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# Phenom™

## Remote Assisent

Improved service for your Phenom Microscope





# Benefits of Remote Assistant

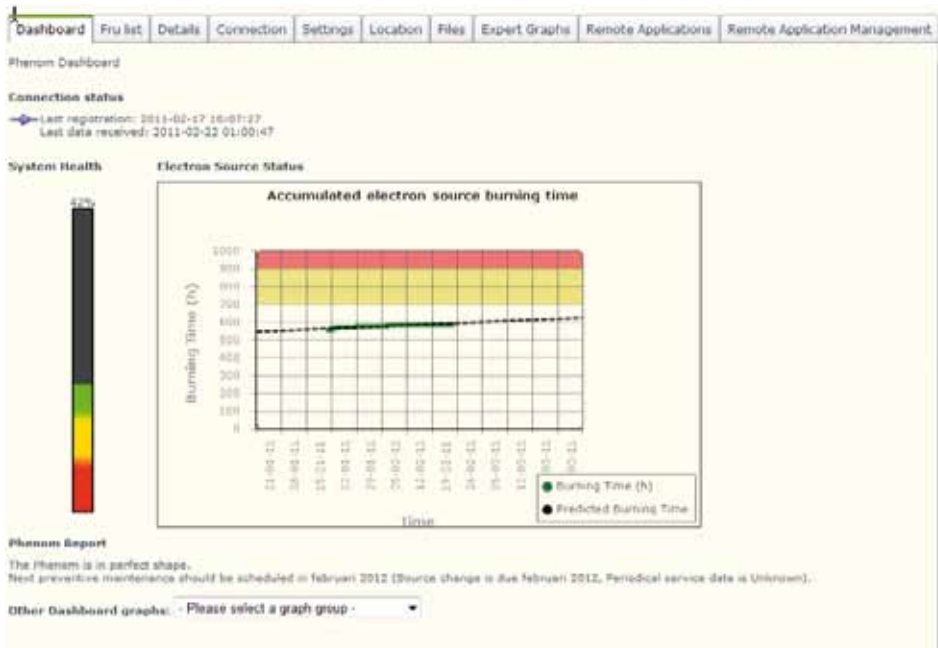
## Improved service for your Phenom Microscope

Phenom™ Remote Assistant (PRA) is a zero-cost service program that allows for remote tracking, diagnostics, adjustments and repair of Phenom systems. Powered by Sioux Remote Solutions' Machine2World®, a secure infrastructure for remote diagnostics, Phenom Remote Assistant can mean reduced time to repair, fewer machine returns to the service center, and increased reliability and up-time for your Phenom system.

Phenom Remote Assistant (PRA) is included at no additional charge with your Phenom. Just connect your Phenom to a network with high-speed Internet access, configure the Phenom, and verify your connectivity to the secure Phenom-World Support Server. You can then start enjoying the benefits and security of Phenom Remote Assistant.

Phenom Remote Assistant uploads on a regular basis data, critical to the performance of your Phenom, to the the Phenom-World Support Server. On the the Phenom-World Support Server Phenom-World service can diagnose your Phenom for:

- 1 Latest status of critical tool parameters.
- 2 Trending info of critical tool parameters.
- 3 Usage information.



Based on this information, Phenom Customer Support Engineers are capable of providing you with suggestions to improve the use of the Phenom for your work. The information is also used to determine when preventive maintenance is needed. In case of a non-recoverable error in your Phenom, the PRA service enables our customer support engineers to quickly diagnose and remedy the problem.

**With Phenom Remote Assistant, you can authorize Phenom-World Customer Support to remotely:**

- Track key performance metrics over time;
- Run service test diagnostics on the system;
- Check and modify tool settings;
- View microscope images (to assess image quality);
- Update Phenom software.

**Phenom Remote Assistant Operation**

Phenom Remote Assistant utilizes a highly secure, encrypted, VPN-based connection with the Phenom-World Support Server to manage the connections between instruments and Phenom-World service engineers.

Two remote modes can be separately enabled by the Phenom user. Data Upload enables the Phenom to send technical performance data, such as turbo pump current and source usage, to the Phenom-World Support Server on a daily basis.

Remote Control enables the Phenom to connect to the Phenom-World Support Server for remote control by authorized Phenom-World service engineers.

A remote control session is only established when the user presses the **initiate** button on the **Connectivity** page of the Phenom **Advanced settings** area. The user must do that for each remote diagnostic session. Communications are always initiated from the customer side of the connection, keeping you in complete control.

