

RANGER

Instrument Reference Guide



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Additional Information

This manual does not contain all the information required to operate and maintain the product. Refer to the Ascent Reference Guide for the required information (available from *Help* menu in Ascent).

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Section 1: Introduction

Please read this guide thoroughly before operating your new Ranger machinery health information system.

Although this book makes use of common vibration analysis concepts, it is not intended as a comprehensive guide or training manual. Please ensure you have the relevant knowledge and experience required to carry out the procedures described.

IMPORTANT! It is essential to follow all appropriate safety precautions when working near rotating machinery!

All instructions for installing the hardware components of your Ranger System are provided in this manual. You can install the Ranger hardware before setting up your Ascent database.

The [Ascent Suite Install and Setup](#) section of this manual assumes you have a working knowledge of Ascent and are familiar with creating Machine structures and measurement setups. You will need to create Machine structures and measurement setups in Ascent *before* taking any measurements.

Product Support

If you have questions that are not answered by this reference guide, please contact help@commtest.com for assistance. You can also visit <http://www.commtest.com> for additional resources and telephone contact details.

FCC & Canadian Compliance

The equipment detailed in this document (Ranger Sensor, Ranger Booster and Ranger Station devices) complies with part 15 of the FCC Rules.

Operation is subject to the following conditions — The devices:

- May not cause harmful interference.
- Must accept any interference received, including interference that may cause undesired operation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

NOTE: To maintain compliance with FCC's RF exposure guidelines, this device and its antennae must operate with a separation distance of at least 20cm from all persons.

NOTE: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices comply with Industry Canada licence-exempt RSS standard(s).

Operation is Subject to the following two conditions:

- The devices may not cause interference.
- The devices must accept any interference including interference that may cause undesired operation of the devices.

Les appareils sont conformes aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

- Les appareils ne doit pas produire de brouillage, et
- l'utilisateur de les appareils doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Wireless Ranger System Overview

The wireless Ranger machinery health information system uses wireless and/or wired sensor devices to collect vibration, temperature, and Machine speed (rotational) data according to user-defined schedules.

Measurement parameters and intervals are configured in Ascent and controlled by OnlineManager.

Recordings are streamed via Ethernet to a PC containing an Ascent database. An Ascent user can then access this database, generate reports, and view collected data as spectra, waveforms, and Machine trends.

Wireless Communication Protocols

The Ranger wireless network communicates using two wireless protocols:

- Wi-Fi (IEEE 802.11g)
- CCN (Commtest Closed Network) based on IEEE 802.15.4-2006

DEVICE	Wi-Fi (g)	CCN
Ranger Station	✓	✓
Ranger Booster		✓
Ranger Sensor		✓

The 802.11g Wi-Fi protocol operates at a frequency of 2.4 GHz and allows data throughput of up to 22 Mbps (54 Mbps layer). The CCN RLAN (Radio Local Area Network) also operates at a frequency of 2.4 GHz, but at much lower data rates of up to 250 kbps. Its low power characteristics make it suitable for industrial applications requiring extended battery life. The CCN protocol employs proprietary technology that is not directly interoperable with other standards-based networks.



CCN and Wi-Fi Antennae

The Ranger Station module communicates using the 802.11g Wi-Fi and CCN protocols as well as its two omni-directional antennae. The Wi-Fi antenna is optionally available to communicate with standard Wi-Fi network devices such as routers and network cards. The CCN antenna is used to communicate with the Ranger Sensor and Ranger Booster modules.



The Ranger Sensor and Ranger Booster modules only use the CCN wireless protocol to communicate via their fixed internal antennae. They can only network with Ranger Station modules.

Software and Mounting Requirements

This topic lists the requirements for the Ranger System components.

Minimum PC System Requirements

Here are the minimum computer requirements for the Ranger System:

- Microsoft® Windows® XP® SP2, Server 2003®, Server 2008®, Vista® (32 or 64-bit) or 7® (32 or 64-bit) operating system
- 1 GHz 32-bit (x86) or 64-bit (x64) processor or faster
- 1 GB of system RAM
- 1 GB of available hard disk space
- A CD-ROM compatible optical drive
- Windows-compatible mouse, touchpad or other pointing device
- Microsoft .NET Framework Version 3.5 SP1 or higher
- An unused Parallel or USB port for Dongle communications (not required if using Ascent CLK software license keys)
- An Ethernet adapter or Wi-Fi network card

Ranger Station Module Requirements

Here are the requirements for each Ranger Station module:

- 35 mm DIN rail mount for each Ranger Station module
- (the housing must be protected against the environment)
- 12 V to 24 V DC nominal power supply (200 mA maximum per Ranger Station device)
- Ethernet access (wireless or wired) for data transfer

Ranger Sensor Device Requirements

Here are the requirements for each Ranger Sensor device:

- Machine (mounting) screw. 1/4-28 Unified Fine (UNF) thread (1/4-20 UNC, M6x1 metric). Maximum height 0.236" (6.0 mm).
- Please contact your local reseller for suppliers of recommended Ranger System accessories.

Ranger System Configuration Examples

In this topic we explore three possible Ranger System configurations.

Example 1: Standalone Controller and Database Viewer

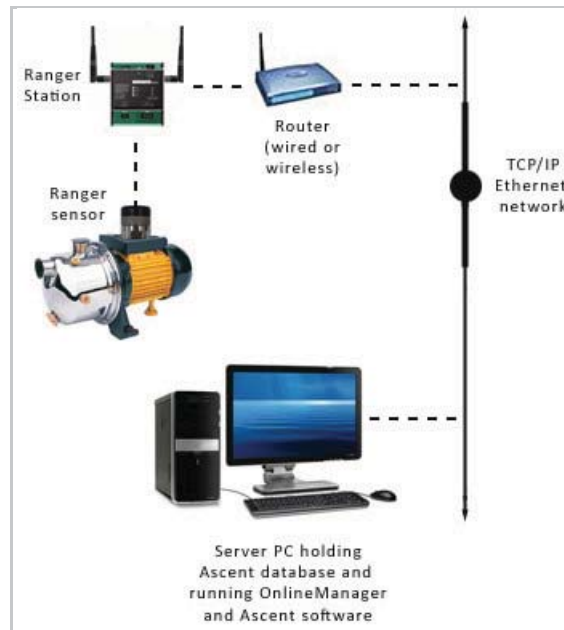
Example 1 below illustrates the most basic system configuration. Here a single PC is used to control all Ranger Station and Ranger Sensor devices, and to display the recorded data. The individual PC runs OnlineManager and Ascent, and also holds the Machine database.

This configuration is sufficient when using a modern, fast computer and when only one analyst is required to view data. Note that the example below does not use a Ranger Booster. Instead the Ranger Station and Ranger Sensor communicate with each another directly.

This type of connection is recommended if the distance between the Ranger Station and Ranger Sensor is relatively short and within the line of sight. If the sensor is to be positioned beyond the line of sight of a Ranger Station, a Ranger Booster will be required and should be installed within 20 meters of the Ranger Sensor.

The Ranger Booster can extend the Ranger network's connection range by about 300 meters (line of sight). However, when installed in electronically noisy industrial environments, Ranger Boosters will typically extend the Ranger System's wireless range by about 100 meters. If required, several 'daisy-chained' Boosters can be used to significantly extend the system's wireless range.

NOTE: OnlineManager is busy requesting and collecting measurements, Ascent's response times may slow, making database access and viewing more time-consuming.



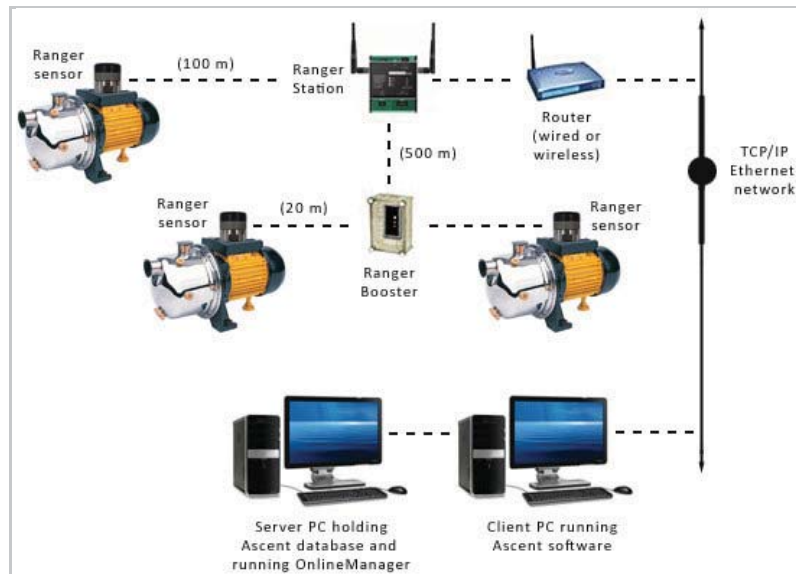
Example 1: Standalone Controller and Database Viewer

Example 2: Controller PC with Separate Database Viewer PC

Example 2 illustrates a system in which a separate client PC is used to view collected data and manage the Ranger Station and Ranger Sensor devices. The second server PC holds the Ascent database and runs OnlineManager.

With this configuration, database access time is generally faster than in example 1 because the server PC controls all measuring processes, adding new recordings to the database as they are collected. Multiple client PCs can be connected to the server, enabling several users to view and work with the database.

This example also uses two additional Ranger Sensors rather than the single sensor used in example 1. These two additional sensors are connected via a Ranger Booster.



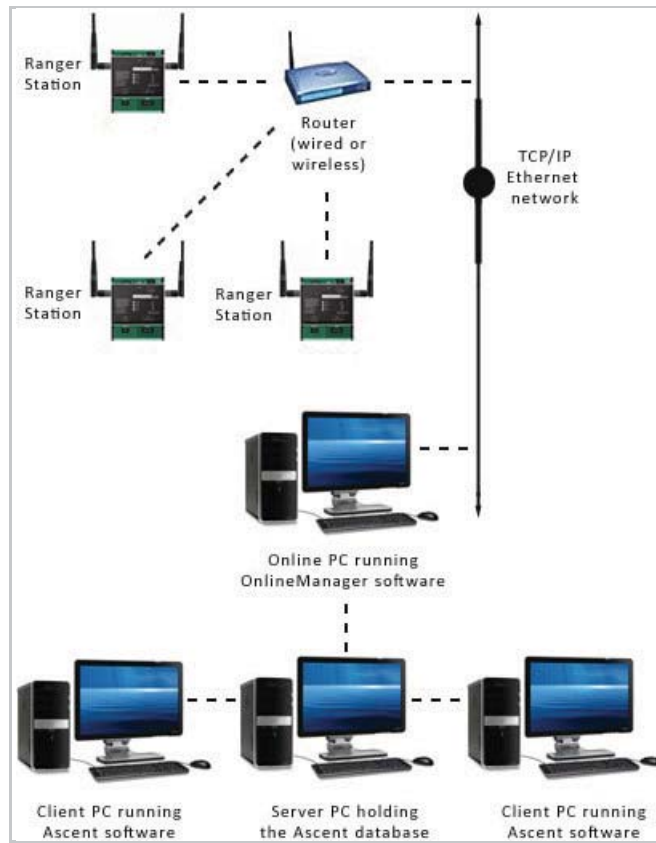
Example 2: Controller PC with Separate Database Viewer PC

Example 3: Control Shared by Two PCs with Multiple Client PCs for Database Viewing

The configuration shown in example 3 is the most resource-efficient solution for situations in which several Ranger Station and Ranger Sensor devices have been installed.

NOTE: Ranger Stations cannot communicate with each other. They can only communicate with Ranger Sensors and PCs. Several people require access to the database.

In this example, a single PC running only OnlineManager controls all measurement processes. This online PC then passes the recorded data to a second server PC which holds the Ascent database. Every user wishing to view the recorded data stored on the server PC can then access it from their own, separate PC. This separation of roles reduces resource use to a minimum.

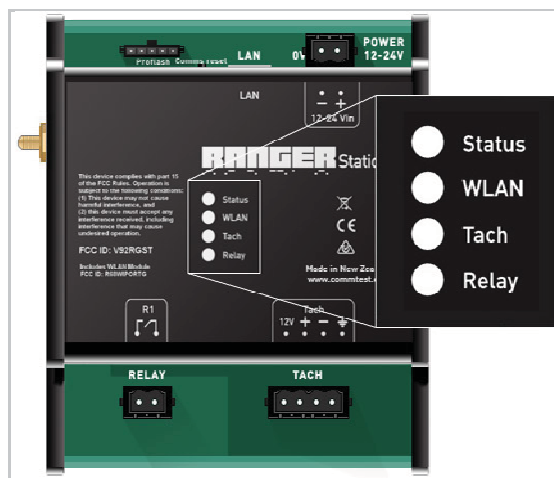


Example 3: Control Shared by Two PCs with Multiple Client PCs
for Database Viewing

Ranger Station LED Status Indicators

The Ranger Station device uses four LEDs to indicate the:

- State of its switch relay
- Network communications link
- Tachometer (if used)
- Ranger device



Ranger Station LEDs

Status LED

The Status LED:

- Flashes green to indicate the device is working normally.
- Shows a steady red if there is a device error or during a Proflash update.
- Shows a steady orange during startup.

WLAN LED

The WLAN LED has two operating modes:

- Intermittent flashing indicates the device is connected to a Wi-Fi network and is sending and receiving network traffic normally.
- Regular bursts of rapid flashing indicate the device is searching for a wireless network to connect to. This indicates a problem. The device may be out of range of the Wi-Fi network, or there may be a problem with the Wi-Fi configuration—either in the device or on the network.

Tach LED

The Tach LED becomes active when a tachometer reading is being taken by the device.

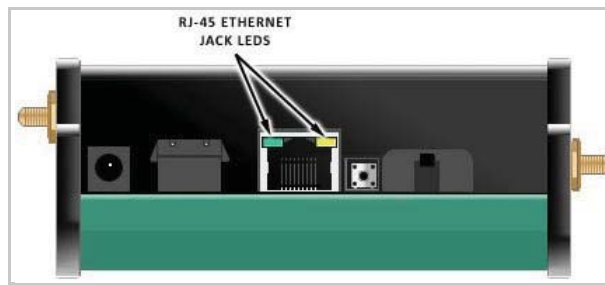
Relay LED

The *Relay* LED becomes active when the Ranger Station's output relay has been activated. The relay is single-pole, normally open, with a 5 A, 30 V DC, 250 V AC current rating. It is typically intended for activating warning lights or sirens.

The output relay is controlled by messages from the PC. It is configured using Ascent and activated when user-specified alarm states are triggered.

NOTE: Relay functionality is not currently enabled in Ascent.

Two bi-colored LEDs built into the front of the Ethernet cable RJ-45 connector socket indicate the type of communication link that has been automatically selected.



Ethernet Jack LEDs

Left LED	Right LED	Indication
OFF	OFF	No Link
OFF	Solid Amber	100BASE-T Half Duplex Link
OFF	Solid Green	100BASE-T Full Duplex Link
Solid Amber	OFF	10BASE-T Half Duplex Link
Solid Green	OFF	10BASE-T Full Duplex Link

NOTE: The left or right LEDs blink when a communications link is active.

Sensor Battery Pack

The Ranger Sensor is powered by a user-replaceable, non-rechargeable, custom lithium-thionyl chloride 1/6D, ER32L100 battery pack with a rated voltage output of 3.6 V. The battery is designed to function within a temperature range of -55 °C to 125 °C (-67 °F to 257 °F). However, below -10 °C (14 °F) and above 60 °C (140 °F) battery performance (current output and usable life) will be significantly reduced.



Ranger Sensor Battery Pack

The Ranger battery pack's lifespan is estimated at approximately 18 months. This estimate is based on an average of six dual axis measurements every 24 hours (Velocity, 1 kHz, 800 lines) and an ambient temperature of 25 °C (77 °F). To maximize battery life, recordings should be scheduled a minimum of **three minutes** apart.

Replacement batteries (part number RBAT0490) are available from authorized Commtest distributors.

Battery Specifications	
Nominal capacity @ 1 mA to 2 V	1.7 Ah
Rated voltage	3.6 V
Diameter	32.9 mm (1.295")
Height	10.2 mm (0.402")
Weight	21 grams

Replace Battery Pack

To replace a depleted Ranger Sensor battery pack:

1. Dismount the Ranger Sensor from its screw mounting (if permanently mounted, move to the next step).



Ranger Sensor

2. Grip the base of the sensor firmly with one hand and the plastic cover with the other.
3. Twist the battery cover anti-clockwise > Remove the plastic housing and set aside.



Battery Cover (Top)

4. Carefully detach the antenna cover and set it aside.

NOTE: The antenna cover is attached to the battery pack via a small Velcro patch.

5. Detach the battery ribbon connector using a small Philips screwdriver or your fingernail. Take care not to damage the antenna > Set the discharged battery aside.



Battery Pack (Side)

6. Connect the new battery to the sensor's battery ribbon connector — A green LED will illuminate on the epoxy-coated Ranger circuit board and flash if power is successfully supplied.
7. Gently fold the antenna over the new battery and re-attach the antenna cover.
8. Screw the battery cover back onto the sensor (clockwise) and re-mount the sensor.

WARNING! Damaged batteries should not be re-inserted into the instrument. Dispose of damaged batteries responsibly and in accordance with local regulations. Do not disassemble the battery or dispose of in fire.

Measurement Duration and Battery Life

When creating a vibration Schedule Entry or Parameter Set (measurement type) for your Ranger Sensor in Ascent, the total measurement duration **must be kept below eight seconds** and **ideally below four seconds**.

The Ranger battery cell is used to slowly charge a capacitor within the sensor. This capacitor provides power during the device's normal operation and enables increased current demand. For example, more power is consumed by the sensor during measurement acquisition and this need cannot be met by the battery alone.

By reducing current demand on the battery in this way, the resultant trickle-charging process greatly extends the usable battery life. However, as a low power energy source, the battery is unable to provide enough current to collect measurements when the capacitor has been fully discharged.

If you try to take a measurement with a total duration that would result in the capacitor discharging before completion of the measurement, Ascent will alert you that the measurement *cannot* be taken. A message will display, informing you that Ascent is unable to perform the requested operation as the sensor battery voltage is too low. If you try to take the measurement, a message will display, informing you that the recording duration exceeds the capabilities of the Ranger Sensor. This message will show under the *Applicable vb Instrument* tab of the *Parameter Set* editor.

Similarly, if you try to take measurements in Ascent manually before the sensor's capacitor has been allowed to sufficiently recharge, the measurement will not be taken. If this happens, you will be notified that the sensor battery voltage is too low.

NOTE: Depending on the measurement duration and battery condition, a sensor's capacitor may take up to three minutes to recharge.

If a configured measurement approaches the device's measurement duration limit, you will be advised that the measurement may not be successful. A message will display, informing you that the battery capacity may be insufficient to perform recordings of that duration. This message will show under the *Applicable vb Instrument* tab of the *Parameter Set* editor.

To extend the Ranger Sensor's battery life, we recommend measurement durations **below four seconds**. Longer duration measurements, although possible, will require more frequent replacement of the battery pack.

Section 2: Ascent Suite — Install and Setup

The Ranger Station and Ranger Sensor devices are programmed via a PC running Ascent. All communication, configuration, recording intervals, alarms, and measurement information is configured via Ascent. Scheduled recordings are triggered by OnlineManager.

Here is a summary of how to configure Ascent and OnlineManager for communication with the Ranger online system and data collection:

1. Install Ascent and use it to create a software database of your Machines. This database should mirror their physical layout and defines the types of measurements that will be carried out on them. To complete this step you will need to be familiar with Ascent.
2. Configure Ascent to communicate with each Ranger Station and Ranger Sensor device within your network > Specify which measurements will be taken at each location.
3. Create recording intervals with Ascent to instruct each Ranger device when to take measurements.
4. Run OnlineManager to start collecting data.
5. View the data using Ascent — Multiple users will be able to access this data on their own PCs.

MORE: See 'Using a Network' in the Ascent Reference Guide.

Install Ascent

You will need administrator rights on your PC to install Ascent. Contact your network administrator for assistance if required, or log onto your computer using an administrative account.

The Ascent CD contains copies of **Ascent**, **OnlineManager**, **AscentWatcher** and **AscentOPC**. You can install some or all of these programs on your computer.

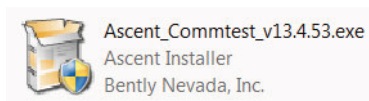
NOTE: Port 10001 must be open in your firewall or router to allow Ethernet communications between the software and the Ranger network. Contact your network administrator if you require assistance with this task or refer to your router and/or firewall software instructions. Note that Windows XP, Vista and 7 include integrated firewalls. If you are using one of these operating systems you may need to enable access through these in addition to any external firewalls present (such as those found in many routers).

