base station shall not exceed three. Loggers need to be placed such a way that, maximum of three nodes connecting to base station from farthest logger for better RF performance.

1.3.5 Repeater Installation

Install repeaters between Logger to Logger / Base station to Logger when the distance is more than 150 ft. or RF signal strength is low, if setup does not have any loggers in between that range, physical repeaters can be easily identified as it is a non-LCD variant as shown in figure 13 below.

Figure 13: Repeater

1.3.6 What's Next?

Once you have connected the Base Station and positioned the Loggers, proceed to Chapter 2 to use the RF ValProbe software and begin taking measurements.

Chapter 2. Installing and Using RF ValProbe Software

2.1 Introduction

Before using the Kaye RF ValProbe system, you have to install the RF ValProbe software on your PC and perform some basic system administration tasks.

When RF ValProbe is installed for the first time, user is asked to select RF hardware to be used. The selection is valid until user decides to switch the RF hardware from Preferences tab by selecting “Change to BaseStation” check box. Software will restart and a screen will appear to select the RF hardware.

Main Menu of RF ValProbe software will appear after appropriate selection of RF hardware.

The RF ValProbe software includes a Password Maintenance utility that allows a user with System Administrator permission to create and maintain user accounts and set site options.

A default System Administrator account is included with the software. You use this account to initially log in to the Password Maintenance utility and create your own System Administrator account. The default account is deleted once your own System Administrator account is created. You can then use your own account to perform all your system administration tasks.

In this chapter you:

- Install the RF ValProbe software, configured for network or local applications
- Start the program and log in to the Password Maintenance utility using the default System Administrator account
- Set site options
- Create your System Administrator account

- Create Supervisor and Operator accounts
- Print the active user list
- Select the Communications Option and other Preferences
- Check system functioning on the Hardware screen
- Access the RF ValProbe online Help

2.2 PC Requirements

To run the RF ValProbe Windows-based software, your PC should meet the following minimum requirements:

- Pentium or equivalent microprocessor with 1 GHz processor speed and at least 1 GB RAM
- At least 40 GB hard disk space available
- Windows 7 Professional (32 bit or 64 bit), Windows 8.1 (32 bit or 64 bit) Professional and Windows 10 Professional (32 bit or 64 bit)
- Microsoft Office 2010, 2013 (32 bit only) and 2016 (32 bit only) for reporting
- One unused USB port for communicating with the Base Station or an Ethernet connection
- One unused USB port for built in calibration interface
- Windows printer with graphical printer capability
- VGA color monitor with resolution at least 800 X 600. If you are performing a calibration:
- One Cal PC cable (USB A-A) for IRTD communication and the built in Kaye calibration interface in Base station

2.3 Installing RF ValProbe Software

When RF ValProbe is installed for the first time, user is asked to select RF hardware to be used. The selection is valid until user decides to switch the RF hardware from Preferences tab by selecting “Change to BaseStation” check box. Software will restart and a screen will appear to select the RF hardware.

Main Menu of RF ValProbe software will appear after appropriate selection of RF hardware.

In addition to standalone operation, Kaye RF ValProbe offers the option of configuring the software for network capabilities. The RF ValProbe data files can thus be saved to and reported on from a central network location, rather than stored on each individual PC's hard drive. In addition, by enabling network capabilities, the RF ValProbe software will utilize one central password database for managing user names and passwords. You can then manage passwords for all your users in one place, rather than having a different password database on each PC running the Kaye RF ValProbe software.

Note: *Network installations may not use the distribution set. Instead, users must create a customized network folder.*

- If you are installing Kaye RF ValProbe to a network drive (from which you will install it to individual PCs), proceed to “Installation for a Network Application” on the next page.
- If you are installing Kaye RF ValProbe to an individual PC, proceed to “Installation for a Standalone Application” on page 30.

2.3.1 Installation for a Network Application

- Be sure the network drive is mapped on your PC. On the drive, identify or create a network location (folder) to hold the RF ValProbe installation and data files. This location will also provide a central database for managing user names and passwords. The folder should be protected against data deletion.
- Insert the RF ValProbe CD into your CD-ROM drive. If the installation does not automatically begin, complete the following steps:

  Click **Start** on the Windows task bar, and then click **Run**.

  Click **Browse.** From the Browse dialog box, select your CD-ROM drive, click **Setup.exe,** and then click **Open.**

- Follow the on-screen instructions to perform the installation.
- Click on the appropriate installation path to install Kaye RF ValProbe to the network drive.
- Once installation has completed, the Kaye RF ValProbe Initialization program will run automatically. The Kaye RF ValProbe splash screen will appear, followed by the two System Administrator Site Options screens -- Policies and Preferences.

2.3.1a Setting Up Site Options

When you start up the program for the first time, you will first set up the System Administrator Site Options, which provide more flexibility while running the RF ValProbe software. You can enable any combination that your site supports.

- Set a login timer for user identification. The login timer allows users, after initial identification, to enter only their password if user identification is within the preset time limit. When this option is enabled, the login timer can be set from 1 to 15 minutes.

Note: *If you enable this option, the Time Interval readout displays to the right of that option, and the timer is initially set to 5 minutes. You can set the timer from 1 to 15 minutes using the spin buttons.*

- Require minimum-length passwords for all user accounts, from 6 to 16 characters.

Note: *If you select this option, use the spin buttons to set the requirement from 6 to 16 characters. The password expiration requirement can be set from 1 to 366 days with the spin buttons. Click the spin buttons once to move in 1-day increments, or click and hold to move in 10-day increments.*

- Set passwords to expire after a number of days, up to 366. Users will be prompted to change their password once their current password has expired. By default, passwords are set to expire after 180 days. The software will display the password expiration date to the user at login when there are five days or less until their password expires.
- Disable user accounts after 3 unsuccessful login attempts. This option will disable a user account if there are three consecutive PC login failures for the same user ID. If a user's account is disabled, the System Administrator must enable the account and assign a new temporary password. This option does not affect logins from the RF ValProbe instrument panel.

2.3.1a Setting Up Site Options (cont.)

- Display User ID during entry. By default, the user ID is shown to the user when logging in. Clearing this option will replace the user ID characters with asterisks (*****).
- Allow Operators to change Preferences. Preferences are workstation defaults that specify the temperature units (Celsius or Fahrenheit), the COM port, and when to issue low battery warnings. Any changes made to the system preferences are effective immediately, and all setups created after the preferences have been changed will reflect these new settings. If this option is not enabled, the System Administrator is responsible for changing preferences
- Disable the password system. User IDs and passwords will not be required to use the software.

Note: *If you select this option, the Kaye RF ValProbe system will not enable compliance with 21CFR Part 11 requirements for electronic records.*

Click the check box next to any option that you want to enable. An X appears in the check box when the option is enabled. Click the check box again if you want to disable it. The check box will be blank. Once your site options have been set, click on the Preferences tab.

2.3.1b Establishing Site Preferences

The Preferences tab has the following settings that can be initially set for all users who install Kaye RF ValProbe software from the network:

- Select temperature units (Celsius or Fahrenheit) for all temperature calculations
- Enter the Company Name.
- Specify the data directory, which will be the default location for storing and retrieving data files and storing the password database. Navigate to the location on the network you identified to store the data files. This folder should be protected against file deletion.
- Allow users to specify the lethality criteria for calculation in reports. Select the desired options, and click **OK**.

2.3.1c Completing Installation

Click **Finish** to complete the initialization program.

Return to the Windows task bar. Click **Programs,** then **Kaye RF ValProbe**, and then **RF ValProbe.**

2.3.2 Installation for a Standalone Application

1. Insert the RF ValProbe CD into your CD-ROM drive.

2. If the installation does not automatically begin, complete the following steps:

   a. Click **Start** on the Windows task bar, and then click **Run**.

   b. Click **Browse**. From the Browse dialog box, select your CD-ROM drive, click **Setup.exe**, and then click **Open.**

3. Click on the appropriate installation path to install Kaye RF ValProbe to your PC.

4. Follow the on-screen instructions to perform the installation.

5. Once installation has completed, the Kaye RF ValProbe Initialization program will run automatically. The Kaye RF ValProbe splash screen will appear, followed by the two System Administrator Site Options screens -- Policies and Preferences. Select the desired Site Options (as discussed on page 27 through page 29), and click **OK**.