Also refer to chapter 5.7.4.4 'Connectivity - Phenom Remote Assistant settings' of the Phenom user manual.

**Which information is exchanged?**

It is important to note that information is only transferred if the customer has explicitly enabled the PRA service.

The following information will be collected daily from your Phenom and transferred to the Phenom-World Support Server:

- System status;
- Board status;
- System software counters (number of restarts, errors);
- Pump/vacuum parameters;
- Gun parameters;
- Stage and door parameters;
- Image quality related parameters (not the images);
- Usage related counters.

User images are NOT transferred, unless you explicitly approve and initiate. Image transfer is required when the Phenom needs to be calibrated with remote support.

It is not possible to control the Phenom remotely (starting image acquisition, changing settings, etc.), unless you explicitly approve and initiate a remote desktop connection for a field service engineer.

When a non-recoverable error is detected by the Phenom software, an immediate message will be sent signaling the error. In addition to the information set described above, this message will also contain the information that is logged by the Phenom that describes the root cause of the error.

This allows the Phenom-World Helpdesk to take immediate action to resolve the problem.

**Key Benefits**

- Phenom-World can detect wear trends and anticipate service problems before they arise.
- Phenom-World can make adjustments remotely to tune-up your system and make sure it is operating at peak performance.
- Phenom-World can remotely diagnose problems and make an accurate assessment as to whether the system needs to be returned to a service center for repair.
- Phenom-World can, in many cases, resolve the problem or propose a work-around while the system remains at your location.
- Phenom-World can observe and assist users with the proper operation of the system.
- User-controlled access and secure connectivity.
- Bottom line: greater up-time and more effective operation.

**Need more information?**

Please contact your Phenom-World service department (support@phenom-world.com) or sales representative with any questions regarding the operation or security of the Phenom Remote Assistant. For more information on the Phenom Remote Assistant secure infrastructure, go to: [www.phenom-world.com/pr](http://www.phenom-world.com/pr).

# Requirements Equipment Side

## The Secure Machine2World® Infrastructure

Phenom Remote Assistant uses the Machine2World® infrastructure to maximize security while making it easy to establish remote connections. Machine2World® is Sioux Remote Solutions' secure remote connectivity platform that allows adding remote service and diagnosis to virtually any equipment. It has been in use for remotely servicing equipment for over eight years by several manufacturers in different domains.

### Key security elements of Phenom Remote Assistant and Machine2World® include:

- All connections are initiated from the customer's Phenom, so the user is always in complete control.
- Communications are encrypted using the open source program OpenVPN.
- The highly secure Phenom-World Support Server manages the independent connections between service engineers and instruments.
- Each Phenom is registered on the Phenom-World Support Server by Phenom-World manufacturing, and each session is under full control of the equipment user.
- Phenom-World service personnel must also be registered on the Phenom-World Support Server and log-in with a user-id and password prior to establishing a Phenom remote connection.
- Phenom-World conducts an annual security review by an independent third-party that includes vulnerability assessment and network penetration testing.
- If a wired network connection is not present, the Phenom is also capable of connecting to a secured wireless LAN via an Ethernet to Wifi client. Appropriate settings (network name (SSID), security keys, etc.) need to be provided.

Phenom-World will provide a checklist to be filled-in together with your IT-department. In close so-operation with your IT department this information will be used to configure the remote connection for the Phenom correctly.

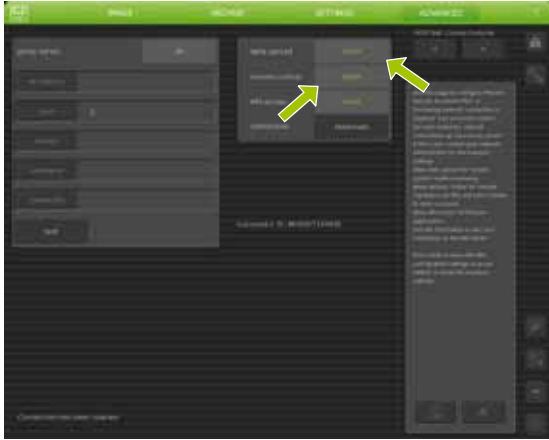
### Setting-up Phenom Remote Assistant

- To set-up the Phenom Remote Assistant, physically connect your Phenom to a network with high-speed Internet access. A minimum of 5 Mbps-rated WAN speed is recommended. Dial-up connections are not supported.
- Next, enable Internet access to the Phenom-World Support Server. For networks protected by a firewall, this requires opening port 1194 for outbound connections for either TCP or UDP traffic. The Phenom-World Support Server network address is pra.phenom-world.com, or IP address 77.222.79.37.
- Third, configure your Phenom by accessing the **Advanced settings** area. Go to the **Network** page, the third screen within the **Advanced settings** area, and ensure the Phenom can communicate within the local area network. For networks using a DHCP server, the IP address and other configuration settings should be set automatically. You will already have completed this step if you have configured your Phenom to use a shared network storage device. Also refer to chapter 5.7.4.3 'Network' of the Phenom user manual.