You can use EITHER of these methods to install Ascent:

1. Close any programs you have open on your PC.
2. Insert the Ascent CD in the CD-ROM drive.
3. Wait for the Ascent installation wizard to open automatically in your web browser. Follow the installation instructions provided in the install wizard.

OR

1. Run the **Ascent_v[Version].exe** installer file located in the CD-ROM's root directory.



NOTE: Ascent requires the Microsoft® .NET Framework 3.5 SP1 or higher to be installed on your computer. The .NET Framework file is included on your installation CD-ROM. If it is not pre-installed on your system, a software prompt will alert you during the Ascent installation.

2. Select the software language you wish to use from the **Languages** dropdown list > Click **OK**. The installer's introduction screen will open.

*NOTE: If you are upgrading from a previous version of Ascent you will be prompted to uninstall the older software. Click **OK** to uninstall the older software automatically.*

3. Click **Next** — The *License Agreement* screen displays.
4. Scroll to the bottom of the license agreement.
5. Tick the two checkboxes located at the bottom of the panel — Doing so indicates you have read and agree to the software's license terms.
6. Click **Next**.
7. Use EITHER of these methods to install some or all programs in the Ascent suite:
 - Click **Next** to install the entire Ascent suite.
 - Select the Ascent programs you wish to install > Click **Next**.

NOTE: Ascent and OnlineManager are typically minimum requirements for a Ranger installation.

8. Click **Browse** to locate and select an installation location.

TIP: We recommend the default installation location.

9. Click **Install**.
10. Click **Next** > Click **Finish**.

Uninstall Ascent

You can use EITHER of these methods to uninstall Ascent:

- Select **Start > All Programs > Commtest > Ascent > Uninstall Ascent**.
- Open the Control Panel > Select **Add or Remove Programs** > Locate and select Ascent > Click **Remove** to uninstall.

Create Machines and Measurement Setups

Machine structures and measurement setups must be created in Ascent before any measurements can be taken. If you have not yet done so, please refer to your *Ascent Reference Guide* to learn how to set up your Machine database.

Once you have created your Machine database, you can start configuring your online system as described in this section.

Online Device Setup Wizard

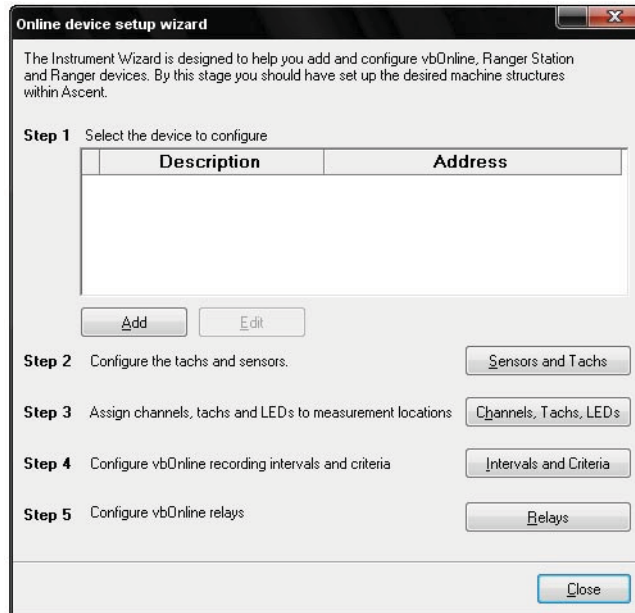
You can use the *Online Device Setup* wizard to configure your Ranger Station and Ranger Sensor devices. The wizard will guide you through the setup process. Some of these steps are optional. You can omit them during the initial configuration and revisit them later if required.

You can run the wizard again at any time after the initial setup if you need to edit a setup item or enable an optional feature.

*NOTE: We recommend you switch on Auto Save, which will automatically save your configuration settings as you make them. Auto Save is switched on by default but you can also activate it by selecting **Options > Auto Save** on the main menu. If you do NOT enable Auto Save, we recommend you manually save your configuration settings every few minutes while setting up your Ranger System. Ascent will prompt you to save all your changes when you close it. Switching on Auto Save will disable Ascent's Undo\Revert function. This means the software cannot go back a step if you make a mistake. You will need to manually correct any errors made.*

To run the *Online Device Setup* wizard:

1. Start Ascent.
2. Select a folder containing the Machines you wish to monitor.
3. Open the *Online Device Setup* wizard using EITHER of these methods:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.



Using the *Online Device Setup* window

Step 1: Set up Communication with Ranger Station

The first step in the setup process is to establish a link between the software and each Ranger Station device, enabling the two-way exchange of data. Initial configuration should be performed using a crossover cable or within a micro network (i.e. a single standalone computer, router/switch, and a Ranger Station isolated from any other network devices). The steps below assume a crossover cable is being used to connect to the Ranger Station. If you are using a router or switch, skip ahead to the *Establish Ascent Communications with Ranger Station* section.

Before you begin the setup process, we recommend you create a list of Ranger Station devices detailing which will be used to monitor and control each group of Ranger Sensors. The list should also contain the IP address of each Ranger Station device so that the devices can be correctly configured.

NOTE: The following instructions assume you have already created your Machine database containing all measurement setups (Machines, Locations, Points, measurement Schedule Entries etc.) for your Ranger network. See the Ascent Reference Guide for information on the steps required to complete this task.

Make Direct Connection via Crossover Cable

Any computer with an RJ-45 Ethernet port can be directly connected to a Ranger Station device via an Ethernet crossover cable.

NOTE: Crossover cables are difficult to differentiate from standard straight-through Ethernet cables as both use the same RJ-45 (8P8C) connector plug. The two cable types differ only in their wiring configuration. Some manufacturers use color-coded boots (typically red or purple) to identify their crossover cables, but there is no recognized international standard. Crossover cables are available everywhere standard straight-through Ethernet cables are sold.

Windows XP

To connect a Ranger Station device to a computer running Windows XP:

1. Select **Start > Control Panel > Network Connections**.
2. Right-click the appropriate connection (Local Area Connection) > Select **Properties**.
3. In the *Local Area Connection Properties* window (*This connection uses the following items* list), select **Internet Protocol (TCP/IP)** > Click the **Properties** button.
4. Select **Use the following IP address** > Set the IP address and subnet mask. Enter an IP address of **192.168.3.1** and a subnet mask of **255.255.255.0**. Specifying a default gateway is NOT required.
5. Click **OK**.
6. Connect one end of the Ethernet crossover cable to the socket labeled **LAN** on the Ranger Station device.
7. Plug the other end into the computer's Ethernet port. Ascent should now be able to communicate with your Ranger Station instrument.

MORE: See [Establish Ascent Communication with Ranger Station](#).

Windows Vista

To connect a Ranger Station device to a computer running Windows Vista:

1. Select **Start > Control Panel > Network and Sharing Center > Manage network connections**.
2. From the new window, right click the appropriate connection (typically *Local Area Connection*) > Select **Properties**.
3. In the *Local Area Connection Properties* window, select **Internet Protocol Version 4 (TCP/IPv4)** > Click the **Properties** button.
4. Select **Use the following IP address** > Set the IP address and subnet mask:
 - Enter an IP address of **192.168.3.1**.
 - Enter a subnet mask of **255.255.255.0** — You do NOT need to specify a default gateway.
5. Click **OK**.
6. Connect one end of the Ethernet crossover cable to the socket labeled *LAN* on the Ranger Station device.
7. Plug the other end into the computer's Ethernet port — Ascent should now be able to communicate with your Ranger Station instrument (as described in the next section, *Establish Ascent Communications with the Ranger Station*).

Windows 7

To connect a Ranger Station device to a computer running Windows 7:

1. Select **Start > Control Panel**.
2. Select **View network status and tasks** from the *Network and Internet* section.
3. Select **Change adapter settings** from the left menu list.
4. Right-click the appropriate connection in the new window that opens (typically *Local Area Connection*) > Select **Properties**.
5. In the *Local Area Connection Properties* window, scroll down the list of options under *This connection uses the following items* to locate and select **Internet Protocol Version 4 (TCP/IPv4)**.
6. Click the **Properties** button.
7. Select **Use the following IP address** > Set the IP address and subnet mask:
 - Enter an IP address of **192.168.3.1**
 - Enter a subnet mask of **255.255.255.0** — You do NOT need to specify a default gateway.
8. Click **OK**.
9. Connect one end of the Ethernet crossover cable to the *LAN* socket on the Ranger Station device.
10. Plug the other end into the computer's Ethernet port — Ascent should now be able to communicate with your Ranger Station instrument.

MORE: See [Establish Ascent Communication with Ranger Station](#).

Establish Ascent Communication with Ranger Station

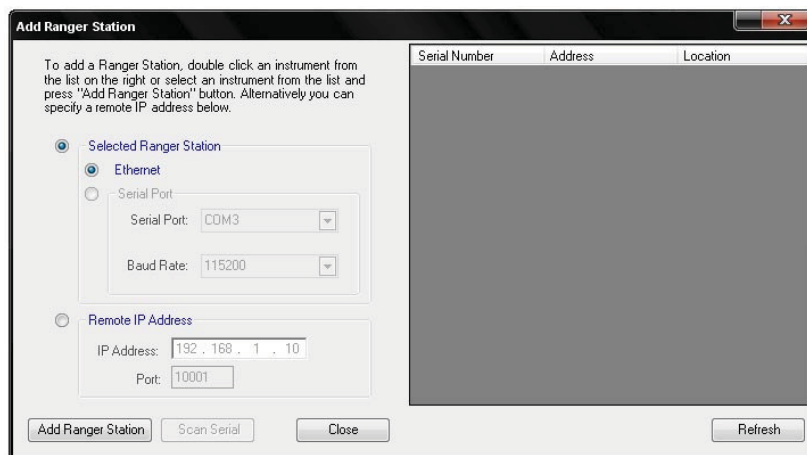
The following instructions assume you have already established a connection with the Ranger Station, as described in the previous topics.

To establish communication between Ascent and the Ranger Station:

1. Start Ascent.
2. Open the *Online Device Setup* wizard using EITHER of these methods:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.
3. Select **Add > Ranger Station** — The *Add Ranger Station* window opens. If the Ranger Station is detected, it will display in the right of this window.
4. Click the device name > Press the **Add Ranger Station** button — The device is connected and added to the Ascent internal instrument database in preparation for configuration.

NOTE: If the Ranger Station is not listed, and you know the IP address of the device, enter the address in the 'IP Address' field. If a different port number is being used to communicate with the device, enter it into the 'Port' field (10001 is the default port number. Under normal circumstances this should not need to be changed).

5. Press **Close** to exit the *Online Device Setup* wizard.



Establishing communication between Ascent and the Ranger Station

Set Network IP Address for Ranger Station

The task of assigning IP addresses to each Ranger Station device must be carried out by a network administrator.

NOTE: The following steps assume you have already established Ascent communication with the Ranger Station as described in the previous topic.

To assign IP addresses to each Ranger Station device:

1. Open the *Online Device Setup* wizard using EITHER of these methods:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.
2. Select the Ranger Station device (identifiable by its serial number) > Select **Edit** — The *VB Device Properties* window opens.
3. Select the **Setup** tab.
4. In the *Set Ranger Station IP Address* field enter the IP address, netmask and, (optionally) gateway supplied by your network administrator for this Ranger Station device.
5. Click **Set Address**. The *Device Details* summary window will be displayed and the new IP address set.
6. Click **OK** to close the *VB Device Properties* window then **Close** to exit the *Online Device Setup* wizard. The Ranger Station is now ready for installation in the destination network.

VB Device Properties

Serial Number: 60012
 Description: RangerStation
 Instrument Type: Ranger Station

Properties | Tasks | Setup | **Configuration**

Prolash
 Re-program the device's firmware with the following file:

Scheduled Recording Types
 Enabled: Interval-based Ranger
 Disabled: (None)

Set Ranger Station IP Address
 Set the IP address that this Ranger Station device uses to connect to a network.
 IP Address: Netmask: Gateway:

Change Ascent -> Ranger Station address
 Change the address that Ascent uses to communicate with this Ranger Station device.
☒ Ethernet IP Address and Port: 192 . 168 . 1 . 221 : 10001

Setup Link Speed (Fast Link)
 Click the Link Speed button to adjust timing parameters for this Ranger Station device

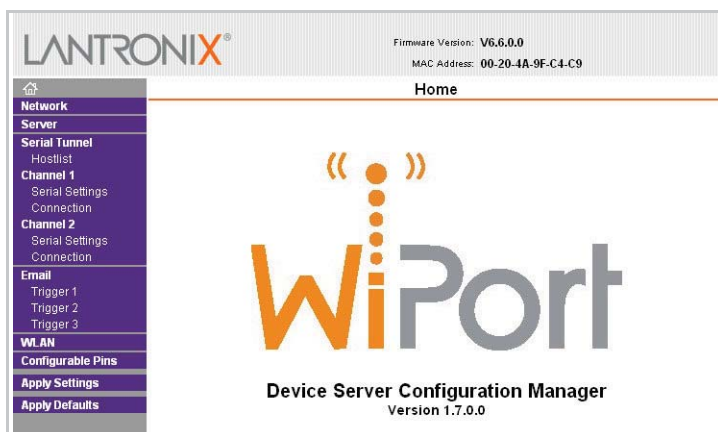
Change Ranger Station: WiFi/Ethernet (Cabled Ethernet)
 Switch vbOnline device comms between WiFi and cabled Ethernet.

Specifying the IP address for a Ranger station device

Set Ranger Station IP via Web Browser

Although the primary means of setting a Ranger Station's IP address is via Ascent, you can also do this using a standard web browser:

1. Open an Internet browser and navigate to the Ranger Station's current IP address — The factory-default IP address is **http://192.168.3.226**. The current IP address should be listed under the *Setup* tab of the *VB Device Properties* panel — The Ranger Station's WiPort web interface opens.
2. If you are asked for a username and password, leave both fields blank > Press **OK**.
3. Select the **Network** button at the top of the left menu — The *Network Settings* screen opens.
4. Enter a new IP address in the field provided > Press **OK** — A confirmation message displays at the bottom of the screen.
5. Press **Apply Settings** near the bottom of the left menu — An update progress bar displays while the Ranger Station's IP address is updated.



Ranger Station Web Interface

LANTRONIX® Firmware Version: V6.6.0.0
MAC Address: 00-20-4A-9F-C4-C9

Network Settings

Network Mode: Wired Only

IP Configuration

☐ Obtain IP address automatically

Auto Configuration Methods

BOOTP: ☒ Enable ☐ Disable
DHCP: ☒ Enable ☐ Disable
AutoIP: ☒ Enable ☐ Disable

DHCP Host Name:

☒ Use the following IP configuration:

IP Address: 192.168.1.214
Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0
DNS Server: 0.0.0.0

Ethernet Configuration

☒ Auto Negotiate

Speed: ☒ 100 Mbps ☐ 10 Mbps
Duplex: ☒ Full ☐ Half

Changing a Ranger Station IP Address via the Ranger web interface

Reset Ranger Station IP Address to Factory Default

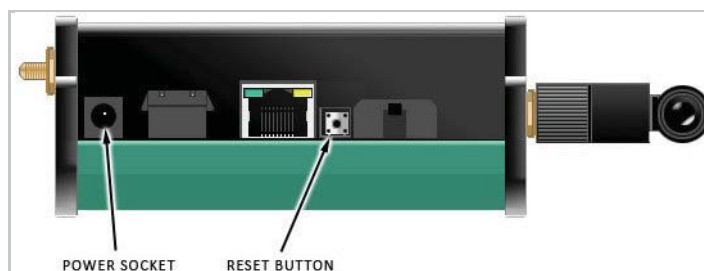
If for any reason you are unable to communicate with the Ranger Station, it can be physically reset to its factory network configuration. To access this option:

1. Disconnect the AC power plug from the device.
2. Press and hold the reset button on the power supply end of the Ranger Station.
3. Reconnect the AC power plug to the instrument's power socket while holding the Reset button — The Ranger Station's Status LED will turn orange for approximately 10 seconds while the device's network configuration is reset to its factory state. Once the Ranger Station has completed the reset sequence, the Status LED will turn green and start flashing.

The Ranger Station's network connection status is now **Wired Ethernet**, using a static IP address of **192.168.3.226**.

MORE: See [Set the Ranger Station's Network IP Address](#) for information on changing the instrument IP address.

NOTE: To toggle between wireless and wired communication modes, briefly press the Reset button. The device will reset itself and begin operating in its alternative wired or wireless communications mode after approximately 30 seconds.



Configure Wireless (Wi-Fi) Connection

Before configuring and activating a Wi-Fi connection with the Ranger Station you will need:

- An appropriate IP address, Netmask, and Gateway for your network.
- The SSID name of your wireless network.
- The channel used by your wireless network.
- A cabled Ethernet connection — For setup only.

Configure Ranger Station for Wi-Fi

To configure a Ranger Station device for Wi-Fi:

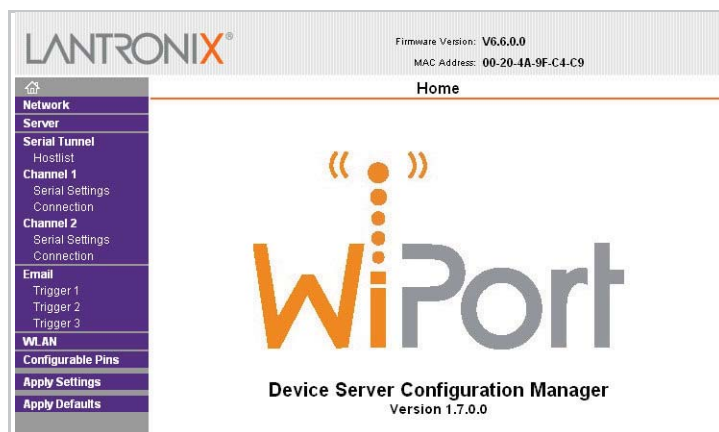
1. Connect your PC to the Ranger Station using EITHER of these methods:
 - A Crossover Ethernet cable.

MORE: See [Make Direct Connection via Crossover Cable](#).

- A standard wired router or switch.
2. Start Ascent.
 3. Select **Edit** > **Online Device Setup** — The *Online Device Setup* wizard opens.
 4. Select your Ranger Station (identifiable by its serial number) > Press **Edit** — The *VB Device Properties* window opens.

*NOTE: If your Ranger Station is NOT displayed in the Online Device Setup wizard, select **Add** > **Ranger Station**. Select the device in the new window and select the **Add Ranger Station** button.*

5. Select the **Setup** tab.
6. Click the **Change...** button beside *Change Ranger Station: Wi-Fi/Ethernet*.
7. Select the radio button beside **Cabled Ethernet**. Ensure you **DO NOT** change this to *Wi-Fi*.
8. Click **Configure Wi-Fi...**
9. You will be asked for a username and password. Leave both username and password fields blank > Click **OK** — The *Lantronix WiPort Device Server Configuration* panel will open in your default web browser.



Ranger Station Web Interface

10. Click **Network** on the left menu.
11. Set the *Network Mode* field to **Wireless Only**.

NOTE: If you wish to change the Ranger Station's IP address, or change the NetMask or Gateway details used on the final network, you should do so now.

12. Click **OK** — A confirmation message displays at the bottom of the screen.
13. Click **WLAN** on the menu bar.
14. Change the *Network Name (SSID)* field to match your Wireless Router's SSID.

Wireless Network Configuration

Network Name (SSID):

Network Type: ☐ Infrastructure ☒ Ad Hoc

Channel: United States

15. Select the **Ad Hoc** Network type > Choose the channel (1-11) used by your wireless network from the *Channel* dropdown list.
16. Click **OK** — A confirmation message displays at the bottom of the screen.
17. Click **Network** from the menu bar > Set *Network Mode* back to **Wired Only**.

18. Click **OK** — A confirmation message displays at the bottom of the screen.
19. Click **Apply Settings** on the menu bar — The Ranger Station will restart. A confirmation message will display when the process is complete.



20. Close the *Lantronix WiPort Device Server Configuration Manager* and return to Ascent.

Activate Ranger Station Wi-Fi

You can activate a Ranger Station Wi-Fi connection:

1. Select **Edit > Online Device Setup** to open the *VB Device Properties* window in Ascent.
2. Select the Ranger Station device > Click **Edit**.
3. Select the **Setup** tab.
4. Click the **Change** button beside *Change Ranger Station: Wi-Fi/Ethernet*.
5. Select the **Wi-Fi** radio button > Click **OK**.
6. Wait for the Ranger Station to reboot — You will receive a confirmation message once the process is complete.
7. Click **OK** and close Ascent.
8. Remove the Ethernet network cable connecting the computer or router to the Ranger Station device.
9. Start Ascent on your Wi-Fi equipped computer.
10. Select **Edit > Online Device Setup**.
11. Click **Add > Ranger Station** > Select your Ranger Station from the list.
12. Click the **Add Ranger Station** button — You are now connected via Wi-Fi.