6. Click **Finish** to complete the initialization program.

7. Return to the Windows task bar.

8. Click **Start**, then **Programs,** then **Kaye RF ValProbe**, and then **Client Setup.**

9. Click on the appropriate installation path to install the client to your PC.

10. Follow the on-screen instructions to finish the installation.

2.4 Starting the RF ValProbe System

To start up the RF ValProbe system for the first time:

1. Power up the Base Station, having connected it via USB to your PC.

2. Position and switch on the Loggers, with any external sensors or auxiliary inputs connected.

3. To open RF ValProbe validation software for the first time, click **Start >Programs>RF ValProbe>RF ValProbe.**

4. The identification required dialog box (shown in Figure 14 below) appears.

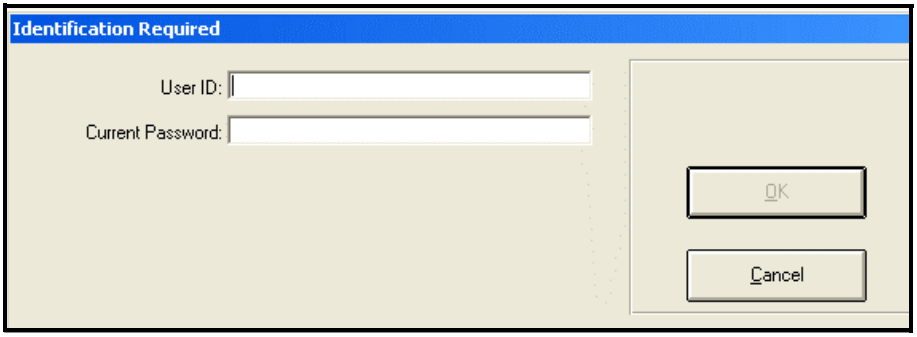

Figure 14: Identification Required Box

5. Enter **Kaye** in the **User ID** text box.

Kaye is the default System Administrator user ID. The User ID text box is case sensitive, so make sure you enter the default user ID exactly as it appears here.

Note: ***Note:****To access the Password Maintenance utility* ***after*** *your initial login, click* ***Start >Programs > RF ValProbe > RF ValProbe Utilities.*** *Then click* ***Site Options,*** *and enter your System Administrator user ID and password in the System Administrator Log In dialog box.*

6. Enter **411** in the **Current Password** text box. 411 is the default System Administrator password.

2.4 Starting RF ValProbe (cont.)

7. Click **OK**. The **Password Maintenance Add New User** screen appears, as shown in Figure 15 below.

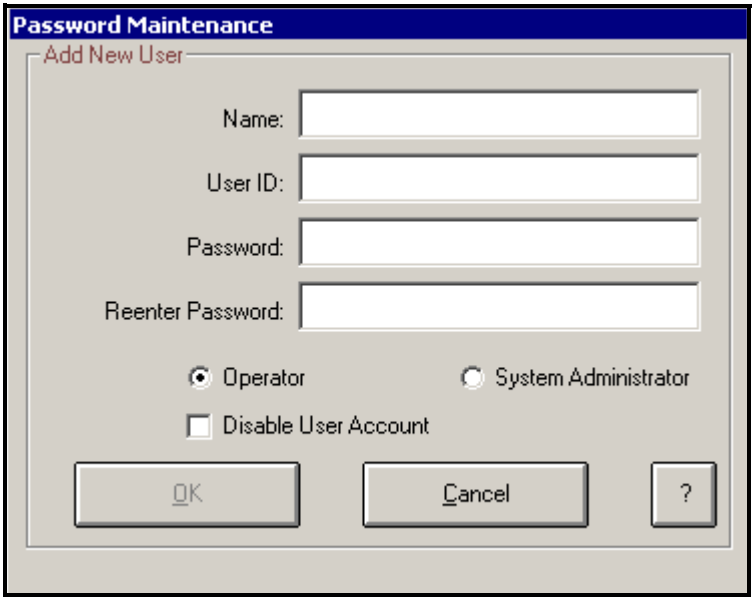

Figure 15: Password Maintenance - Add New User Screen

You are now ready to create your own System Administrator account and add users to the system. The next section provides instruction on creating your new System Administrator account from this screen and adding additional users.

2.5 Creating User Accounts

The RF ValProbe software is designed for two levels of users:

System Administrator - Creates and maintains user accounts, sets site options and system preferences, backs up and restores user information, and views, prints, and maintains the audit trail. The System Administrator also performs Logger calibration.

Operator - Programs Loggers, reads Loggers, creates reports, and performs calibration verification. Operators can also change system preferences if the System Administrator has enabled the Allow Operators to change Preferences site option.

In this section you:

- Create a new System Administrator account
- Create Operator accounts

2.5.1 Creating a New System Administrator Account

The first task you must perform when you log in for the first time is to create a System Administrator account. Once this is accomplished, you can add users (Operators or other System Administrators) to the system and set site options. Once your System Administrator account is created, the default account you used to log on to the system (Kaye/411) will be deleted. You will then be logged in under the user name you create.

Note: *It is good practice to establish more than one individual as a System Administrator. This way, the Password Maintenance utility functions can still be accessed, even if one of the System Administrators is unavailable.*

The next time you log in to the Password Maintenance utility you will need to enter your own System Administrator user ID and password. The Password Maintenance utility is able to identify you by name using your unique user ID and password combination.

Note: *If you want to use the Kaye RF ValProbe software to program Loggers, read Loggers and generate reports, create an Operator account for yourself using a different name and user ID than your System Administrator account.*

1. The **Password Maintenance Add New User** screen should be displayed after you logged in to the system for the first time using the default System Administrator account. Enter your name (up to 32 characters) in the Name field.

   The name you enter here displays in the active user list. User names must be unique. Once you have added your name to the active user list, you can never enter the same name again. Your name is associated with the unique user ID/password combination that you enter in steps 2 and 3. You use this user ID/password combination to log in to the Password Maintenance utility. The user ID and password are case sensitive.

2. Enter your new System Administrator identification in the **User ID** field. Your user ID can be any combination of numbers and characters, up to a maximum of 16. A user ID may not be used by more than one active account.
3. Enter your new System Administrator password in the Password field. Your password can be any combination of numbers and characters, up to a maximum of 16. For security reasons, it is preferable to use more than six characters or numbers.
4. Enter your password again in the **Reenter Password** field.

   At this point you should record your user ID and password for future reference. You will need them to log in to the Password Maintenance utility. Because this is the first System Administrator account created, the system assumes that this is your account, and you will not need to change the password. However, for any additional System Administrator accounts created, the user will need to change the password when logging in for the first time.

5. The permission level is set to System Administrator by default. Click OK.

The **Password Maintenance** screen (shown in Figure 16 on the next page) appears. Your new System Administrator account name appears in the active user list.

2.5.1a Creating a New System Administrator Account (cont.)

