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ACTION INSTRUMENTS

WebView I/O Series
WVC16-2000
WebView I/O Communications Interface

User's Guide

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1 INTRODUCTION

1.1 Product Description

The WVC16 WebView I/O Communications Interface Module provides an Ethernet interface to WebView I/O process modules through a bi-directional infrared data bus. The WVC16 allows configuration and calibration of process modules, as well as viewing of process data over local intranet, and the Internet, in near real-time. Process data can also be logged in internal battery backed-up storage and later downloaded for use in a spreadsheet. With the WVC16, email notification can be sent when signals meet certain conditions, and each process module contains a timer that can notify the user when it is time for routine maintenance.

This manual is intended for people familiar with web browsing, signal conditioners, alarm modules and network and firmware configuration.

This manual describes WebView I/O Communications Interface Module model WVC16-2000 with firmware version 2.0.

1.2 What is in This Manual

This manual contains all the information needed to connect and configure a WVC16 WebView I/O Communications Interface Module along with process modules in the WV series. This includes connecting and configuring the WVC16's Administration Console and network connections, software and configuring software operational parameters of the WV series process modules.

1.3 What is on The WVC16 CD

The WVC16 CD contains, outside of this manual, the following:

- Adobe Acrobat Reader 5.1 installer for Microsoft Windows, needed to read this and other manuals.
- Documentation for the WV series process modules, provided as a backup of the manual included with the modules.
- Java Plug-in version 1.4.2, needed to use the WebView I/O Data Viewer. Note that the web browser may also automatically install the Java Plug-in.
- WebView I/O Custom Protocol (WVCP) specification document, intended for software development efforts outside the scope of this manual.

1.4 Supported Platforms and Browsers

The WVC16 WebView I/O Communications Interface Module supports the following operating system:

- Microsoft Windows XP

The WVC16 WebView I/O Communications Interface Module supports the following browsers on Microsoft Windows XP:

- Microsoft Internet Explorer 6.0 or later
- Netscape Navigator 7.0 or later

The WebView I/O Data Viewer can be run under the following Java environment:

- Sun Microsystems Java Runtime Environment (JRE) version 1.4.2

The WVC16 WebView I/O Communications Interface Module may work with many platforms and browsers. However, Eurotherm Inc. can only render support for the platform, browsers, and Java environments mentioned above. Eurotherm recommends using a PC with at least a 500 MHz processor and 128 MB of RAM.

Note: The Java environment mentioned above is for the WVC16-2000 module running firmware revision 2.0. Older WVC16 modules will not function properly with that Java environment.

2 PHYSICAL DESCRIPTION

Figure 1 below shows the different parts of the WVC16 Communications Interface Module.

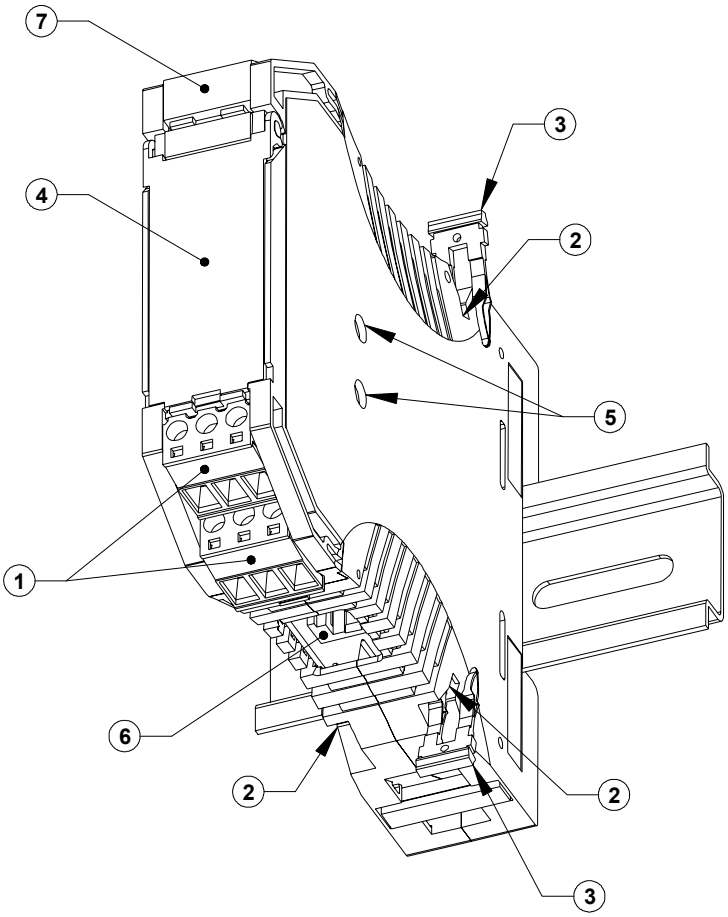


Figure 1: WVC16 Communications Interface Module

The different parts of the WVC16 module are listed below.

1. **Power Connectors**
   Use either of these connectors to power the WVC16. The connectors are wired in parallel. The WVC16 can also be powered through the Power Bus.

2. **Power Bus Sockets**
   Use WebView I/O power bus jumpers (3) to supply power to or from an adjacent process module through these sockets.

3. **Power Bus Jumpers**
   Use these jumpers to supply power to or from an adjacent process module. A pair of jumpers is provided with each module.

4. **Front Panel**
   The front panel of the WVC16 features LEDs, a reset pushbutton, and a battery switch. See Figure 2 for details.

5. **WebView I/O Infrared Ports**
   The WVC16 communicates with the other WebView I/O process modules through these two infrared ports. Keep these ports clean and unobstructed to ensure proper communication with the process modules.

6. **Ethernet RJ-45 Socket**
   This socket supports 10Base-T only. Use it to connect the WVC16 to the local area network.

7. **Administration Console Port**
   To connect a computer to the administration console port, remove the port cover, plug in the WVC16 serial cable accessory, and plug the other end of the cable into the computer's serial port. The serial cable is part of the C650 accessory kit (P/N: 936-0383-00). See section 4.1, Connecting to the Administration Console.

Figure 2 below shows the front panel of the WVC16 Communications Interface Module.

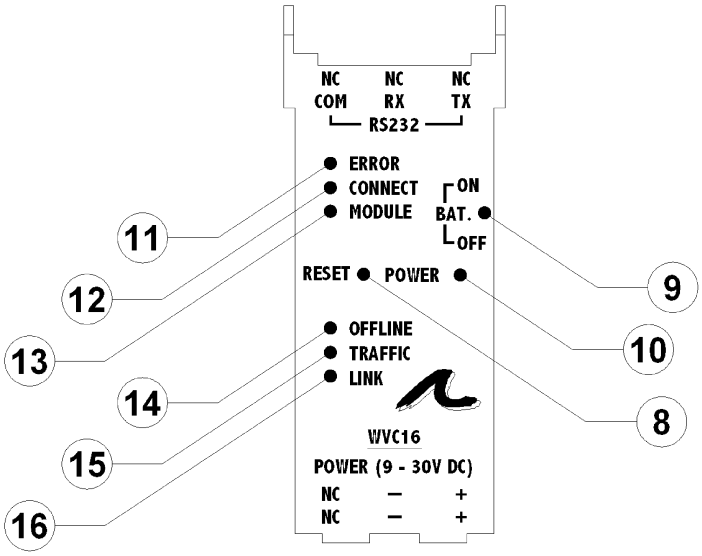


Figure 2: WVC16 Front Panel

8. Reset Button

The WVC16 can be reset by pressing this button, located under the Front Panel.

9. Battery Switch

The battery switch turns the internal backup battery on or off. New WVC16's are shipped with the battery switch turned off to preserve the freshness of the battery during storage. The switch is located under the Front Panel door. Turn the battery switch on for normal operation. With the battery switch on, the battery is expected to last approximately 16 months with no external power applied. Normal operation battery life with power applied is 10 years. When storing the WVC16 for extended periods, turn the battery switch back to off to save battery backup time.

10. Power LED

The power LED (green) is on when the WVC16 is powered.

11. Error LED

The Error LED (red) indicates that the WVC16 has logged an error. Errors are retained through power interruptions. See Appendix B: Error Log Messages.

LED on steady: a fatal error occurred.

LED on flashing: a non-fatal error or warning occurred.

LED off: no errors. The error log is clear.

12. Connect LED

The Connect LED (green) indicates whether one or more clients, such as the Data Viewer, are currently connected to the WVC16.

LED on steady: one or more clients are currently connected to the WVC16.

LED on flashing: no client is currently connected to the WVC16.

LED off: the TCP/IP communication software initialization failed.

13. Module LED

The Module LED (amber) indicates whether one or more process modules are communicating with the WVC16.

LED on steady: one or more modules have been acquired.

LED on flashing: no modules have been acquired.

LED off: faulty WVC16. The Module LED should never be off.

14. Offline LED

The Offline LED (red) is normally off, and turns on to indicate that the WVC16 has gone offline. This will happen if the amount of traffic on the network is too high for the WVC16. In normal circumstances, the WVC16 will recover after a few seconds. If the WVC16 stays offline for more than 45 seconds, a safety watchdog feature will reset the WVC16. This will allow the WVC16 to reconnect to the network after reset.

15. Traffic LED

The Traffic LED (amber) indicates Ethernet traffic to and from the WVC16, including broadcast traffic. It is the standard transmit/receive/collision LED found on most network interface cards. It can be used to verify proper connection to a local area network.

16. Link LED

The Link LED (amber) indicates the presence of Ethernet link pulses. It is the standard link LED found on most network interface cards. It can be used to verify proper connection to a local area network.

3 INSTALLING THE HARDWARE

To install the WVC16 hardware, proceed as follows:

1. Mount the WVC16 on a TS-35 DIN rail. WebView I/O process modules must be mounted to the right of the WVC16.

2. Apply 9 to 30 volts DC power to the WVC16, either through the power connectors or through the power bus. When powering the WVC16 through the power connectors, apply DC Power (+) to terminal 11 or 21, and DC Power (–) to terminal 12 or 22.

   CAUTION*:* The power bus connections are rated for 16 WebView I/O modules maximum.

   This applies to both WVC16 and process modules. Do not power more than 16 modules through a single power bus connection. When connecting more than 16 modules together, it is recommended to power the end modules via the power connectors. This configuration has the added benefit of keeping modules powered when a power jumper is pulled out.

   CAUTION: Do not exceed the current limits of the 9-30 Volt external power supply. Over current protection must be provided in the external power supply or power supply connections and should be rated for 5 A maximum.

3. Verify that the Power LED (green) comes on.

4. Verify that the Error, Connect, and Module LED's flash alternately for about 3 seconds, then that the Connect and Module LED's (green and amber) flash together. The WVC16 is now ready for configuring.

4 CONFIGURING THE WVC16 COMMUNICATIONS INTERFACE MODULE

To configure the WVC16 Communications Interface Module, the following items are generally required:

- A PC with Ethernet and serial ports.
- A serial communications program (*e.g.* HyperTerminal, ProComm).
- Eurotherm C650 accessory kit (P/N: 936-0383-00).
- One Category 5 Unshielded Twisted Pair (Cat-5 UTP) Ethernet cable, or a Cat-5 crossover cable for direct connection to the PC.

4.1 Connecting to the Administration Console

In most cases, configuring the WVC16 Communications Interface Module requires connecting to the administration console. Proceed as follows:

1. If the WVC16's Ethernet port is connected, disconnect it.
2. Connect the administration console port to the computer's serial port using the WVC16 serial cable accessory. The serial cable is part of the C650 accessory kit (P/N: 936-0383-00).
3. Power up the WVC16 and wait 5 seconds for the boot process to complete.
4. On the computer, start a serial communications program.
5. Configure the communications program for 9600 bits per second, 8 data bits, 1 stop bit, no parity, and no flow control.
6. In the serial communications program, type the Enter key. The WVC16 should reply:

```
WVC16 ADMINISTRATION CONSOLE
----------------------------

Enter h to display the help menu.

WVC16>_
```

7. To display the help menu, enter **h** (*i.e.* type **h** then type the Enter key). The WVC16 should reply:

```
Administration Console Help Menu

c   : Clear error message log
d   : Display node settings
e   : Display logged error messages
g # : Change the gateway address
h   : Display this menu
i # : Change the node IP address
m   : Display MAC (Ethernet) address
p   : Display DHCP client status
p d : Disable the DHCP client
p e : Enable the DHCP client
s # : Change the subnet mask
u   : Undo all changes
v   : Display version information
x   : Reboot the unit
x f : Restore factory defaults and reboot
?   : Display this menu

# represents an IP address (xxx.xxx.xxx.xxx)
```

This is the complete list of available commands. See Appendix F: Administration Console Commands.

4.2 Ethernet Configuration

The WVC16 Ethernet network parameters must be configured before the WVC16 is physically connected to an Ethernet network. There are two basic methods of configuring the WVC16: (a) using DHCP, or (b) using a fixed IP address.

4.2.1 Ethernet Configuration Using DHCP

The Dynamic Host Configuration Protocol (DHCP) allows for the automatic assignment of network parameters (IP address, gateway address, and subnet mask). The WVC16 supports DHCP, which makes it very easy to connect the WVC16 to a network.

When configuring the WVC16 using DHCP, the following requirements apply:

- A DHCP (or BOOTP) server must be available on the same subnet as the WVC16, and must have at least one unused IP address in its DHCP address pool. Check with IT personnel to confirm.

- DHCP must be enabled. WVC16's are configured at the factory with DHCP enabled. To enable DHCP, see the **p** command in the administration console.

(Note: If a DHCP server is not available then DHCP must be disabled and the method of section 4.2.2, Ethernet Configuration Using a Fixed IP Address used).

With the above requirements satisfied, connect the WVC16 to the network and power it up. Verify that the LINK LED is on steady. The WVC16 will boot and request an IP address from the DHCP server; the DHCP server should then assign an unused IP address to the WVC16. There are two methods to determine which IP address are assigned to the WVC16: (a) through the DHCP server, or (b) through the WVC16 administration console.

Method (a): to determine the assigned IP address through the DHCP server console, search for newly assigned leases, either by date and time, or by MAC addresses; this may require support from the network administrator. To determine the exact MAC address of the WVC16, use the **`m`** command in the administration console; WVC16 MAC addresses all start with 00:04:88.

Method (b): to determine the assigned IP address through the WVC16 administration console, use the **`d`** command at the console prompt. The WVC16 should reply (example):

```
DHCP Enabled

IP Address   149.121.40.212
Gateway      149.121.40.254
Subnet Mask  255.255.255.0
```

The network parameters (IP address, gateway address, and subnet mask) listed above are examples, and the actual network parameters listed are those assigned by the DHCP server. To verify the new IP address assignment, use the IP address to point a Web browser to the WVC16 as described in Section 4.3, Accessing the WVC16 on the Network, below.

The assigned IP address survives power interruptions as long as the WVC16 is not kept offline for a period exceeding the duration of the DHCP lease. This duration is configurable on the DHCP server. In the event that the WVC16 is kept offline for a period exceeding the lease duration, the WVC16 may get a new IP address when powered up again. This can be avoided if it is possible to configure the DHCP server to reserve a particular IP address for a particular WVC16; contract the network administrator.

4.2.2 Ethernet Configuration Using a Fixed IP Address

It may be desirable to assign a fixed IP address to the WVC16. To configure the WVC16 using a fixed IP address, three network parameters are required:

- IP address
- Gateway (or router) address
- Subnet mask

Once the desired network parameters for the WVC16 are known, follow the procedure below to assign them to the WVC16.

1. Connect to the administration console as described in section 4.1, Connecting to the Administration Console, above.

2. Enter **p**. If the WVC16 replies:

   ```
   DHCP is disabled.
   ```

   The DHCP client is already disabled. Proceed to step 8 below.

   If the WVC16 replies:

   ```
   DHCP is enabled.
   ```

   The DHCP client is still enabled. Continue to the next step.

3. Enter **p d**. The WVC16 should reply:

   ```
   DHCP disabled. Reboot for changes to take effect.
   ```

4. Enter **x** to reboot the WVC16. The WVC16 should reply:

   ```
   Reboot the unit? Enter Y to confirm: _
   ```

5. Enter **y**. The WVC16 should reply:

   ```
   Rebooting the unit. End of session.
   ```

   and should then reboot.

6. Wait 5 seconds for the boot process to complete.

7. Type the Enter key. The WVC16 should reply:

   ```
   WVC16 ADMINISTRATION CONSOLE
   ----------------------------

   Enter h to display the help menu.

   WVC16>_
   ```

8. Enter **d**. The WVC16 should reply:

   ```
   Address       Current          After Reboot
   -------       -------          ------------
   IP Address    0.0.0.0          no change
   Gateway       0.0.0.0          no change
   Subnet Mask   0.0.0.0          no change
   ```

   The actual `Current` addresses may be different.

9. Enter **i** followed by the desired IP address.

Example: **`i 192.168.1.10`**

The WVC16 should reply:

```
IP address changed. Reboot for changes to take effect.
```

10. Enter **`g`** followed by the desired gateway address.

    Example: **`g 192.168.1.1`**

    The WVC16 should reply:

    ```
    Gateway address changed. Reboot for changes to take effect.
    ```

11. Enter **`s`** followed by the desired subnet mask.

    Example: **`s 255.255.255.0`**

    The WVC16 should reply:

    ```
    Subnet mask changed. Reboot for changes to take effect.
    ```

12. Enter **`d`**. Assuming the above examples, the WVC16 would reply:

    ```
    Address      Current          After Reboot
    -------      -------          ------------
    IP Address   0.0.0.0          192.168.1.10
    Gateway      0.0.0.0          192.168.1.1
    Subnet Mask  0.0.0.0          255.255.255.0
    ```

13. Verify that the "After Reboot" parameters are correct. If not, correct them using **`i`**, **`g`**, or **`s`** as required, or **`u`** to undo all changes. When the "After Reboot" parameters are correct, enter **`x`** to reboot the WVC16. The WVC16 should reply:

    ```
    Reboot the unit? Enter Y to confirm: _
    ```

14. Enter **`y`**. The WVC16 should reply:

    ```
    Rebooting the unit. End of session.
    ```

    and should then reboot.