### Which are the pre-requisites for the PRA service?

- An Internet connection, provided through your local network.
- Your local network/fire-wall allows OpenVPN traffic between the Phenom and the Phenom-World Support Server. (Connection information (IP-address, port number) of the Phenom-World Support Server will be supplied). If using a proxy server, also the proxy server is required to allow OpenVPN traffic to the Phenom-World Support Server (on the standard OpenVPN port number 1194).
- The Phenom can either be assigned a fixed IP address or a dynamic (DHCP based) IP address.
- The Phenom is capable of using a proxy server for accessing the Internet.
- Appropriate credentials need to be provided to allow the Phenom to authenticate itself on your local network and/or proxy server. The Phenom is compliant with several authentication protocols.
- If access restrictions based on MAC addresses are used on the network to which the Phenom is connected, the MAC address of the Phenom needs to be authorized.

- Now move to the fourth screen, entitled **Connectivity**. If your network requires a proxy server for Internet access, enter the proxy settings here: IP address, port, domain name, local username and password. Also refer to chapter 5.7.4.4 'Connectivity' of the Phenom user manual.



- To enable **data upload**, make sure the **allow** button is on (displays in green). This feature permits the Phenom to transfer a small file containing Phenom technical performance data daily from the system to the Phenom-World Support Server. This data can be used by Phenom-World service engineers to detect trends and anticipate service problems before they arise. The data also can provide invaluable forensic information to help diagnose a current problem. Image data is never uploaded. Allowing daily uploads is strongly recommended. This is the default setting.
- To enable **remote control**, make sure the **allow** button is on (displays in green). This feature permits the Phenom to connect to the Phenom-World Support Server and allows authorized Phenom-World service engineers to remotely access your system. Clicking **allow** does not initiate a connection; it only enables the feature. Allowing **remote control** is strongly recommended.
- You should now have PRA enabled and ready to go. To verify, press the **test** button to perform an end-to-end connectivity test between the Phenom and the Phenom-World Support Server. If the test fails, check with your IT department that you have the correct proxy settings and that port 1194 on the firewall is properly opened.