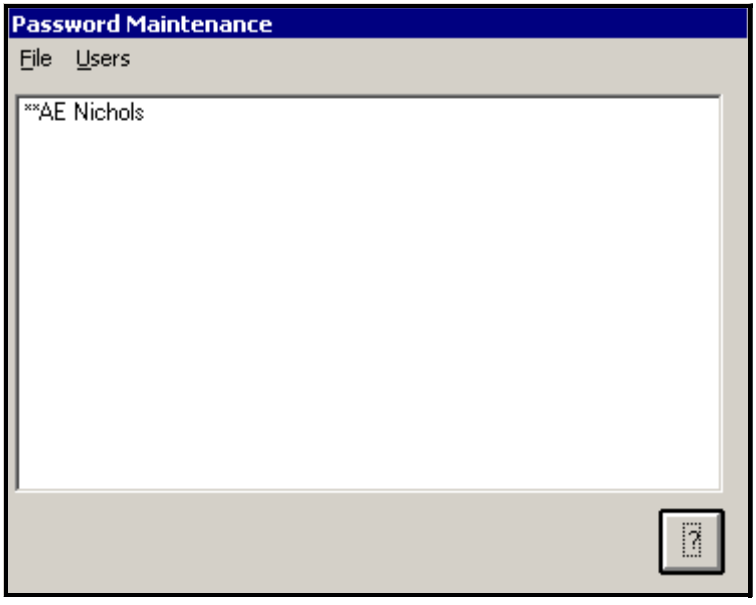

Figure 16: Password Maintenance Screen

2.5.2 Creating Operator Accounts

Now that you have created your own System Administrator account, you are ready to add user accounts. All Password Maintenance activity you now perform will be recorded in the audit trail under your user name.

When you create user accounts, each user's name is added to the active user list. You assign a unique user ID for each user and a temporary password. The user will change the password when they first log in.

To create Operator accounts:

1. On the Password Maintenance screen, click the Users menu, and then click **Create User**. The **Password Maintenance Add New User** screen (shown in Figure 17 below) appears.

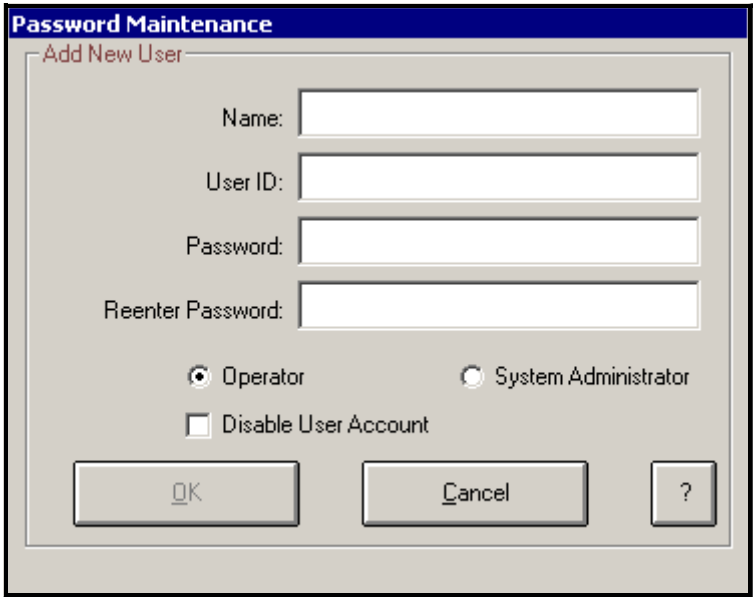

Figure 17: Password Maintenance Add New User Screen

2. Enter the new user name (up to 32 characters) in the Name field.

The user name is associated with the user ID/password combination that you enter in steps 3 and 4. The user ID/password combination is used to identify the user to the RF ValProbe software. The name you enter here appears in the active user list.

Note: *User names must be unique. Once a name has been used, it cannot be used again. You should keep a separate record of all user names that you assign to avoid future problems.*

3. Enter the new user identification in the **User ID** field. The user ID can be any combination of numbers and characters, up to a maximum of 16. The user ID and password are case sensitive. A user ID may not be used by more than one active account.

4. Enter the new user password in the **Password** field. The password can be any combination of numbers and characters, up to a maximum of 16. The user will change this password when they first log in to the Kaye RF ValProbe software.

5. Enter the password again in the Reenter Password field.

At this point you should record the new user ID and password. You will need to supply this information to each new user. A user ID/password combination is required any time a user:

- Programs and/or reads Loggers
- Verifies sensor calibration
- Creates reports
- Moves or copies data files
- Changes preferences (if the System Administrator has enabled the Allow Operators to change Preferences site option)

6. Click **Operator** to set the account's permission level.

7. The **Disable User Account** option allows you to deny access to the system for this user. For example, if you are creating an account for a user who will not need access to the system for several months, you may want to select this option to deny access to the user. You can de-select this feature once the user is ready to use the system (see the Kaye RF ValProbe online Help for instructions on editing user accounts).

Select this option if you want to disable the user account.

8. Click **OK**.

The **Password Maintenance** screen (Figure 18 below) appears with the newly added user name in the active user list.

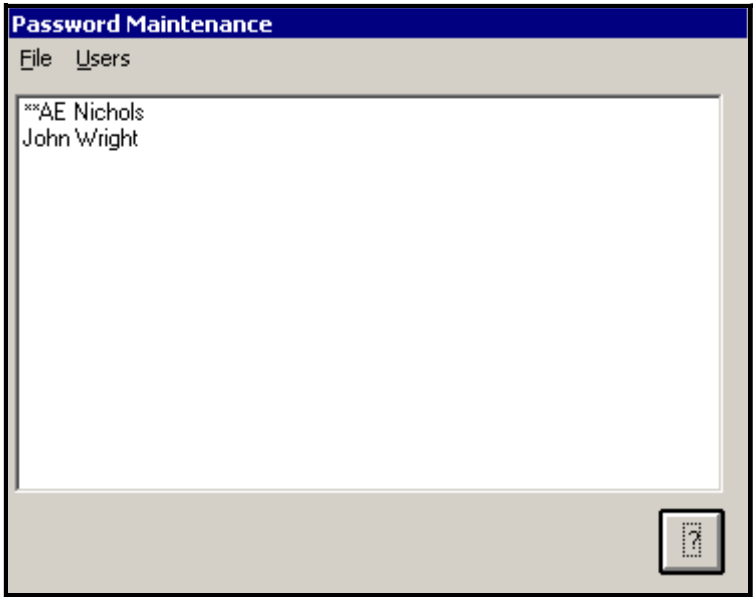

Figure 18: Password Maintenance Screen

9. Repeat steps 1 through 8 to add more users to the system.

2.5.3 Printing the User List

All active and deleted user accounts are included in the printed list.

To print the user list:

1. On the Password Maintenance screen, click the **File** menu, and then click **Print Users**. The Windows Print dialog box appears.
2. Select a printer and click **Print**.
3. Click **OK** when prompted that the user list has been printed.

2.5.4 Selecting Site Options

The Password Maintenance utility provides site options that give users more flexibility while running the Kaye RF ValProbe software. To access the site options from the Password Maintenance screen, click **File >Options**. The **System Administrator Site Options** screen opens, as shown in Figure 19 below.

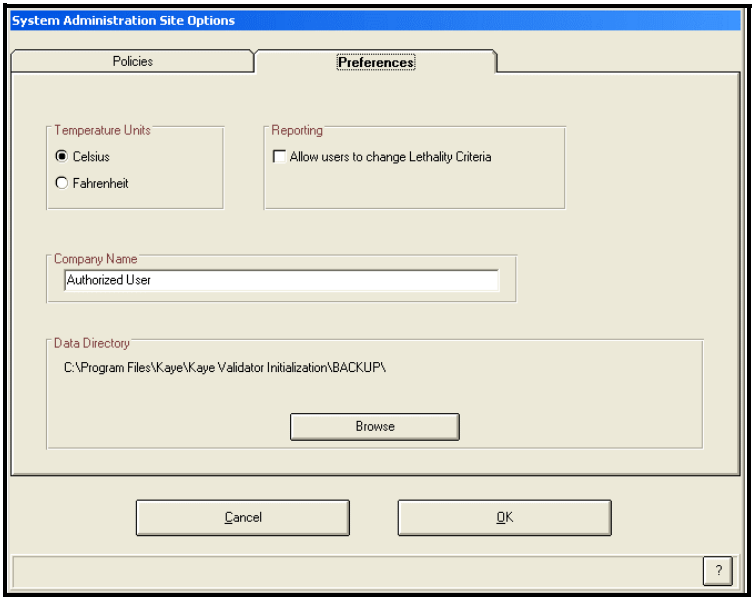

Figure 19: System Administrator Site Options Screen

2.5.4 Selecting Site Options (cont.)

As the System Administrator, you can select options that will:

- Disable the user identification requirement.