15. Wait 5 seconds for the boot process to complete.

16. Type the Enter key. The WVC16 should reply:

```
WVC16 ADMINISTRATION CONSOLE
----------------------------

Enter h to display the help menu.

WVC16>_
```

17. Enter `d`. Assuming the above examples, the WVC16 would reply:

```
Address       Current          After Reboot
-------       -------          ------------
IP Address    192.168.1.10     no change
Gateway       192.168.1.1      no change
Subnet Mask   255.255.255.0    no change
```

18. Verify that the `Current` parameters are correct. If so, the WVC16 is ready for connecting to the Ethernet network.

19. Disconnect the serial cable from the WVC16 and close the serial communications program. Proceed to the next section to connect to the WVC16.

4.3 Accessing the WVC16 on the Network

After the WVC16 has been configured with valid network parameters, proceed as follows to display the WVC16 home page:

1. If not already connected, connect the Ethernet cable from the WVC16, and verify that the other end is connected to the network.

2. Verify that the LINK LED on the WVC16's front panel is on steady.

3. Verify that there is a computer connected to the same network as the WVC16. The computer's network parameters must be configured so that the computer is able to access the WVC16. This is especially important to check in case of manual IP address assignment.

4. When both the WVC16 and the computer are correctly connected to the network, start a web browser (Internet Explorer or Netscape Navigator) on the computer.

5. In the web browser's address field, enter the WVC16's IP address and wait for the WVC16 home page to load.

6. Verify that the WVC16 home page is correctly displayed as shown in Figure 3.

7. The WVC16's Ethernet configuration procedure is now complete. If the home page is not correctly displayed, see Appendix A: Troubleshooting Guide.

4.3.1 The WVC16 Home Page

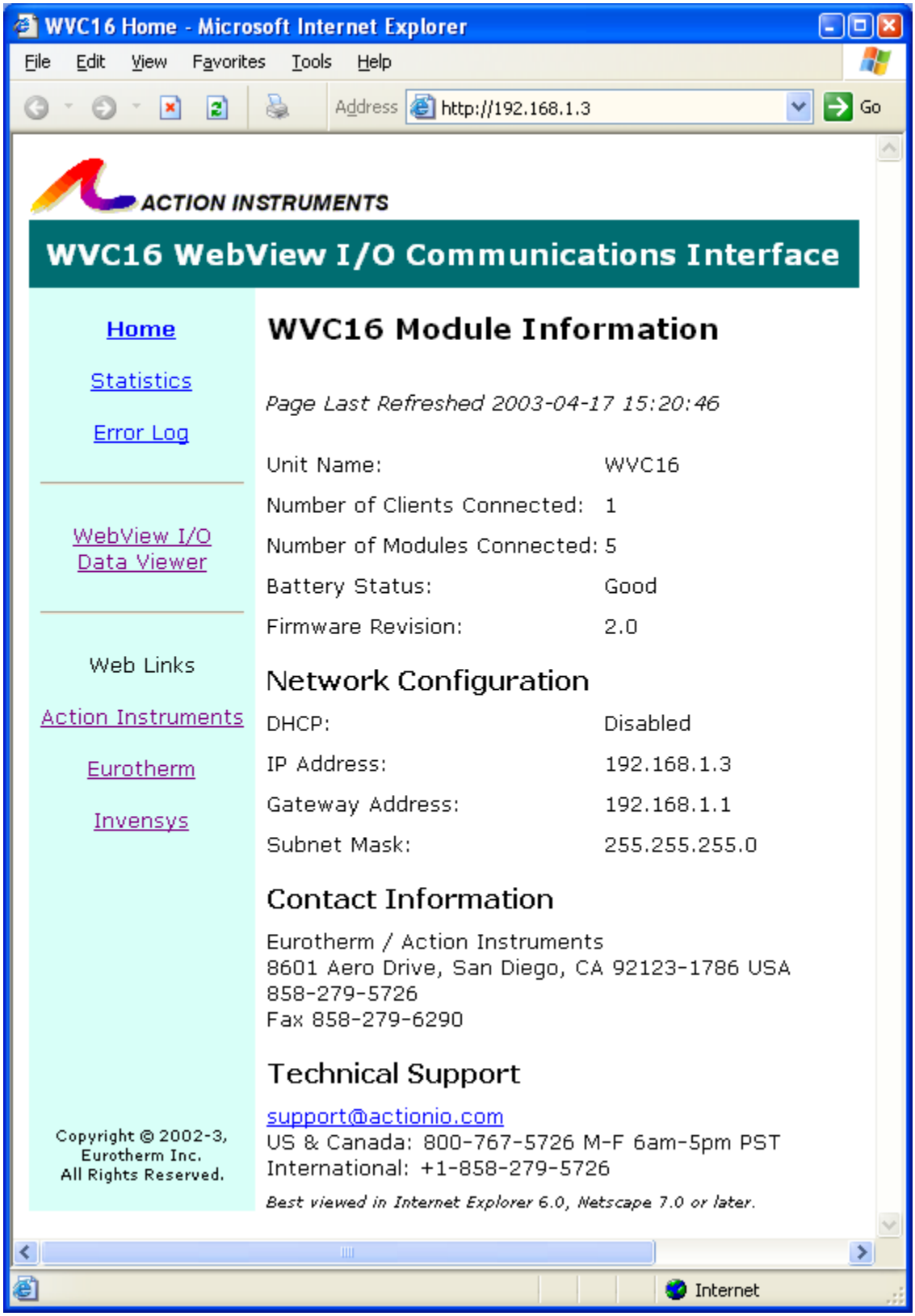


Figure 3: WVC16 Home Page

The WVC16 Home page contains basic information about how the system is operating and how to contact Eurotherm. On the left side is a menu for reaching the other web pages, the WebView I/O Data Viewer, and web links to the company web pages. The company web pages will only work if the browser has access to the Internet.

Status information

Unit name

The unit name is a simple descriptive name to help the user identify the WVC16; it has no effect on functionality. The name is set in the WebView I/O Data Viewer, see section 5.2, WVC16 Basic Settings.

Number of clients connected

The number of clients connected indicates the number of WebView I/O Data Viewers (or other clients) that are currently active on the system; it does not indicate web browsers currently using the system. If the special administrator user is using the Data Viewer, the page will display "1 (Admin)" in red, to indicate that changes may be in the process and that no one else can be logged in; see section 5.1, Starting the WebView I/O Data Viewer.

Number of modules

Number of modules connected reflect the number of process modules with which the WVC16 is currently communicating.

Battery status

Battery status indicates the power level of the on-board battery, it can either be "Good" or "Low" (in red); the latter indicates that the battery needs replacing or that the battery switch is off.

Firmware Revision

Firmware Revision indicates what revision of the firmware is currently loaded.

Network configuration

The DHCP status, IP address, gateway address and subnet mask are set in the administration console, see section 4.2, Ethernet Configuration.

As with most web pages, the WVC16 web pages are not automatically updated (the statistics page has an exception to this, see next section). To update a page, simply click the browser's refresh button. All the web pages contain a time stamp at the top, to indicate when the page was last refreshed.

4.3.2 The Statistics Page

To display the Statistics page, click on the Statistics link in the left side of the home page. The statistics page displays as shown in Figure 4. This page shows basic statistical information about the Ethernet and infrared connections.

The statistics counters do not retain their values through power interruptions. Power cycling or resetting the WVC16 resets all statistics counters to zero.

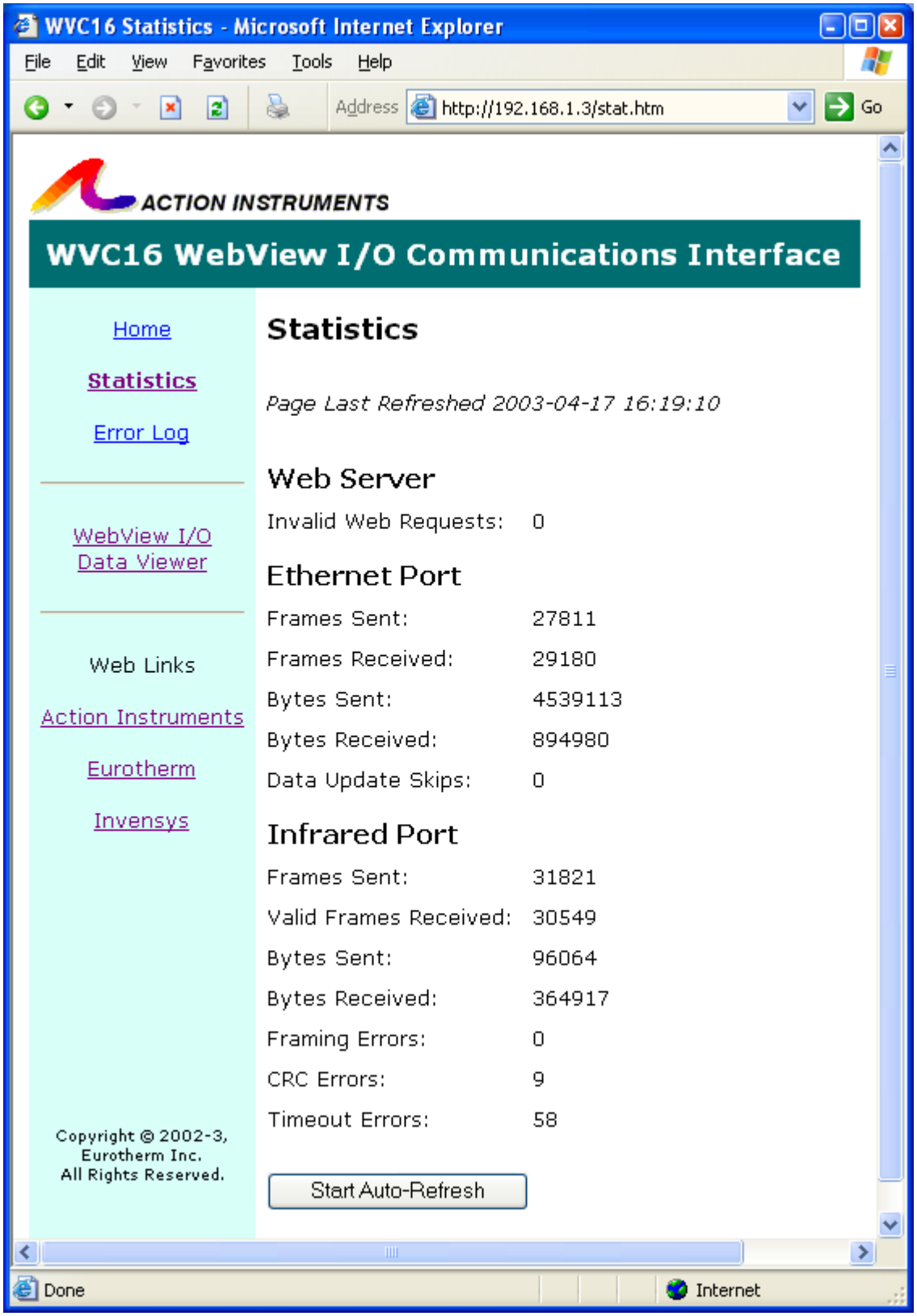


Figure 4: Statistics Page

Ethernet Port

This section contains Ethernet port statistical counters. These counters can be used to diagnose the Ethernet connection.

Frames Sent
The number of Ethernet frames sent by the WVC16 to the network.

Frames Received
The number of Ethernet frames received by the WVC16 from the network.

Bytes Sent
The number of bytes sent by the WVC16 to the network.

Bytes Received
The number of bytes received by the WVC16 from the network.

Data Update Skips
Counts the number of interruptions to process modules real-time data updates to a connected client. This is typically caused by network congestion.

Invalid Web Requests
Counts the number of invalid requests received by the WVC16. A high count may indicate unauthorized attempts to break into the WVC16 from an outside source (hacking). This is more likely to occur when the WVC16 is directly connected to the Internet without any kind of protection (such as a firewall).

Infrared Port

This section contains infrared port statistical counters. These counters can be used to diagnose problems with the infrared bus.

Frames Sent
The number of frames sent by the WVC16 to the process modules.

Valid Frames Received
The number of valid frames received by the WVC16 from the process modules.

Bytes Sent
The number of bytes sent by the WVC16 to the process modules.

Bytes Received
The number of bytes received by the WVC16 from the process modules.

Framing Errors
The number of times an invalid frame was received. A non-zero value is not necessarily indicative of a problem. Invalid frames are discarded and the information is requested again.

CRC Errors

The number of times a frame with a cyclic redundancy check (CRC) error was detected. A non-zero value is not necessarily indicative of a problem. Frames with bad CRC's are discarded and the information is automatically requested again.

Timeout Errors

The number of times the WVC16 requested information from the process modules but did not receive a response in a timely manner. A non-zero value is not necessarily indicative of a problem. The WVC16 requests the information again after a timeout period.

Start Auto-Refresh

To enable the Auto-Refresh feature, click on the Start Auto-Refresh button. The statistics page will then automatically refresh itself every 10 seconds. Auto-Refresh can be stopped by clicking on the Stop Auto-Refresh button or by simply selecting another web page.

4.3.3 The Error Log Page

To display the Error Log page, click on the Error Log link in the left side of the home page. The Error Log page displays as shown in Figure 5.

Whenever an error condition occurs, the WVC16 turns on the red Error LED on the front panel and logs an error code and description in the error log. The error log is maintained through power interruptions by the internal battery. The Error LED flashes for warnings and errors and is turned on steady for fatal errors. Consult the error log whenever the Error LED is not off. For a description of the error codes, see Appendix B: Error Log Messages.

To clear the error log, click Clear Error Log. Doing so also turns off the Error LED. The error log can also be consulted and cleared from the administration console using commands `e` and `c` respectively.

The error log only keeps the last 32 error log entries. Older log entries are discarded. Each error log entry consists of a time stamp showing the date and time the error occurred, an error class (FATAL, ERR, WARN) and code, an internal task number and name, and an error description.

Figure 5: Error Log Page

4.4 Upgrading the Firmware

The internal firmware of the WVC16 can be upgraded to a new revision in the field, even without interrupting the process modules. To determine the current firmware revision in the WVC16 module, consult the Firmware Revision line in the WVC16 home page.

CAUTION: The firmware upgrade procedure deletes the current WVC16 firmware before loading the new revision.

The WVC16 is inoperative without firmware. Proceed with caution. The firmware upgrade procedure does not affect the monitor program; it is therefore safe to interrupt power at any time during the firmware upgrade procedure. Should a power interruption occur during firmware upgrade, simply restart the procedure from step 1.

To upgrade the WVC16 firmware, first obtain the desired revision from Eurotherm Inc. (typically download it from the web site at www.actionio.com), and then follow the firmware upgrade instructions below:

1. Remove power and disconnect the Ethernet cable from the WVC16.

2. Connect the administration console port to the computer's serial port using the WVC16 serial cable accessory. The serial cable is part of the C650 accessory kit (P/N: 936-0383-00).

3. On the computer, start a serial communications program.

4. Configure the communications program for 115200 bits per second, 8 data bits, 1 stop bit, no parity, and XON/XOFF flow control. If 115200 bps is not available, a lower data rate can be used. Doing so will increase the download time.

5. Power up the WVC16, and ***within the first 3 seconds after power-up***, press the 'a' key. It may be necessary to press the 'a' key a few more times. The system should start the E86MON monitor and reply:

   ```
   Welcome to AMD's EMon 186!      (? <Enter> for help)

   es86mon: _
   ```

6. At the `es86mon:` prompt, enter the following command: **`xa`**
   This command instructs the monitor program to erase the WVC16's flash memory.
   The WVC16 should reply:

```
Erasing flash sector at 60000.....
Erasing flash sector at 70000......
Erasing flash sector at 80000.....
Erasing flash sector at 90000.....
Erasing flash sector at A0000.....
Erasing flash sector at B0000......
Erasing flash sector at C0000.....
Erasing flash sector at D0000.....
Erasing flash sector at E0000.....
Erasing flash sector at F0000.....

Note -- the flash operation used (overwrote) the RAM.

es86mon: _
```

The xa command takes approximately 8 seconds to execute.

7. Verify that no flash sectors were reported protected. Some older WVC16 units shipped with sector 8 (E0000) protected. If sector 8 is protected, the WVC16 will show the following line for sector 8:

   ```
   Erasing flash sector at E0000... Protected! (not erased by XA)
   ```

   If this is the case, it will be necessary to erase sector 8 separately. To do so, enter the following command at the es86mon: prompt: **`x8`**
   This command instructs the monitor program to erase flash sector 8.
   The WVC16 should reply:

   ```
   Erasing flash sector at E0000.....

   Note -- the flash operation used (overwrote) the RAM.

   es86mon: _
   ```

   It is possible to configure the E86MON monitor to unprotect all flash sectors so that the **`x8`** command will no longer be necessary when reflashing the WVC16 in the future. See section 4.4.1, Unprotecting All Flash Sectors, below for instructions.

8. After the **`xa`** command has completed and the `es86mon:` prompt is displayed, send the firmware upgrade HEX file (wvc16_*xx*.hex, where *xx* represents the desired firmware revision code) from the communications program using ***plain ASCII text*** (some programs use the *Send Text File…* menu item) (do not use communication protocols such as ZModem or other).

   The monitor program should then start reprogramming the WVC16. The entire reprogramming process takes approximately 3 minutes.
   The WVC16 should reply:

```
es86mon: :0200000270008C
Transferring hex file (Press Esc to abort)..... ...
.................................................. ...
.................................................. ...

      (approx. 50 more lines of dots)

.................................
Device programmed successfully

Note -- the flash operation used (overwrote) the RAM.

es86mon: _
```

9. After the download has completed and the `es86mon:` prompt is displayed, close the serial communications program, remove power from the WVC16, disconnect the serial cable from the WVC16, and reconnect the Ethernet cable to the WVC16.