Switch Between Wired and Wireless Mode

To quickly toggle between wireless and wired communication modes, briefly press the **Reset** button on the Ranger Station device. The Status LED on the Ranger Station turns orange for approximately 10 seconds while the device resets itself. After approximately 30 seconds the device will begin operating in its alternative wired or wireless communications mode.

Once the Ranger Station has completed the reset sequence, the Status LED will turn green and begin flashing.

NOTE: If you are unable to successfully communicate with the Ranger Station device after changing communication mode more than twice, see [Reset Ranger Station IP Address to Factory Default](#).

Step 2: Set up Communication with Ranger Sensor

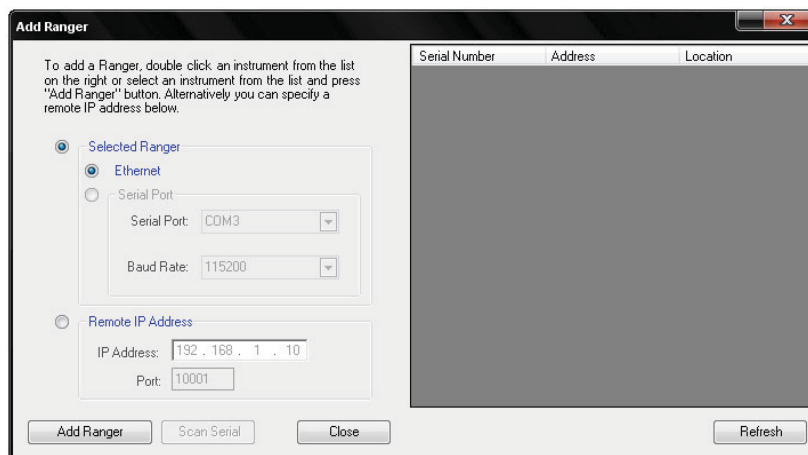
The first step in the setup process was to establish a link between the software and the Ranger Station device. Now you must establish a link between the software and the Ranger Sensor(s).

NOTE: You cannot establish a connection with a Ranger Sensor without first communicating with a Ranger Station. Ranger Sensors cannot communicate directly with wireless routers or network cards. Ensure the Ranger Sensor is powered up and within range before proceeding with the steps below.

MORE: See [Set up Communication with Ranger Station](#).

To set up communication with the Ranger sensor:

1. Open the *Online Device Setup* wizard using EITHER of these methods:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.
2. Click **Add > Click Ranger** — The *Add Ranger* window opens. If detected, the Ranger Sensor displays in the right half of the window.
3. Click the device name > Press **Add Ranger** — The Ranger Sensor is now connected.



Setting up communication with the Ranger sensor

Troubleshoot Ranger Sensor Communication

If the Ranger Sensor does NOT appear in the right half of the window, you will need to:

1. Confirm that a communications link has been established with the Ranger Station.
2. Confirm that the Ranger Station is switched on.
3. Confirm that a battery is connected to the Ranger Sensor.
4. Reposition the sensor closer to the Ranger Station to confirm that the device is operating normally.

If you are still unable to connect to the sensor at your chosen sensor location you might need to position a Ranger Booster between the Ranger Station and the Ranger Sensor. Doing this will amplify the wireless signal between the two devices. If the sensor was previously displayed, but no longer appears, you will need to replace the Ranger Sensor battery.

NOTE: It is only possible to add a Ranger Sensor to a Ranger Station if both devices have been configured to use the same wireless RF channel. If the Ranger Sensor and Ranger Station do NOT use the same RF channel, the Ranger Sensor will NOT be visible in Ascent. RF channels are assigned during initial system installation and can only be adjusted by Commtest installer personnel.

Step 3: Assign Ranger Stations to Tachometer Measurement Locations

The third step in the setup process is to specify which Ranger Station devices, should be used for taking tachometer measurements. If tachometer measurements are not required, proceed to step 4.

1. Open the *Online Device Setup* wizard using EITHER of these methods:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.
2. Select the Ranger Station device (identifiable by its serial number) > Click the **Tachs** button beside step 2. The *Tachometer Configuration* panel opens.
3. Enter a tachometer description into the *Description* field.
4. Enter the number of tachometer pulses per revolution in the *Pulses per Rev* field (typically 1). Click **OK**.

	Description	Keyphasor(TM) Mode	Pulses per Rev
1.	Tachometer 1	☐	1

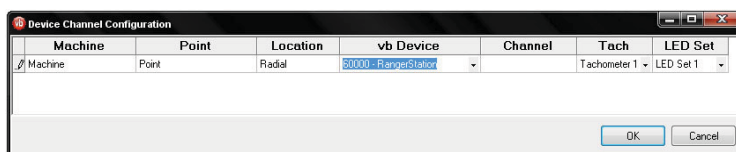
Tachometer Setup Screen

5. From the *Online Device Setup* wizard click the **Channels, Tachs, LEDs** button beside step 3 — The *Device Channel Configuration* panel opens.
6. Select the Ranger Station from the **vb Device** dropdown list.

NOTE: A Machine, Point and Location must already exist in the navigator list and be selected before a device can be assigned.

7. Select the tachometer description (*Tachometer 1* in the example above) from the *Tach* dropdown list.

NOTE: The Tach dropdown field is only available when configuring a Ranger Station device. When configuring a Ranger Sensor this field will remain empty and unavailable.



Machine	Point	Location	vb Device	Channel	Tach	LED Set
Machine	Point	Radial	60000 - RangerStation		Tachometer 1	LED Set 1

Tachometer Assignment

8. Click **OK**.
9. Repeat the above procedure for all tachometer measurements > Click **OK** when you have finished to close the *Device Channel Configuration* window.

Device Channel Configuration window

The *Device Channel Configuration* window lists all subelements beneath a selected item. Because we selected a Machine, the window lists all the Points and Locations on this single Machine. If you select the top-level Folder, every Machine's Points and Locations will be listed.

The Ranger Station, Ranger Sensor, and tachometers you previously defined will appear in the dropdown lists when you click the arrows to make a selection.

You can resize the grid width by placing the cursor between two columns until it changes to a left-right arrow. Hold down the left-mouse button and drag it in either direction to resize.

You can use the dropdown fields in each column to select the Ranger Station, Ranger Sensor, channel, and tachometer (if required) that will be used to take measurements at each Location.

MORE: To learn how to quickly assign a single Ranger Station device to multiple Locations, see [Copy Items to Multiple Locations](#).

Machine	Point
Alarm Types	Bands

Step 4: Assign Ranger Sensors to Measurement Locations

The fourth step in the setup process is to specify which Ranger Sensor device should be used for taking temperature or vibration measurements at each Location. To do this:

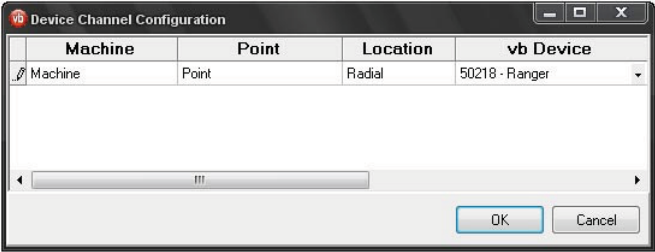
1. Select a Machine in the navigator.
2. Open the *Online Device Setup* wizard using EITHER of these methods:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.
3. Select the Ranger Sensor device (identifiable by its serial number) > Click the **Channels, Tachs, LEDs** button beside step 3 — The *Device Channel Configuration* panel opens.
4. Use the dropdown boxes in each column to select the Ranger Sensor device and axis that will be used to take measurements at each Location.

NOTE: This is NOT required for temperature measurements.

MORE: To learn how to quickly assign a single Ranger Station device to multiple Locations, see [Copy Items to Multiple Locations](#).

5. To choose another Machine to work with, simply select it in the navigator and repeat the previous steps (the window will update to show this Machine's Points/Locations, and more).
6. Click **OK** when you have finished to close the *Device Channel Configuration* window.

NOTE: You might encounter situations where there are several shafts running at different speeds due to gearbox ratios, pulley ratios or roller diameters. Solutions to these special cases are discussed under [Configure Tachometers/Speed Sensors](#).



Assigning Ranger Sensors to Measurement Locations

Clear Ranger Station or Ranger Sensor Device from Location

Click the dropdown field arrow and select a different device or the black highlight bar to leave this Location empty.

Copy Items to Multiple Locations

You can quickly assign a Ranger Station or Ranger Sensor device (or other item) to multiple Locations using 'copy and paste'. To do this:

1. Use the dropdown arrows to assign a device to one Location — The cell will be highlighted.



2. Press **CTRL+C** to copy this device to memory.
3. Move the cursor to the next row down and hover it over the dividing line between the row cells until it changes direction to face towards the right (it will only do this if you are directly over the cell dividing line).



4. With the cursor facing to the right, drag the mouse down the column to select every row that you want this Ranger Station or Ranger Sensor device to be copied to. The cells will be highlighted to indicate that they are selected.



5. Press **CTRL+V** to paste the device into every one of the selected Locations.



This 'copy and paste' method can be used in any situation where the same item can be assigned to multiple places in this window.

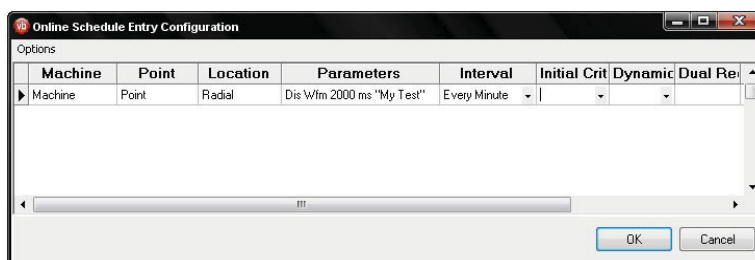
Step 5: Configure Recording Intervals

The fifth step in the setup process is to create *Recording Intervals* that specify how often measurements will be taken at each Location. When you run OnlineManager it reads the recording intervals you have created and takes measurements accordingly. All measurements you want automatically collected must have a recording interval assigned to them.

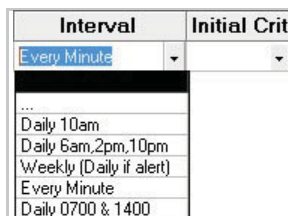
To configure the recording intervals:

1. Open the *Online Device Setup* wizard using EITHER of these methods:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.
2. Select a Ranger Station or Ranger Sensor from the wizard selection pane.
3. Click the **Intervals and Criteria** button beside step 4 — The *Online Schedule Entry Configuration* panel opens.

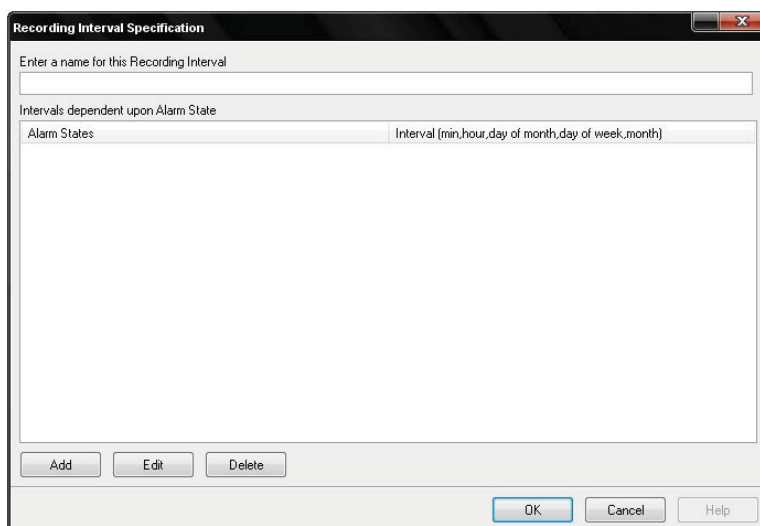
NOTE: If the window is empty, select a Machine, Point, Location or Schedule Entry in the navigator.



- The *Online Schedule Entry Configuration* window lists all the Points, axes and Schedule Entries contained in the Machine. The window also contains fields that enable you to create recording intervals and assign any criteria you have created.
- The *Interval* dropdown field contains a list of all recording intervals you define.



4. Select the ellipsis (...) entry to open the *Recording Intervals* editor window where you can add, edit, and delete recording intervals.
5. Click the *Interval* dropdown field > Select the ellipsis (...) entry.
6. Click **Add** to create a new recording interval — The *Recording Interval Specification* panel opens.



7. Enter a description for this recording interval in the field provided. The description should be an informative label using keywords that describe the purpose of this particular recording interval e.g. *Weekly depending on alarm state* or *Monthly any state*.
8. Click **Add** to specify the recording interval details.

Interval Details

I want Ascent to collect Schedule Entries in these months:

☒ All Months

☐ January
☐ February
☐ March
☐ April
☐ May
☐ June
☐ July
☐ August
☐ September
☐ October
☐ November
☐ December

and on these days of the month:

x

on these days

☒ Everyday

☐ Monday
☐ Tuesday
☐ Wednesday
☐ Thursday
☐ Friday
☐ Saturday
☐ Sunday

(If you wish to specify all hours or minutes use '*'. If you wish to specify a range use a '-' e.g. [1-12]. Otherwise use a ',' to specify individual units e.g. [1,2,3,4])

at these hours 10 and these 00 minutes within the hour

Using these criteria the next 5 collection times from the date below will be:

01/01/2015 11:55:47a.m. Test

I want this collection interval to be used when the schedule entry is in the following alarm states:

☒ unknown
☒ ok
☒ warning
☒ alert
☒ danger

OK Cancel

- You can use the *Interval Details* window to specify how often a recording will be taken. You might wish to create multiple entries, each with a different data recording interval depending on the current alarm state. For example, you could create a recording interval with three entries: the first collects data weekly regardless of the alarm state; the second collects data daily if the Location being measured triggers a warning alarm; and the third collects data hourly if a danger alarm is triggered.

10. Fill out the fields as follows:

- a. *All Months* is selected by default. If you wish to select specific months, untick **All Months** and tick the required checkboxes.
- b. The next two fields are used to select specific days and dates for data collection.

The dialog box has a title bar with a close button. The main content area is titled "and on these days of the month:". Below this title is a text input field containing an asterisk (*) and a browse button (...). Below the input field is a section titled "on these days" which contains a list of days with checkboxes:

- ☒ Everyday
- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday
- ☐ Saturday
- ☐ Sunday

- c. If you want to specify particular days of the month e.g. the 3rd and 10th day of each month, click the browse (...) button and use the *Day Selector* to *deselect* the days you do NOT require (every day will be selected by default, indicated by the green checks). Click **OK** to close the window. Leave the *on these days* field below at its default value of *Everyday*.

The "Day Selector" dialog box has a title bar with a close button. The main content area is titled "Days" and displays a calendar grid. Each day of the month is represented by a number and a green checkmark, indicating that all days are selected by default. The grid shows days 1 through 31. At the bottom of the dialog is an "OK" button.

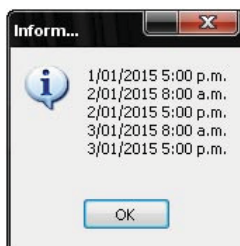
- d. To select one or more specific days of the week for data collection, leave the top field (days of the month) at its default value of '*' (an asterisk indicating all months). Below this, deselect the checkbox for *Everyday* > Use the checkboxes to select the required days.
- e. To select a date and day e.g. the 3rd day of the month only if it is a Monday, click the browse  button and use the Day Selector to *deselect* the days you do not require. Every day will be selected by default, indicated by the green check marks. Below this, untick the checkbox for *Everyday* > Use the checks to select the required days.
- f. Specify the times you would like data collection to be carried out using the *hours* and *minutes* fields. You can specify exact hours and minutes. For example, you can take a measurement at 10:15 a.m. Alternatively, you can specify a time range within which to take measurements. For example, you could take a measurement every minute between 10 and 15 minutes past the hour at 3 p.m., 4 p.m. and 5 p.m.

at these hours	10	and these	00	minutes within the hour
----------------	----	-----------	----	-------------------------

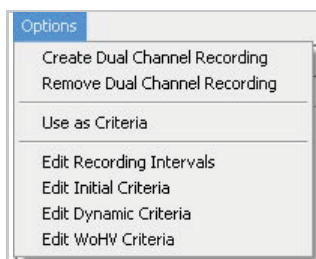
- g. Hours are specified using the 24 hour clock — E.g. for 10 a.m. enter 10, for 10 p.m. enter 22.
- h. If you want measurements to be taken every hour, enter an asterisk (*) in the *hours* field.
- i. To take measurements at particular hours of the day, enter the hour numbers separated by commas — E.g. to take measurements at 1 p.m., 3 p.m., and 5 p.m., enter 13, 15, and 17 in the *hours* field (remember to use the 24-hour clock).
- j. To take measurements over a range of hours, enter the range separated by a dash — E.g. to take a measurement every hour between 1 p.m. and 5 p.m., enter 13-17 (remember to use the 24-hour clock).
- k. Minutes work in the same way as hours using the asterisk, comma, and dash to specify exact times or ranges. Bear in mind when setting your recording intervals that to maximize Ranger Sensor battery life, recordings should be scheduled a minimum of **three minutes** apart.

MORE: See [Measurement Duration and Battery Life](#).

- I. You can click the **Test** button to check whether you have set the time correctly. This lists when the next five measurements will be taken, using your settings.



11. The final step in defining a recording interval is to assign alarm states:
 - a. Check the alarm states you want this recording interval to apply to. To take recordings regardless of the alarm state of the measurement Location, tick every checkbox. If you have no alarms at a Location, select **unknown**.
 - b. Click **OK** to finish defining the recording interval details > Click **OK** again to close the *Recording Interval Specifications* window.
 - c. The recording intervals you define display in the *Recording Interval* dropdown list and can be assigned to any Schedule Entries.
 - d. To add additional entries to the recording interval, repeat the process from the beginning of this topic — E.g. You might wish to define different recording intervals for when the Location triggers an alarm.
 - e. Click **Close** when you have finished defining recording intervals.
 - f. At the top left of this window, the *Options* menu contains options for working with dual channel recordings, recording intervals, and criteria. Some of these options are also accessible using the right-click shortcut menu.



Use as Criteria

Criteria define a single condition that must be met in order for a recording to be taken. For example, 'Is the Machine running between 1600 to 1800 RPM?'. If yes, take a recording. If no, don't take a recording.

Creating and assigning criteria is an optional step that can be performed either now or after configuring a Ranger Sensor. To create criteria, you must first create special numeric data Schedule Entries to base the criteria on.

MORE: See [Criteria and Conditional Monitoring](#) to learn about creating numeric data Schedule Entries and assigning criteria.

Hours and Minutes Example

You want the Ranger Sensor to take measurements at 1 p.m., 3 p.m. and 5 p.m. Three measurements will be taken each hour with the first measurement starting at 10 minutes past the hour and successive measurements being taken at 15 and 20 minutes past the hour.

Measurements will be taken at 1:10, 1:15, 1:20, 3:10, 3:15, 3:20, 5:10, 5:15 and 5:20.

1. In the *hours* field, enter **13, 15, 17** (1 p.m., 3 p.m. and 5 p.m.).
2. In the *minutes* field, enter **10, 15, 20**.
3. Click **Test** to confirm the time has been set correctly.

Criteria and Conditional Monitoring

Creating criteria is optional. Once your monitoring program is operational you can add criteria at a later stage to fine-tune the data collection cycle to more closely monitor particular conditions of interest.

You might sometimes want to collect recordings only when machinery is running in a particular operating mode — E.g. when it is running at a particular linear speed. You can control when recordings are collected using *Criteria*.

Criteria define a condition that must be met before a recording is taken. An example of a condition is 'the machine must be running'. If this condition is met, the Ranger Sensor device will take a recording. If the machinery is switched off, no recording is taken.

To determine whether a condition is met or not you will need to set up a numeric data Schedule Entry to measure a particular output such as temperature or running speed. These numeric data Schedule Entries return a single value which is then matched against whatever criterion/condition you specify.

Criteria are set up as a three stage process:

1. Create a numeric data Schedule Entry to measure a particular output such as machinery running speed.

MORE: See [Create Numeric Data Schedule Entries](#).