IMPORTANT: *If you disable the user identification requirement, the Kaye RF ValProbe system does not meet FDA regulations for electronic signatures (21 CFR Part 11).Kaye recommends that you always require user identification.*

- Set passwords to expire after a number of days, up to 366. The user will be prompted to change their password once their current password has expired. By default, passwords are set to expire after 180 days.
- Require minimum-length passwords for all user accounts, from 1 to 16 characters.
- Disable user accounts after three unsuccessful login attempts. This option will disable a user account if there are three consecutive login failures for the same user ID. If a user's account is disabled, the System Administrator must enable the account and assign a new temporary password.
- Allow Operators to change Preferences. Preferences are system defaults that specify the temperature units, the communications port, the network ID, and when to issue low battery warnings. Any changes made to the system preferences are effective immediately, and all setups created after the preferences have been changed will reflect these new settings. If this option is not enabled, the System Administrator is responsible for changing preferences.

2.5.4 Setting Site Options (cont.)

To set site options:

1. Select the check box next to any option to enable that option. To set the number of days until passwords expire, use the spin buttons to set the number of days in 30-day increments, or enter a number from 1 to 366 in the box. To specify a minimum password length, select the *Require minimum password length* option and use the spin buttons to set the password requirement from 1 to 16 characters, or enter the number directly into the box.

To disable an option, clear the associated check box.

2. Click **OK**. The Password Maintenance screen appears.
3. On the **File** menu, click Exit to log out of the Password Maintenance utility. The RF ValProbe Main Menu appears, as shown in Figure 20 below.

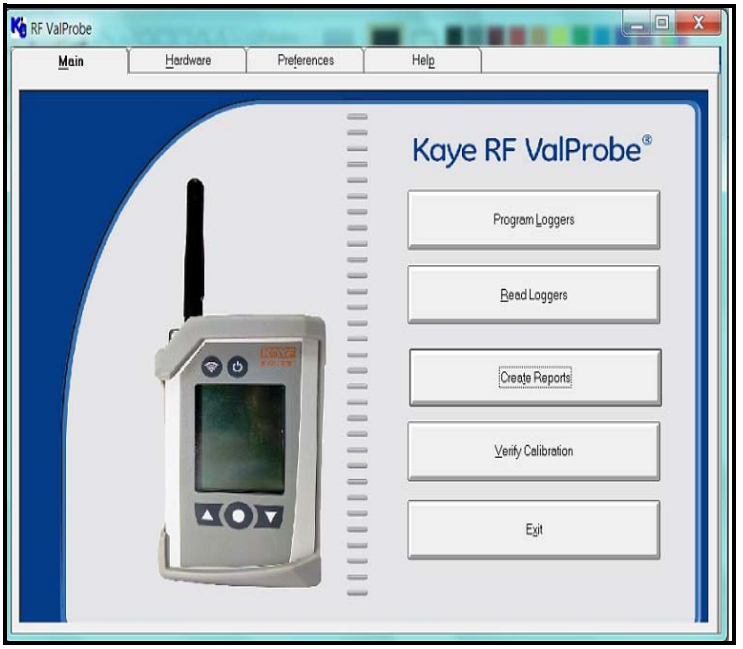

Figure 20: Kaye RF ValProbe Main Menu

2.5.5 Selecting a Communications Option and Establishing Preference

The Kaye RF ValProbe Base Station is the communications link between the Kaye RF ValProbe Loggers and your computer. After installing the Kaye RF ValProbe software and connecting the Base Station to your PC via USB, you must select or confirm a communications option in order for the Base Station to communicate with your PC. You might also need to change the Network ID of your Base Station, or select the temperature displayed (in °F or °C).

To select a communication option:

1. On the Kaye RF ValProbe Main Menu, click the Preferences tab. The **Change Preferences** (Figure 21 below) dialog box appears.

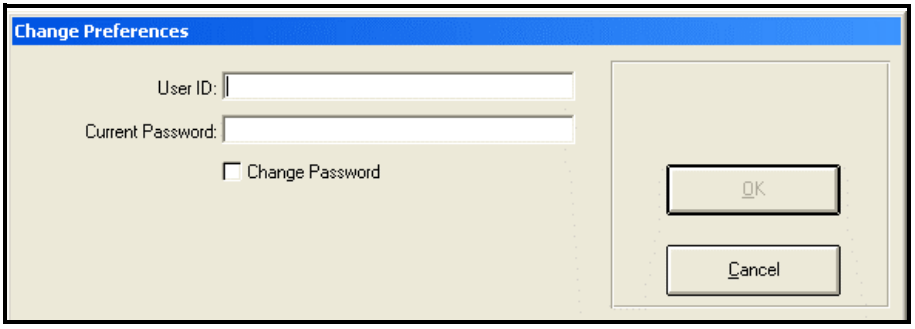

Figure 21: Change Preferences Dialog Box

2. Enter your System Administrator user ID and password and click OK (you can use an Operator user ID and password if you have enabled the Allow Operators to change Preferences site option).

The **Preferences** screen (Figure 22 on the next page) appears.

Note: *Three items on the Preferences screen appear for information purposes only -- the Machine ID, the Company Name and the Data Directory for backup files. These items are not user-selectable.*

2.5.5 Selecting a Communications Option and Establishing Preferences (cont.)

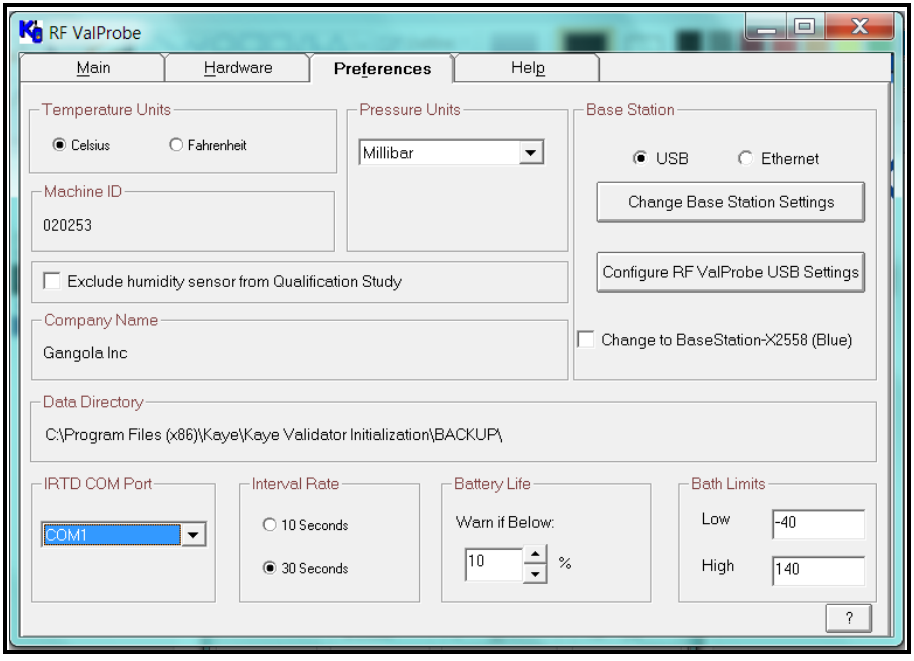

Figure 22: Preferences Screen

3. To select the units in which you wish to display temperature (Celsius or Fahrenheit), click on the appropriate radio button.

Note: *This selection applies to the entire RF ValProbe --both the Base Station and Loggers.*

4. If you are connecting an IRTD to the PC, click on the COM port to which you will connect the IRTD from the pull-down list.

5. The Battery Life warning signals the user to change the battery if its life drops below a certain percentage (from 0 to 90%). The default setting is 10%. If you want a different percentage, use the arrow keys to scroll to the desired percentage.