10. Some firmware revisions initialize the EEPROM when executed for the first time. If the new firmware revision initialized the EEPROM, perform the Ethernet configuration procedure (i.e. IP address assignment). See section 4.2, Ethernet Configuration.

11. Power up the WVC16 and let it boot, start a web browser to display the WVC16's home page, and verify that the Firmware Revision line shows the correct firmware revision code. The WVC16's firmware upgrade procedure is now complete.

4.4.1 Unprotecting All Flash Sectors

When erasing the flash memory (using the **xa** command), some older WVC16 units do not erase sector 8 (at address E0000); an **x8** command is then necessary to complete the flash erase operation (see step 7 above). To unprotect the entire flash memory and avoid having to use the **x8** command during future firmware upgrades, follow the instructions below.

1. At the `es86mon:` prompt, enter the following command: **p protectflash 0**

   The WVC16 should reply:

   ```
       protectflash   = 000e0000

   You can make your system unbootable if you
    program invalid values into the flash.

   Would you like to test by rebooting with
    this value before you make it permanent?  (Y/N):  _
   ```

2. Answer **N**. The WVC16 should reply:

   ```
   Make the permanent value of 'protectflash' = 0?
     (Y/N):  _
   ```

3. Answer **Y**. The WVC16 should reply:

   ```
   Permanent variable successfully updated.


   Note -- the flash operation used (overwrote) the RAM.

   es86mon: _
   ```

4. The configuration procedure is now complete. Reboot the WVC16, start the E86MON monitor, and run the **xa** command. Verify that the monitor erases all flash sectors and that it no longer reports any protected flash sectors.

5 WORKING WITH THE WEBVIEW I/O DATA VIEWER

The WebView I/O Data Viewer is a small application that is downloaded to the browser and executed. It receives and displays near real-time data from the WVC16 and allows configuration not only of the WVC16 but also of the process modules connected to the WVC16.

5.1 Starting the WebView I/O Data Viewer

To start the WebView I/O Data Viewer, click on the WebView I/O Data Viewer link in the left side of the WVC16 home page. A new browser window will appear where the Data Viewer downloads and executes. Downloading may take a couple of minutes depending on the speed of the connection between the client computer and the WVC16.

Installing the Java Plug-In

If the Data Viewer is run for the very first time and the Java Plug-in has not previously been installed, the browser attempts to install it automatically. If the client computer is connected to the Internet, this process is completely automated, and the user only has to wait and follow the instructions presented on the screen from Sun's web site. When the installation is completed, the WebView I/O Data Viewer will start automatically.

If the client computer is not connected to the Internet, the automatic installation will fail. If this is the case, the Java Plug-in can be installed from the CD-ROM in the C650 accessory kit (P/N: 936-0383-00). First, close all web browser windows and all applications. Then run the "j2re-1_4_2_03-windows-i586-p.exe" application in the "Java Plug-in 1.4.2_03" directory on the CD-ROM and follow the instructions on screen. When the installation is complete, start a web browser and load the WVC16 home page by entering the IP address into the web browser. Then click on the WebView I/O Data Viewer link and, if the installation has been successful, the Data Viewer will start.

If an error should occur during the operation of the Data Viewer, see Appendix C: WebView I/O Data Viewer Error Messages.

Granting Permission

In technical terms, the WebView I/O Data Viewer is an electronically signed applet; this insures that it can be safely downloaded over the Internet and that it can only be run inside an applet executor, such as the Java Plug-in. Once the Data Viewer has been downloaded to the browser, the Java Plug-in asks the user to grant the Data Viewer permission to access the client computer:

Figure 6: Java Plug-in security warning.

If permission is not granted, the Data Viewer will not be able to save data on the client computer hard drive, but will otherwise function as if permission were granted. If Always is selected, the security warning will not appear again.

At some point in the future, the time limit on the license will run out. This can either be ignored or the firmware updated. This will not impact the functionality.

Logging In

After the security question is answered, the Data Viewer displays the login window:

Figure 7: Log in window

Select “admin” in the User name field, enter “system” in the Password field and click Log in. The default “user” password is “password.”

When the user name and password have been verified, the Data Viewer starts querying the WVC16 and any attached process modules:

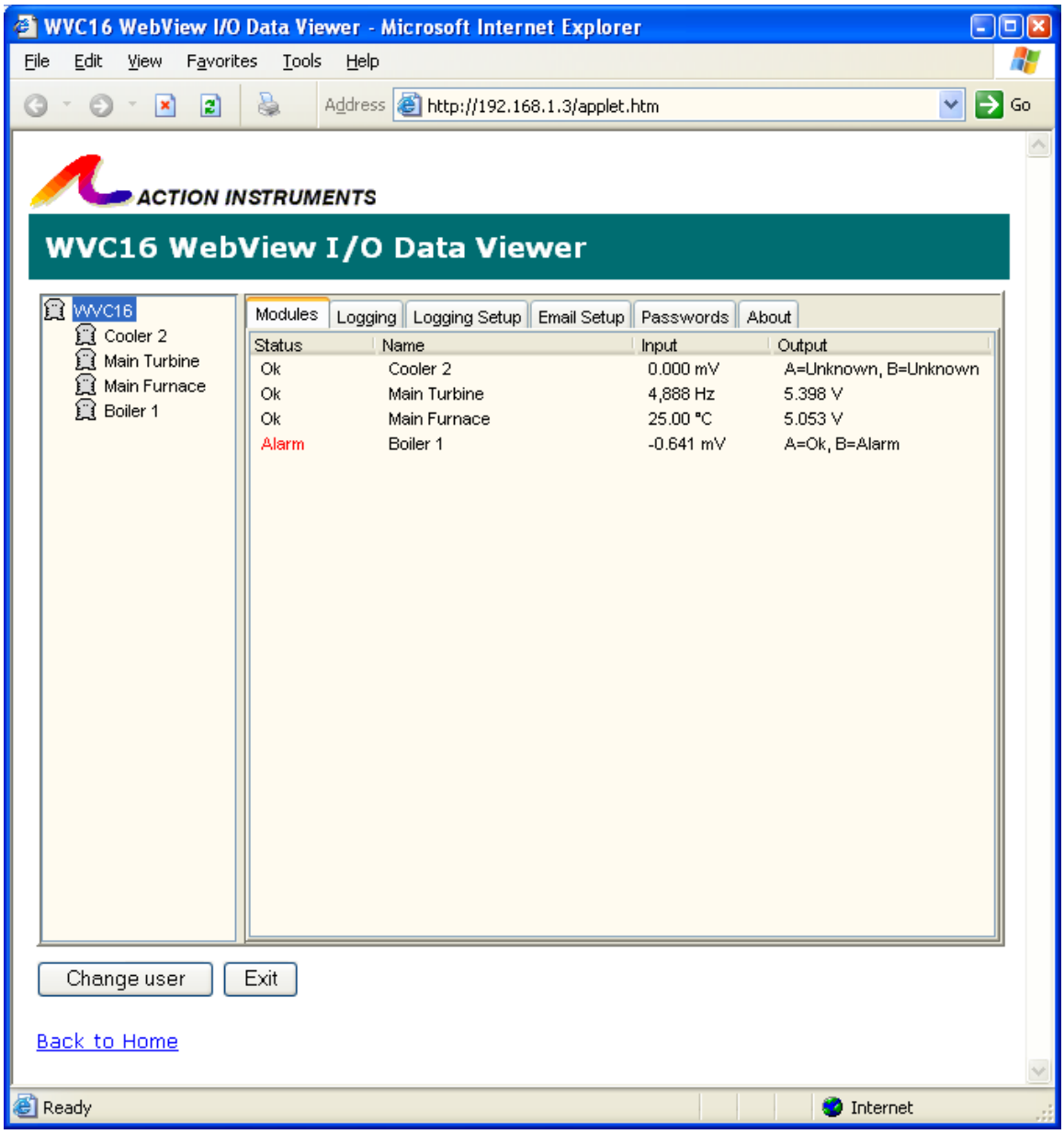


Figure 8: The module tree and the Modules tab in the browser window

At the bottom of the page are a two buttons and a link back to the home page. Clicking on the Change user button will logout the current user and present the login window, so that another user can log in. Clicking on the Exit button will log out the current user and close the window; the same thing will happen if the window is closed using the standard window buttons.

The Module Tree and the Modules Tab

In the left side of the Data Viewer is the module tree, which contains all the process modules currently registered with the WVC16 and the WVC16 module itself. The WVC16 is always at the top, but the process modules do not appear in any specific order.

The WVC16 is selected when the Data Viewer starts. The process modules are dynamically acquired so it may take a few seconds for all of them to appear.

At the bottom of the browser window is the status bar. Whenever the Data Viewer is communicating with the WVC16, the status message will change from "Ready!" to "Querying modules…"

When the Data Viewer starts up, the Modules tab is displayed (to the right of the module tree). The Modules tab shows all of the process modules currently registered with the WVC16 and their status, names, input and output values. The status column displays:

- "Ok," if the module's input is between the current operational input high and low settings and, in case of a relay module, the none of the outputs are in an alarm state. See section 5.3.2, Setting Operational Parameters.
- "Input high," if the module's input is above the operational input high setting.
- "Input low," if the module's input is below the operational input low setting.
- "Alarm," if the module is a relay module where any of the relays are in an alarm state or in "Unknown" state; see section 5.3.1, Process Module Basic Settings.

Columns can be resized by clicking on the border of a column heading and, while holding down the mouse button, dragging the border to the desired position. In addition, a column can be moved by clicking on the column heading, and while holding down the mouse button, dragging the heading.

The module tree, the Modules tab and the Process tab (see section 5.3, Setting up Process Module Operation) are all updated in near real-time. This means that process modules are displayed when they are acquired by the WVC16 and removed when they are no longer in contact with the WVC16. While the process modules are acquired, the Data Viewer displays the current information about the modules in those tabs.

5.2 WVC16 Basic Settings

There are a few basic settings on the WVC16 module that should be configured initially. If not currently selected, select the WVC16 in the module tree by clicking on it.

Changing Name

The name of the WVC16 module can be changed by triple clicking on its name in the module tree. When that happens, the name label turns into an input field where the new name can be typed:

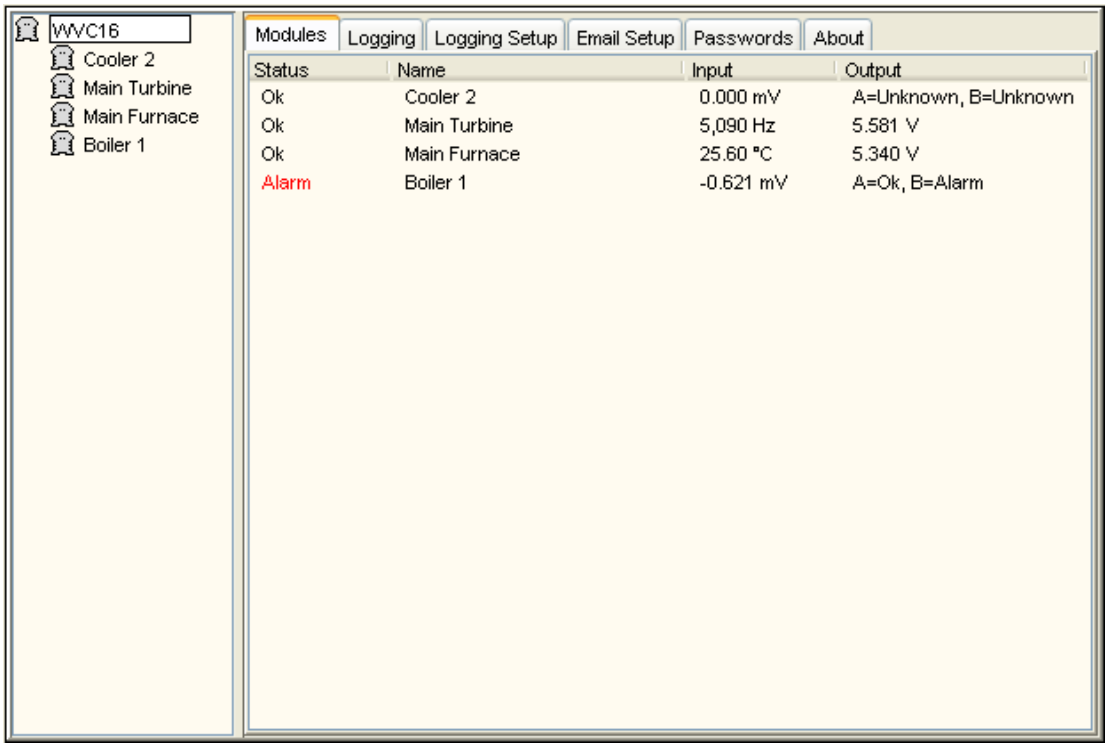


Figure 9: WVC16 selected for renaming

The name is stored when the enter key is pressed or another module is selected. Names may contain letters, numbers, symbols and spaces, but are limited to 16 characters. The name is also used on the home page and in emails (see section 5.4, Alerts).

Setting Date and Time

The WVC16's internal clock is set on the About tab. Simply select the tab by clicking on title:

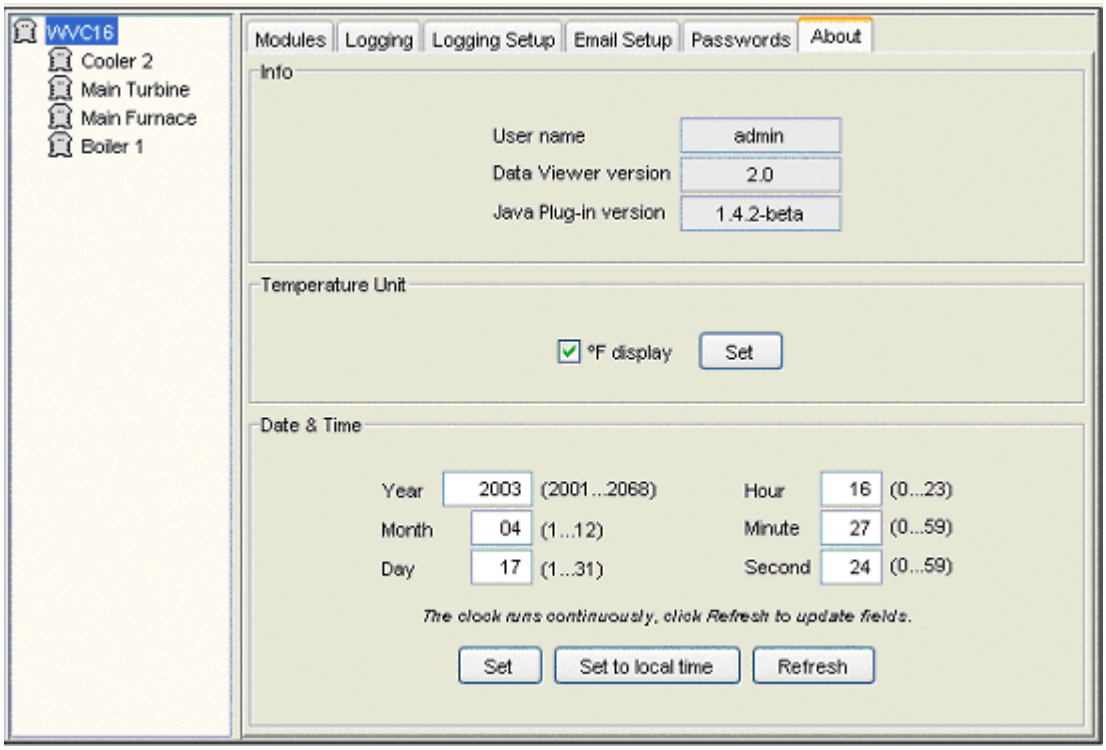


Figure 10: Communications interface About tab

When the tab is selected, the Date & Time fields show the clock's current date and time. The fields are not updated automatically, but can be updated by clicking Refresh.
To set the clock, either, enter the date and time in the fields and click Set, or click the Set to local time which will set the WVC16 to the date and time of the local computer. To check that the clock is progressing correctly, simply click Refresh.

Setting the temperature unit

The WVC16 can display temperatures in degrees Fahrenheit, in addition to Celsius, in the Process tab. This is selected in the Temperature Unit area also in the About tab. Simply click on the checkbox and click Set to enable this feature.

Info

The Info area contains a few pieces information that can be useful. The User name field shows the current user. The Data Viewer version and the Java Plug-in version fields shows the version of the Data Viewer and Java Plug-in being currently being used.

Users and Passwords

The WVC16 supports two user accounts: "admin" and "user," each with its own password. The "user" account is used for general access to the system, and it does not allow

changes to configuration settings. The “admin” account, on the other hand, can change all settings, including the passwords. Logging in as “admin” has the following consequences: all “user” users are logged out and further logins, both “user” and “admin,” are denied. This continues until the “admin” logs out again or the WVC16 is reset. The WVC16’s home page displays the current number or status of connected clients. Unless necessary Eurotherm recommends using the “user” account.