2. Create a criterion that specifies a condition, such as a small range of running speeds that an RPM must fall between. The numeric data Schedule Entry will be used to determine whether this condition is met.
3. Assign this criterion to as many Schedule Entries as required. When the numeric data measurement is taken, its value will be compared with your criterion to see if the condition has been met. If the condition has been met, a regular recording (vibration, temperature, speed) will be taken.

Validity Period and Retry Interval

To create criteria, you must first create a numeric data schedule entry, then specify a range of values that this measurement must fall between.

Once you have done this, you can specify how long the criteria measurement is valid for — i.e. how long after it has been taken that it may continue to be used. After a set amount of time, you can also instruct the Ranger device whether or not to take the criterion measurement again — E.g. if the criterion is not met on the first measurement attempt.

Specifying *Validity Periods* enables you to reduce unnecessary recordings. This is because you won't have to take a criterion measurement repeatedly to determine if a machine is still in the same operating mode. You can simply specify a length of time for which a measurement value remains valid and can be used.

For example, consider a schedule entry that has a criterion assigned to it with a validity period of 5 minutes. When the criteria measurement is taken, its value is recorded and locked in place for 5 minutes. Within this 5 minutes there may be another schedule entry that uses the same criterion due to be taken. OnlineManager will first check to see if the validity period on the original criterion has expired. If it has, the criteria measurement will be retaken for the next schedule entry. If it has not expired, OnlineManager will re-use the original criteria measurement to determine whether the next schedule entry will be recorded.

You should set the validity period according to how often the machine changes state/speed. For example, paper machines tend to run at the same speeds for several hours. This means you can set the validity period to several minutes with minimal risk that the value will become out of date.

Other optional settings you can specify for a criteria measurement are the *Retry Interval* and *Number of Retries*. The retry interval and number of retries will be most useful for machines whose operating mode changes often or for machines that run intermittently. When OnlineManager tries to take a schedule entry recording that has a criterion assigned to it, the criteria measurement is taken first to see if the value falls within the required range. If the value does not fall within the required range, the measurement is taken again after a timeout equal to the retry interval. The retry process repeats for the number of retries you have specified *OR* until the criteria is within range.

For example, a criterion is created with a retry interval of 1 hour and number of retries set to 3. The first time the criterion is evaluated, its value is outside the specified range. This means the schedule entry it is assigned to is not recorded. One hour later the first retry is taken — This also fails. After another hour the criterion is retaken again (and again fails). The third and final retry is taken an hour later — Its value determines if the associated schedule entry is recorded or not. If any of the retries had succeeded in meeting the criteria range, the schedule entry would have been recorded and any further retries would have been cancelled.

Create Criteria

To create criteria:

1. Create a numeric data schedule entry at your chosen machine locations.

MORE: See [Creating Numeric Data Schedule Entries](#) to learn what types of signals can be measured and how to create the schedule entries.
2. In the *Online Device Setup* wizard, click the button for step 4

*TIP: If the wizard is closed, you can open it by selecting **Edit** > **Online Device Setup**.*
3. In the *Online Schedule Entry Configuration* window, locate and select the numeric data schedule entry that will be used to create this criterion.
4. Select **Options** > **Use as Criteria** to open the *Recording Criteria* window.

5. Give the criterion an appropriate description to identify its purpose — E.g. The Machine/Point it applies to, what it is measuring, and the range of values it encompasses. This will make it easier to identify later if you create a large list of criteria.
6. Enter a range of values that a measurement must fall between to meet this criterion — You can specify negative numbers and non-integer values such as 1.8.
7. Enter a validity period for this criterion (if required) — You can specify this in hours, minutes, or seconds.
8. Enter a retry interval and the number of retries to carry out (if required).
9. Tick the **Post validation** checkbox if you wish to confirm the criteria is valid (i.e. within the specified RPM range) both before and after the recording is taken. This will prevent measurements that exceed the specified criteria range during recording from being stored.
10. Click **OK** to close the window.

Recording Criteria

Based on: Machine - Point - Horizontal [Tach] - RPM [Tachometer 1]

Description: Running Speed 1600-1800

Range: 1600 To 1800 RPM

Enter a period over which the machine state is not likely to change

Validity Period: 00:05:00 (hh:mm:ss)

If this recording criteria is not met then retry after this interval

Retry Interval: 01:00:00 (hh:mm:ss)

Number of Retries: 10

☐ Post validation: confirm that this criteria is still valid after recordings have been taken.

☐ Store all OPC values for this machine

☐ Use as a source of machine RPM

OK Cancel

Specifying recording criteria

Record RPM from OPC source

It is also possible to store the initial criteria from an OPC source as an RPM. To do this you must configure the OPC sensor to measure in Hz or CPM:

1. Select **Edit > Manage > Sensors**.
2. Use EITHER of these methods to select Hz or CPM:
 - Select **Add > Standard Sensor** or **Edit**.
 - Click the top **Other** button.

Alternatively, to record linear speed rather than RPM, you can specify the diameter of the roller pulleys at the Point location. To do this, right-click the Point in the navigator tree > Select **Edit**.

Both methods will result in enabling the **Use as a source of machine RPM** checkbox at the bottom of the *Recording Criteria* panel.

Storing the initial criteria from an OPC source as an RPM

Store all OPC Values for Machine

This checkbox is used to instruct OnlineManager to record all OPC schedule entries if the initial criteria recording is successful. If post-validation is enabled and these checks are also successful, OnlineManager will once again record all OPC schedule entries. This process ensures the OPC recordings are taken as close to the initial vibration recording as possible.

MORE: See the Ascent Reference Guide for more information on associating Process Variables with Vibration Recordings for charting and additional configuration information.

NOTE: Only use the 'Store all OPC values for this machine' option when the OPC server is fast and reliable. For example, it should be on the same LAN as OnlineManager, and have a response (ping) time of less than 50 ms.

Discard Criteria Measurements

Because criteria measurements are only used to determine if a recording should be taken, these measurements are automatically discarded after use rather than being stored. This is done to reduce the potential size of your database. However, you can choose to keep criteria measurements if required.

MORE: See [Discard Recordings Automatically](#).

Assign Criteria

Once criteria have been created they can be used at any Location on a Machine. For example, you might have a tachometer attached to a Machine to take running speed measurements. You can create a single tachometer Schedule Entry with one criterion then assign this criterion to every Location on your Machine so that the Ranger device will only take recordings if the Machine is switched on.

NOTE: Ensure you set the running speed between values x and y.

To assign criteria:

1. Select **Edit > Online Device Setup**.
2. Select a Machine in the navigator that you want to apply this criteria to.
3. Choose a Ranger Station or Ranger Sensor device.
4. Click the **Intervals and Criteria** button beside step 4.
5. In the *Online Schedule Entry Configuration* window, select a Location to apply the criteria to.
6. Use the *Criteria* dropdown fields to assign criteria to one or more parameter sets.

TIP: You can copy and paste the same criterion to multiple parameter sets.

NOTE: The dropdown fields will be empty if you have not created any criteria.

7. When you've finished assigning criteria click **OK** > Click **Close** to close both this window and the wizard.

Criteria measurements taken with one Ranger Sensor can be used to control recordings on other Ranger Sensors. For example, this might be appropriate on a paper machine that measures linear speed at just one Location but uses ten or more Ranger Sensors to monitor all points of interest. The criteria's validity period should be reasonably long in such a situation (≥ 5 minutes) otherwise the Ranger device which measures speed will spend all its time performing this task in response to criteria requests from the other Ranger devices.

Variable Speed Machines

When a Machine has multiple operating modes, for example variable operating speeds, this can present problems when trying to trend data, compare data or set alarm levels. Vibration amplitudes fluctuate depending on the operating mode of the Machine, perhaps giving the appearance of a fault where none exists. Alarms that cover peaks such as running speed will no longer be valid if the running speed changes significantly.

You cannot compare data taken on a Machine running at 1800 RPM with measurements taken on the same Machine running at 3600 RPM. Also, how might one know when the Machine is operating in one mode or another?

The solution to this predicament is to instruct the Ranger device to take measurements only if the Machine is in one or more specific operating modes, and to keep the recordings from each mode separate.

Example

A user wants to monitor a Machine that usually operates in one of two modes — Near 1800 RPM or near 3600 RPM. The user sets up two Schedule Entries at the same measurement Location, each with its own parameter set and alarms. One Schedule Entry will be recorded only if the RPM falls within the criteria range 1700-1900 RPM. The other Schedule Entry will be recorded only if the RPM falls within the criteria range 3400-3800 RPM.

NOTE: These two criteria are created from a single tachometer Schedule Entry.

When OnlineManager tries to take the first recording it sees that this Schedule Entry can only be taken when a specific criterion is met. To determine whether the criterion is met, the program instructs the Ranger Station to take a tachometer reading. OnlineManager finds that the criterion is met (the Machine is running at 1786 RPM) so the first Schedule Entry is now recorded.

The program then moves to the second Schedule Entry and sees that this also has a criterion assigned to it. The program rechecks the RPM criteria, which fails as the RPM does not fall within the specified range — The Machine is still running at 1786 RPM. The second Schedule Entry is ignored.

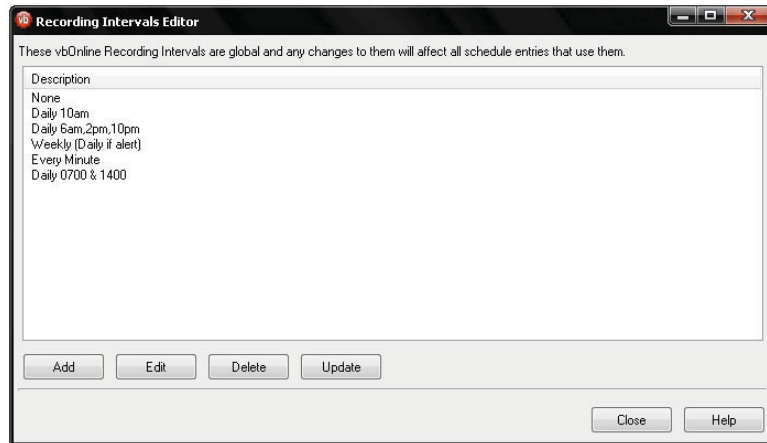
The 1800 RPM and 3600 RPM recordings will be kept separate in the navigator, each stored under its own Schedule Entry.

Edit Recording Intervals and Criteria

Recording intervals and criteria are not Location-specific. This means they can be assigned to any Machine. Consequently, any changes in a recording interval or criterion will affect all Machines that use it. If you want to change only one instance of a recording interval or criterion you will need to create a new one and re-assign this to your chosen Location(s).

Whenever you need to change any part of a Ranger Station or Ranger Sensor setup:

1. Select **Edit > Online Device Setup** or press **CTRL+ALT+S** to open the wizard.
2. Click the appropriate numbered step button.
3. Click the **Intervals and Criteria** button beside step 4.
4. Select any Machine in the navigator if the window is empty.
5. From the *Options* menu in this window, select **Options > Edit Recording Intervals** (or **Edit Recording Criteria**) — The *Recording Intervals* editor displays below.
6. In the editor, select the item you wish to change > Click **Edit** > Select a recording interval > Click **Edit** again.
7. Make your changes > Click **OK**.
8. If you are editing a recording interval click **OK** twice to close both windows.
9. Click **Update** — This will update the *next measurement due* date for any recordings that use this interval.
10. Click **Close** > Click **Save**.
11. Click **Close** to close the wizard.



Editing recording intervals and criteria

Create Numeric Data Schedule Entries

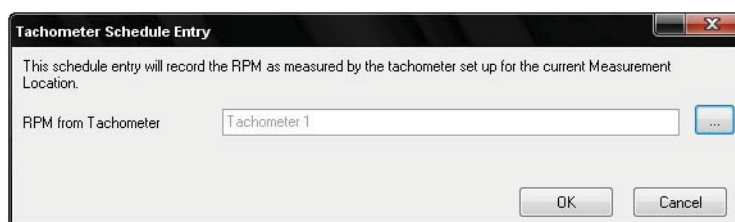
Creating numeric data schedule entries involves:

- Creating a tachometer schedule entry
- Creating a linear speed schedule entry
- Creating a linear speed schedule entry
- Creating alarms for numeric data

Create Tachometer Schedule Entry

Tachometer Schedule Entries measure the running speed of the Machine by taking a reading from a Ranger Station tachometer. To create a tachometer schedule entry:

1. Right-click a Point and select **New>Tach Schedule Entry**. The tachometer assigned to this Point is displayed in the window. Click the browse  button to assign a Ranger Station and tachometer to the Schedule Entry if the *RPM from Tachometer* field is blank.
2. Click **OK** to create the Schedule Entry and close the window.

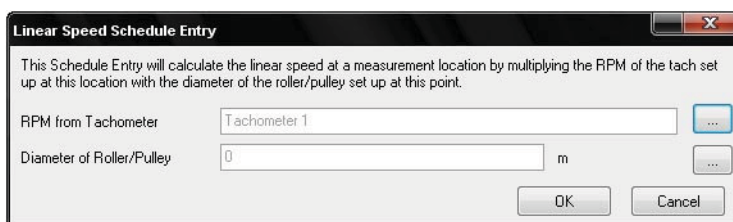


Creating a tachometer schedule entry

Create Linear Speed Schedule Entry

Linear Speed Schedule Entries calculate the linear speed of the Machine using the RPM supplied by a tachometer and the diameter of the roller/pulley at the specified Point. To create a linear speed schedule entry:

1. Right-click a Point > Select **New > Linear Speed Schedule Entry** — The tachometer assigned to this Point is displayed in the top field. Click the browse  button to assign a Ranger Station and tachometer to the Schedule Entry if the *RPM from Tachometer* field is blank.
2. Click the second browse  button > Enter the diameter of the roller/pulley at this Point in the *Point* editor. The tachometer multiplier value will normally be 1, indicating that the roller is turning at the same speed as the shaft measured by the tachometer.
3. Click **OK** twice to close both windows.



The dialog box titled "Linear Speed Schedule Entry" contains the following elements:

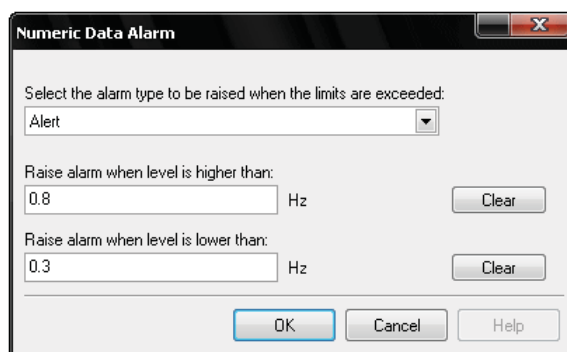
- A descriptive text: "This Schedule Entry will calculate the linear speed at a measurement location by multiplying the RPM of the tach set up at this location with the diameter of the roller/pulley set up at this point."
- A field labeled "RPM from Tachometer" with the text "Tachometer 1" and a browse button .
- A field labeled "Diameter of Roller/Pulley" with the value "0" and a unit "m", followed by a browse button .
- Buttons for "OK" and "Cancel" at the bottom right.

Create linear speed schedule entry

Create and Edit Alarms for Numeric Data

To create and edit alarms for numeric data:

1. Right-click a numeric data Schedule Entry and select **New > Numeric Data Alarm**.
2. Select the type of alarm that will be raised using the dropdown field.
3. Enter the upper and lower threshold values for this alarm.
Alternatively, specify one and leave the other blank.
4. The values you enter will be measured in the default units for your sensor type. For example, for a tachometer Schedule Entry the units will be in RPM. For an average value temperature Schedule Entry, the temperature units will be whatever default you have specified under **Options > Unit Preferences**.
5. Click **OK** when you are finished.



Edit Numeric Data Alarms

To edit a numeric data alarm, simply right-click the alarm in the navigator list and select **Edit**. You may need to select the schedule entry in the navigator first in order to display its alarms in the navigator list.

Take Ranger Sensor Temperature Measurement

The Ranger Sensor device can be used to collect temperature measurements as part of your condition monitoring program (note that the measurement is of the internal temperature of the sensor housing). The recorded temperature values can be trended in the same way as vibration recordings using Ascent's Trend view.

MORE: See the 'Trend Data' section of the Ascent Reference Guide.

In addition, Warning, Alert and Danger alarms can be created that will trigger when the returned value is above, below or within a user-specified range.

MORE: Setting alarms for numeric data Schedule Entries under [Create and Edit Alarms for Numeric Data](#).

You can record a temperature measurement by creating a special numeric data Schedule Entry called an *Average Value Schedule Entry*. This Schedule Entry measures the value of any input signal—In this case temperature—over a specific duration (100 milliseconds).

1. Right-click a Point or Location.
2. Select **New > Average Value Schedule Entry**.
3. Select the **Ranger Sensor Temperature** tab.
4. Enter a meaningful description for this new Schedule Entry in the field provided.
5. Click the browse  button to configure the device channels.
6. Select the Ranger Sensor that will be used to take the measurement from the *vb Device* dropdown list.

NOTE: Your instrument will not be listed if it has not been added to the Ascent database. See [Set Up Communication with Ranger Sensor](#).

7. Click **OK** — The *Device Channel Configuration* window closes. The *Channel* and *Sensor* fields on the *Average Value Recording* panel are populated automatically.

8. Click **OK** to close the window — The new Schedule Entry appears in the top-left navigator list in Ascent.

*NOTE: To manually test the Schedule Entry, select it in the navigator list > Press **CTRL+ALT+R** — A temperature recording will be attempted immediately.*

9. Select the new Average Value schedule entry in the navigator.
10. Select **Edit > Online Device Setup** or press **CTRL+ALT+S** to open the *Online Device Setup* wizard.
11. Press the **Intervals and Criteria** button beside *Step 4* on the wizard.
12. Select a recording interval in the dropdown field provided to specify how often measurements will be taken.

MORE: See [Configure Recording Intervals](#).

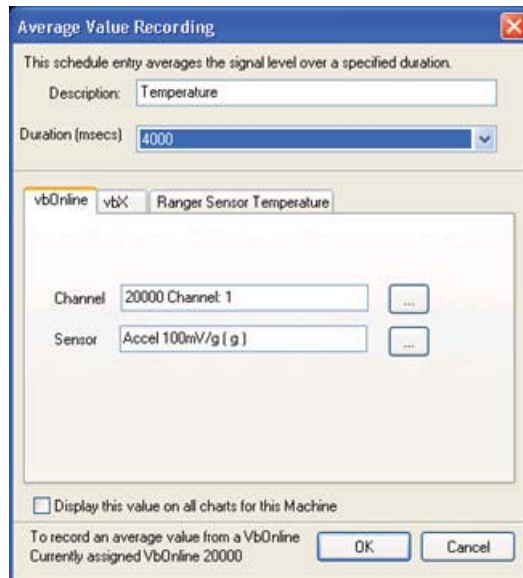
13. Click **OK** then **Close** to exit the wizard — The temperature measurement will be taken using the assigned Ranger Sensor via OnlineManager when next OnlineManager is run.

The value returned by this numeric data Schedule Entry can also be used to determine whether a criterion has been met and therefore whether a vibration recording is taken or not.

MORE: See [Criteria and Conditional Monitoring](#).

Only one instance of this Schedule Entry will normally be created at a Point. This is because the temperature being measured will typically be common to everything at that Point.

NOTE: See 'Associating Process Variables with Vibration Recordings' in the Ascent Reference Guide for more information on the 'Display this value on all charts for this Machine' checkbox. This checkbox enables Ascent to display Ranger temperature measurements (amongst other process variables) on vibration charts. Ascent will automatically associate the Ranger temperature measurement recorded closest to a vibration measurement when it is charted. This feature may, depending on measurement intervals, provide data indicative of a Machine's state at the time of a vibration measurement.



The dialog box is titled "Average Value Recording" and contains the following elements:

- A text box for "Description" containing the word "Temperature".
- A dropdown menu for "Duration (msecs)" set to "4000".
- Three tabs: "vbOnline" (selected), "vbK", and "Ranger Sensor Temperature".
- Inside the "vbOnline" tab:
 - A "Channel" text box containing "20000 Channel: 1" and a browse button (...).
 - A "Sensor" text box containing "Accel 100mV/g (g)" and a browse button (...).
- A checkbox labeled "Display this value on all charts for this Machine", which is currently unchecked.
- Footer text: "To record an average value from a VbOnline Currently assigned VbOnline 20000".
- "OK" and "Cancel" buttons.

Taking a Ranger Sensor Temperature Measurement

Wake on High Vibration (WoHV)

The Wake on High Vibration (WoHV) feature instructs Ranger Sensors to 'wake' from their normal sleep states in the interval between regularly scheduled measurements. They wake up if vibration states exceeding specified user-selectable levels are detected.