6. Click on the desired communications option (USB or Ethernet) from the Base Station radio buttons. USB is the default selection. You can use USB or Ethernet, but not both simultaneously.
7. Click on **"Change to BaseStation"** check box to switch the RF hardware to be used. Software will restart and a screen will appear to select the RF hardware. Main Menu of RF ValProbe software will appear after appropriate selection of RF hardware.

2.6 Setting Up the USB Connection

First, be sure you have selected the USB option for your Base Station on the Preferences screen. Also, be sure you have powered up the Base Station and connected it to your PC's USB port before completing the following steps:

1. If you need to change the Base Station settings, click the **Change Base Stations Settings** button. The USB Base Station Settings window opens, as shown in Figure 23 below.

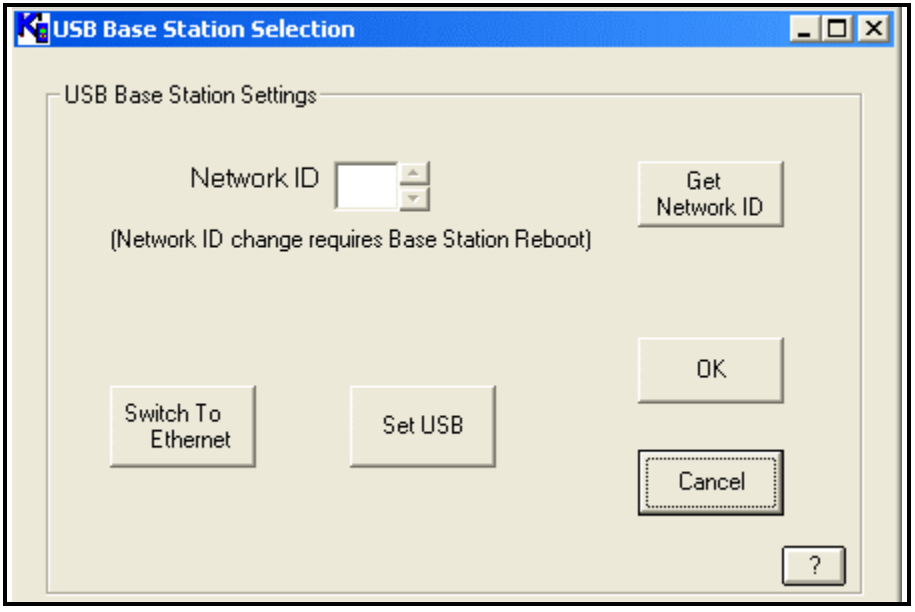

Figure 23: USB Base Station Settings

2. A default network ID of 0 has been programmed into the Base Station. You can use this ID or enter a new Network ID, from 0 to 9 or A to F.

- To obtain the programmed ID, click on the **Get Network ID** button. The software obtains the programmed ID from the Base Station.
- To enter a different Network ID, use the arrow keys next to the text box.

3. Click **OK** to confirm the settings and return to the **Preferences** screen.

2.6.0 Setting Up USB Connection (cont.)

Note: *Be sure that the ID number at the back of each Logger matches the network ID number programmed in this window.*

By clicking the **Set USB** button, you set the static IP address on your PC to correspond to the static IP address of the USB-to-Ethernet converter used in the Base Station. The software performs this function on startup, but you may need to perform it here if, for example, the USB cable was plugged in after startup.

2.7 Setting Up the Ethernet Connection

Note: *If you plan to use an Ethernet connection, please be sure the Ethernet cable is no longer than 30 m to the nearest hub/switch. If you switch the Base Station to Ethernet mode, the Base Station acquires the IP address by DHCP from your network during startup. Please make sure that there is a DHCP Server available before switching to Ethernet mode. After switching to Ethernet mode, the Base Station will no longer communicate over USB. To restore USB communication, you must establish an Ethernet connection.*

If you want to switch to Ethernet operation, you must click on the **Switch to Ethernet** button, and follow the on-screen instructions. Be sure the Base Station remains connected to the USB port until you receive specific instructions to change the connection.

The **Ethernet Base Station Settings** window opens, similar to Figure 24 below.

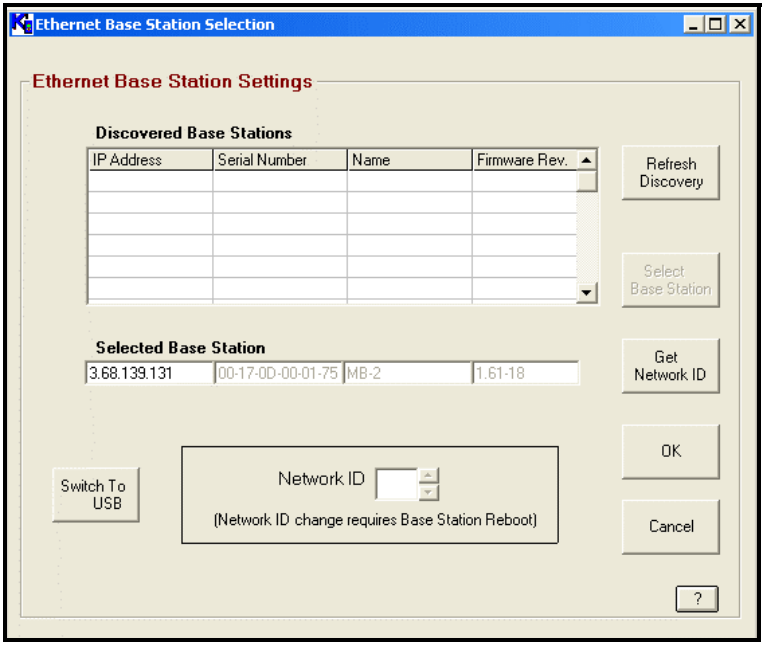

Figure 24: Ethernet Base Stations Settings

2.7.0 Setting Up the Ethernet Connection (cont.)

1. To locate the Base Stations on the network, click on the **Refresh Discovery** button. The software scans the network and locates the Base Stations on the network.
2. To select and program a specific Base Station, highlight the desired Base Station in the **Discovered Base Stations** window and click on the **Select Base Station** button.
3. Users can either accept the network ID programmed into the Base Station or enter a new Network ID, from 0 to 9, or A to F. (The default ID is 0.)

- To obtain the programmed ID, click on the **Get Network ID** button. The software obtains the programmed ID from the Base Station.
- To enter a Network ID, use the arrow keys next to the text box.

4. Click **OK** to confirm the settings and return to the **Preferences** screen.

Note: *Be sure that the ID number at the back of each Logger matches the network ID number programmed in this window.*

Note: *If you switch to new hardware only new base station will be displayed and if you switch to old hardware only old base station will be displayed. User cannot use old base station if he has switched to new RF hardware*

If you want to return to USB operation, click the **Switch to USB** button while the Ethernet cable remains plugged into the Base Station. Then follow the on-screen instructions.

2.8 Viewing the RF ValProbe Hardware Inputs

Once you have set up your Loggers and Base Stations and established your Preferences, you can view the RF ValProbe system on the **Hardware** tab, to ensure that the system is functioning properly.

From the **Main Menu** or the **Preferences** tab, click on the **Hardware** tab. The Hardware screen initially appears blank. As the software receives data from the Base Station and Loggers, it appears similar to Figure 25 below.

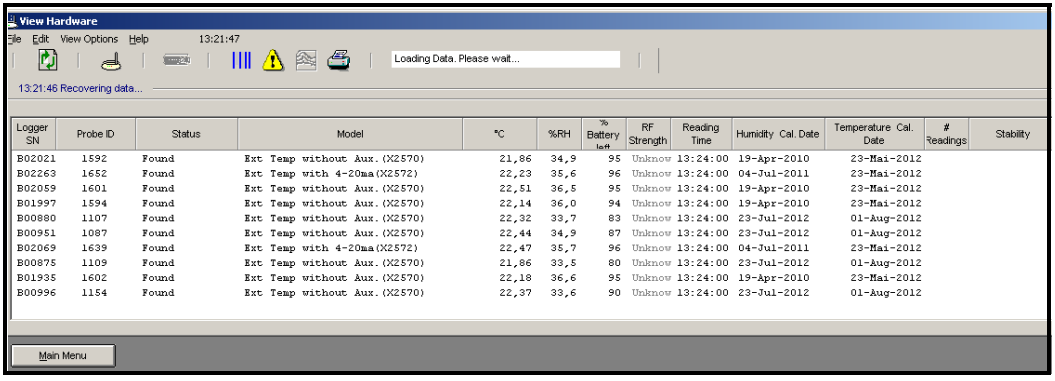

Figure 25: Hardware Screen Identifying Loggers

Once the software has established data inputs from the Base Station and Loggers, the screen appears similar to Figure 20 on the next page, with the temperature and humidity displayed.