Passwords are set in the Passwords tab:

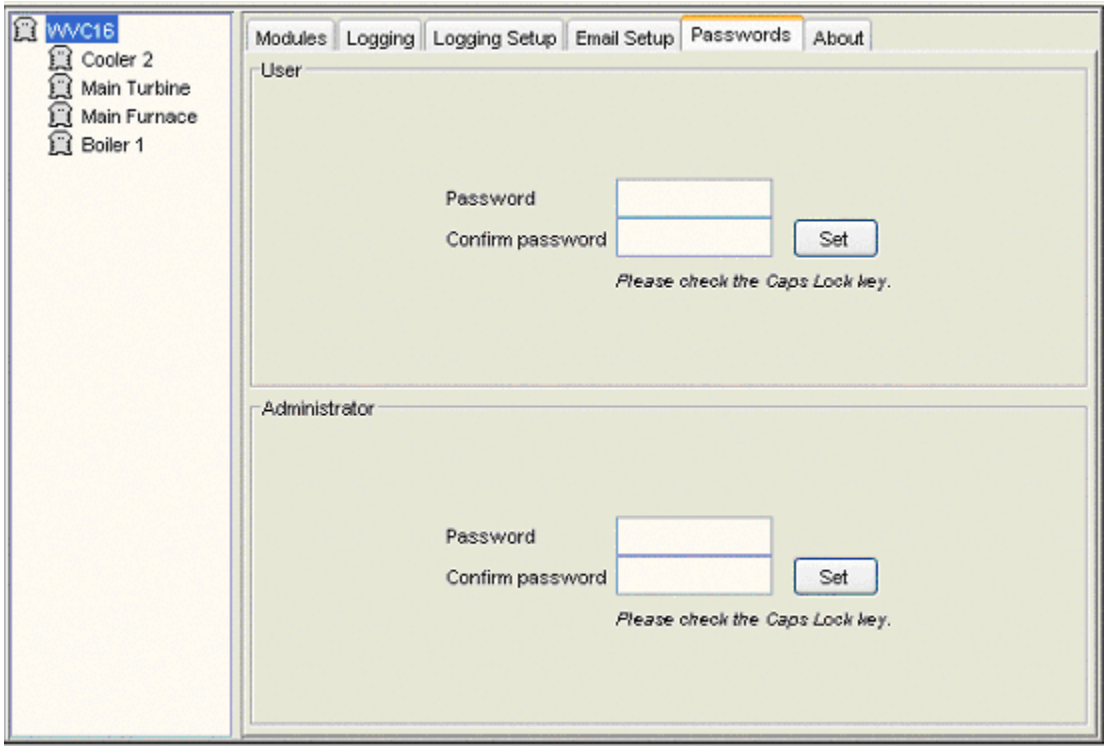


Figure 11: Passwords tab

For each user, simply enter the password into the Password field and retype the password in the Confirm password field, and then click Set. Changing both passwords from the factory defaults is strongly recommended.

A Word about Passwords

WVC16 passwords may contain letters, numbers, symbols and spaces in any combination and are case sensitive, *i.e.* uppercase letters are considered different from corresponding lowercase letters. The passwords can be up to ten characters but cannot be empty. Passwords should be chosen with great care, so that they are not easily guessed. Never write passwords down, and generally guard them carefully. It is recommend that passwords be at least six characters long and that they contain letters, numbers and symbols.

5.3 Setting up Process Module Operation

To select a particular process module, click on its name in the module tree. This replaces the tabs to the right of the module tree with tabs concerning the process module.

5.3.1 Process Module Basic Settings

The Process Tab

When a process module is first selected in the module tree, the Process tab for that module is displayed. For a signal conditioning module the tab look like this:

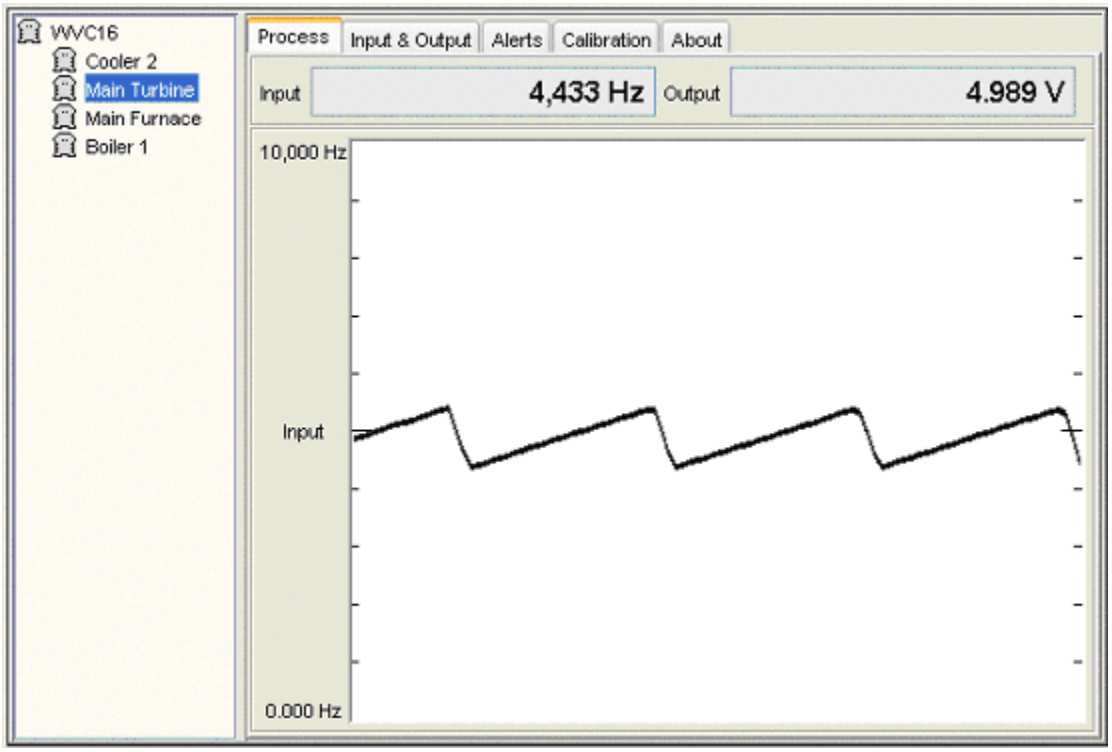


Figure 12: Process tab for signal conditioning module

The Process tab shows the input and output values of the process module along with a graph of the recent input signal. The input and output fields, and the graph are updated in near real-time. However, the update rate depends on the number of process modules registered with the WVC16. The graph may also contain several lines indicating alert border values, see section 5.4.2, Setting User-defined Alerts.

For a relay module the tab looks like this:

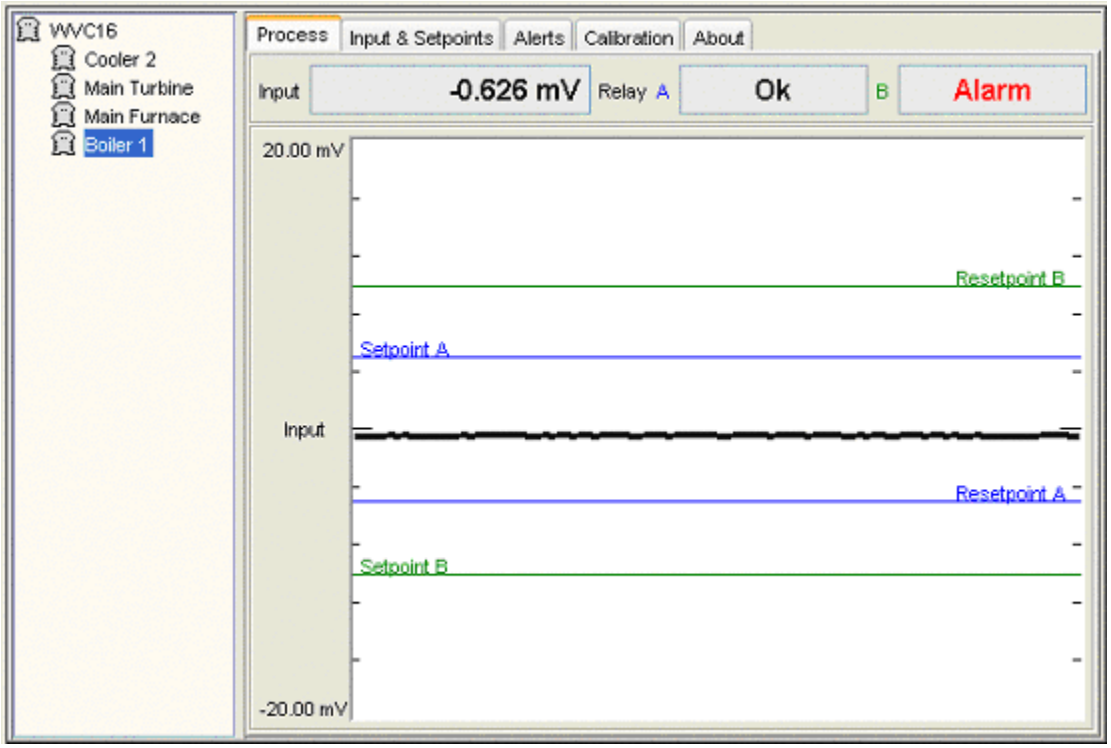


Figure 13: Process tab for relay module

The relay fields at the top show the status of the relays. If any of the displays show Unknown, the module has suffered a power interruption and should be reset as soon as possible, see the datasheet associated with module. The graph also shows setpoints and reset points as vertical lines, see section 5.3.2, Setting Operational Parameters.

Changing Name

Changing the name of a process module is done the same way as changing the name of the WVC16: triple click on the name of a process module in the module tree, type in the new name and press enter or select another module in the tree.

The About Tab

The About tab contains useful diagnostic information about the selected process module:

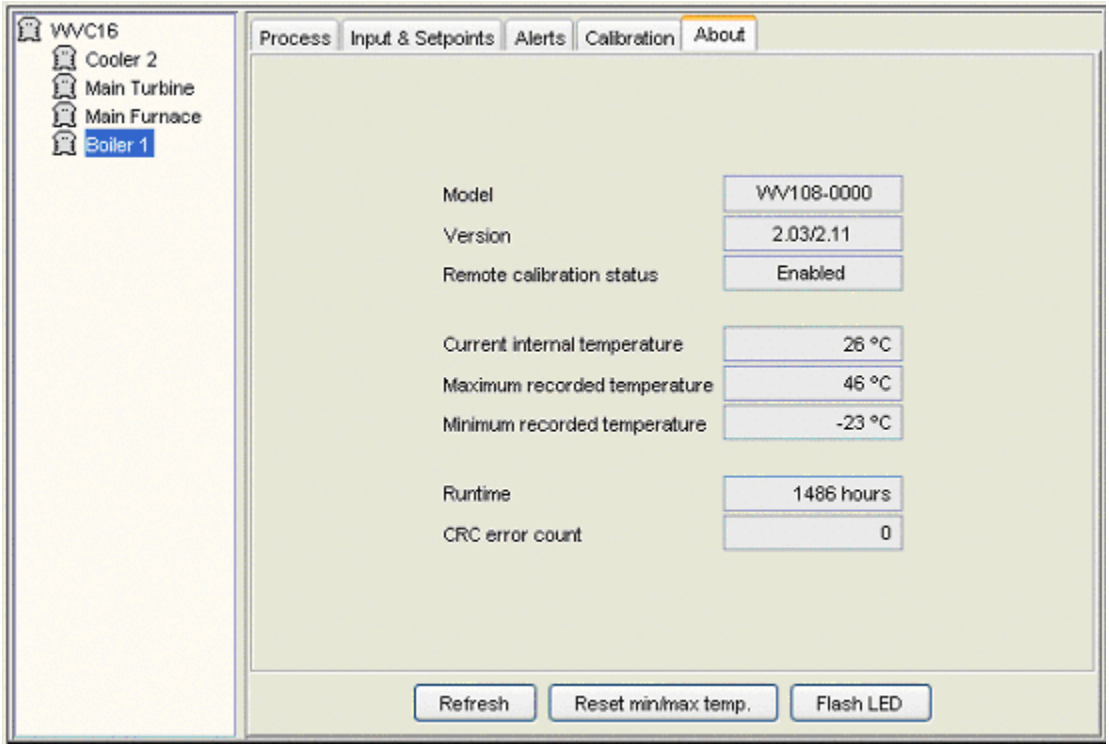


Figure 14: About tab

Model and version fields are self-explanatory. The Remote calibration status determines whether the Data Viewer can configure the process module. The Remote calibration status can only be set on the process module hardware and cannot be changed from the Data Viewer. For the Data Viewer to be able to configure a process module, the Remote calibration status must be "Enabled."

Temperatures

Each process module measures its internal temperature and that is displayed in the Current internal temperature field. The process modules also records the highest and lowest temperature experienced, which are displayed in the Maximum and Minimum recorded temperature fields. The temperatures can be reset to the current temperature by clicking Reset min/max temp..

Visually Identifying Process Modules

To easily identify a particular process module on a crowded DIN rail, click Flash LED. This makes the front LEDs on the module flash rapidly for about 15 seconds.

5.3.2 Setting Operational Parameters

The setting of the operational parameters varies with the different process modules. For signal conditioners an Input & Output tab will be available, where as for relay modules, and Input & Setpoints tab will be available.
The operational parameters for a process module are set in the either one of those tabs:

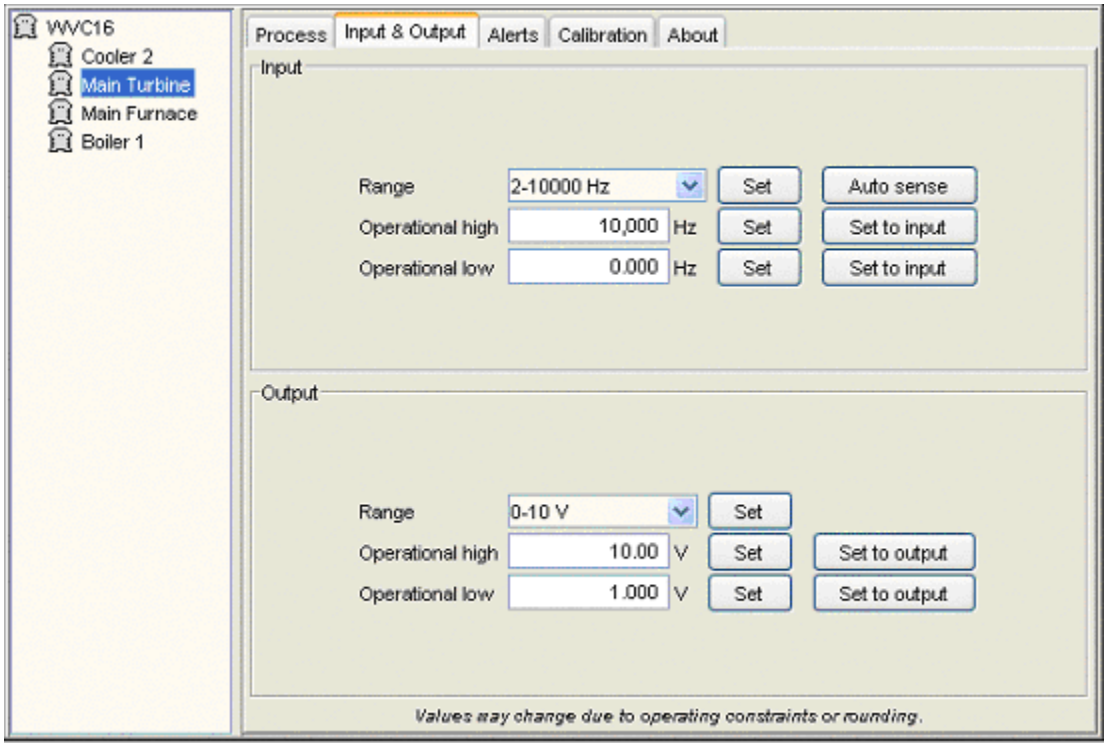


Figure 15: Input & Output tab

Adjusting to the Signal Level

Some process modules, such as the WV478-*xxx*0, require that the input level of the module to be adjusted to accommodate the input signal. The datasheet for the process module will state if the input level can be adjusted. If this is the case, the input signal level must be set before any function that depends on the input signal is used; these functions include setting the input operational parameters and calibration.

Some of the process modules that require that the input level be adjusted, including the WV478-*xxx*0, have an automatic input level function. This allows the module to automatically sense the input signal and adjust the input level. If the selected module has this function, an Auto level button appears next to the Input Range setting as seen in Figure 15: Input & Output tab. To perform an automatic input level adjustment, apply an input signal to the process module, equivalent to what the process module is going to work with and click Auto level.

Selecting Input Operational Parameters

The input operational parameters are configured in the same fashion for all process modules. To select input operational parameters, proceed as follows (all fields and button in the Input area):

1. Select an Input Range from the dropdown list box and click Set. After the range has been selected, the Operational high and Operational low fields display the current values for that range.

2. If necessary, perform an input level adjustment.

3. Either:
   a. Type in a numeric value in the Operational high field and click the Operational high Set.

   Or:
   b. Apply an input signal to the process module representing the largest expected working input signal. Then click the Operational high Set to input.

4. Either:
   a. Type in a numeric value for the Operational low field and click the Operational low Set.

   Or:
   b. Apply an input signal to the process module representing the smallest expected working input signal and click the Operational low Set to input.

The input operational parameters have now been set. For the initial setting, it is recommended to set Operational high before Operational low, but after that, they can be used in any order. The Operational high and Operational low values may change slightly if the process module must change them to accommodate its resolution.

Configuring Additional Input Settings

Some process modules have additional input settings, these will appear in the Input section. For instance, the WV128-*xxx*0, WV128-*xxx*1, and WV428-*xxx*0 allow different leads configurations. The leads configuration is set by selecting a configuration in the drop-down list and clicking Set.

Selecting Analog Output Operational Parameters

Signal conditioning modules have an Output section in the Input & Output tab, where the output settings can be configured. To select output operational parameters, proceed as follows (all fields and button in the Output area):

1. Select the input operational parameters.

2. Select an Output Range from the dropdown list box and click Set. After the range has been selected, the Operational high and Operational low fields displays the current values for that range.

3. Either:
    a. Type in a numeric value in the Operational high field and click the Operational high Set.

    Or:

    b. Apply an input signal to the process module to drive the output to the largest expected working output signal, and click the Operational high Set to output.