When the WoHV feature is triggered, a sensor is prompted to send a single measurement back to its parent Ranger Station and on to the Ascent database via OnlineManager. This measurement is intended to trigger an alarm state in Ascent. You will need to manually configure this alarm state.

You can configure WoHV parameters using the Dynamic Criteria feature in Ascent. WoHV dynamic criteria entries can only be assigned to vibration measurements. They cannot be assigned to speed (tachometer) or temperature readings.

To use the WoHV feature you will need to configure at least one Schedule Entry in the navigator to take measurements at regular intervals. This can be a Schedule Entry assigned specifically to use the WoHV feature, or a normally scheduled waveform measurement that is also used as a WoHV trigger.

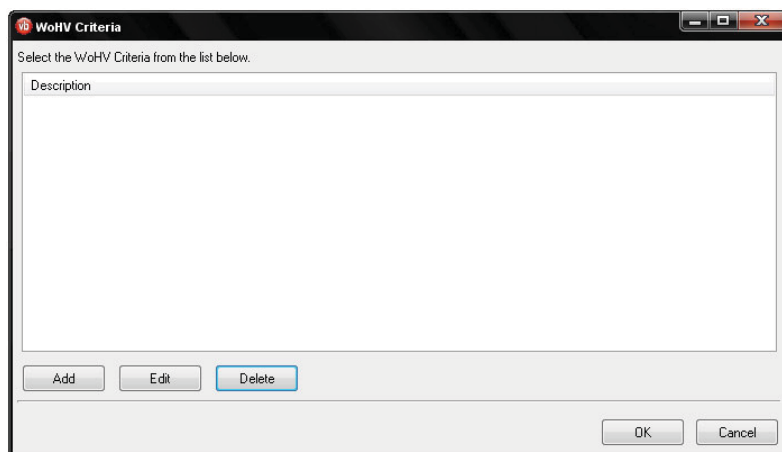
MORE: See [Edit Recording Intervals and Criteria](#).

When the WoHV feature is triggered, subsequent recordings enable OnlineManager to determine whether vibration levels have fallen below 70% of the trigger threshold. If this occurs, the WoHV feature will be reset and 're-armed', enabling polling for excessive vibration levels to restart. If no further measurements are taken (as would occur if the WoHV feature were configured but no associated interval specified), the WoHV mode would remain 'set' (active).

Create WoHV Criterion

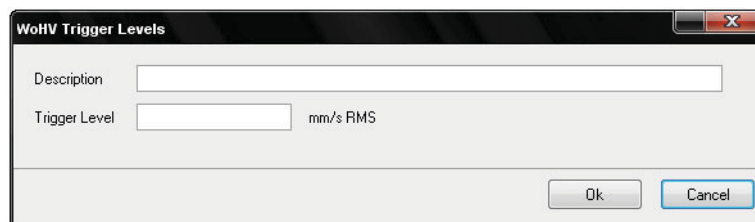
To create a WoHV Criterion:

1. Select a previously generated waveform Schedule Entry from the navigator list, or generate a new waveform Schedule Entry — This is the Schedule Entry that the WoHV criteria will be applied to.
2. Select **Edit > Online Device Setup** or press **CTRL+ALT+S** to open the *Online Device Setup* wizard.
3. Select the Ranger Sensor device you wish to assign the WoHV criteria to.
4. Click the **Intervals and Criteria** button beside *Step 4* — The Online Schedule Entry Configuration panel opens.
5. Open the Dynamic Criteria dropdown list > Click the ellipsis (...) to open the WoHV Criteria panel.



Wake on High Vibration Criteria

6. Click **Add** — The *WoHV Trigger Levels* window will open.



WoHV Trigger Level

7. Enter a description for the WoHV criteria in the field provided.
TIP: You could use the name of the equipment being monitored or the trigger level you will use.
8. Enter a vibration level in the *Trigger Level* field — Any vibrations above this level will trigger the WoHV criterion.
*NOTE: The trigger level unit used is determined by the velocity power level configured in Ascent. You can access this setting by selecting **Options > Unit Preferences > Velocity Power Level**.*
9. Click **OK** twice to close the WoHV Trigger Levels and WoHV Criteria panels.
10. Click **OK** > Click **Close** to close the *Online Device Setup* wizard — The new WoHV criteria is assigned to the measurement and displayed in the *Dynamic Criteria* column. The new WoHV Dynamic Criteria entry will be activated when next OnlineManager is started.

The Wake on High Vibration schedule entry in the navigator list will be appended with the text **[WoHV Armed]** once OnlineManager has been started. If the specified WoHV trigger level is exceeded, this text will be updated to display **[WoHV Exceeded]**.

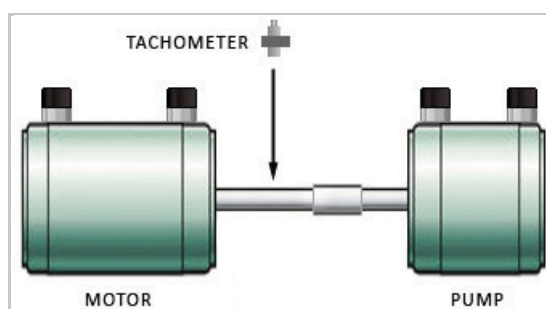
Edit WoHV Criterion

To edit a WoHV criterion:

1. Select **Edit > Online Device Setup** or press **CTRL+ALT+S** to open the *Online Device Setup* wizard.
2. Select the Ranger Sensor device you wish to assign the WoHV criteria to.
3. Click the **Intervals and Criteria** button beside *Step 4* — The *Online Schedule Entry Configuration* panel opens.
4. Expand the **Dynamic Criteria** dropdown list > Click the ellipsis ('...') to open the *WoHV Criteria* panel.
NOTE: Select the black horizontal bar at the top of the dropdown list to remove an existing WoHV criterion.
5. Select an existing WoHV criterion > Click **Edit** — The *WoHV Trigger Levels* window opens.
6. Edit the name or trigger level of the WoHV entry > Click **OK**.
7. Click **OK** again to close the *WoHV Criteria* panel.

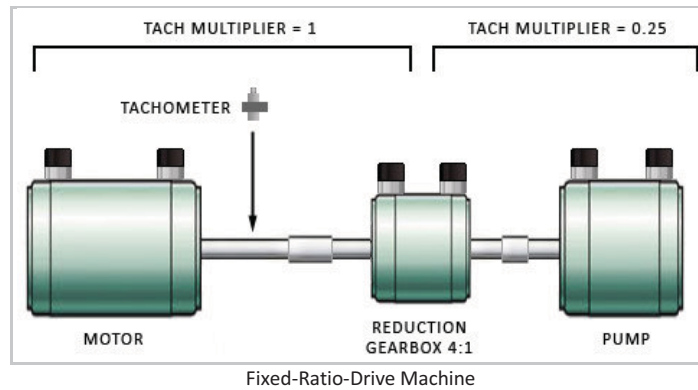
Configure Tachometers/Speed Sensors

A single speed sensor will usually be installed for a typical, basic Machine comprising a motor, coupling, and a driven device such as a pump. Ascent can then use the RPM from this one speed sensor with any vibration measurements taken from surrounding Ranger Sensors.



Basic Machine with Speed Sensor

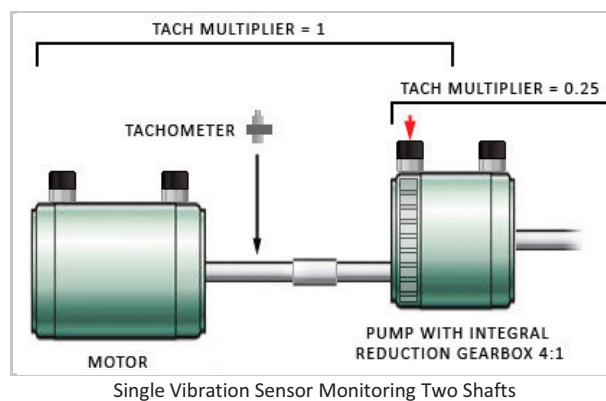
Ascent also caters for situations where the Machine includes a gearbox or other fixed ratio drive such as a belt or chain. The two (or more) shafts in the Machine will be turning at different speeds, but these speeds are all related to each other. As with the basic Machine configuration, only one speed sensor is required. However, you must tell the software how fast each shaft is turning relative to the shaft where the speed sensor is located. This ratio is called the Tach/RPM multiplier and is assigned to specific **Points** on the Machine. The tachometer reading is then multiplied by the Point's tachometer multiplier value to determine the true running speed for individual shafts. (The default tachometer multiplier value is 1).



To add a tachometer multiplier value to an existing Point:

1. Right-click the Point in the navigator > Select **Edit**.
2. Enter an RPM multiplier value in the field provided — The RPM generated by the tachometer will be multiplied by this value to calculate the true running speed of this shaft.
3. Click **OK**.

Ascent also caters for situations where a single Ranger *vibration* sensor is used to monitor two shafts turning at different speeds. A common example is a gearbox as shown in the diagram below. The arrow indicates the best available location for measuring the input shaft as well as the low speed shaft from the gearbox.



To set up measurements for this situation it will be necessary to define *two Points* (and two measurement Locations with appropriate Schedule Entries and alarms) that represent the same physical location on the Machine. For example:

- Sludge Pump - Pump DE Input - Vertical
- Sludge Pump - Pump DE LSS – Vertical

The Schedule Entries at both locations should be configured to use the same Ranger device and speed sensor. The only difference between the two Locations is that the Pump DE LSS (low speed shaft) Point should have its tachometer multiplier set to 0.25, instead of the default 1.

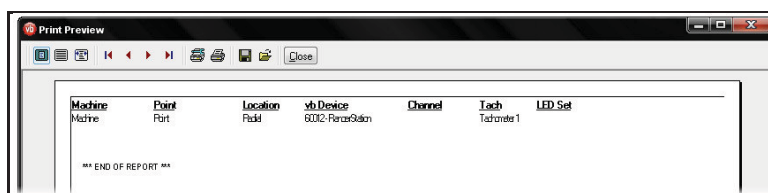
Create Structure Report

As you set up your Ranger System you can create structure reports that detail the system's:

- **Physical connections** — Which tachometers and Ranger devices are assigned to each Location.
- **Measurement scheduling system** — Which recording intervals and criteria have been assigned.

These reports can be produced as hard copy references that can then be used to set up other Machines in identical fashion. If a Machine is disassembled and sent away for maintenance, these reports can be used to quickly return configurations to their previous states.

Each of the numbered step buttons on the *Online Device Setup* wizard open a specific configuration window. These windows are used to generate the reports. The following image shows a preview of a Ranger Station channel configuration report.



Machine	Point	Location	vtu Device	Channel	Tach	LED Set
Machine	Point	Field	BUZ2-ParasStation	Channel	Tachometer 1	LED Set

*** END OF REPORT ***

Ranger Station channel configuration report

To create a report detailing the setup of a single Machine:

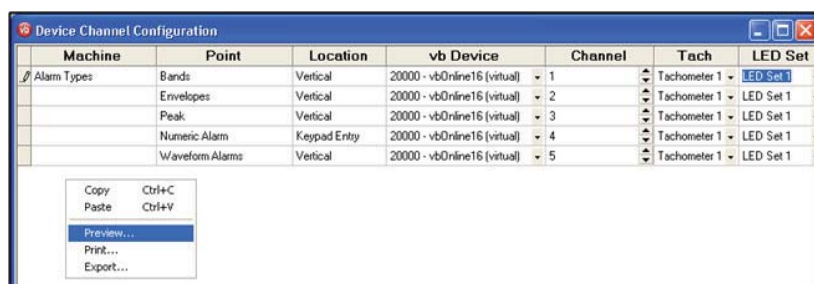
1. Select the Machine in the navigator.

TIP: Click the folder icon at the top of the navigator to select all Machines in a Folder.

2. Select **Edit > Online Device Setup** or press **CTRL+ALT+S**.
3. Click the button beside a numbered step button to display a part of your system structure.

*EG: Click **Channels**, **Tachs**, **LEDs** to see whether the tachometer input is connected to a particular Machine.*

4. Right-click anywhere in the displayed window to access these options:
 - **Preview** displays the report onscreen without printing it. After previewing, click the printer icon at the top of this window to print the report.
 - **Print** sends the displayed report directly to the printer.
 - **Export** creates a CSV file that can be emailed off site and opened on another PC using a spreadsheet program such as Microsoft Excel®.



Preparing to preview a report you have created

Section 3: Test your System

Once you have established communication between Ascent and Ranger and set up basic Schedule Entry, you will need to test the physical system — Sensor installations, connections, cabling, and component communication. Testing the physical system is useful for determining whether the speed of the Ranger network requires adjustment.

Take Recording Manually

You can use EITHER of these methods to take a recording manually:

- Right-click a Schedule Entry in the navigator > Select **Online Devices > Record Now!**.
- Select a Schedule Entry > Press **CTRL+ALT+R**.

The Ranger Sensor or Ranger Station will take the measurement. This might take a short time as the sensor settles and various communication transactions take place. Any recording interval or criteria associated with this Schedule Entry will be bypassed. The recording will automatically display in the lower navigator window when the measurement is complete.

Troubleshooting

If you have not assigned a Ranger device to a Schedule Entry you will not be able to take a recording. The *Online Channel Configuration* window will open automatically to enable you to assign these now.

If you attempt to take a recording when the Ranger device is actively measuring you will receive an error message stating that the device is currently not ready. This is likely to occur if OnlineManager is running or if another user is also trying to take a manual recording. You might need to stop OnlineManager.

MORE: See [Stop OnlineManager](#).

Test Ranger Sensor Connections

You can perform a quick, functional check of each Ranger Sensor. However, we recommend you perform a more thorough, one-off, post-installation test to ensure each sensor is working as expected and connected correctly. This test requires two people and a convenient form of communication, such as radios.

MORE: See [Take Recording Manually](#).

One person gently taps each sensor in turn while the other takes recordings manually on each sensor, looking for signal spikes caused by the tapping. The person taking the recordings reports the result back via the radio and the person repeats the test with the next sensor.

The tapping will display as periodic spikes in a time waveform recording. The time waveform Schedule Entry used for the test can be copied and pasted into each measurement Location in Ascent and deleted once testing is complete.

To test Ranger sensor connections:

1. Create a list of Machines and their measurement Locations to facilitate coordination between the two people — You can easily create a Machine list using the *Export* function in the *Online Device Setup* wizard.

MORE: See [Create Structure Report](#).

2. Create a time waveform schedule using Ascent — The number of samples and duration must be sufficient to capture the transient tapping signal (e.g. 1024 samples, 2000 ms duration).
3. Copy and paste this Schedule Entry to each Machine Location.

TIP: You can paste a single Schedule Entry to every Location simultaneously — See [Copy to Multiple Locations](#).

4. Send one person to the factory floor to perform the tapping. Test each sensor by right-clicking a Schedule Entry and selecting **Online Devices > Record Now!** — This procedure must be carefully synchronized to ensure you capture the signal spikes.

5. Continue until you have verified that every sensor responds appropriately to the applied signal. If a sensor does not respond correctly check whether the sensor:
 - Is communicating with the Ranger Station device — Is it out of range? Battery low? Sensor not properly mounted?
 - Is assigned correctly in Ascent.

Copy to Multiple Locations

To copy to multiple locations:

1. Right-click the Schedule Entry > Select **Copy Branch to Clipboard**.
2. Select the required machines using EITHER of these methods:
 - Select the required Machines individually within the folder.
 - Right-click the top-level Folder to select all Machines within it.
3. Click **Paste** — Click **Yes** to have the machines pasted to *all* appropriate places that exist below the item you have selected.

Adjust Connection Speed Settings

You will only need to adjust the Ascent/Ranger Station connection speed settings if you have difficulty communicating with your Ranger Station or Ranger Sensor (e.g. if you experience occasional timeouts). Before altering the connection speed settings, you should first check that:

- Both devices are switched on.
- The green *Status* LED is flashing on the Ranger Station.
- The Ethernet cable is plugged securely into the Ranger Station (if using a wired connection).
- The Ascent/Ranger device link works as expected with any other Ranger devices.
- The correct Ranger Station IP address is being used (and no other network devices have been assigned the same IP address).
- The correct Ranger Station or Ranger Sensor is assigned to any Schedule Entries you are trying to record.

The connection speed of your online system depends on the type of physical setup used (wired LAN or wireless connection). In order for the Ranger components and Ascent to communicate, the connection speed selected in Ascent must match the *actual* connection speed of your system.

If you are experiencing difficulties connecting to a Ranger device you can adjust the default settings, which are set to the most common connection type — slow connection speed for wireless, fast connection for wired.

NOTE: Changing the connection speed settings in Ascent does not change the physical connection speed of your system. Connection speed settings are only used to describe the speed of your existing connection to Ascent.

To adjust the connection speed settings:

1. Select **Edit > Online Device Setup**.
2. Select the Ranger device you wish to alter speed settings for > Click **Edit**.
3. Select the **Setup** tab > Click **Link Speed** — The *Setup Link Speed (Ranger Station)* or *Setup Link Speed (Ranger)* panel opens, depending on the device type you selected. The Ranger preset option is selected.
4. Expand the **Presets** dropdown field > Select **Custom Configuration** if you have been unable to establish a stable connection using the Ranger default. You will need to manually adjust the other connection timing parameters in this window (typically increasing timing values rather than reducing them). You might need your network administrator to assist with this task.
5. Manually enter your connection values in the connection fields.

NOTE: The 'Header Timer' value should be set to a minimum of 55 seconds and the Connection Timer to 15 seconds for Ranger communications. If these higher values are not already entered (if, for example, you previously chose 'Slow Link' rather than 'Ranger' from the 'Presets' dropdown list) you will need to adjust these now.

6. Click **OK**.

Setup Link Speed (Ranger Station)

Link Speed

Using the drop-down box select the description that best describes your connection or adjust the timing parameters manually.

Presets

Ranger

Connect Timer (s) Header Timer (s)

15 40

Packet Timer (s) Character Timeout (s)

8 0.0042

OK Cancel

Configure Network Link Speed

Section 4: Take Recordings — **OnlineManager**

OnlineManager reads the recording intervals you set up and instructs the Ranger device(s) to take recordings.

You can also take measurements manually (without a recording interval) at any time.

MORE: See [Take Recording Manually](#).

Manage Several Ranger Devices

When requesting recordings from more than a single Ranger device, OnlineManager will communicate with each device in turn, instructing it to take recordings. As each device receives its instructions it will begin the recording process immediately. This process enables multiple devices to collect data at the same time.

The process of retrieving and saving recordings to the database takes several seconds to complete. If you have several Ranger devices installed, this may noticeably slow the rate at which recordings are taken. To increase data collection speed, we recommend you run several instances of OnlineManager with each managing its own Ascent database and associated Ranger devices.

There are some important points to bear in mind with this approach:

- You cannot run more than one instance of OnlineManager on the same computer. Each instance must be installed on a separate PC.
- OnlineManager must each work with their own database. They cannot share the same Ascent database.
- You can have more than one Ascent database on a PC.

Example Configuration

You have three large paper machines with 300 or more Points on each Machine.

1. Assign as many Ranger devices to the three Machines as needed.
2. Create three databases, one for each Machine.
3. Install three OnlineManager programs on separate computers to manage each group of Ranger devices (Ranger Station parents and their Ranger Sensor children). Each OnlineManager program will read and write data to one of the three Ascent databases.

If required you can also 'split' or divide Machines across several databases if the number of recordings to be taken is expected to slow the collection time considerably. For example, separate databases could be created for the Machine's drive end and non-drive ends. This setup will require you to open each database in turn (if they are all stored on one PC) to view the separate sections of the same Machine.

Auto Save

We recommend you use Auto Save when OnlineManager and Ascent are running at the same time. Auto Save automatically saves changes as they are made, thereby preventing deadlocks caused by more than one person or process trying to update an Ascent database at the same time.

Auto Save is switched on by default. To toggle this feature on/off, select **Options > Auto Save** in Ascent.

NOTE: Turning on Auto Save will disable the Ascent Undo\Revert function. In other words, if you mistakenly delete an item you will need to manually recreate it. For this reason we recommend switching off Auto Save if you are deleting large numbers of items.