IMPORTANT:

- Single channel temperature logger is treated as humidity/temperature logger with no humidity sensor present.
- Repeater logger is treated as humidity/temperature logger with no humidity sensor and no temperature sensor present. Serial number of repeater logger always starts with either "R" or "r".

2.8 Viewing the RF ValProbe Hardware Inputs (cont.)

- Software will automatically include single channel temperature logger for programming even if humidity sensor value is not available.Similarly, software will automatically exclude repeater logger from programming.
- Humidity value will be displayed as 398.4 in reports for Single channel temperature logger.

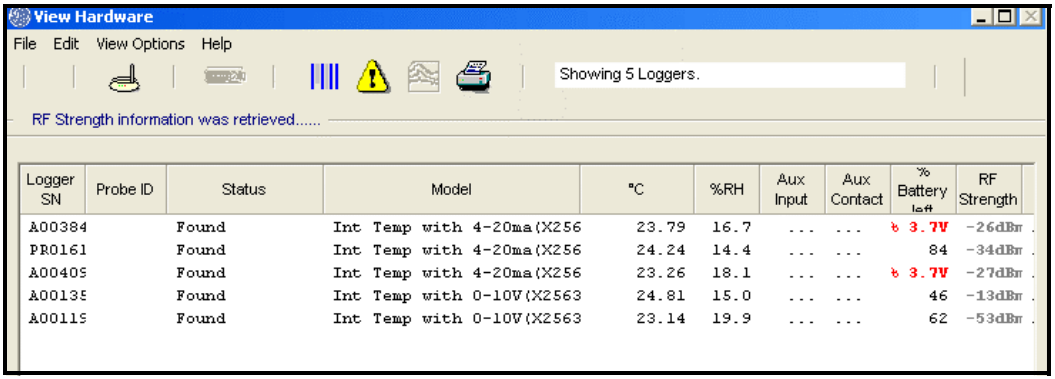

Figure 26: Hardware Screen with Data Inputs Established

As the RF ValProbe locates and retrieves data for Loggers via the Base Station, it displays Logger status via a variety of brief messages:

- Searching -- Logger is detected, and the system is getting more information. It may be ready to use.
- Found -- Logger is available, and ready to use.
- Starting - The software is asking each Logger to start collecting data at the specified rate and at the specified time, but the Logger has not yet acknowledged that it has begun the program.
- Logging -- The Logger is currently running in a study.
- Running -- The Logger is programmed and waiting to run in a study at a specified time.

2.8 Viewing the RF ValProbe Hardware Inputs (cont.)

- Waiting -- The expected readings/samples are late in arrival, due, perhaps, to poor RF communications or a stopped logger.
- Ready to Read -- The Logger has completed its study.
- Retrieving -- The system is obtaining data from the Loggers.

Note: *When the system is Re-reading Loggers, even if the Logger is turned OFF, you can read the Logger data from the Base Station. Kaye recommends leaving the base station and loggers turned ON until the study is read, to avoid any issues retrieving data.*

- Read -- The system is reading the Logger samples.
- Done -- The reading is complete.
- Configuring -- The system is uploading or sending calibration/verification information to the Logger.
- Stopping -- The software sends Stop Data Collection to the logger when the run is ended.
- Requesting -- The system is getting additional or needed readings/samples from the Logger.
- Failed Update -- For calibration or verification, the system failed to update Loggers. Consult Kaye.

2.8 Viewing the RF ValProbe Hardware Inputs (cont.)

The screen offers several additional display and information options:

- To view real-time data from one or more Loggers in graph format, highlight one or more Loggers in the list (use Ctrl + click to select two or more Loggers) and click on the Graph Sensors button or click **File>Graph Sensors** from the File menu. A blank graph screen appears, similar to Figure 27 below.

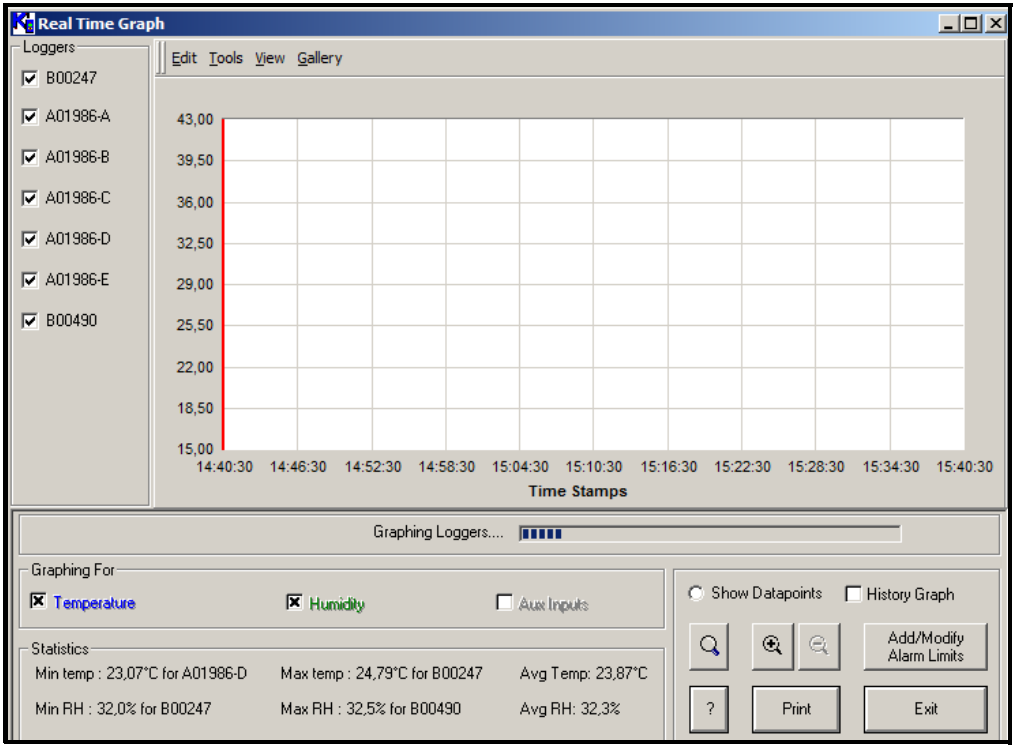

Figure 27: Real-Time Graph Screen

2.8 Viewing the RF ValProbe Hardware Inputs (cont.)

Data logging begins when you have started the Graph option. To plot the data collected prior to starting the real time graph, click the History Graph check box; the software will read historical data from the Base Station and plot it in the real time graph. Once the historical data has been read and plotted, the History Graph check box will be disabled. After a few minutes, the screen appears similar to Figure 28 below.

Figure 28: Real-Time Graph Screen Displaying Data

2.8 Viewing the RF ValProbe Hardware Inputs (cont.)

You can select the type of sensor displayed, copy and print the graph, and choose from a number of graph options.