4. Either:
    a. Type in a numeric value for the Operational low field and click the Operational low Set.

    Or:

    b. Apply an input signal to the process module to drive the output to the smallest expected working output signal, and click the Operational low Set to output.

The output operational parameters have now been set. As with the input, for the initial setting, it is recommended to set Operational high before Operational low, and operational values may change slightly to accommodate the process module's resolution.

Configuring Additional Output Settings

Some modules have additional output settings. The WV408-*xxx*0, for instance, have an Output logic setting. The Output logic setting allows the polarity of the output signal to be reversed. The setting is selected from the Output logic drop-down list and clicking Set.

Selecting Relay Parameters

There are two kinds of relays: conventional and latching, and they are configured in two different ways. Conventional non-latching relay modules have a setpoint and a reset point setting, and latching relay modules have a set point and a mode setting.

The Input & Setpoints tab for a conventional relay looks as follows:

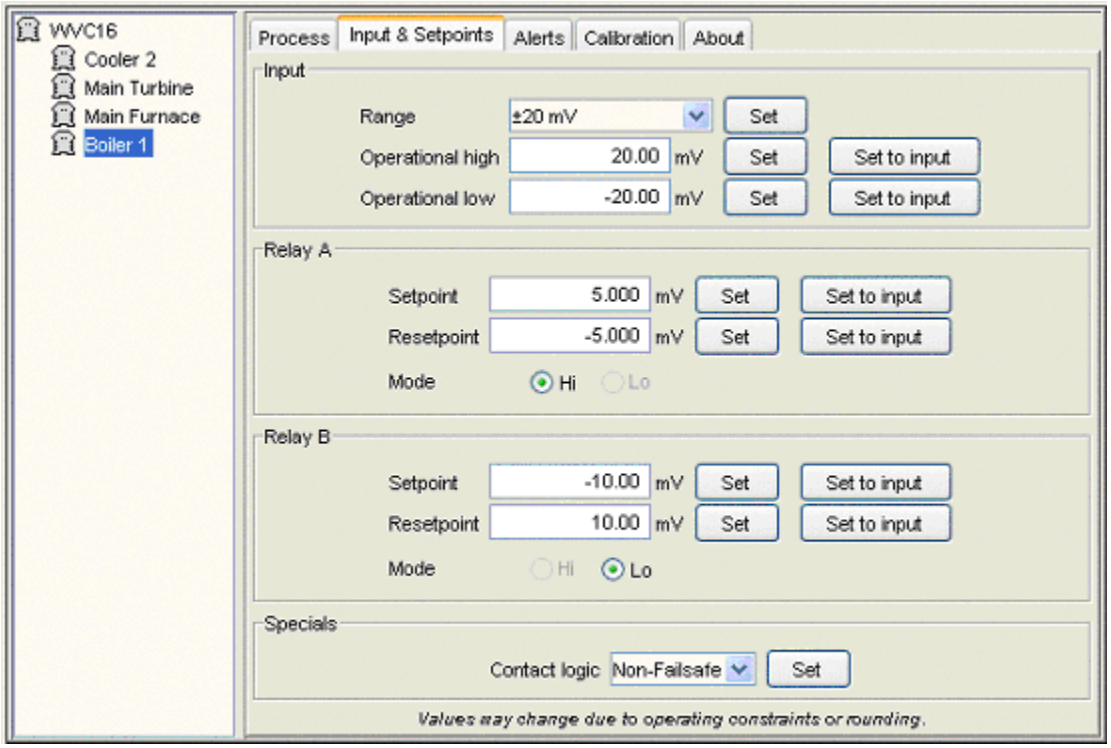


Figure 16: Input & Setpoints tab, conventional relays

To select operational parameters for a conventional relay, proceed as follows (all fields and button in a Relay area):

5. Either:
   a. Type in a numeric value in the Setpoint field and click the Setpoint Set.

   Or:
   b. Apply an input signal to the relay module corresponding to the setpoint, and click the Setpoint Set to input.

6. Either:
   a. Type in a numeric value in the Reset point field and click the Reset point Set.

   Or:
   b. Apply an input signal to the relay module corresponding to the reset point, and click the Reset point Set to input.

This procedure has to be repeated for each relay in a module. The Mode indicator will now display the operating mode of the relay: High indicates that the relay in is in okay (non-alarm) state when the input signal is above the set point (but below the reset point), and Low indicates that the relay in is in okay (non-alarm) state when the input signal is below the set point (but above the reset point).

To select operational parameters for a latching relay, proceed as follows (all fields and button in a Relay area):

7. Either:
    a. Type in a numeric value in the Setpoint field and click the Setpoint Set.

   Or:
    b. Apply an input signal to the relay module corresponding to the setpoint, and click the Setpoint Set to input.

8. Select a mode in the Mode selector, by clicking on the desired mode, and click Set.

The output operational parameters have now been set. As with other operational settings, the values may change slightly to accommodate the process module's resolution or minimum deadband.

Setpoints are displayed in the graph in the Process tab as seen in Figure 13: Process tab for relay module.

Special Settings

Some modules, such as the WV108-*xxx*0, WV128-*xxx*0 and WV168-*xxx*0, have a Special setting, displayed at the bottom of the tab, see Figure 17: Input & Setpoints tab with Specials area.

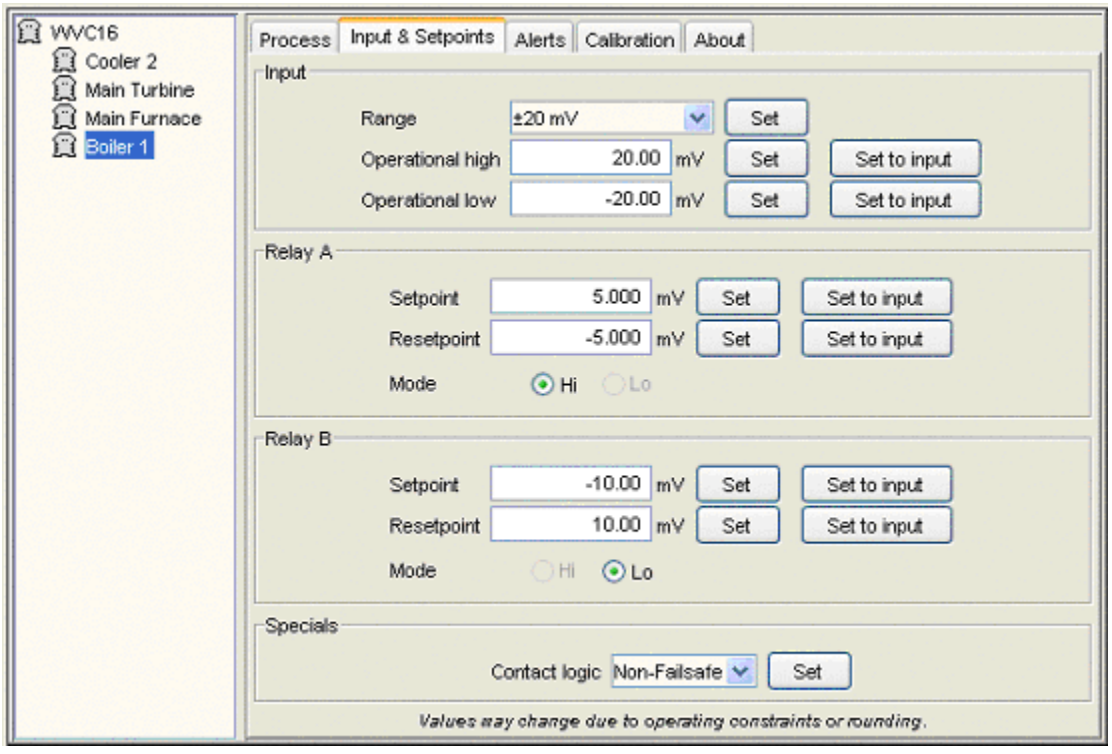


Figure 17: Input & Setpoints tab with Specials area

The failsafe logic setting determines the energizing of the relay: in non-failsafe mode the relay is energized when the input signal is between the setpoint and reset point, and vice

versa in failsafe mode. The Failsafe logic setting is selected by selecting from the drop-down list box in the Special area and clicking Set.

5.3.3 Calibration

CAUTION: Changing calibration values will invalidate the factory calibration and may result in poor accuracy of the process module's measurement system. If the calibration is not carried out correctly, it is possible to get a process module into a mode where only a pushbutton calibration can get the module functioning correctly again.

To perform a calibration, the following is needed depending on the particular process module:

- Precise signal source standards for voltage, current or frequency.
- Precise measuring equipment for voltage, current and temperature.

Modules that feature an auto level function must apply this function with a valid input signal before any calibration can begin, even if the input itself cannot be calibrated. Refer to section 5.3.2, Setting Operational Parameters. If a module does not display an input or output calibration section, it means the input or output cannot be recalibrated.

Calibrating Input

To calibrate the input of a process module, proceed as follows:

1. Select the Range tab.
2. Select the input range that the module is going to operate in, and then set the widest possible values for input operational high and low.
3. Select the Calibration tab:

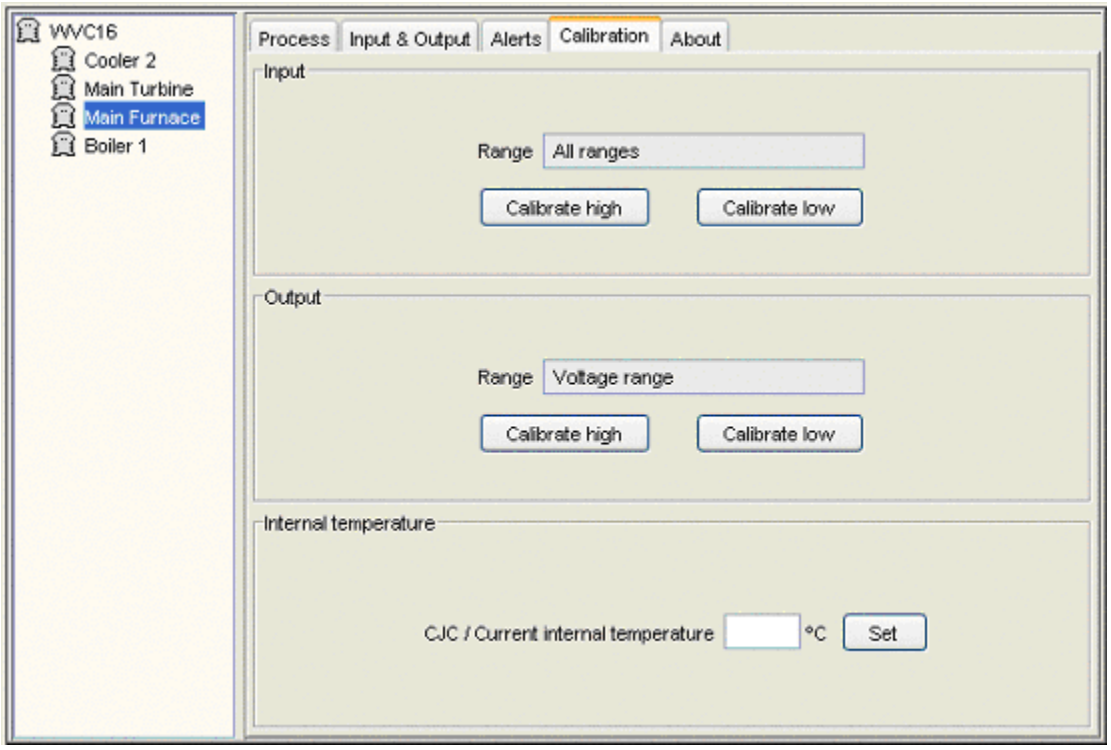


Figure 18: Calibration tab

4. Click Calibrate high in the Input section.
5. The Data Viewer displays a caution window; read it carefully and click the correct button.
6. The Data Viewer then displays a window with instructions to apply a certain input signal. The signal will depend on the module's type and the input range selected. Apply the signal and click Calibrate.
7. Back in the Data Viewer, click Calibrate low in the Input section.
8. The Data Viewer displays a caution window; read it carefully and click the correct button.

9. The Data Viewer then displays a window with instructions to apply a certain input signal. Apply the signal and click Calibrate.

The input should now be calibrated. To verify the calibration, go to the Process tab, apply the high and low input signal of the range, and confirm that the module is measuring correctly. The Calibrate high and Calibrate low can be reapplied in any order to improve the calibration, however, for the initial calibration Calibrate high should be used first.

Calibrating Output

Before calibrating output of a process module, the input should be calibrated. Then, to calibrate the output, proceed as follows:

1. Select the Range tab.

2. Set the widest possible values for input operational high and low.

3. Select the output range that the module is going to operate in, and then set the widest possible values for output operational high and low. To calibrate the current output range, select the 0-20 mA range, not the 4 mA MIN range. If a user attempts to calibrate the low point of the 4 mA MIN range, the WVC16 will ask the user to switch to the 0-20 mA range, then will abort the calibration process.

4. Select the Calibration tab.

5. Click Calibrate high in the Output section.

6. The Data Viewer displays a caution window; read it carefully and click the correct button.

7. The Data Viewer then displays a window with instructions to apply an input signal to drive the output a certain signal. The signal will depend on the module's type and the output range selected. Apply the signal and click Calibrate. If it is impossible to attain the requested output signal, see below.

8. Back in the Data Viewer, click Calibrate low in the Output section.

9. The Data Viewer displays a caution window; read it carefully and click the correct button.

10. The Data Viewer then displays a window with instructions to apply an input signal to drive the output a certain signal. Apply the signal and click Calibrate. If it is impossible to attain the requested output signal, see below.

The output should now be calibrated. To verify the calibration, go to the Process tab, apply the high and low input signal of the range, and confirm that the module is measuring correctly. The Calibrate high and Calibrate low can be reapplied in any order to improve the calibration, however, for the initial calibration Calibrate high should be used first.

It is possible to get a process module into a mode where it is impossible to attain the requested input or output values. In this case, the process module must be calibrated using the pushbutton found on the module; please refer to the module's datasheet.

Calibrating Internal Temperature

The temperature calibration is crucial to the correct operation of thermocouple modules, such as the WV128-*xxx*0, WV128-*xxx*1 and WV428-*xxx*0.

First, bring the process module into thermal equilibrium by powering on the module for 15 minutes. In order to calibrate the internal temperature of a process module, the temperature must be accurately measured inside the module's case. This can be done using a RTD sensor and meter calibrated to an accuracy of ±0.1 ºC. The temperature is best measured off the printed circuit board's surface near J3. When the internal temperature has been determined, enter it into the Current internal temperature field in the Calibration tab and click Set. Wait 3-5 seconds and then select the About tab. The Internal temperature field should now show the measured internal temperature ±1 ºC. If not, wait another 3-5 seconds and click Refresh. If the Current internal temperature does not correspond with the measured temperature, repeat the calibration.
Once the internal temperature has been calibrated, it is recommended to reset the internal minimum and maximum recorded temperatures. Select the About tab and click Reset min/max temp., and the minimum and maximum recorded values will coincide with the current internal temperature.

5.4 Alerts

The WebView I/O process modules are capable of detecting and conveying a number of conditions to a group of users via email. Setting up the system to report alerts involves setting up the email configuration on the WVC16, and possibly the alert conditions on each module. There are two types of alerts: system alerts and user-defined alerts. System alerts are sent when the input signal of a process module goes outside of the set full-scale range or the operational interval. These alerts can only be disabled by the Automatic email alerts setting in the Email setup tab, see below. User-defined alerts, on the other hand, can also be enabled or disabled on a per module basis, and can be set to any value within the set range. See section 5.4.2, Setting User-defined Alerts. The WV process modules also feature an administrative alert to help schedule routine maintenance, for instance recalibrations.

5.4.1 Configuring Email

To display the email configuration, select the WVC16 module in the module tree and select the Email Setup tab:

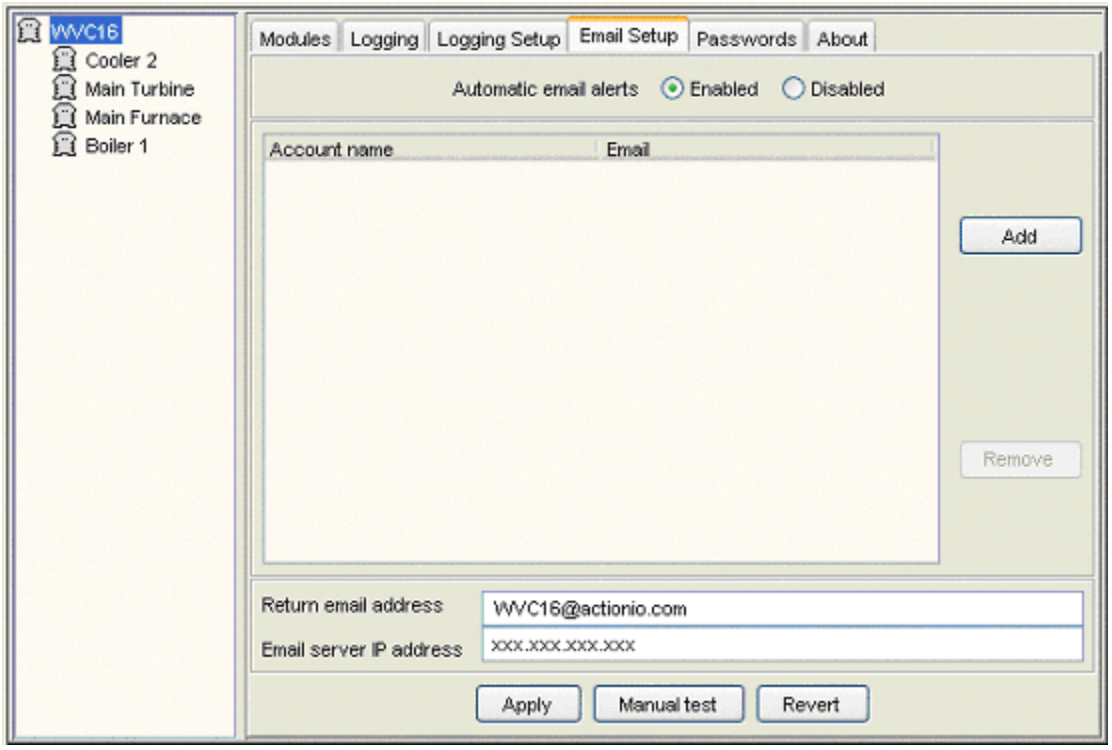


Figure 19: Email Setup tab

At the top of the tab is the Automatic email alerts setting. While configuring a system the automatic sending of email alerts can be disabled, to avoid sending false alerts. This is done by selecting the Disabled button and clicking Apply. When the system is fully configured and tested, the automatic sending of emails should be re-enabled. Eurotherm strongly recommends enabling the automatic sending of alert emails for running production systems, so that problems can be detected and remedied as early as possible.