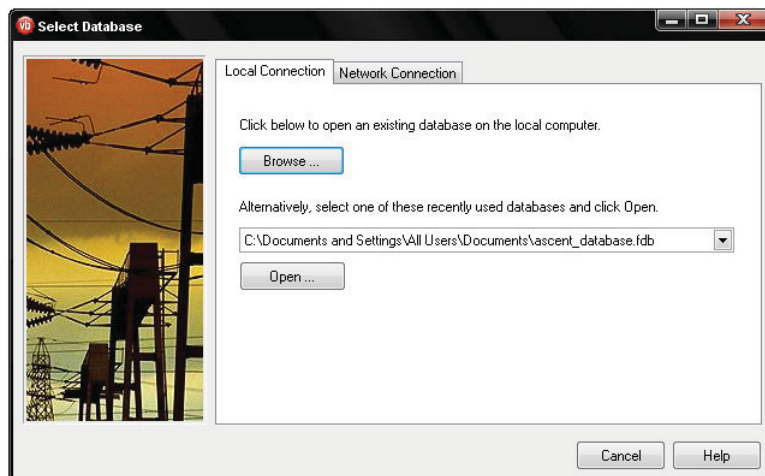
Run OnlineManager

To run OnlineManager:

1. Use EITHER of these options to open OnlineManager:

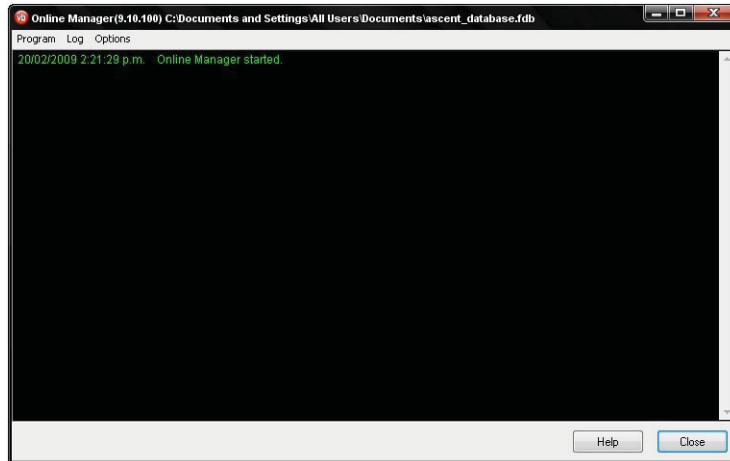


- Double-click the  shortcut on your desktop
 - Select **Start > All Programs > Commtest > Ascent > OnlineManager**.
2. Select the database you wish to monitor in the *Select Database* window — This displays the first time you open OnlineManager.
 3. Click **Open** — You will automatically be connected to this database when you run in OnlineManager in future.



Database Selection

4. To start taking automated measurements select **Program > Start** from the OnlineManager window.



Starting OnlineManager

NOTE: OnlineManager writes the transactions to the screen as they occur. Only the last 50 events are displayed in this screen. You can use the log viewer to access a more complete history.

5. Select **Options > Verbose Mode** to de-activate verbose mode. Repeat the process to re-activate verbose mode.

NOTE: Verbose mode lists each step in the measurement process and is displayed by default. If verbose mode is switched off, the display will list only the start and finish of each recording.

NOTE: Measurements are added to the database as they are recorded. Any users currently using Ascent will see a Refresh  button on their toolbar. When this button is pressed, that user's view of the database will be updated and the new recordings will display in the navigator.

Start Recording Automatically

You can configure OnlineManager to start taking recordings automatically when you start the program. To do this:

1. Select **Options > Configure**.
2. Tick the **Run on start up** checkbox.
3. Click **OK**.



Setting OnlineManager to run on startup

Manually Stop / Start OnlineManager

You can manually stop or start recordings or close OnlineManager completely.

NOTE: If OnlineManager is running on a remote PC you will need to ask the person in charge of that computer to carry out this procedure for you.

To access these options:

1. To temporarily stop recording, select **Program > Stop now!** — This halts measurement collection without closing OnlineManager.
2. To restart automated recordings, select **Program > Start.**

*NOTE: If instrument communications have previously been lost, the 'Start' option will not attempt to take missed recordings scheduled during the outage. If you would like OnlineManager to take these recordings (to catch up), select the **Start (including overdue)** option. OnlineManager will take all overdue recordings in their originally scheduled order. This may take some time, and may impact future scheduled recordings if you have a large site installation, slow network, or scheduled recordings due shortly. In this case, select **Start only**.*

3. To stop taking recordings immediately, select **Stop now!** — The current recording(s) will be aborted and no alarms will be checked.
4. To close OnlineManager completely, click **Close**. No more recordings will be taken until you re-open OnlineManager and select EITHER of these options:
 - **Program > Start**
 - **Program > Start (including overdue)**

Select Different Database

OnlineManager can only take recordings from one database at a time. To choose a different database:

1. Select **Options > Change Database**.
2. Select another database from the dropdown field.
3. Click **Open**.

The last database you viewed will be selected by default the next time you run the program.

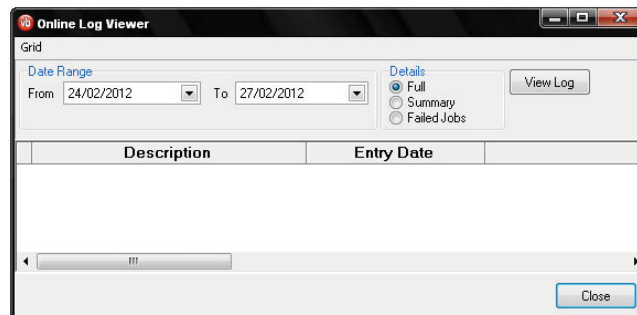
Log Measuring Process

The online log lists all the actions taken by OnlineManager, providing a history of transactions that occurred while the system was unattended.

You can use the online log to view all transactions, show a basic summary of the recording jobs, or only display the jobs that failed. You can do all this over a specified data range.

To access the log:

1. Start OnlineManager.
2. Select a database to view.
3. Select **Log > View**.
4. Select the transactions you wish to see in the *Details* section of the form — *Full*, *Summary* or *Failed Jobs*.
5. Click **View Log** to perform the search and list the results.
6. Click **Close** when you have finished viewing the log results.



OnlineManager Log Viewer

Choose Date Range

To select your preferred date range:

1. Enter your chosen date range directly into the *From* and *To* boxes or use the calendar.
2. Click the **From** dropdown field to open the date selection calendar.
3. Use the left ◀ and right ▶ buttons to change the month or year.
4. Click a specific date to select it.
5. Repeat the date selection process for the *To* dropdown field.

TIP: To return the 'From' and 'To' fields to today's date, click  Today: at the bottom of the calendar.

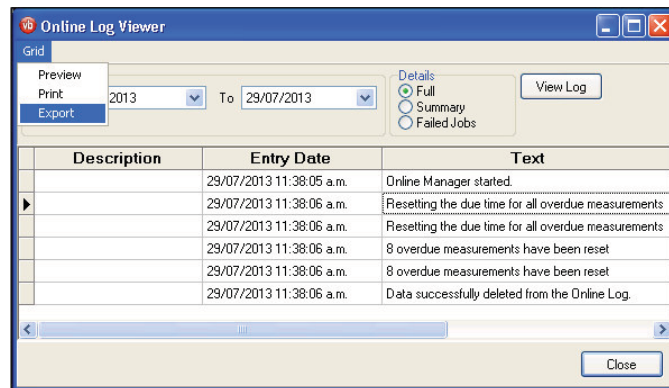


Selecting your preferred date range

Preview/Print/Export Log

To preview, print, or export the log:

1. Select **Log > View**.
2. Select the date range for the transactions you wish to view.
3. Select **Full**, **Summary**, or **Failed Jobs** to specify the level of data you wish to view.
4. Click **View Log** to perform the search and list the results.
5. Select **Grid** or right-click within the window to access these options:
 - **Preview** — Displays the log onscreen without printing it. After previewing, click the print  button at the top of this window to print the report.
 - **Print** — Sends the displayed log directly to the printer.
 - **Export** — Creates a CSV file that can be emailed off site and opened on another PC using a spreadsheet program such as Excel.



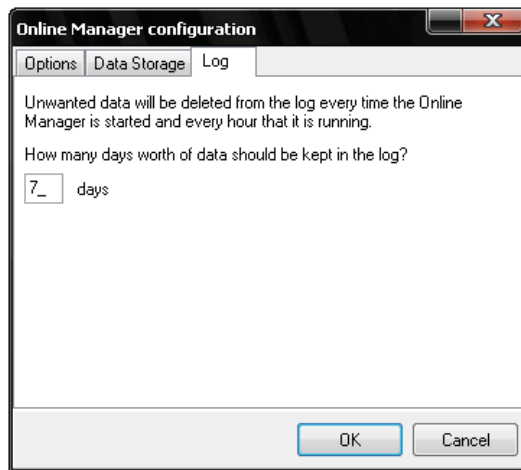
Preparing to export the selected log data

Delete Data from Log

Log data is deleted from the log table when you start OnlineManager and after each hour that it is running. OnlineManager stores seven days of data by default.

To change the number of days of data to keep in the log:

1. Select **Options > Configure > Select the Log** tab.
2. Enter the new number of days > Click **OK**.
3. Select **Log > Delete Entries** > Click **Yes** to delete all data from the log table.



Specifying how long you want data kept in the log

Deleting log entries does not remove associated recordings from the Ascent database.

MORE: See [Data Thinning](#) to learn how to remove recordings from an Ascent database.

You can also discard specific measurement types automatically. For example, you could delete measurements that don't trigger any alarms, rather than storing them in the database. This will significantly reduce your data storage requirements.

MORE: See [Discard Recordings Automatically](#).

View Data

Once data has been collected, you can display and manipulate it using Ascent.

MORE: See the Ascent Reference Guide for guidance on charting, reporting, and other data presentation methods.

Section 5: Manage Data Storage Effectively

Once you have established a program for collecting and storing Machine information, you might find you are storing hundreds or thousands of recordings in your Ascent database. If a database is allowed to grow unnecessarily large it will eventually slow down Ascent's data retrieval and display times.

Although it is important to collect enough historical data to be able to trend a Machine's condition over time, it is not necessary to keep every recording ever taken on each Machine.

To reduce the size of your Ascent database you will need to reduce the number of recordings stored within it. There are several approaches you can take to do this. You can:

- Use the OnlineManager *Data Thinning* function to selectively delete recordings manually or automatically on a regular basis.

MORE: See [Data Thinning](#).

- Automatically discard specific types of recording, for example criteria recordings, so that they are never stored.

MORE: See [Discard Recordings Automatically](#).

- Periodically thin your database by manually deleting old recordings.
- Use a combination of options 1, 2, and 3 to automatically discard some recordings then delete others manually every few months.
- Back up your database regularly (every few months or so) and store these old recordings separately on your hard drive, CD-ROM or pen drive. You can then delete all recordings from the 'active' copy of your database.

You can also use the Ascent database optimization tools to compact the database and reclaim lost space. This will help to speed up the program if it is slowing noticeably.

MORE: See the 'Database Optimization' in the Ascent Reference Guide for more information on backing up your database and using the database optimization tools.

Data Optimization (Thinning)

Data thinning enables you to 'thin out' your recordings by removing unneeded historical data. This process can significantly reduce the size of your database thereby improving the speed of data retrieval and display. A thinned out database will also take up less storage space on your hard drive.

You can use data thinning to keep different numbers of recordings for different time periods. For example, you could keep most new recordings but only keep a few recordings from 6 months ago and even fewer recordings from 1 year ago. To help avoid accidental deletions, you will need to view recordings before you can delete them. You can also create a backup file to restore deleted data.

You can perform data thinning using Ascent or OnlineManager. If you use Ascent to do this, you can selectively remove recordings from Folders and individual Machines (unlike OnlineManager where thinning is carried out on the entire database). However, OnlineManager has an additional *automated* data thinning option that is not available with Ascent. You can use this to run your data thinning process automatically on a regular basis.

MORE: See the 'Data Thinning' section in the Ascent Reference Guide.

To thin data using OnlineManager:

1. Select **Options > Configure**.
2. Click the **Data Thinning** button.

Data Thinning ...

Assists in the selective removal of old recordings from your database.

Step 1 : Select the data that you wish to thin

☒ Entire database
☐ Current site
☐ Current folder
☐ Current navigator selection

Step 2 : Define thinning parameters (used by both Ascent and Online Manager)

For recordings older than	1	weeks	, keep one recording per	1	hours
For recordings older than	1	months	, keep one recording per	6	hours
For recordings older than	6	months	, keep one recording per	1	months
For recordings older than	1	years	, keep one recording per	1	years

☒ Keep baseline recordings
☒ Keep recordings with notes or remarks

Add Row Delete Row

Step 3 : View the recordings that will be deleted

View

Step 4 : Perform thinning

☐ Backup database before thinning

Directory ...

Thin Data

Step 5 : Automate data thinning

☐ Automatically perform thinning at regular intervals

Thin every days at hh:mm am/pm (local time)

Ok Cancel Help

Data Thinning

NOTE: 'Entire database' beside Step 1 is the only option available beside Step 1 for removing recordings via OnlineManager to thin data.

3. Select the number of recordings you want to keep over a specified period beside Step 2.
4. Use the dropdown fields and enter numbers in the blank fields to specify how you wish to retain your recordings.

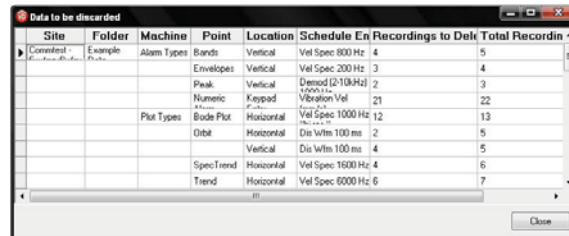
EG: "For recordings older than 2 days, keep one recording per 6 hours".

5. Click **Add Row** to specify additional periods. Any additional rows must have a time defined *further* in the past than the preceding rows.

NOTE: If you click 'Add Row' or 'Delete Row', the bottom row will be added or removed.

6. Tick the required checkboxes to keep all baseline recordings or those that have notes or remarks associated with them.
7. Click **View** beside Step 3 to see the specific schedule entries and number of recordings that will be deleted, and the total number of recordings that exist for that Schedule Entry.

NOTE: The 'Thin Data' button will not become active until you view the records.



Site	Folder	Machine	Point	Location	Schedule En	Recordings to Del	Total Recordin
Example	Example	Alarm Types	Bands	Vertical	Vel Spec 800 Hz	4	5
			Envelopes	Vertical	Vel Spec 200 Hz	3	4
			Peak	Vertical	Demod (2-10kHz)	2	3
			Numeric	Keypad	Vibration Vel	21	22
		Plot Types	Bode Plot	Horizontal	Vel Spec 1000 Hz	12	13
			Orbit	Horizontal	Dis Wfm 100 ms	2	5
				Vertical	Dis Wfm 100 ms	4	5
			SpectTrend	Horizontal	Vel Spec 1600 Hz	4	6
			Trend	Horizontal	Vel Spec 6000 Hz	6	7

Viewing Data to be Thinned

8. Click **Close** to close the window.
9. Adjust your thinning criteria if required.
10. Tick the checkbox beside *Step 4* If you wish to back up your database before removing recordings > Use EITHER of these methods to specify where the backup should be stored:
 - Enter the file path.
 - Click the browse  button > Locate and select a backup folder.
11. Click **Thin Data**.
12. Choose how regularly you want your data to be thinned beside *Step 5* and at what time of the day/night you want the process carried out — OnlineManager will apply your data thinning parameters every time the specified number of days has passed. If the thinning process does not successfully complete, OnlineManager will retry every hour.

NOTE: This step is optional.

*NOTE: If you make a mistake you can use **File > Database > Restore** to restore the data using the backup file you created.*

NOTE: Both recordings will be kept if a recording with a corresponding dual channel recording is marked to be kept. This does not guarantee that orbit plots will be preserved. Orbit plots may only contain an X axis or a Y axis after thinning.

Discard Recordings Automatically

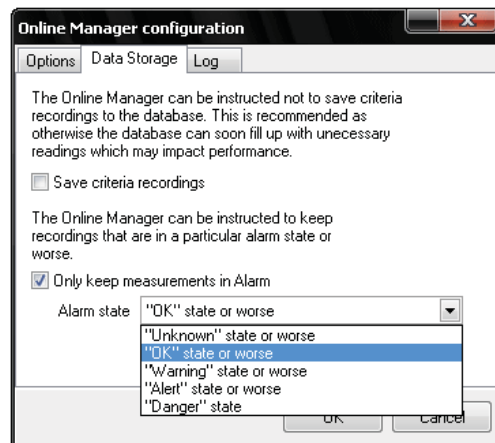
You can use OnlineManager to automatically discard criteria recordings and/or any recordings that do not trigger an alarm. To do this:

1. Select **Options > Configure**.
2. Select the **Data Storage** tab.
3. Select **Only keep measurements in Alarm**.
4. Use the dropdown field to select the alarm states for the recordings that will be saved.

Each alarm state includes itself and any worse alarm states. For example, if you choose *OK*, any recordings that trigger an alarm of *OK*, *Warning*, *Alert* or *Danger* will be saved — All other recordings will be discarded.

NOTE: If you wish to establish baselines and collect trendable data, you will need to save at least some recordings that are in an 'OK' state.

TIP: By default, criteria recordings are automatically discarded to prevent your Ascent database filling up with unnecessary recordings. We recommend that you keep this default setting.

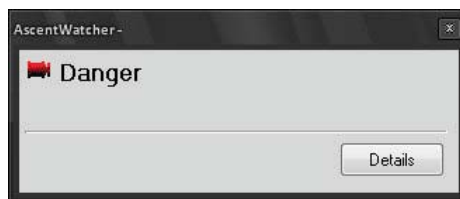


Discarding Non-Alarming Measurements

Section 6: Automated Alarm Notification

— AscentWatcher

AscentWatcher is used to monitor Ascent databases and provides automated notification of any changes in Machine alarm state. You can receive notifications via email, SMS/TXT message, onscreen popup messages, and/or a flashing icon in the system tray.



Example popup Notification Message

An monitor  icon will display in your system tray when a database is being monitored. This will change color when a Machine's alarm status changes. Depending on your settings it will flash.



System Tray Icon

Once you receive notification of a Machine's changed state you will need to 'acknowledge' the alarm to clear the message. You can then use Ascent to display and analyze the recordings that have triggered the alarm(s).

NOTE: AscentWatcher monitors entire databases rather than individual Folders or Machines.

Create AscentWatcher File

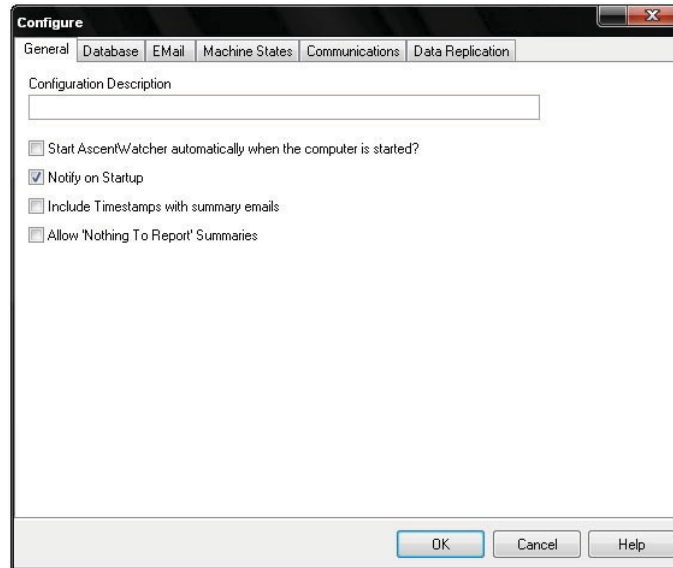
To monitor a database you will need to create a file in *.AscentWatcher* format. This file contains information telling AscentWatcher which database to monitor and when and how you want to be notified of a Machine's changed alarm state — Email, popup message, and/or a flashing icon in the system tray. These files can be configured to run automatically each time you start your PC — If you do this you will never need to manually start the program after the initial setup.

When new data is received by Ascent and AscentWatcher is running, you will be notified of any changes in Machine status. Alarms are checked automatically by Ascent when new recordings are received so AscentWatcher will notify you immediately.

NOTE: You do not need to run Ascent to set up your .AscentWatcher files.

To create an *.AscentWatcher* file:

1. Start AscentWatcher using EITHER of these methods:
 - Double-click the AscentWatcher shortcut on your desktop:
 - Select **Start > All Programs > Commtest > Ascent > AscentWatcher.**
2. Click **Config** on the toolbar to open the *Configure* window — You can use this area to specify which database to monitor and how you wish to receive alarm notifications.