- To view Base Station information, you can click on the Base Station icon  , or click **View Options>RF Base Station** from the View Options menu. The Base Station window lists serial number, IP address, Network ID and Base Station name.
- To customize your view of the Hardware screen, click on the **Customize Column Layout** icon  , or click **View Options>Customize Column Layout** from the View Options menu. In addition to Status, Logger model number, and current temperature and humidity readings, you can select or deselect auxiliary inputs and contacts, percentage of battery life remaining, stability, calibration and calibration verification dates, probe ID, firmware version, RF strength, number of readings and time received.
- To refresh the view click the Refresh view button  . This button reloads and redisplays information on Hardware view screens when the initial view of the Loggers or the commands sent to Loggers do not appear. Try clicking the Refresh button if a screen or a process seems to be stopped or frozen.
- To view and graph the RF Strength of the various RF strengths of signal paths, click **Map RF Strength** from the File menu. The Logger Network Strength Graph screen opens, displaying the paths and their signal strengths. You can add a background diagram or photo (as shown in Figure 29 on the next page) on which the software will superimpose the signal path graph.

Note: *Signal strength loading for the first time will take approximately 15 minutes. Mapping RF strength will function only after the signals have been loaded.*

2.8 Viewing the RF ValProbe Hardware Inputs (cont.)

Figure 29: Logger Network Strength Screen

- To print a Logger list report from the current screen view, click on the Print button, or click **File >Print Logger list report from current view** from the File menu.
- To return to the Main Menu, click on the Main Menu button.

2.9 Accessing the Kaye RF ValProbe Online Help

The RF ValProbe online Help provides step-by-step instructions for using the software, including: programming Loggers, reading Loggers, creating reports, and performing calibration verification.

Note: *The Kaye RF ValProbe online Help will work with Internet Explorer 4 or later, however, Internet Explorer 11 or later is recommended.*

To access online Help:

- With the Kaye RF ValProbe program running, click the Help tab.

The Kaye RF ValProbe Help window (shown in Figure 30 below) appears.

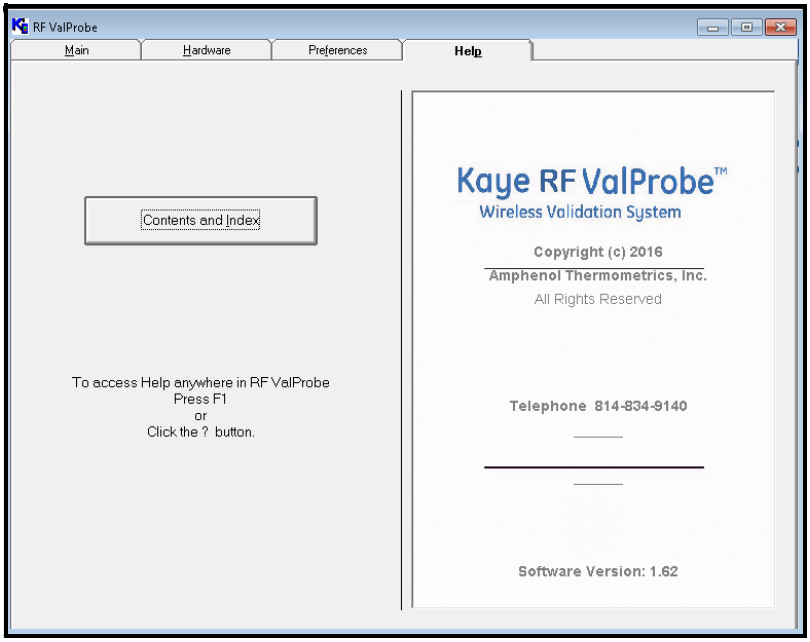

Figure 30: RF ValProbe Help Window

Click on the **Contents and Index** tab to access specific Help features.

2.9.1 Tabs

- The following tabs and buttons are available to assist you in navigating Help:
- The **Contents** tab displays the Table of Contents. Click a book to display the pages in that book. Click a page to view the corresponding help topic in the right-hand window.
- The **Index** tab displays the Index. Enter the keyword to search for, select it from the list, and click Display to view the associated topic.
- The **Search** tab provides full-text search capabilities. This feature enables you to search the entire Help system for a word or phrase. Enter the word or phrase and click List Topics. Select a topic from the list and click Display. The word or phrase you searched for will be highlighted in the topic text.
- The **Favorites** tab enables you to store a list of your favorite or most frequently used Help topics. Whenever you open Help, you can quickly go to the topics you view most often by selecting them from this tab. When a topic you would like to store in the favorites list is displayed in the right-hand pane, click Add. You can update the list at any time by removing topics you no longer want to mark as favorites.

2.9.2 Buttons

- The **Show/Hide** buttons show or hide the left pane of the Help window. When you access Help for individual screens within the Kaye ValProbe software, you can use the Show button to access the Contents, Index, Search, and Favorites tabs. Use the Hide button to view a topic only and provide more room on your screen.
- The **Back** button returns you to the previously viewed Help topic.
- The **Forward** button opens the next topic in a previously viewed sequence.
- The **Print** button prints the current Help topic to your default printer.
- The **Options** button opens a menu that provides access to the **Show/Hide**, **Back**, **Forward**, and **Print** features, in addition to:
  - **Home** - Links to the website.
  - **Stop** - Stops loading a new topic or stops downloading information (click this option to stop a Web page from opening).
  - **Refresh** - Updates the topic content displayed in the topic pane.
  - **Search Highlight On/Off** - When this option is enabled (default setting), words entered using the **Search** feature are highlighted in the topic text

2.10 Screen-Level Help

You can also access online Help for individual screens in the RF ValProbe software by clicking the  button in the lower right corner of the screen, or by pressing **F1**.

MASTER CERTIFICAÇÕES

Organismo de Certificação Designado - OCD - ANATEL
Organismo de Certificação de Produtos - OCP - INMETRO

MARCAÇÕES - MARKS

- Equipamentos de Telecomunicações -

0394-17_SELO_ANATEL.DOC

Processo: OS 0394-17
Fabricante / *Manufacturer:* Amphenol Thermometrics, Inc.

Modelo / *Model*: RF3005

Selo ANATEL no produto

ANATEL

00159-18-10141

Master Associação de Avaliação de Conformidade

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- Equipamentos de Telecomunicações -

0394-17_SELO_ANATEL.DOC

Dizeres da Res. 680 no Manual, pg 61.

Appendix A. Specifications

A.1 RF ValProbe System Specifications

A.1.1 RF System Operating Frequency

2.4 GHz

A.1.2 RF Certification

USA, Canada, EU (CB scheme). For other, contact factory.

A.1.3 Number of Loggers

Up to a maximum of 40 Loggers per Base Station.

A.1.4 Transmission

Maximum antenna to antenna distance in open space: 150 ft (45m)

A.1.5 PC Update Rate

10 seconds maximum

A.1.6 Maximum Network Form Time

- For 8 Loggers evenly distributed over 5 cubic ft / 0,15 m^3: typical, 2 minutes
- For 12 Loggers in a 30 ft (9m) radius single plane, typical, 4 minutes

A.1.7 Data Retention

Loggers retain up to 10,000 data samples per sensor.

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados

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Processo: OS 0395-17
Fabricante / *Manufacturer:* Amphenol Thermometrics, Inc.

Modelo / *Model*: RF3010

Selo ANATEL no produto

ANATEL

00160-18-10141

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A.1.7 Data Retention

Loggers retain up to 10,000 data samples per sensor.

A.2 Base Station

Autonomous Base Station operation configuration. The external connection (Ethernet or USB) to the Base Station can be broken and reconnected at any time with no interruption in system operation and no loss of data.