To configure is the Email server IP address, obtain this information from the network administrator. Enter it into the Email server IP address field and click Apply.

The sent emails can be furnished with a return address. This can be useful when receiving emails or when emails do not reach their intended recipient, in which case the emails are returned to the return address. Some email servers will only send emails with return addresses from a list that the network administrator controls, and in this case a return address must be supplied; see Appendix G: SMTP Server Configuration Issues. Simply enter a return address, if warranted, into the Return email address field and click Apply.

At the top center is the address book, which will contain the account names and email addresses of users who are to receive the alerts. The address book can contain up to ten

recipients. All recipients will receive all alerts. The account name is just a string to help recognize for whom the email is intended and the email address is the actual address where alerts are sent. The alert emails may eventually end up being sent to cell phones (as SMS) or pagers, depending on the setup at the receiving end.

To enter a new recipient, first click Add. This inserts an empty entry into the table, where account name and email address can be entered. The account name can be left empty, but the email address must be filled in. Simply click in the fields and enter the information. To remove recipients, click on a row to select it and click Remove; multiple rows can be selected by holding down the Ctrl or shift key while clicking on rows. When the address book is complete (or at any time), click Apply to submit the changes to the WVC16.

When the recipients have been entered into the address book, a test email can be sent. Test emails can be send even if the Automatic emails alerts are disabled; in this case the email will contain a warning about this fact. Click Manual test and the recipients should receive an email like the following:

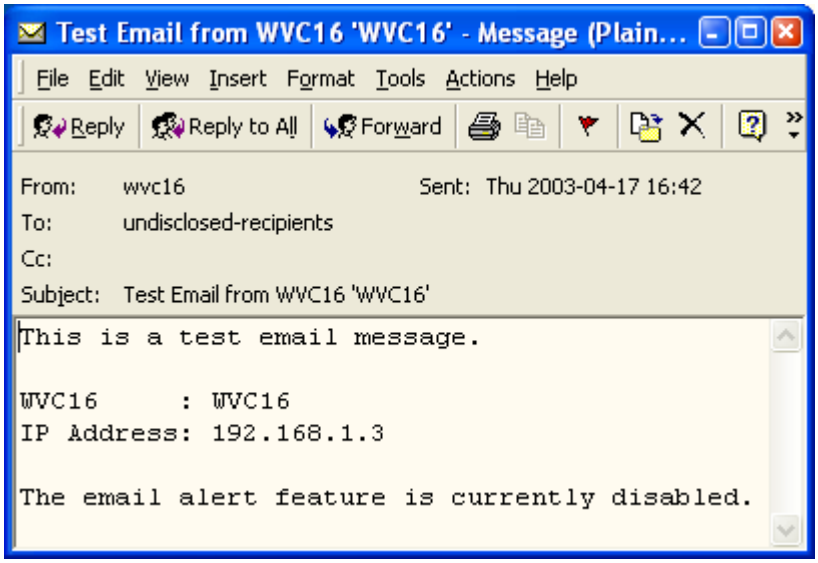


Figure 20: A test email

The actual screen may be different, depending on the email reader used.

5.4.2 Setting User-defined Alerts

Each process module has its own set of alarms and alerts. To configure them, select a process module in the module tree and then select the Alerts tab:

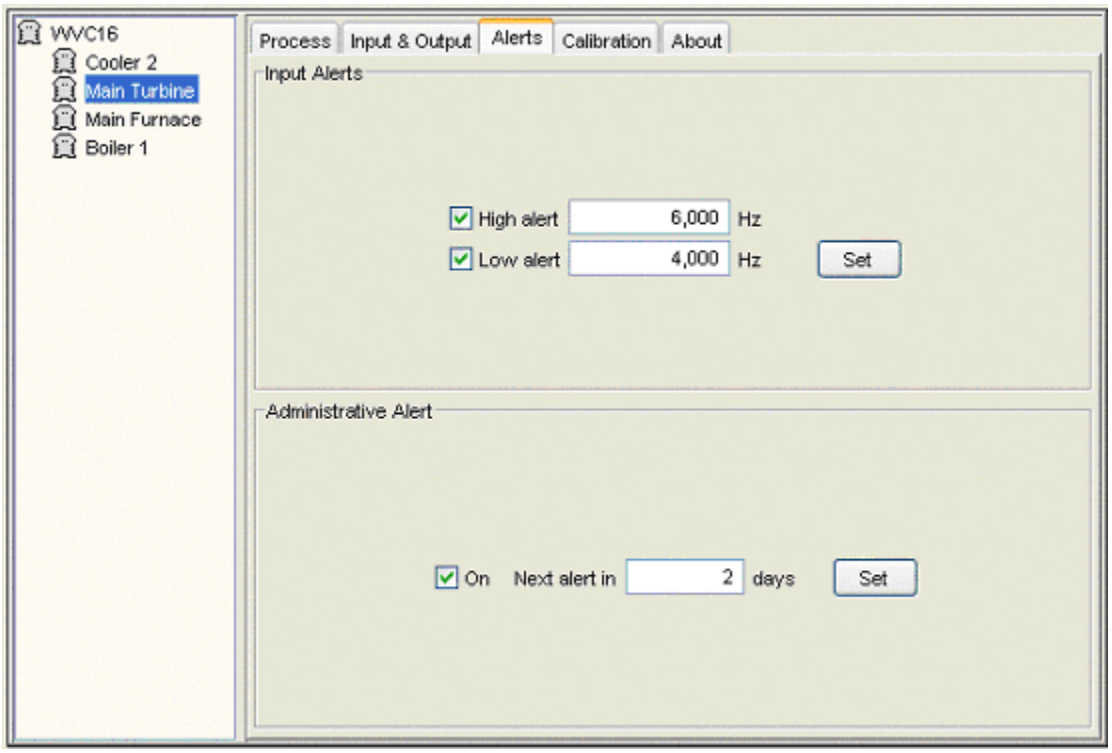


Figure 21: Alerts tab

In the Input Alerts section are the two alerts that can be set on each process module: one for input too high and one for input too low. To enable or disable either alert, click on the corresponding checkbox; a check mark indicates that the alert is on (as with the High alert and Low alert in Figure 21). The setpoint for the alert is entered into the field next to the checkbox label. When the alerts have been configured, click Set.
Enabled alerts are displayed in the graph in the Process tab, as red lines with labels:

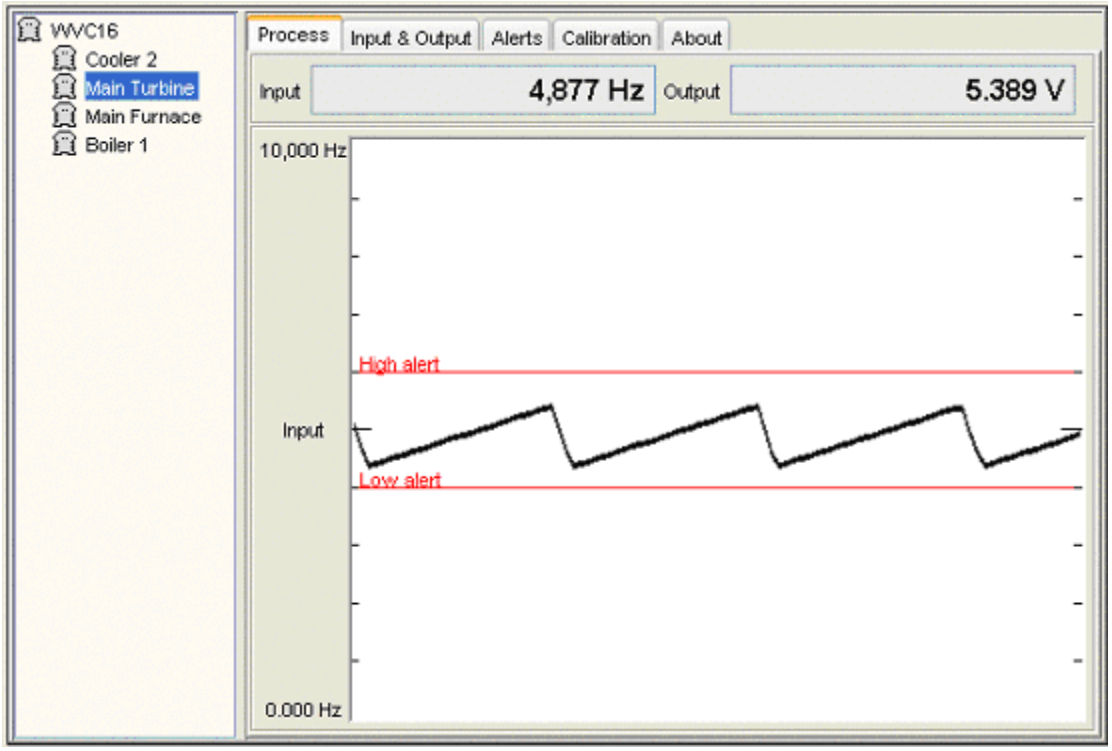


Figure 22: Enabled alerts displayed in graph

Each process module also has an administrative alert associated with it. The alert goes off after a certain number of days to notify an operator that an user defined administrative task is due, such as maintenance or calibration. The administrative alert is enabled by clicking on the On box in the Administrative Alert section. The number of days until the alert is sent is entered into the Set days to next alert field, which must contain a whole number.

When the alerts are configured, click Apply to send the configuration to the WVC16. The contents of the tab can be reverted back to the settings of the WVC16 by clicking Revert.

When alerts are fully configured and an alert situation occurs, an email such as the following is sent:

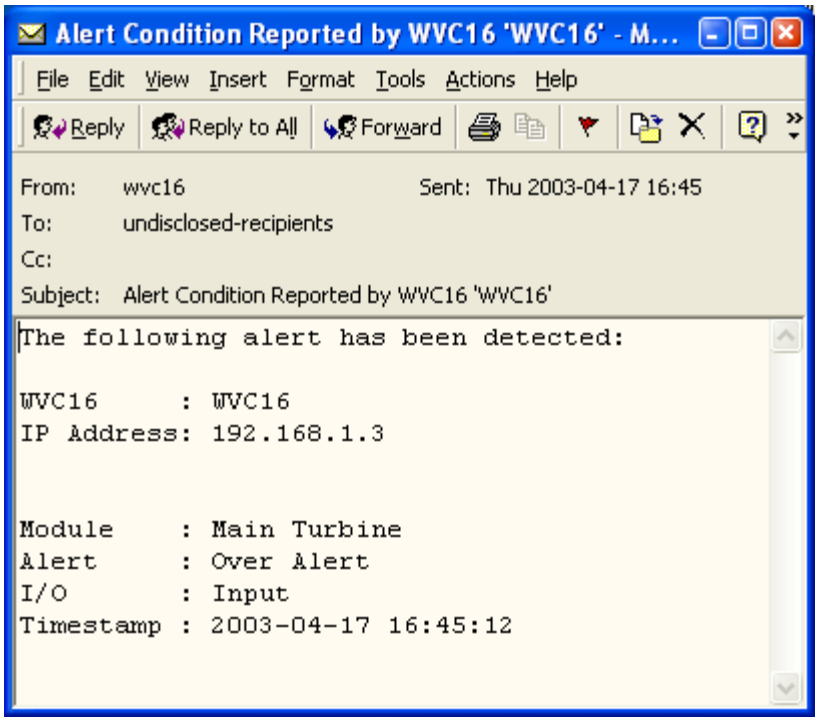


Figure 23: Alarm email

The actual screen may be different, depending on the WVC16 configuration, the process module configuration and the email reader used.

When multiple alerts occur within a short amount of time, the WVC16 limits the number of emails sent to avoid flooding email accounts with messages. The procedure employed is as follows: the first alert condition that occurs will cause an email to be sent. Then no email is sent for five minutes. Alarm conditions that happen during this time are recorded in one email that is send at the end of the five minutes. This continues until there are no alert conditions during a five minutes period.

5.4.3 Alert Descriptions

There are a number of possible alert messages: There are built-in input and output alerts, user-defined input alerts and an administrative alert. When discussing alerts, the word “span” is defined as a high point minus a low point. For example, if a full-scale range is selected to be ±150 mV, the high point is 150 mV and the low point is -150 mV. The full-scale span in this case is 150 mV minus -150 mV, or 300 mV.

User-defined Alerts

User-defined alerts can be enabled or disabled on a per-module basis but alerts can only monitor the input signal.

Over Alert

A user-defined limit on the input has been exceeded by going over the set limit. For example, a WV408 module whose input range is set to ±150 mV has an input signal at 75 mV. The user has decided to be notified if the signal exceeds 100 mV. The user would receive an email if the input signal rises above 100 mV. The user only receives one email notification while the alert stays in this state of being over 100 mV. If the signal drops below 100 mV minus about 1.5% of the full-scale input span, the alert is reset and will trigger again if the signal rises above 100 mV again.

Under Alert

A user-defined limit on the input has been exceeded by dropping below the set limit. For example, a WV428 module whose input range is set to -20 mV to +80 mV and has an input signal at 30 mV. The user has decided to be notified if the signal drops below 10 mV. The user would receive an email if the input signal falls below 10 mV. The user only receives one email notification while the alert stays in this state of being under 10 mV. If the signal rises above 10 mV plus about 1.5% of the full-scale input span, the alert is reset and will trigger again if the signal drops below 10 mV again.

Administrative Alert

A user has specified a countdown timer from a set number of days. The users receive an email after the number of days has passed. The timer is kept on the process module. While a process module is powered down, it will not count down days and no alert will be sent.

Out of Range

This message is related to the user-defined alerts. Notice this message does not have the word "Over" or "Under" like the other alerts do. This message is here to support older WV408/WV428/WV478 units. If the customer receives this message, it is because the process module has an output firmware version that is equal to or lower than the table below:

Model Name	Output Firmware Version
WV408	2.17
WV428	2.12
WV478	2.09

System Alerts

Operational and full-scale alerts are not optional. They cannot be disabled (except by disabling email alerts altogether). However, these alerts usually indicate that the system that the WVC16 is monitoring needs attention and it is not advised to circumvent the alert mechanism. Secondly, these alerts can indicate problems with the input and as well as with the output signal. When it comes to operational and full-scale alerts, the deadband is set to 6% of the full-scale span.

Over Operational
Either the input or the output signal has risen above the operational high setting by 6% of the operational span.

Under Operational
Either the input or the output signal has fallen below the operational low setting by 6% of the operational span.

Over Full-Scale
Either the input or the output signal has risen above the full-scale high setting by 6% of the full-scale span. On thermocouple units reporting this alert on the input, it could also mean that there is an open circuit. If this alert is reporting this alert on the output, it could also mean a short circuit. This applies to any module, not just the thermocouple units.

Under Full-Scale
Either the input or the output signal has fallen below the full-scale low setting by 6% of the full-scale span. If the alert is reporting an issue with the output, it could also mean that there is a short circuit.

5.5 Data Logging

The WVC16 is capable of recording data from the process modules at regular intervals. The data can later be downloaded to the client computer and used in for instance a spreadsheet application.

5.5.1 Setting Up Data Logging

Setting up data logging involves choosing a set of process modules to be logged and an interval at which the modules are logged. Data logging is configured using the Logging Setup tab:

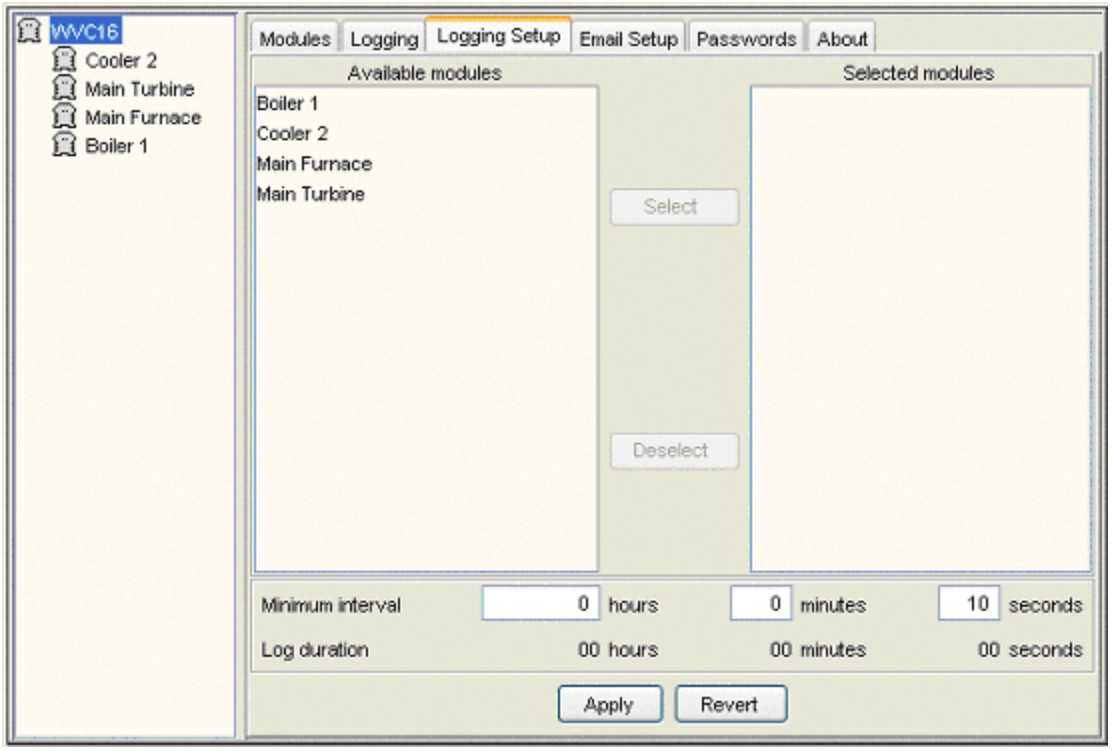


Figure 24: Logging Setup tab

If the Apply and Revert buttons are inoperative, the data logging is already running and it must be stopped before configuration can take place, see section 5.5.2, Logging Data.