AscentWatcher Configuration

3. Enter a descriptive name for the configuration in the field provided — For example, you may wish to use the name of the database you will be watching. This description will display in notification messages, the main AscentWatcher window title bar, and the Windows tooltip when you hover the mouse over the system tray icon. If you are monitoring several databases a well-named description will help identify the database currently being monitored.
4. Tick the top checkbox if you would like AscentWatcher to run automatically when you switch on your computer.
5. Select a database to monitor:
 - a. Select the **Database** tab.
 - b. Enter the absolute path to the database file or click the browse  button to locate and select your database — Here are the default locations by operating system:
 - **Windows XP, Server 2003** — *C:\Documents and Settings\All Users\Documents\<name of database>.FDB.*
 - **Windows Vista** — *C:\Users\Public\Documents.*
 - **For Windows 7** — *C:\Users\Public\Public Documents.*

Configure

General Database **Email** Machine States Communications Data Replication

Select the database to watch

Enter the Username / Password to use to connect to the database

Username:

Password:

Default

It is recommended that you test the details that you have entered to make sure that they are correct. You can do this by clicking on the Test button below.

Test

OK Cancel Help

Database Connection Configuration

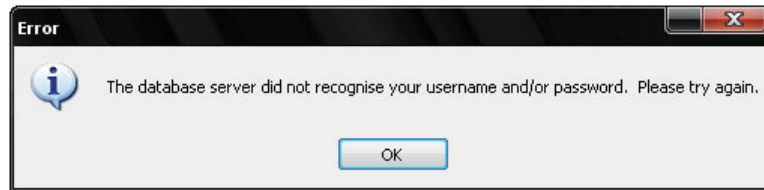
6. Enter your username and password if you normally log in to this Ascent database — If you do not use an Ascent login this means the default settings are still enabled.
7. Click **Default** to automatically populate the fields.
8. Click **Test** to check whether you can connect to your chosen database.

NOTE: If you have not previously been granted access to this database, your system administrator will need to set up user accounts for each database you wish to monitor. Please refer your system administrator to the 'Create and Manage User Accounts' section of the Ascent Reference Guide.

9. Select the **Machine States** tab.
10. Tick the **Enable monitoring of machine states** checkbox.
11. Select an alarm state in the dropdown field — AscentWatcher will notify you whenever a Machine enters this state.
12. Tick or untick the checkboxes to select your preferred type of notification.

Troubleshooting

When you click **Test** or **OK** on the *Configure* window, an error message will display if you do not have permission to access the selected database.



NOTE: If you have not previously been granted access to this database, your system administrator will need to set up user accounts for each database you wish to monitor. Please refer your system administrator to the 'Create and Manage User Accounts' section of the Ascent Reference Guide.

If you get a different error message read it carefully to try and determine the source of the problem. For example, if Ascent cannot connect to your chosen database you may have entered the path incorrectly.

Set up Email Notification

You can have email notifications sent to one or more people. For this to happen, you will need to enter their email account details in the AscentWatcher file. To do this:

1. Click **Config** to open the *Configure* window.
2. Select the **Email** tab.
3. Enter the name of your SMTP server and its port number — See [Outlook Express Users](#) or ask your system administrator for this information.
4. Enter the name you'd like the message receiver to see in the *From Name* field — If the message is received by you, this name will be replaced with the name you have set up in your email program.
5. Enter your email address in the *From Address* field — This is the address that will display in the *Reply To* field when the message is received. You can specify any email address here, including those you use off-site or at home. You do not have to use the 'work' email address on your company's SMTP server.
6. Enter the username and password required to access the SMTP server In the *Logon Information* fields.
7. Click **Add**.
8. Enter an email address you want notifications sent to.
9. Select the email address > Click **Test** — AscentWatcher sends an email to this address to confirm that this notification method is working.
10. Repeat the above steps to send email notifications to additional addresses (if required).

NOTE: If you have an existing distribution list that you use to send messages to several people in your company, you can use this single address here instead of specifying multiple individual addresses.

The screenshot shows a 'Configure' dialog box with a tabbed interface. The 'Email' tab is selected. The dialog contains the following sections and fields:

- General** (selected tab), **Database**, **Email**, **Machine States**, **Communications**, **Data Replication**
- Simple Mail Transfer Protocol (SMTP) is used to send outgoing emails. Please ask your System Administrator for your SMTP server details and logon details and fill them in below.
- SMTP Server Information**
 - Server Name: smtp.commtest.com
 - Port: 25
- Logon Information**
 - User Name: jsmith
 - Password: [masked]
- Sender Information**
 - From Name: John Smith
 - John Smith ()
 - From Address: jsmith@commtest.com
- Enter the email address that you would like notifications sent to:
 - jsmith@commtest.com
 - jdoe@commtest.com
 - maintenance@commtest.com
- Buttons: Add, Edit, Delete, Test
- Buttons: OK, Cancel, Help

Email Notification Configuration

Outlook Express Users

To access your IT details for Outlook Express:

1. Open Outlook Express.
2. Select **Tools > Accounts**.
3. Select the **Mail** tab > Select an appropriate email account > Click **Properties** to view the account details.
4. Select the **Servers** tab > Write down the name of the *Outgoing* mail server — This is the SMTP server name you will need to enter in the AscentWatcher *Email* window.
5. Find your username and password under *Incoming Mail Server*.
6. Select the **Advanced** tab — The port number is listed under *Outgoing mail SMTP* server (depending on the version of Outlook you are running). If the port number is not listed, try entering **25** (the default). If this does not work when you send a test email, ask your system administrator for the correct port number.
7. Close all windows to return to the AscentWatcher *Email* window.
8. Enter the details you wrote down.

NOTE: Email reports that include an asterisk () beside a Machine indicate that the Machine(s) have not yet been acknowledged.*

Set up SMS Notification

SMS (Short Message Service) enables you to receive alarm notifications as text messages on your mobile phone. An SMS gateway provider will be able to supply you with an email address you can use to redirect alarm notifications to your mobile. Your local telecommunications service provider should be able to help you with such a service.

To set up SMS notification, follow the instructions in the previous topic for setting up email notifications. Use the email address supplied by the SMS gateway provider when entering the email address.

Communication Error Notification

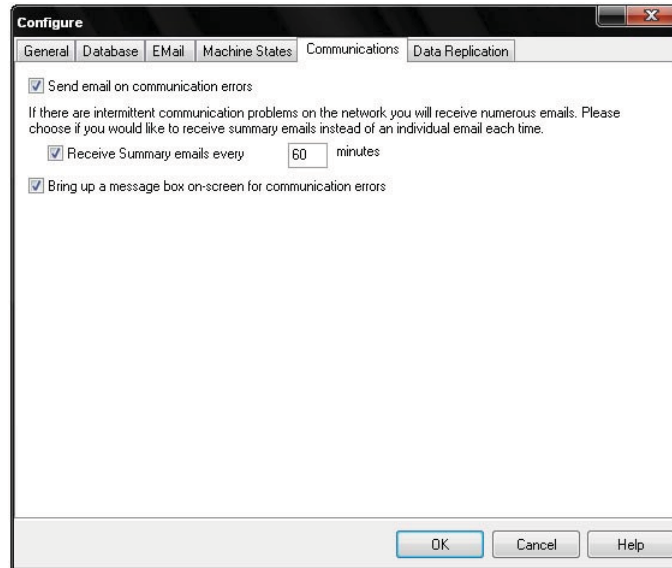
AscentWatcher can notify you if communication is lost between OnlineManager and a Ranger device. You can receive individual error notifications or a summary of communication problems over a specified number of minutes. (The email summary option is provided for networks with high latency or low bandwidth issues as these could generate numerous communication errors and therefore several emails.)

To set up communication error notifications:

1. Select the **Communications** tab.
2. Select your preferred notification method — Email or popup message.
3. Tick the **Receive Summary emails every** checkbox to limit the number of summary emails you receive and prevent a constant stream of messages > Enter a minute value to specify the frequency that emails will be sent.
4. Click **OK** to finish.

If you select the email option, messages will be sent to the email addresses, distribution lists, and SMS gateway service addresses you specified under the *Email* tab.

MORE: See [Set up Email Notifications](#).



Error Notification Configuration

Save AscentWatcher File

To save an AscentWatcher file, click **OK** — Save this configuration with a descriptive file name.

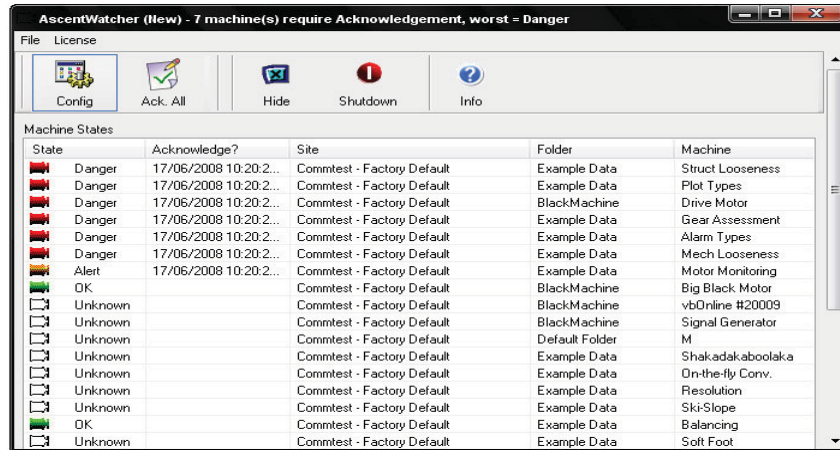
TIP: We recommend saving the .AscentWatcher file to the default location.

Troubleshooting

Popup messages display by default at the bottom-right corner of your screen. If you drag the message elsewhere it will display there from then on until you close and restart the program.

To view details about an error message for a machine:

1. Use EITHER of these methods to access error message details:
 - Click **Details** to clear the popup message.
 - Click the icon in the system tray if you chose the flashing icon option.
2. Select **right-click > Acknowledge** to view the details of your Machines and acknowledge any alarms — The main window lists the contents of your chosen database by Site, Folder, and Machine.
3. Acknowledge any flashing machines by clicking **Ack. All**.
4. Open your Ascent database and analyze the latest recordings of any Machines that are in alarm.



AscentWatcher Status Window

Monitor More Than One Database

A single *.AscentWatcher* file can only monitor one database. If you have several databases you wish to monitor, you must create a separate *.AscentWatcher* file for each one. To do this:

1. Click **Config**.
2. Select another database and set up your preferred notification method.
3. Select **File > Save As** and enter a new name so that you don't overwrite the previous *.AscentWatcher* file.

Edit AscentWatcher File

When you run AscentWatcher, it automatically loads the *.AscentWatcher* file for the previously watched database. To edit an *.AscentWatcher* file:

1. Click **File > Load > Locate** and open the *.AscentWatcher* file you wish to edit.

NOTE: You can skip this step if the .AscentWatcher file you wish to edit is already open.

2. Click **Config**.
3. Edit the details as required.
4. Click **OK**.
5. Select **File > Save** to retain your changes.

AscentWatcher

You can have AscentWatcher run automatically when you start your PC. To do this, simply select the *run at startup* option when you create each *.AscentWatcher* file:

1. Select **File > Config**.
2. Select the **General** tab of the *Configure* window that opens.

MORE: See [Create AscentWatcher File](#).

You can monitor multiple databases simultaneously by creating an *.AscentWatcher* file for each database and selecting this option for each one.

Manually Monitor Database Using AscentWatcher

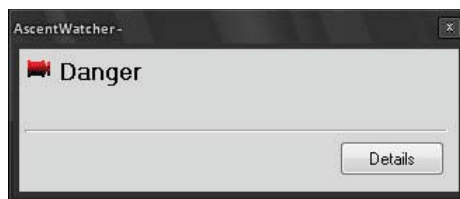
You can start AscentWatcher manually at any time by selecting it from the Windows Start menu. The last database you monitored will be loaded automatically when you run the program.

To select a different database to monitor, select **File > Load > Choose another .AscentWatcher file**.

To monitor more than one database using this method, start another instance of the program using the Start menu > Load a different .AscentWatcher file. Repeat the process for additional databases.

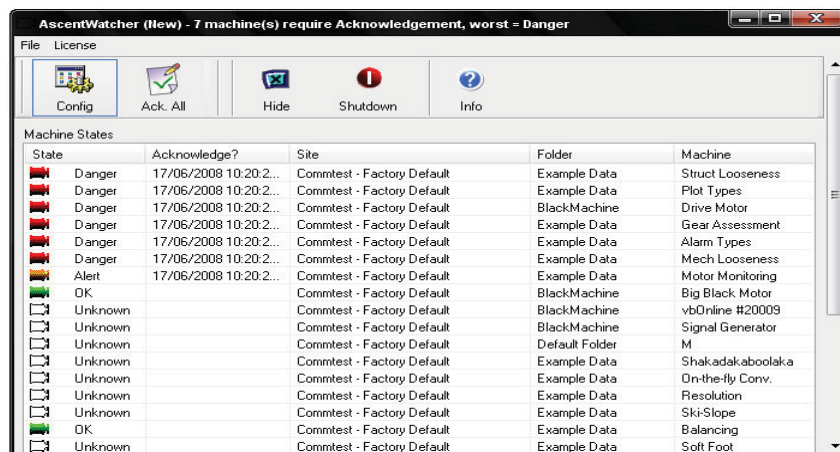
Use AscentWatcher

Popup messages identify a database by its description and display the worst alarm state.



Popup Alarm Notification

The main AscentWatcher email opens when you click the **Details** button on the popup message or the flashing taskbar icon. This window shows you all the Machines in the currently monitored database. If a Machine has no alarms assigned to it, its state will be listed as *Unknown*.



AscentWatcher Status Window

The window title bar contains a description of the database currently being monitored. This is the description you entered when you created the .AscentWatcher file for this database.

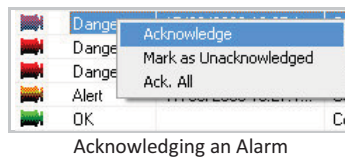
MORE: See [Create AscentWatcher File](#).

Acknowledge Machine is in Alarm

When a Machine is in alarm you will need to acknowledge that Machine using EITHER of these methods:

- Click the **Ack. All** button.
- Use the right-click shortcut menu to select and acknowledge individual Machines.

Acknowledging an alarm stops the icon flashing — No other action is carried out.



Mark Machine as NOT in Alarm

You can also mark one or more Machines as NOT acknowledged. You might find this function useful if there are several Machines newly in alarm and you want to check them one at a time in Ascent. An unacknowledged Machine will continue to flash until acknowledgement is received. This can serve as a useful reminder of which Machines you have and have not checked.

To mark one or more Machines as NOT acknowledged, right-click the machine > Select **Mark as Unacknowledged** from the shortcut menu.

Change Sort Order

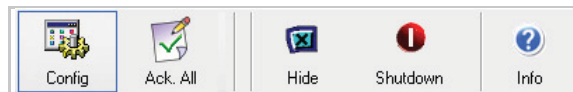
You can use different sort orders to group Machines in a manner practical for you. For example, you can sort Machines by Folder to list each Machine in an individual Folder by its alarm state. This makes it easier to decide which Folders to investigate first.

You can click the labels at the top of each column to re-order the Machines. For example, you can click **State** to order Machines by their highest or lowest alarm state, or **Machine** to sort Machines alphabetically by name.

Machines are always sorted first by column then by alarm. For example, clicking **Folder** will sort the Machines in each Folder and rank them according to their alarm state. Clicking **Folder** again will toggle the alarm state from highest to lowest.

Toolbar Buttons and File Menu

Most options are available from the main toolbar and also accessible from the **File** menu (along with some additional options).



AscentWatcher Menu Bar

The table describes the functions available.

Function	Description
Config	Open the configuration window so you can create/edit an <i>.AscentWatcher</i> file.
Ack. All	Acknowledge all relevant Machines in this database.
Hide	Hide the main AscentWatcher window but leave it running in the background. The icon remains in the system tray. You can click the icon to make the main window re-appear.
Shutdown	Close AscentWatcher completely.
Info	Display AscentWatcher version information.
File > Load	Load an <i>.AscentWatcher</i> file to monitor a specific database.
File > Save	Save the current configuration to an <i>.AscentWatcher</i> file — i.e. save the Machine list you see in the main window.
File > Save As	Create a new <i>.AscentWatcher</i> file to monitor a different database.

Troubleshoot Startup Files

If you tick the checkbox to run an *.AscentWatcher* file automatically at startup, the program creates a link which it uses to locate this file when Windows starts. This link can be broken by accidentally moving or deleting the *.AscentWatcher* file, which might produce the following problems:

- *File not found* errors when starting Windows.
- The wrong *.AscentWatcher* file opening when Windows starts.

To fix the error you will need to remove the links to some or all *.AscentWatcher* files. To do this:

1. Open an *.AscentWatcher* file in the main window.
2. Click **Config**.
3. Untick the option to start the program automatically.
4. Click **OK**.
5. Right-click the Windows **Start** button > Select **Explore**
TIP: Ensure you do NOT select 'Explore All Users'.
6. Navigate to **Programs > Startup** — Your *.AscentWatcher* file startup links will be listed here.
TIP: You can recognize them by their machine icons.
7. Delete any links that are not working correctly — Once this is done you can re-create the links by editing the files.
8. Open an *.AscentWatcher* file in the main window.
9. Click **Config**.
10. Reselect the **start automatically** option.
11. Repeat the above steps for all databases you want automatically monitored when Windows starts.

Section 7: Making Data Available – AscentOPC

The AscentOPC application is intended for use on 32-bit operating systems. If your computer uses a 64-bit operating system a separate application, AscentOPC (x64), must be used.

MORE: See [Install AscentOPC \(x64\)](#) for the required installation procedure.

The AscentOPC system makes information from an Ascent database available to OPC clients. AscentOPC can be integrated into your factory's existing Distributed Control System using OLE for Process Control (OPC).

AscentOPC enables you to make machine data available to anyone across your factory's Windows network. You can display all vibration and band alarm values from machine level down to individual sensors be for the following schedule entry types:

- QuickScan
- Tach
- Linear speed
- Average value

In addition to raw numeric data—E.g. for average value and speed—and alarm status at each hierarchy level, AscentOPC provides information on hardware faults by publishing a *channel inoperative* status (alarm level 11).

Recordings and alarms are updated in real time, ensuring you always have the most recent information at hand.

How AscentOPC System Works

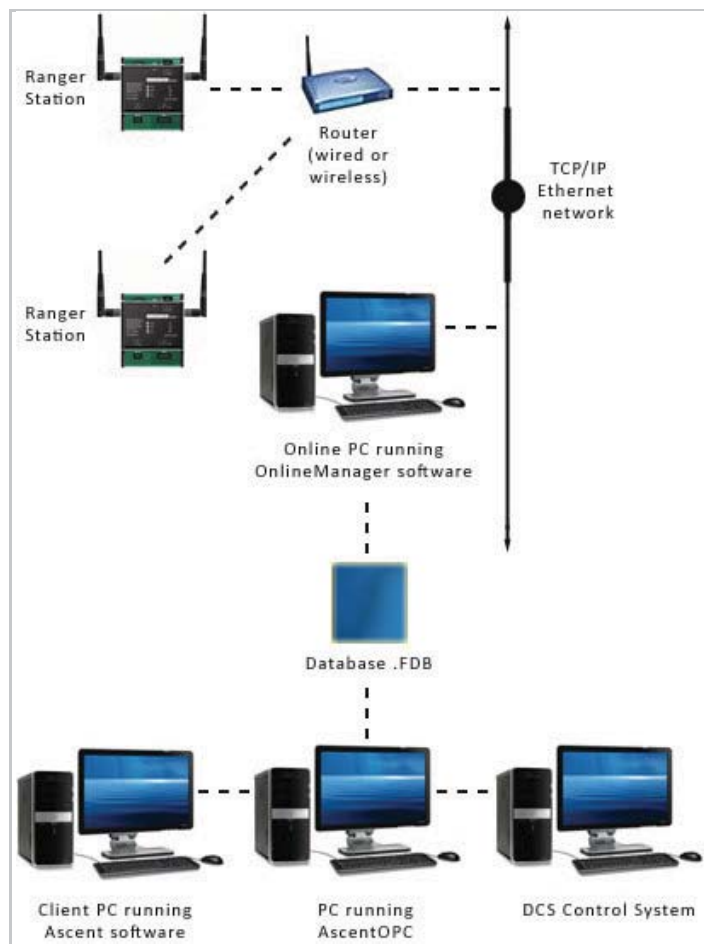
The AscentOPC system comprises the AscentOPC server program and one or more OPC clients (one for each user). The AscentOPC server publishes any new recordings as soon as they are added to an Ascent database and updates all connected OPC clients. You can connect to the AscentOPC server via an OPC client and view the published data on your own computer.

Setup

Your system administrator only needs to install the AscentOPC server program on one computer. They can then run Ascent and select one or more Folders of Machines to publish, making them available for viewing.