A.2.1 Connections

Ethernet full speed, Cal PC for IRTD and BATH

Note: *Connections are mutually exclusive.*

A.2.2 Power

Power Adapter
Input: 100 to 240 Volts AC
50-60 Hz input
Battery: Two 3.7V AA size secondary (Rechargeable) batteries

A.2.3 Indicators

Power, RF Link, Study, Mains/Battery supply

A.3 Logger

A.3.1 Measurement Types

- Temperature
- RH
- 4-20 mA input
- 0-10 voltage input
- Contact Closure

A.3.1a Sensor Configurations

T with external temperature sensor

T/RH with external temperature sensor

T/RH with external temperature sensor, 0-10 V input, contact closure T with two external temperature sensors

T/RH with external temperature sensor, 4/20 mA input, contact closure

T with five external temperature sensors

Table 3: Sensor Configurations

Model #	RTD1	RTD2	RTD3	RTD4	RTD5	RH	Voltage	Current	Contact
X3001D-0-0	√								
X3001D-H-0	√					√			
X3001D-H-V	√					√	√		√
X3001D-H-A	√					√		√	√
X3002D-2	√	√							
X3002D-5	√	√	√	√	√				
X3001N-R									

A.3.2 Environmental

A.3.2a Logger Body (Enclosure)

-40°C to 60°C, 0 to 90% RH non-condensing….Storage Temperature

-25°C to 60°C, 0 to 90% RH non-condensing….Operating Temperature

Note: *Logger on Battery mode only (Logger External Power adapter rated for operating temperature 0°C to 60°C)*

A.3.2b Base Station Body (Enclosure)

-40°C to 60°C, 0 to 90% RH non-condensing….Storage Temperature

0°C to 50°C, 0 to 90% RH non-condensing…....Operating Temperature

A.3.2c Logger External Probe

-196°C to 200°C

A.3.2d Logger Dimensions

110 mm x 65 mm x 30 mm (4.3 in x 2.6 in x 1.2 in)

A.3.2e Base Station Dimensions

190 mm x 130 mm x 55 mm (7.6 in x 5.2 in x 2.2 in)

A.3.3 Accuracy

A.3.3a Temperature-Validation (External Sensor)

Single / Multi Channel External Sensor

±0.1°C, range -50°C to +130°C
±0.2°C, range -80°C to -50°C
±0.5°C, range -80°C to -22°C
Accuracy for -196°C to -80°C & +130°C to 200°C ...Contact Factory

A.3.3b Relative Humidity

±2.0% from 25% to 85% RH at 25°C to 40°C (Non-condensing environment) Certificate states ICH Points

A.3.3c Auxiliary Inputs

3.8 to 22 mA Input, 16 bit A/D input, accuracy: 0.5% FS 0 to 10 V input, 16 bit A/D input, accuracy: 0.5% FS Contact Closure (dry)

A.3.3d Sensor Sampling Rate

5 seconds maximum, 12 hours minimum

A.3.4 Battery / Power Supply

Logger Battery Life (Varies ±10% @ 25°C)

1 minute samples: 1 Year with Kaye recommended battery

Note: *Additional factors impacting battery life are RF network configuration, sampling rate, temperature, LCD operation and SD card operation.*

Battery Type: Kaye# 200-165, 2 AA Lithium primary (Non-rechargeable) Batteries- 2600mAH

Power Adapter: Input: 100 to 240 Volts AC 50-60 Hz input

CAUTION! **If it becomes necessary to replace a Logger battery, use only Kaye# 200-165, 3.6 V Lithium primary (Non-Rechargeable) battery. Use of any other battery will void your Logger warranty.**

A.3.5 Logger Indicators

- Power
- RF Link

A.3.6 Logger Timing

Date and Time stamp required for each sensor reading

Time synchronization: 15 sec/day minimum

Indication of logger loss of communications interval: either 2 samples or 15 minutes (whichever is less)

A.3.7 Logger Storage

Non-volatile storage up to 10,000 data samples per sensor

A.4 Environmental/EMC

A.4.1 EMC-EN61326

A.4.1a Base Station Emissions classification: Class A

Immunity classification: Table A1, Annex A, for use in industrial locations
Performance Criteria: Continuous unmonitored operation

A.4.1b Logger

Emissions classification: Class A

Immunity classification: Annex C, Table C1, portable and battery operated equipment

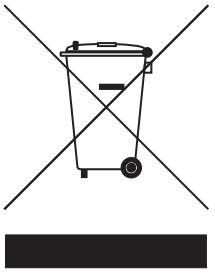
Appendix B.Environmental Compliance

This appendix contains information on the following topics:

- WEEE Directive (see *Section B.1 on page 73*)
- Battery disposal (see *Section B.2 on page 74*)

B.1 Waste Electrical and Electronic Equipment (WEEE) Directive

Amphenol Thermometrics, Inc. is a participant in Europe's Waste Electrical and Electronic Equipment (WEEE) take-back initiative, directive 2002/96/EC.



The equipment that you bought has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end life equipment in a sound way.

The crossed-out wheeled bin symbol invites you to use those systems.

If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administration.

Contact your Amphenol Thermometrics, Inc. team for additional take-back information.

B.2 Battery Disposal

This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling return the battery to your supplier or to a designated collection point.

B.2.1 What do the Markings Mean?

Batteries and accumulators must be marked (either on the battery or accumulator or on its packaging, depending on size) with the separate collection symbol. In addition, the marking must include the chemical symbols of specific levels of toxic metals as follows:

- Cadmium (Cd) over 0.002%
- Lead (Pb) over 0.004%
- Mercury (Hg) over 0.0005%

B.2.2 The Risks and Your Role in Reducing Them

Your participation is an important part of the effort to minimize the impact of batteries and accumulators on the environment and on human health. For proper recycling you can return this product or the batteries or accumulators it contains to your supplier or to a designated collection point.

Some batteries or accumulators contain toxic metals that pose serious risks to human health and to the environment. When required, the product marking includes chemical symbols that indicate the presence toxic metals: Pb for lead, Hg for mercury, and Cd for cadmium.

- **Cadmium** poisoning can result in cancer of the lungs and prostate gland. Chronic effects include kidney damage, pulmonary emphysema, and bone diseases such as osteomalcia and osteoporosis. Cadmium may also cause anemia, discoloration of the teeth, and loss of smell (anosmia).
- **Lead** is poisonous in all forms. It accumulates in the body, so each exposure is significant. Ingestion and inhalation of lead can cause severe damage to human health. Risks include brain damage, convulsions, malnutrition, and sterility.
- **Mercury** creates hazardous vapors at room temperature. Exposure to high concentrations of mercury vapor can cause a variety of severe symptoms. Risks include chronic inflammation of mouth and gums, personality change, nervousness, fever, and rashes.

[no content intended for this page - proceed to next page]

Warranty

Each instrument manufactured by Amphenol Advanced Sensors is warranted to be free from defects in material and workmanship. Liability under this warranty is limited to restoring the instrument to normal operation or replacing the instrument, at the sole discretion of Amphenol Advanced Sensors. Fuses and batteries are specifically excluded from any liability. This warranty is effective from the date of delivery to the original purchaser. If Amphenol Advanced Sensors determines that the equipment was defective, the warranty period is:

- one year for general electronic failures of the instrument
- one year for mechanical failures of the sensor

If Amphenol Advanced Sensors determines that the equipment was damaged by misuse, improper installation, the use of unauthorized replacement parts, or operating conditions outside the guidelines specified by Amphenol Advanced Sensors, the repairs are not covered under this warranty.

The warranties set forth herein are exclusive and are in lieu of all other warranties whether statutory, express or implied (including warranties or merchantability and fitness for a particular purpose, and warranties arising from course of dealing or usage or trade).

Return Policy

If a Amphenol Advanced Sensors instrument malfunctions within the warranty period, the following procedure must be completed:

1. Notify Amphenol Advanced Sensors, giving full details of the problem, and provide the model number and serial number of the instrument. If the nature of the problem indicates the need for factory service, Amphenol Advanced Sensors will issue a RETURN AUTHORIZATION number (RA), and shipping instructions for the return of the instrument to a service center will be provided.
2. If Amphenol Advanced Sensors instructs you to send your instrument to a service center, it must be shipped prepaid to the authorized repair station indicated in the shipping instructions.
3. Upon receipt, Amphenol Advanced Sensors will evaluate the instrument to determine the cause of the malfunction.

Then, one of the following courses of action will then be taken:

- If the damage is covered under the terms of the warranty, the instrument will be repaired at no cost to the owner and returned.
- If Amphenol Advanced Sensors determines that the damage is not covered under the terms of the warranty, or if the warranty has expired, an estimate for the cost of the repairs at standard rates will be provided. Upon receipt of the owner's approval to proceed, the instrument will be repaired and returned.

B

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Customer Support Centers

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