Selecting Modules

Modules that have already been selected for logging appear in the Selected modules list. Process modules that are not already selected for logging appear in the Available modules list. To move a module from one list to the other, simply click on the module name and click Select or Deselect. Multiple modules can be selected by holding down the Ctrl or shift key while clicking on the modules. If there are modules in the module tree that do not appear in either list, the lists can be updated by clicking Apply or Revert.

Setting Logging Interval

The Minimum interval fields determine how frequently process module data is recorded. All selected module inputs are logged at the same interval. The Minimum interval sets the minimum time between each log capture. In some situations, with very short intervals (less than 10 seconds) and many modules selected, the actual time between log entries may be slightly longer. Three fields are used to set the interval: the hours, the minutes, and the seconds fields. Fill in the fields based on how often data logging should occur.

When all the lists and fields have been set up, click Apply. The Log duration fields then display how long it takes before the log is filled.

When the log is filled, the WVC16 does not stop logging, rather, it starts recording from the beginning again, gradually overwriting previous data.

5.5.2 Logging Data

Starting and stopping logging, and downloading of logged data is handled in the Logging tab:

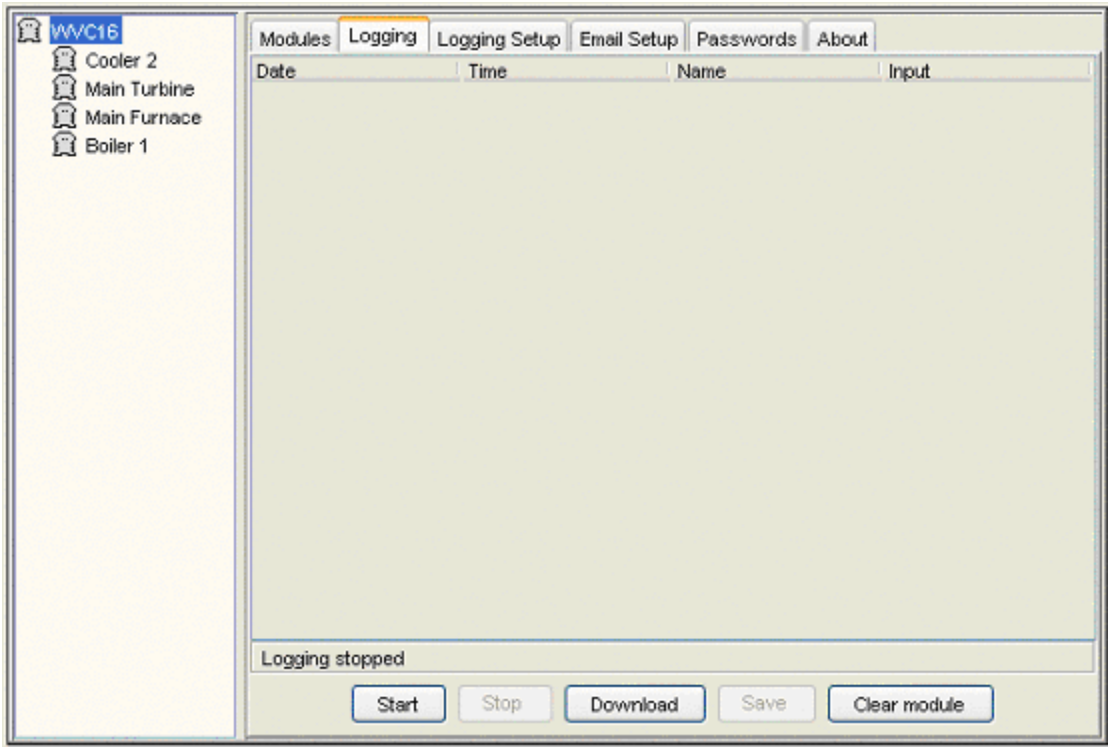


Figure 25: Logging tab

Logging is started by clicking Start. However, before starting, the internal buffer on the WVC16 can be cleared by clicking Clear module. Logging is stopped by clicking Stop. While logging is stopped, the logged data can be downloaded to the Data Viewer by clicking Download. Downloading a full log takes at least two minutes, and can take considerably longer depending on the speed of the connection between the client computer

and the WVC16. Once downloaded, the data can be saved to a file on the client computer. Click Download and select a file name and a directory in the Save Log window:

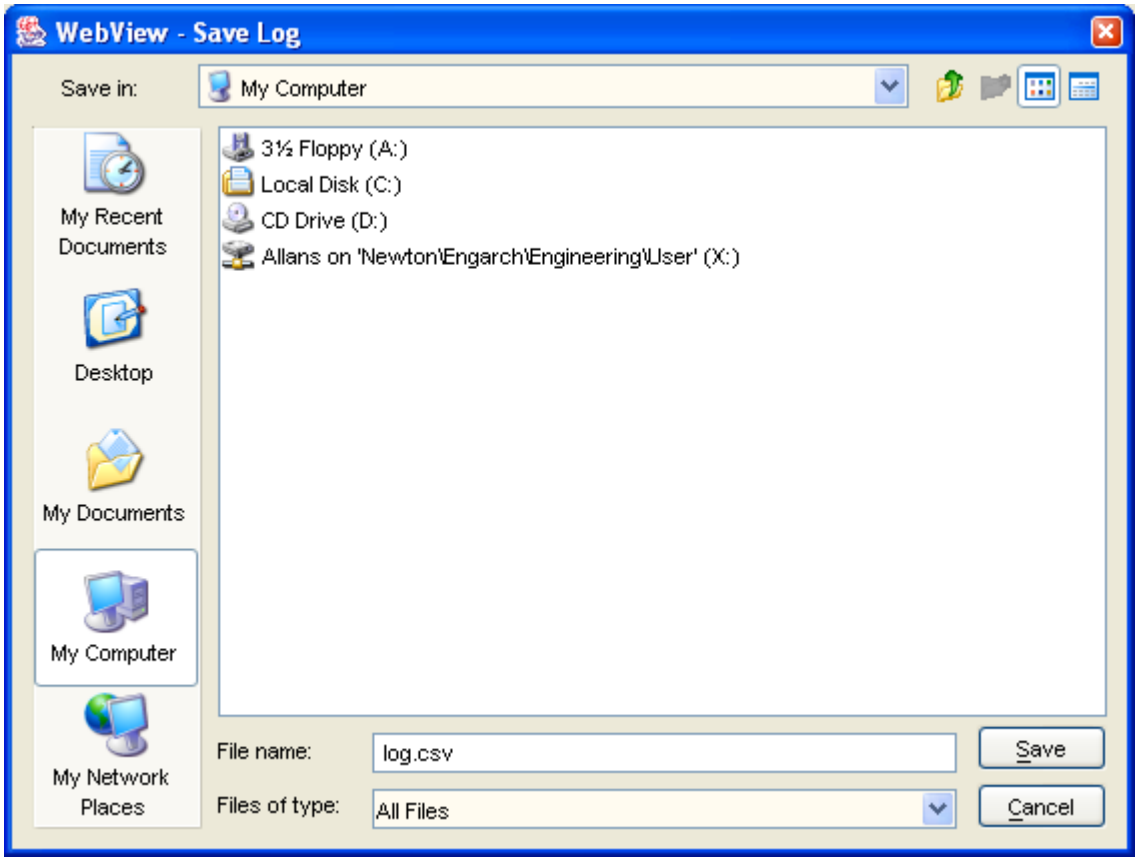


Figure 26: Save Log window

The directory, in which the log is to be saved, is selected at the top of window, and the file name is entered in the File name field. Click Save to save the file and Cancel to abort saving. Either way, the Data Viewer retains a copy of the data. The data is saved in CSV (comma-separated values) format and can be read by most text editors and spreadsheet applications, including Microsoft Excel.

CAUTION: The log data integrity can be compromised if modules are switched out while logging is enabled and in general any change to a module will reset the log. An existing log will not save correctly if the process modules are rearranged after the data was logged. Every time the user rearranges the process modules on the rail, the data log becomes invalid and therefore must be stopped and cleared.

APPENDIX A: TROUBLESHOOTING GUIDE

Problem	Solution
WVC16 administration console port not answering	o Verify that the client computer's serial port is configured correctly; see section 4.1, Connecting to the Administration Console. o Make sure that the terminal application is using the correct serial port on the client computer.
Module(s) not powering on	o Check the power supply. The voltage must be between 9 and 30V DC. Check for reversed power supply polarity (+ and – wires reversed). o Check that the power supply can supply the current needed. o Check power bus jumpers. During installation, jumpers may come undone or poorly connected.
Network LEDs off	o Check that the Ethernet cable is securely inserted in the Ethernet socket o Check that the Ethernet outlet is connected to the network. This issue may require the network administrator's assistance.
Network offline LED on steady	o This is an indication that the network is severely congested and the WVC16 cannot function correctly on such conditions. This issue may require the network administrator's assistance.
Clock not running during power interruptions	o Check the home page for low battery status. See "Battery status low on home page."
Log empty after power cycle	o Check the home page for low battery status. See "Battery status low on home page."
Battery status "low" on home page	o Check the battery switch. If the switch is off, the home page will report low battery status. o Replace the internal battery.
Browser cannot reach WVC16 / WVC16 does not serve web pages	o Check using a ping program that the WVC16 is online and reachable from the client computer; in Windows, use the following command: `ping ipaddress` where *ipaddress* is the IP address of the WVC16. If the WVC16 does not respond, see "WVC16 does not respond to pings" below. o Disable proxy server on the web browser when communicating directly with the WVC16 using a crossover cable. o Check that the client computer and browser are using the correct network settings; this issue may require the network administrator's assistance.

Problem	Solution
WVC16 does not respond to pings	o Check that the WVC16 is connected to Ethernet by checking the network LEDs. If the LEDs are not on or do not flash, see "Network LEDs off." o Check that the correct IP address or host name is being used. If DHCP is used, the IP address may change every time the WVC16 is rebooted. o If the WVC16 is connected directly to the client computer, make sure that a crossover cable is used, not an ordinary network cable. o Check that the WVC16 is configured with the correct network settings using the administration console. o There may be a firewall or proxy server interfering; contact the network administrator. (If a different IP address has recently been assigned to the WVC16, the network administrator may have to clear the ARP cache of a network switch.)
Java Plug-in does not install automatically	o Check that the browser can reach Sun's web site www.sun.com. If this is not the case, the Java Plug-in can also be installed from the installation CD-ROM, see section 5.1, Starting the WebView I/O Data Viewer.
Data Viewer window does not appear	o The browser may not allow new windows to appear; check browser settings.
Wrong or forgotten user password	o Simply log in as "admin" and change the user password from the Passwords tab.
Wrong or forgotten admin password	o Use the administration console to reset the WVC16 to factory defaults.
Data Viewer does not load correctly	o Check to see if the Java Plug-in is installed, if not see "Java Plug-in does not install automatically." o The network may be congested on the WVC16's Ethernet segment. Check the network offline LED, and if it is on steady, see "Network offline LED on steady."
Data Viewer does not communicate with WVC16	o Start a telnet session with the communications port on the WVC16; in Windows, use the following command: `telnet ipaddress 17604` where *ipaddress* is the IP address of the WVC16. If there is no response, but the home page is loaded correctly, then the traffic is not being let through the network. The Data Viewer uses TCP port 17604 to communicate with the WVC16, and a firewall or proxy server may block communication on this port. This issue may require the network administrator's assistance. o Check that there is no firewall software currently running on the PC and interfering with traffic. To run the firewall software with the Data Viewer applet, configure the firewall software to allow TCP port 17604 traffic.

Problem	Solution
Data Viewer stops communicating with WVC16 after a while	o Check, using a ping program, that the WVC16 is online; if not, see "WVC16 does not respond to pings." o Check the network offline LED on the WVC16; if it is on see "Network offline LED on steady."
Process modules are not acquired by WVC16	o Check that the modules are mounted on the correct side of the WVC16. o Check that the I/R LEDs are not obscured, misaligned or broken. o Check the number of modules on the rail; the maximum is 32. o Check that the process modules are supported by the WVC16 firmware version.
Process modules intermittently go offline	o Check that the I/R LEDs are not obscured, misaligned or broken. o Check that the power supply is stable.
Data Viewer is unresponsive when downloading log or takes a long time	o This is to be expected. Even at full speed, it takes more than two minutes to download a full log.
Changes of module names do not take effect	o This can happen when a module is acquired while the name change is taking effect. Simply try again.
Data Viewer does not update Process tab	o This can happen after an error has occurred. Simply restart the Data Viewer. o If the problem persists, see "Process modules intermittently go offline."
Operational values changes when Set is clicked	o Process modules have limited resolution and will try to set the operational value as close to the requested value as possible. The value displayed after Set is clicked is the actual operational value.
Emails do not reach recipients	o Check the email addresses and be sure to click Apply. o Check the Email server's IP address. o Check the Return email address; some email servers require a return address for all outgoing emails and some even require the address to come from a special list; contact the network administrator. See Appendix G: SMTP Server Configuration Issues. o Check the return email account for emails reporting delivery errors.
Data Viewer does not allow saving	o If the Data Viewer was started by denying it permissions, it cannot save. Restart the Data Viewer and select Grant permission to enable saving. o If the Data Viewer was started by granting permissions, or permissions have been granted permanently, this means that the Data Viewer's security has been compromised. Please contact the network administrator and Eurotherm Inc. immediately.

Problem	Solution
Security certificate has expired	o When the Data Viewer starts, the permission dialog box states that the security certificate has expired. This is due to the limited duration of the certificate and will not impair the operation of the Data Viewer. However, an update can be requested from Eurotherm Inc.
During calibration of output, requested output signal cannot be attained	o Try applying a signal outside the input range. o Use the push-button on the module to do the calibration.
Time stamps on log entries are not progressing	o The internal clock has not been set.

APPENDIX B: ERROR LOG MESSAGES

This appendix describes the error log messages that may appear in the WVC16's error log.

B.1 Fatal Errors

Fatal errors cause the red Error LED to turn on steady. In most cases, this class of errors will cause the WVC16 to reset and/or will prevent normal operation.

Message	Explanation
Fatal Error 1: Unknown error.	Indicates software malfunction. Please contact technical support.
Fatal Error 2: Memory alloc timeout error.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 3: Dynamic memory free error.	No longer used. Should never occur.
Fatal Error 4: Timer allocation error.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 5: Invalid command ID.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 6: Invalid module address.	Indicates infrared communication problems and/or software malfunction in the process modules. Will most likely cause the WVC16 to reboot. Please contact technical support if the error persists.
Fatal Error 7: Null pointer exception.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 8: Error binding network task.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 9: No client struct available.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 10: Invalid connect socket.	Indicates that a problem occurred while establishing a TCP connection with a new client. Check client network settings and software. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 11: Invalid get_client() call.	Indicates software malfunction. This error may reboot the WVC16. If not, reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 12: RTC 2-wire ACK error.	Indicates a probable hardware fault. The real-time clock may be faulty. Please contact technical support if the error persists.
Fatal Error 13: Invalid range index.	Indicates infrared communication problems and/or software malfunction in the process modules. This error most likely prevented a process module from registering with the WVC16. Please contact technical support if the error persists.

Message	Explanation
Fatal Error 14: Invalid XML parser state.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.
Fatal Error 15: Index out of range.	Indicates software malfunction. Reboot the WVC16. Please contact technical support if the error persists.

B.2 Non-Fatal Errors

Errors cause the red Error LED to flash. This class of errors does not normally prevent normal operation to continue, and should be addressable by the user.

Message	Explanation
Error 16: Out of module addresses.	The WVC16 supports up to 32 process modules. If more modules are detected, this error will be logged. Limit the number of modules to 32.
Error 17: Queue full.	Indicates a receive buffer overflow in the administration console port or on the infrared port. When using the administration console, limit the data rate to the WVC16 to normal typing speed.
Error 18: Alert queue full.	Indicates that too many alerts have occurred since the last alert e-mail message was sent. One or more process modules are generating alerts too frequently. Determine which process modules are generating the alerts and correct the situation.
Error 19: General SMTP error.	Indicates a non-specific error with the SMTP client. This error occurs when the WVC16 was unsuccessful in sending out an email message. Check the SMTP (email) server accessibility and settings.
Error 20: EEPROM init code error.	Indicates invalid EEPROM contents. After logging this error, the WVC16 attempts to restore the EEPROM contents to its factory defaults. If this error persists, it may indicate a faulty EEPROM chip. Contact technical support if the problem persists.
Error 21: I/R msg dequeue error.	Indicates an operating system malfunction. Please contact technical support.
Error 22: Unexpected register type.	Indicates infrared communication problems and/or software malfunction in one or more process modules. It may also be the result of incompatible process module firmware. Please contact technical support if the error persists.
Error 23: Unexpected I/R message.	Indicates infrared communication problems and/or software malfunction in one or more process modules. Please contact technical support if the error persists.
Error 24: WV model not supported.	Indicates that the WVC16 does not recognize the model name of one of the process modules on the rail and could not register it. Use the module tree to determine which process module is missing. Contact the factory for assistance.