Each client user will need to install an OPC client on their computer. They can then use this to connect to the AscentOPC server across the network. Once you are connected to the server, you can use your OPC client to select the Machines you wish to monitor.

NOTE: This is NOT Commtest software.



An Example AscentOPC Configuration

Notes

Here are some things to be aware of when using AscentOPC:

- Client users do not need to have Ascent installed on their PC. This is because they will be accessing the data through the AscentOPC server.
- You can install the Ascent database and AscentOPC server on one PC or separate PCs if your Ascent licence includes network support.
- Ascent does not need to be running for clients to view information. Once the AscentOPC server has been set up and pointed at a database, the server can access any new recordings and their associated alarms.
- When the database is updated by Ascent—e.g. when new Ranger recordings are collected—AscentOPC updates any clients that are connected. The Ascent database can be updated by a Ranger device or by an Ascent user manually transferring data from a portable vbSeries instrument.
- The server will only publish one database at a time. OPC clients can only see the database currently being published.

Install AscentOPC (x64)

AscentOPC and AscentOPC (x64) offer similar functionality and operational characteristics. The procedure below describes the steps required to install the AscentOPC (x64) application for 64-bit operating systems. If your computer uses a 32-bit operating system, you should use the AscentOPC application installed as part of the Ascent software suite.

MORE: See [Ascent Software Suite Installation and Setup](#).

To install AscentOPC (x64):

1. Run the **AscentOPC (x64)** [Version].exe program located at the root of your installation CD-ROM.
2. Click **Next**.
3. Scroll down to the bottom of the license agreement text > Tick the
4. two checkboxes.
5. Click **Next** twice.
6. Click **Install**.
7. Click **Next**.
8. Click **Finish**.

Available OPC Data

The table lists the data items you can retrieve from the Ascent database using an OPC client.

Item	Data
Alarm Level	A numeric value indicating the alarm level. 0 = OK 1-3 = Warning 4-6 = Alert 7-10 = Danger 11 = Channel Inoperative
Alarm Status	A text conversion of the Alarm Level number, such as 'Channel Inoperative' or 'OK'.
RPM	Revolutions per minutes.
Units	The measurement unit being recorded, such as 'mm/s', 'm/s' or 'deg K'
Value	The actual measured value.

Band Alarms

When publishing band alarm information, AscentOPC provides the following details:

- **Alarm value** — Displayed in the OPC client tree under *Folder.Machine.Point.Location.SE Name.Band Alarm Name.Value*.
- **Unit** — Displayed in the OPC client tree under *Folder.Machine.Point.Location.SE Name.Band Alarm Name.Units*.
- **Alarm level** — Displayed in the OPC client tree under *Folder.Machine.Point.Location.SE Name.Band Alarm Name.Alarm Level*.
- **Alarm status** — Displayed in the OPC client tree under *Folder.Machine.Point.Location.SE Name.Band Alarm Name.Alarm Status*.

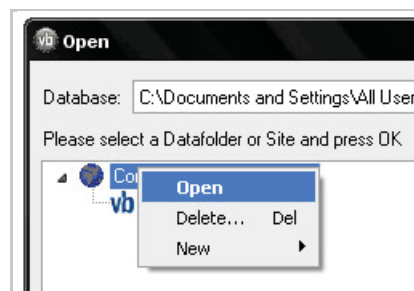
NOTE: To view an Overall value, simply create a band alarm that covers the entire frequency range of the recording.

Publish Folder

Each site in a database can contain several Machine Folders. These Folders are published by the AscentOPC system (rather than individual Machines). Publishing a Folder makes every Machine in that Folder available to the AscentOPC server, which displays this information to OPC clients. To publish a folder:

1. Open Ascent.
2. Right-click the Site  icon > Select **Open** — When the navigator opens it will group and display every Folder in that Site.
3. Right-click a Folder > Select **Publish using OPC**.
4. Repeat this process for each Folder you want published > Click the **Save** button on the toolbar when you have finished.
5. Close Ascent — You do not need to run Ascent at the same time as AscentOPC. This is because the server can access any new data directly through the database file.

NOTE: Publishing makes every Machine within the Folder visible to OPC clients. If you do not want a Machine published you can move it into another, unpublished Folder.



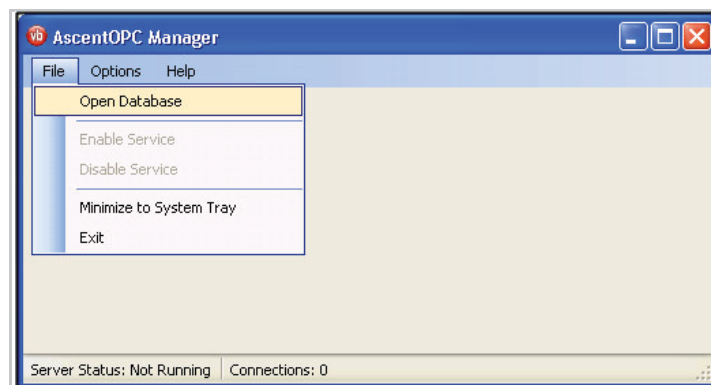
Open Site

Set up AscentOPC

To set up AscentOPC:

1. Use EITHER of these methods to access the OPC Manager:
 - **32-bit environment** — Select **All Programs > Commtest > Ascent > AscentOPC**.
 - **64-bit environment** — Select **All Programs > Commtest > AscentOPC (x64) > AscentOPC Manager**.
2. Open the required database using ONE of these methods:
 - Select **File > Open Database**.
 - Click **Open** if your database is already displayed in the *Select Database* window.
 - Select a recently opened database > Click **Open**.
 - Use the **Browse** button to locate and select a database held on your PC.
 - Select the **Network Connection** tab to open a database held elsewhere on the network (if your Ascent licence allows networking) > Click **Open** when you have selected a database.

MORE: See the 'Connect to Network Database' section in the Ascent Reference Guide.



AscentOPC Server Application

Run AscentOPC

These functions do not apply to the AscentOPC (x64) application. AscentOPC (x64) will automatically activate when it detects an OPC client request. It will continue to operate automatically when you close AscentOPC Manager. This means you do not need to minimize the manager interface during operation.

When the AscentOPC server is running, any user can run their OPC client to connect to the server and view Machine data.

To run AscentOPC:

1. Click the **x** button at the top right of the server window to minimize it without closing the program.
2. Double-click the AscentOPC server  icon in the system tray to maximize the server window.
3. Close the server program using EITHER of these methods:
 - Select **File > Shutdown**.
 - Right-click the system tray icon > Select **Shutdown** from the shortcut menu.

Run AscentOPC Server Automatically on Startup

You can have the AscentOPC server run automatically whenever the computer is switched on and a user is logged in. To access this setting, select **Options > Run on startup** — The application will run minimized in the system tray.

View another Database

Database selection is carried out via the AscentOPC server. OPC clients can only view the database currently being published.

To view a different database:

1. Select **File > Open Database** on the AscentOPC server menu.
2. Use EITHER of these methods to select the required database:
 - Click the **Browse** button to navigate to the required database.
 - Select the **Network Connection** tab to open a database held elsewhere on the network.
3. Click **Open** when you are returned to the *Select Database* window.

NOTE: If you are publishing this database for the first time you will need to run Ascent and select the Folders you wish to publish. See [Publish Folder](#) for more information.

Update AscentOPC Server

These functions do not apply to the AscentOPC (x64) application.

When the server is running it takes an initial 'snapshot' of the current Machine structures and displays all new data as it arrives. If new data is added to a Folder while the server is running—E.g. if a new Location is added—the OPC client will NOT show any structural changes until you restart the server program. If data is removed from the database—E.g. a Location is deleted, the server will continue publishing the last values before the data was removed. However, the changed data will be labeled as poor quality.

To update the server:

1. Right-click the AscentOPC server  icon in the system tray.
2. Select **Shutdown**.
3. Restart the program.

Change AscentOPC (x64) Server Name

This function applies only to the AscentOPC (x64) application.

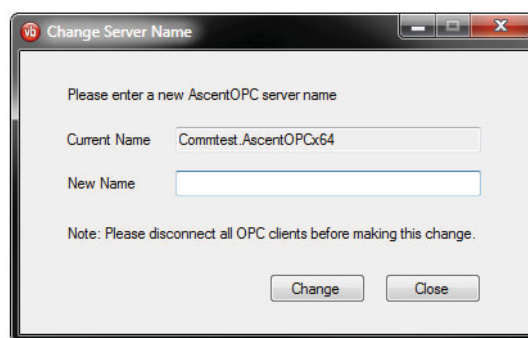
After installing the AscentOPC (x64) application, the AscentOPC server's default name is *Commtest.AscentOPCx64*. If you are upgrading from an older version of the AscentOPC application, you may have previously configured your OPC clients to use the previous AscentOPC application's server name. For past versions, this was *AscentOPC* by default.

To simplify configuration of connected OPC clients expecting to connect to the previous server name, you might wish to edit the AscentOPC (x64) server name to match that of the previously used 32-bit AscentOPC name.

NOTE: If you are NOT upgrading an existing AscentOPC instance, changing server name should not be necessary.

To change the AscentOPC server name:

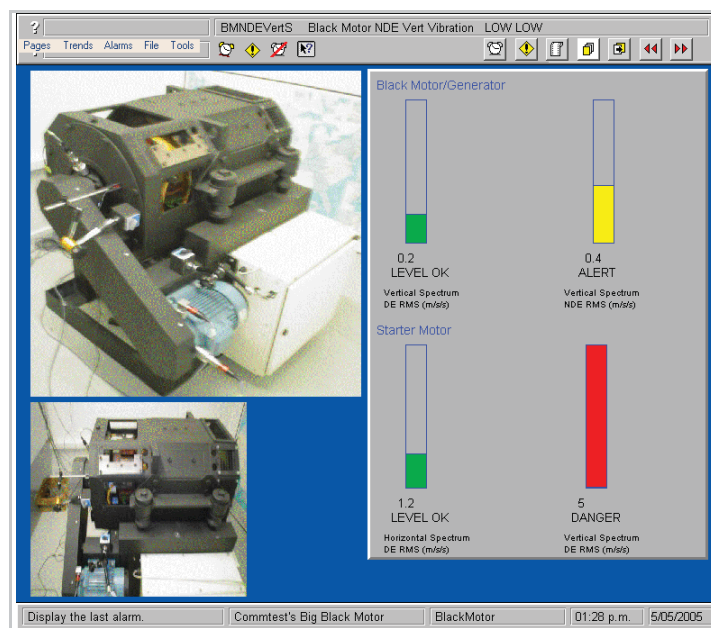
1. Select **All Programs > Commtest > AscentOPC / AscentOPC (x64) > AscentOPC Manager** — The AscentOPC Manager opens.
2. Ensure all OPC clients are disconnected from the OPC server.
3. Select **Options > Change Server Name ...**.
4. Enter a new server name in the field provided, ensuring this does not contain any spaces.
5. Click **Change**.
6. Click **OK** — The new server name will now be used, and displayed on connected OPC clients.



Changing the AscentOPC server name

View Data — OPC Clients

Once the AscentOPC server is running, anyone with an OPC client on their PC can connect to the server to view Machine data. There are several OPC clients available that you can use to connect to the AscentOPC server — E.g. CitectSCADA. Your Distributed Control System administrator will be able to advise you on the most suitable OPC client for your requirements.

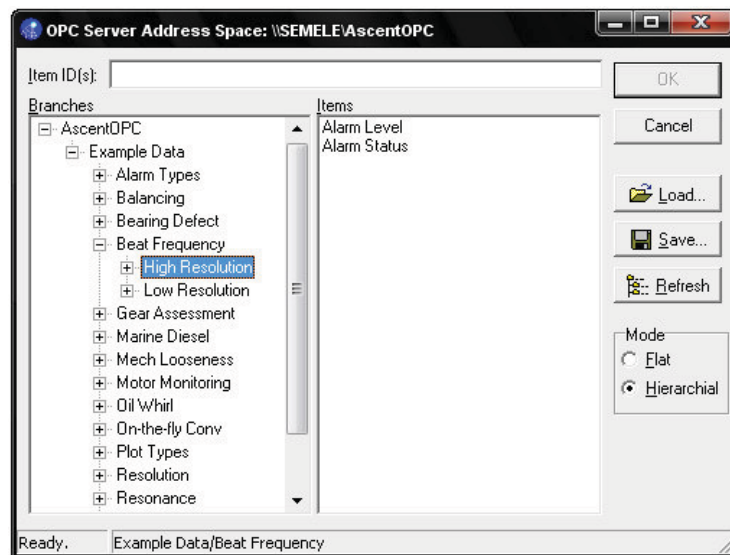


Graphical Interface Created with CitectSCADA Showing Live Alarm Levels

View Data in List or Navigator Tree Style

OPC clients can browse the AscentOPC data using a navigator tree-style display rather than a complete item list.

The *Hierarchical Browsing* option enables clients to see a view of the data similar to the Ascent navigator tree structure. Clients can click on parts of the tree structure to expand Machines, Points, and measurement Locations.



Example OPC Client Viewing Data Using Hierarchical Browsing

To display data using a navigator tree-style in AscentOPC or AscentOPC Manager, select **Options > Hierarchical Browsing**. You can deselect this option to display items in list-style.

NOTE: Because the display of data is controlled from the server program, ALL connected clients will see their data in the format selected here — Tree or list style.

NOTE: Browsing options can only be changed when no clients are connected. If clients are connected, the software will notify you of this restriction.

Section 8: Maintenance and Support

This section contains details on device maintenance, setup tasks, as well as contact details should you require technical support.

Proflash Ranger Device with New Firmware

New Ranger device firmware may be available periodically to provide new features and improve system stability.

You can download the latest firmware version for your Ranger devices from the Commtest website — <http://www.commtest.com/>.

Once you have downloaded the firmware, you can apply it to the Ranger devices using Ascent. This process is called Proflashing.

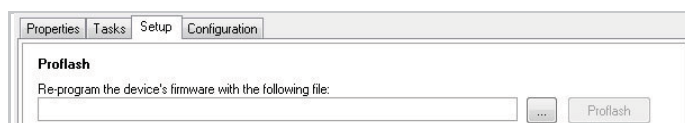
Proflashing the Ranger device will typically take one to two minutes. Ensure you do NOT interrupt this process as doing so may damage the Ranger device.

To Proflash to a newer version of the Ranger device firmware (.hex file format) using Ascent:

1. Use EITHER of these methods to open the *Online Device Setup* wizard:
 - Select **Edit > Online Device Setup**.
 - Press **CTRL+ALT+S**.
2. Select a Ranger Station or Ranger Sensor device from the *Online Device Setup* wizard > Click **Edit** — The *VB Device Properties* panel opens.
3. Select the **Setup** tab to display the Proflash option.
4. Use EITHER of these methods to locate and select the required Proflash file:
 - Enter the local path to the downloaded .hex file in the field provided.
 - Use the browse  button to navigate to the correct location > Select the Proflash file > Click **Open**.
5. Click the **Proflash** button.
6. Follow the onscreen instructions — You will be notified when the Proflash is complete.

7. Repeat the Proflash sequence for all Ranger Sensor and Ranger Station devices in your Ranger System.

NOTE: The firmware for the Ranger Booster device is typically upgraded using a direct serial connection. This is a procedure that only can be performed by Commtest-authorized personnel (e.g. system installers).



Selecting a Proflash File

Proflash Multiple Ranger Stations

You can use the *Macro* editor / *Bulk Tasks* tool to repeat one task on multiple instruments in a single automated step — E.g. Proflash all wired Ranger Station devices in a network.

NOTE: Ranger Sensors must be Proflashed individually due to slower wireless network speeds.

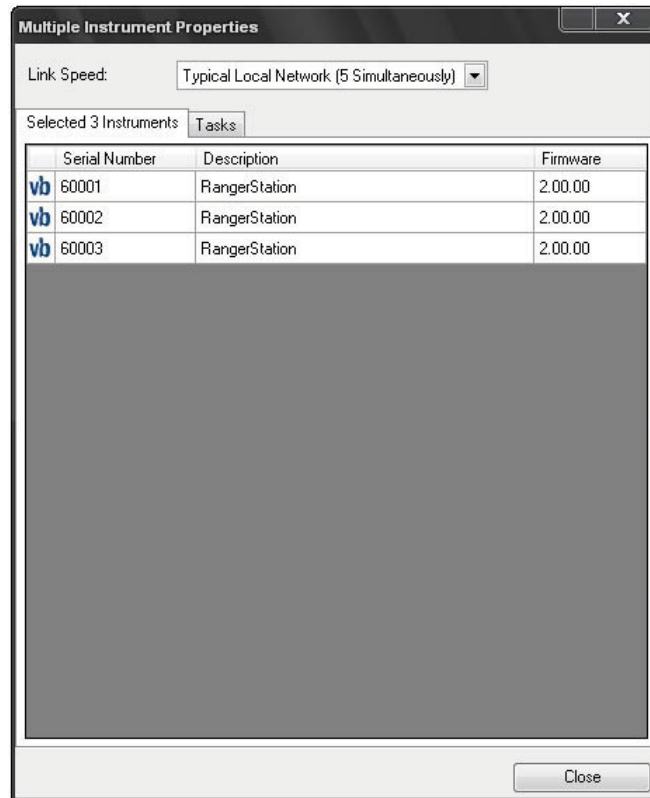
To Proflash Multiple Ranger Stations:

1. Open Ascent.
2. Select **Edit > Manage > vb Instruments ...**.
3. Select all devices you wish to update or modify from the device list.

*TIP: You can select multiple instruments by holding down the **CTRL** key while you click the instruments you wish to select.*

NOTE: The number of selected devices will be appended to the  button as you select or deselect them.

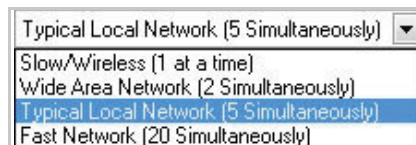
4. Press the **Configure** button — The *Macro Editor* system begins its configuration sequence. This process may take several seconds depending on the number of devices selected. Once the configuration process is complete, the *Multiple Instrument Properties* panel opens.



Multiple Instrument Properties

5. Select a network link speed from the *Link Speed* dropdown field.

NOTE: On a fast network you may be able to Proflash up to 20 Ranger Stations simultaneously. However, in most networks a maximum of five devices should be upgraded at once.



Link Speed — No. of Simultaneous Device Actions Supported

6. Select the **Tasks** tab.
7. Select ONE of these options:
 - **Proflash** — Proflashes all selected Ranger devices.
 - **Reset Device** — Resets all selected Ranger devices. This is equivalent to restarting the device.
 - **Abort Recording** — Not applicable to Ranger Systems.
8. Click the **Proflash** button — The firmware selection window opens.
9. Browse to the correct firmware location > Select the Proflash file (.hex file extension).
10. Click **Open** — The *Multiple Tasks* window opens and the required task is performed for all instruments.

NOTE: The Multiple Tasks window will keep you updated about the progress of the Proflash task. This may take several minutes to complete, depending on the number of devices being upgraded. A checkbox will be ticked beside each instrument once it has been successfully Proflashed.

11. Click **Close** once the Proflash sequence is complete.

IMPORTANT! *Ensure you do NOT interrupt the Proflash process. Doing so may damage the Ranger device. Ascent will notify you when the Proflash is complete.*

Using Multiple Ranger Stations

If multiple Ranger machinery health information system Personal Area Networks (PANs) are required within a site—either due to physical segregation or if the required number of Sensors exceeds the maximum that individual Ranger Stations can accommodate (32)—each network of Ranger Stations and Ranger Sensors must be configured to communicate using different CCN RLAN radio frequency channels. Doing so prevents co-channel interference and the possibility of system slowdowns due to bandwidth constriction or collisions.

The 2.4 GHz RF channel selected for each PAN should also be free of other interference, such as that generated by:

- **Communication and networking devices** — E.g. cordless telephones, radios, and wireless network routers.
- **Other RF emission sources** — E.g. Microwave ovens and compact fluorescent lights.

You cannot change the Ranger network's CCN RLAN RF channel in Ascent. It must be configured during initial setup using a separate installation and configuration utility. Please contact Commtest Support or your system installer if you suspect RF interference is affecting your sensor network.

NOTE: RF channels should not be confused with Wi-Fi channels. To change the Wi-Fi channel used to communicate with the Ranger Station, see '[Configure Wireless \(Wi-Fi\) Connection](#)'.

Contact Technical Support

If you require technical support for your Ranger System or the Ascent software suite, please contact Commtest Support at help@commtest.com.

A knowledgebase of frequently asked questions (FAQs) is also available at <http://www.commtest.com>.

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