Message	Explanation
Error 25: Module registration error.	Indicates that a process module failed to register with the WVC16. May be the result of infrared communication problems, software malfunction in the process modules, and/or incompatible process module firmware. Please contact technical support if the error persists.
Error 26: SMTP wait error.	Indicates a wait error with the SMTP client. This error occurs when the WVC16 was unsuccessful in sending out an email message. Check the SMTP (email) server accessibility and settings.
Error 27: SMTP socket error.	Indicates a TCP socket error with the SMTP client. This error occurs when the WVC16 was unsuccessful in sending out an email message. Check the SMTP server accessibility and settings.
Error 28: SMTP send failure.	Indicates a send failure with the SMTP client. This error occurs when the WVC16 was unsuccessful in sending out an email message. Check the SMTP server accessibility and settings.
Error 29: Response string too long.	Indicates infrared communication problems and/or software malfunction in one or more process modules. It may also be the result of incompatible process module firmware. Please contact technical support if the error persists.
Error 30: SMTP server not set.	Indicates that the email alerter attempted to send an email message, but the SMTP server's IP address was not set properly. Correct the SMTP server's IP address.
Error 31: SMTP error.	Indicates a non-specific error with the SMTP client. This error occurs when the WVC16 was unsuccessful in sending out an email message. Check the SMTP server accessibility and settings.
Errors 32 thru 35	*Reserved*

B.3 Warnings

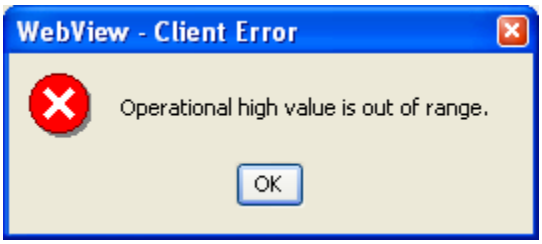
Warnings also cause the red Error LED to flash and will not prevent normal operation to continue. Warnings may occur from time to time under adverse environmental conditions.

Message	Explanation
Warning 36: Module firmware obsolete.	One or more of the process modules connected have an obsolete firmware revision. Use the module tree to determine which process module is missing. The missing module generated the error and has obsolete firmware.

Message	Explanation
Warning 37: RAM init code error.	Indicates that the non-volatile portion of SRAM, backed up by the internal battery, lost all or part of its data. This warning occurs if the two boards inside the WVC16 are separated, or if the WVC16 is reprogrammed with new firmware. If the warning persists, verify that the battery switch on the front panel is in the ON position, and check the WVC16's home page to verify that the battery is still good. If not, replace the battery.
Warning 38: I/R message send failure.	Indicates an unexpected reply from a process module. This warning may accompany a related error message.

APPENDIX C: WEBVIEW I/O DATA VIEWER ERROR MESSAGES

This appendix describes the error messages that can be displayed while running the WebView I/O Data Viewer. The messages will appear in a window like the following:



The window must be dismissed before operation can continue; it is dismissed by clicking Ok.

Title / Type	Message	Explanation
Client Error	*Reason*	This message is displayed when the user has attempted to perform an operation that the selected module cannot accept; often a value is out of range. *Reason* will explain the problem further.
Connection Failed	Communication with the Communications Interface Module failed due to: *reason* The Data Viewer will now exit. To continue please reload the page.	This message is displayed when the connection between the Data Viewer and the WVC16 has been severed, but can also be displayed when using a high latency, low bandwidth connection, such as a shared dial-up connection. The *reason* will explain the situation further.
General Error	*Reason.* Please restart the Data Viewer.	This indicates a non-fatal internal error in the Data Viewer. The Data Viewer may be operating incorrectly, and should be restarted as soon as possible; this is simply done by refreshing the page. If the problem persists contact Technical support. See below.

Title / Type	Message	Explanation
Java Version Error	The WebView I/O Data Viewer requires the Java Plug-in version 1.4.1 or higher. Please uninstall the current version and install a new version, available at http://java.sun.com/getjava. The system will now exit.	The Data Viewer has detected an earlier version of the Java Plug-in, which it cannot run in. Please uninstall the installed version and install a newer version. After this message the browser will terminate (depending on the browser), which is necessary for the Plug-in to be uninstalled.
Load Error	The WebView I/O Data Viewer did not load correctly, possibly due to network congestion. Please reload the page and try again.	The message is displayed when during the download of the Data Viewer, the connection is interrupted or is experiencing very low throughput. Simply follow the instructions, and if the problem persists, contact your network administrator.
Login Failed	*Reason*	This message is displayed if login has failed. *Reason* will explain the cause, usually an incorrect password.
Module Not Available	The module *module name* is not online. -or- The module is not online.	This message is displayed when the Data Viewer is in the process of communicating with a process module and the connection to the process module is lost.
Module Registration Failed	A process module failed to communicate during registration.	This is an indication that WVC16 lost connection with a process module while the Data Viewer was in acquiring it. Check the error log to see if problem is persistent; see Appendix A: Troubleshooting Guide for possible resolutions.
Permission Denied	Sorry, only the admin user can do this.	This message is displayed when trying to change a protected setting while logged in as “user.”
Process Configuration Error	The system is reporting an invalid configuration for the selected process module. Please power cycle the system and perform a push-button calibration of the process module.	This may be an indication of an invalid calibration, or a serious firmware problem that can only be corrected by Eurotherm. Follow the instructions, and if the problem persists, contact Technical support. See below.
Security Exception	The WebView I/O Data Viewer was not granted permission at the start of the session. To complete the task, close all web browser windows and start over from the home page.	This message is displayed when trying to save the log, in a browser where the Data Viewer has not been granted permission.

Title / Type	Message	Explanation
System Error	The Communications Interface Module is not responding correctly. Please contact Action Instruments.	This is an indication of a serious firmware problem with the WVC16 that may only be corrected with the help of Eurotherm. See below. The process modules may continue to perform without problem.

APPENDIX D: ALERT MESSAGES REFERENCE

The table below enumerates the possible meanings of the email messages sent when an alert is triggered. For a more in-depth description, see section 5.4.3, Alert Descriptions.

Signal	Alert Type	I/O	Meaning
Over	Operational	Input or Output	Signal has risen above the process module's operational high setting
Under	Operational	Input or Output	Signal has fallen below the process module's operational low setting
Over	Full-Scale	Input	1. Signal has risen above the full-scale high setting -or- 2. Thermocouple module open circuit
Over	Full-Scale	Output	1. Signal has risen above the full-scale high setting -or- 2. Output voltage has exceeded the compliance voltage for current output. Check impedance of output level.
Under	Full-Scale	Input	Signal has fallen below the full-scale low setting
Under	Full-Scale	Output	1. Signal has fallen below the full-scale low setting -or- 2. Short Circuit (for voltage output ranges only)
Over	Alert	Input only	Signal has risen above the user-defined alert setting
Under	Alert	Input only	Signal has fallen below the user-defined alert setting
N/A	Out of Range	Input only	See section 5.4.3, Alert Descriptions
N/A	Timer Expired	N/A	The process module's administrative alert timer has expired

APPENDIX E: TECHNICAL SPECIFICATIONS

Power Specifications

Power supply voltage ..... 9 to 30 V_{DC}

Power consumption ..... 1 W typical, 1.2 W maximum

Environmental Specifications

Ambient operating temperature ..... 0 to 60 ºC (32 to 140 °F) (measured one inch above or below case with free air flow)

Storage temperature ..... –25 to +85 ºC (–13 to 185 °F)

Operating humidity ..... 15 to 95 %RH, non-condensing, up to 45 ºC

Storage humidity ..... 90 %RH for 24 hours at 60 ºC

Isolation Specifications

Isolation voltage ..... 1500 V_{RMS} minimum

Ethernet interface RJ45 connector to any other external connector

General Operational Specifications

Power on or push button start up/reset time ..... 4 seconds minimum

Battery low detection voltage ..... Approx. 2.7 V_{DC} typical

Battery Specifications

For power down data retention and real time clock maintenance, one battery installed at battery holder location BH1 on the baseboard is required.

Industry Standard battery types CR2032

BR2032 (performs better in storage at high temperatures)

Capacity ..... 235 mAh typical

Life Expectancy:

With battery switch on ..... 16 months

With battery switch off ..... 10 years

Handling and Disposal:

1. Improper use or handling may cause battery to explode or leak, causing potential bodily injury.
2. Replace only with the following 3 V lithium button/coin cell: CR2032 or BR2032.
3. Do not recharge, put in or dispose of in fire, disassemble, put in backwards or short circuit.
4. Lithium cells may be considered a “characteristic” hazardous waste but are not a US EPA listed hazardous waste. Disposal and recycling regulations and policies may vary among states and governmental jurisdictions. Contact local jurisdictions for specific advice on disposal.

Display Specifications

WVC16 Status LEDs

Reference	Name	Color	Description
DS1	ERROR	Red	Indicates one or more errors logged
DS2	CONNECT	Green	Indicates one or more Data Viewers are connected
DS3	MODULE	Yellow	Indicates one or more process modules have been acquired

Ethernet Status LEDs

Reference	Name	Color	Description
DS6	OFFLINE	Red	Indicates Ethernet communications problem
DS4	TRAFFIC	Yellow	Indicates Ethernet transmit, receive or collision activity
DS5	LINK	Yellow	Indicates Ethernet link activity

Ethernet Specifications

Topology 10Base-T
Maximum data rate ..... 10 Mbps
Connector RJ-45
Cable ..... Cat-5 Unshielded Twisted Pair (UTP)
Shielded Twisted Pair recommended in electrically noisy environments.

Network Services Specifications

Network services available from the WVC16:

- HTTP ..... TCP Port 80
- WVCP ..... TCP Port 17604

Number of supported HTTP connections ..... 4 maximum
Number of supported WVCP connections ..... 4 users maximum. 1 admin maximum.

WebView I/O Module Infrared Communications Specifications

Space between a WVC16 and a WebView I/O process module:

- Minimum ..... 0.0 in (0.0 mm)
- Maximum ..... 0.7 in (17.8 mm) typical, when properly aligned

Bit rate ..... 28.8 kbps peak
Data rate ..... 11 kbps typical
Number of process modules supported ..... 32 maximum

RS232 Interface Specifications

Electrical	3 wire: TX, RX, COM (no hardware handshaking or modem control)
Connector	3 terminal plug with accessory cable to 9 pin DB9 female connector (cable part of C650 accessory kit, P/N: 936-0383-00)

Administration Console:

Baud rate	Fixed at 9600 bps
Data bits	8
Stop bits	1
Parity	None
Flow control	None

E86MON Boot Monitor Console:

Baud rate	1200 to 115200 bps, Auto baud rate detection
Data bits	8
Stop bits	1
Parity	None
Flow control	Requires XON/XOFF

Case Physical Specifications

Mounting rails	EN50022-35x7.5 (DIN TS35x7.5 35 mm Top Hat) EN50022-35x15 (DIN TS35x15 35 mm Top Hat)
Case width	22.5 mm (0.89 in)

APPENDIX F: ADMINISTRATION CONSOLE COMMANDS

This appendix describes the commands available in the WVC16 administration console. The commands are listed alphabetically. All commands are one character, optionally followed by an argument. The commands are not case sensitive.

C — Clear error message log

Arguments None

Command `c`

Reply

```
Clear the error log? Enter Y to confirm: _
```

Confirm by entering `y`. The WVC16 replies:

```
Error log cleared.
```

Description

Clears the contents of the error log. Turns the red Error LED off.

d

Display network settings

Arguments None

Command **`d`**

Reply Example

```
DHCP Disabled

Address      Current          After Reboot
-------      -------          ------------
IP Address   192.168.1.10     no change
Gateway      192.168.1.1      no change
Subnet Mask  255.255.255.0    no change
```

Description

Displays the network settings of the WVC16. The `After Reboot` column shows user changes to the network parameters that will take effect after rebooting the WVC16.

If the DHCP client is enabled, the **`d`** command only shows the DHCP assigned settings.

e

Display logged error messages

Arguments None

Command **`e`**

Reply Example

```
2002-06-04 19:22:17 WARN32 TASK08 (INIT): RAM init code error.
```

Description

Displays the contents of the error log.

g — Change the gateway address

Arguments The desired gateway (router) IP address.

Command Example `g 192.168.1.1`

Reply

```
Gateway address changed. Reboot for changes to take effect.
```

Description

Changes the gateway (router) IP address. This address is used when the WVC16 needs to send messages to a device that does not reside on the same subnet, such as an SMTP server. Changes to the gateway address are only allowed when the DHCP client is disabled.

h — Display the help menu

Arguments None

Command `h`

Reply

```
Administration Console Help Menu

c   : Clear error message log
d   : Display node settings
e   : Display logged error messages
g # : Change the gateway address
h   : Display this menu
i # : Change the node IP address
m   : Display MAC (Ethernet) address
p   : Display DHCP client status
p d : Disable the DHCP client
p e : Enable the DHCP client
s # : Change the subnet mask
u   : Undo all changes
v   : Display version information
x   : Reboot the unit
x f : Restore factory defaults and reboot
?   : Display this menu

# represents an IP address (xxx.xxx.xxx.xxx)
```

Description

Displays the help menu.

i — Change IP address

Arguments The desired IP address.

Command Example `g 192.168.1.10`

Reply

```
IP address changed. Reboot for changes to take effect.
```

Description

Changes the WVC16's IP address. This address is used by other devices that need to communicate with the WVC16. Changes to the IP address are only allowed when the DHCP client is disabled.

m — Display MAC (Ethernet) address

Arguments None

Command `m`

Reply Example

```
MAC (Ethernet) Address: 00:04:88:FF:00:13
```

Description

Displays the MAC address of the WVC16. The MAC address is a unique 48 bit identifier that cannot be modified and that is guaranteed to be unique among all IEEE 802.3 compliant devices. The MAC address is used by low-level protocols, such as ARP, and by DHCP servers.

p — Display DHCP client status

Arguments None

Command `p`

Reply

```
DHCP is enabled.
```

or

```
DHCP is disabled.
```

Description

Shows the current status of the DHCP client, whether enabled or disabled. See section 4.2.1, Ethernet Configuration Using DHCP for more details about the DHCP protocol.

p d — Disable the DHCP client

Arguments `d`

Command `p d`

Reply

```
DHCP disabled. Reboot for changes to take effect.
```

Description

Disables the DHCP client.

p e — Enable the DHCP client

Arguments `e`

Command `p e`

Reply

```
DHCP enabled. Reboot for changes to take effect.
```

Description

Enables the DHCP client.

s — Change the subnet mask

Arguments The desired subnet mask.

Command Example `g 255.255.255.0`

Reply

```
Subnet mask changed. Reboot for changes to take effect.
```

Description

Changes the WVC16's subnet mask. The subnet mask is used to determine whether a given device resides on the same subnet or must be accessed via the gateway. Changes to the subnet mask are only allowed when the DHCP client is disabled.

u — Undo all changes

Arguments None

Command `u`

Reply

```
Changes undone.
```

Description

Undoes all changes applied before rebooting the WVC16, such as the IP address. This does not apply to the DHCP client state (`p` command).

v — Display version information

Arguments None

Command `v`

Reply Example

```
WVC16 WebView I/O Communications Interface, Version 1.0
```

Description

Displays the WVC16 model name and firmware version.

x — Reboot the unit

Arguments None

Command **`x`**

Reply

```
Reboot the unit? Enter Y to confirm: _
```

Confirm by entering **`y`**. The WVC16 replies:

```
Rebooting the unit. End of session.
```

Description

Reboots the WVC16. This command is equivalent to pressing the WVC16's reset button on the front panel.

x f — Restore factory defaults and reboot

Arguments **`f`**

Command **`x f`**

Reply

```
CAUTION! This command will overwrite all
user-defined settings with factory defaults.
Are you sure you wish to proceed?
Enter Y to confirm:
```

Confirm by entering **`y`**. The WVC16 replies:

```
Restoring factory defaults.
Rebooting the unit. End of session.
```

Description

This command destroys any user settings applied after the WVC16 left the factory and restores factory defaults. Caution is advised. Use this command if the administrator forgot the admin password (the admin password resets to `system`).

?

Display the help menu

Arguments None

Command `?`

Reply Same as the `h` command.

Description

Displays the help menu. Equivalent to the `h` command.

APPENDIX G: SMTP SERVER CONFIGURATION ISSUES

This section is intended for network administrators.

The WVC16 interfaces with a SMTP (Simple Mail Transport Protocol) server, elsewhere called email server, to send emails. There are a number of configuration issues that may prevent emails from reaching their intended recipients.

The SMTP server may refuse emails entirely if the emails do not include a return email address. Some SMTP server configurations even require that the return email address come from a set of email addresses specified on the server.

One configuration setting on the SMTP server that is frequently a cause of problems is the relay setting. The relay setting determines whether the SMTP server will relay (send) emails from senders, which are not authenticated with the SMTP server, to recipients that are outside of the server's network domain. The WVC16 does not support authentication with a SMTP server. One way this problem will manifest itself, is that email recipients on the SMTP server's network domain receive emails, whereas recipients outside the server's domain do not. There are a number of solutions to this problem.

One solution is to turn relaying on. For security reasons, a server with such a configuration should be kept behind a firewall that only allows inbound connection from computers on the same LAN. Even with the firewall in place, there are severe security issues to be aware of.

Another solution is to have a SMTP server dedicated to the WVC16 modules. The server should be configured to only allow connections from WVC16 modules; one way to establish this is by only allowing connections from the WVC16 modules' network host names or IP addresses.

Yet another solution is to use email mailing lists. An email mailing list is an email server feature that automatically forwards emails to a number of recipients. Most SMTP servers allow unauthenticated senders to email to the network domain and thereby allowing the WVC16 initiate the email.