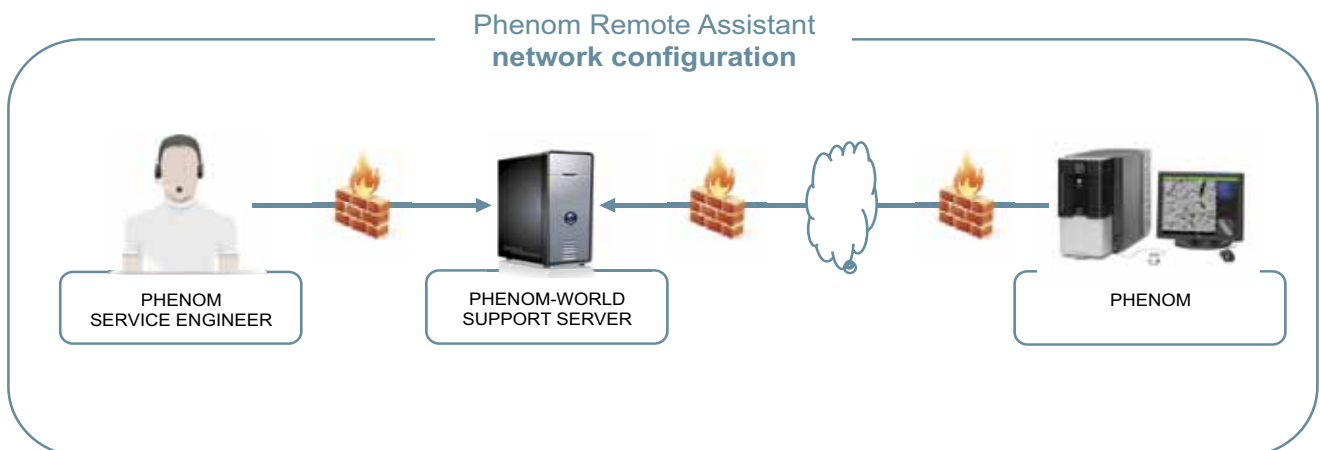
### Using Phenom Remote Assistant

- The **data upload** function of Phenom Remote Assistant operates automatically as long as the option is enabled and the Internet connection to the Phenom-World Support Server remains available. If PRA attempts an upload and fails, you will see the 'Check Connectivity' message.
- Use the **remote control** function only when requested to do so by a Phenom-World-authorized service engineer to diagnose a problem. Go back into the **Advanced Settings** area, go to the fourth screen, marked **Connectivity**, and press the **initiate** button next to the **connection** label. The Phenom then establishes an outbound connection with the Phenom-World Support Server. The service engineer also establishes a connection to the Phenom-World Support Server, and initiates a remote desktop session to your Phenom. Now, the service engineer can remotely control the Phenom to view images, run diagnostic routines, check configuration settings, etc. 'Remote Controlled' will display on the menu bar whenever the system is controlled in this way. Also refer to chapter 5.7.4.4 'Connectivity - Phenom Remote Assistant settings' of the Phenom user manual.
- You can end the communication at any time by pressing the **terminate** button next to the **connection** label. After a remote control session, the connection automatically times-out within 5 minutes.

### Need more information?

Please contact your Phenom-World service department ([support@phenom-world.com](mailto:support@phenom-world.com)) or sales representative with any questions regarding the operation or security of the Phenom Remote Assistant.

For more information on the Phenom Remote Assistant secure infrastructure, go to [www.phenom-world.com/prs](http://www.phenom-world.com/prs).



# Phenom™ Remote Connectivity - Checklist

## 1 Contact information:

- Customer name: .....
- Phone: .....
- e-mail: .....
- Representative IT department: .....
- Phone: .....
- e-mail: .....

## 2 Physical connection:

**Is there a physical Ethernet wall outlet located near the Phenom location?**

- Yes
- No, no network connection at all.\*\*

## 3 Network access:

**Is network access allowed from any machine connected to the network?**

- Yes
- No, only systems that are supported by the IT department are allowed.\*  
(IT department needs to 'release' the Phenom.)
- No, only specific MAC addresses are allowed Internet access.\*  
(IT department needs to add MAC address Phenom to list of allowed systems.)
  - o MAC address for Phenom: \_ \_ . \_ \_ . \_ \_ . \_ \_ . \_ \_ . \_ \_

**Does the network support DHCP?**

- Yes, each connected machine dynamically obtains an IP address via DHCP.
- No, each connected machine has it's own a fixed IP address.\*
  - o IP address for Phenom: \_ \_ . \_ \_ . \_ \_ . \_ \_ . \_ \_ . \_ \_

## 4 Internet access:

**Is Internet access allowed from the wall outlet you are planning to use?**

- Yes
- No\*  
(IT department needs to enable port.)

**Is Internet access allowed from any machine connected to the network?**

- Yes
- No, only specific MAC addresses are allowed Internet access.\*  
(IT department needs to add MAC address for Phenom to list of allowed systems.)

**Is a proxy server used to give Internet access?**

- Yes
  - o Proxy server IP address: \_ \_ . \_ \_ . \_ \_ . \_ \_ . \_ \_ . \_ \_
  - o Proxy server port number: .....
- No

**Requires the proxy server a username / password?**

- Yes
  - o Proxy server Username: .....
  - o Proxy server Password: **DO NOT DISCLOSE ON PAPER – PROVIDE DURING INSTALLATION**
- No

\* Contact remote connectivity consultant.

\*\* No remote connectivity possible.

**5 Authentication:**

**Does the Phenom have to authenticate itself on the network?**

- Yes
  - o Domain: .....
  - o Username: .....
  - o Password: .....
- No

**What kind of authorization protocol is used to log on to the network?**

- None
- Active Directory / NTLM
- Kerberos
- Basic authentication
- Other, ..... \*

\* Contact remote connectivity consultant.

\*\* No remote connectivity possible.

# Technology of Phenom™ Remote Assistant

## Improved service for your Phenom Microscope

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### How does the PRA service work and which technologies are used?

The Phenom Remote Assistant service requires a remote connection between your Phenom and the Phenom-World Support Server. This remote connection will be established via your local network. From your local network it should be possible to gain access to the Internet.

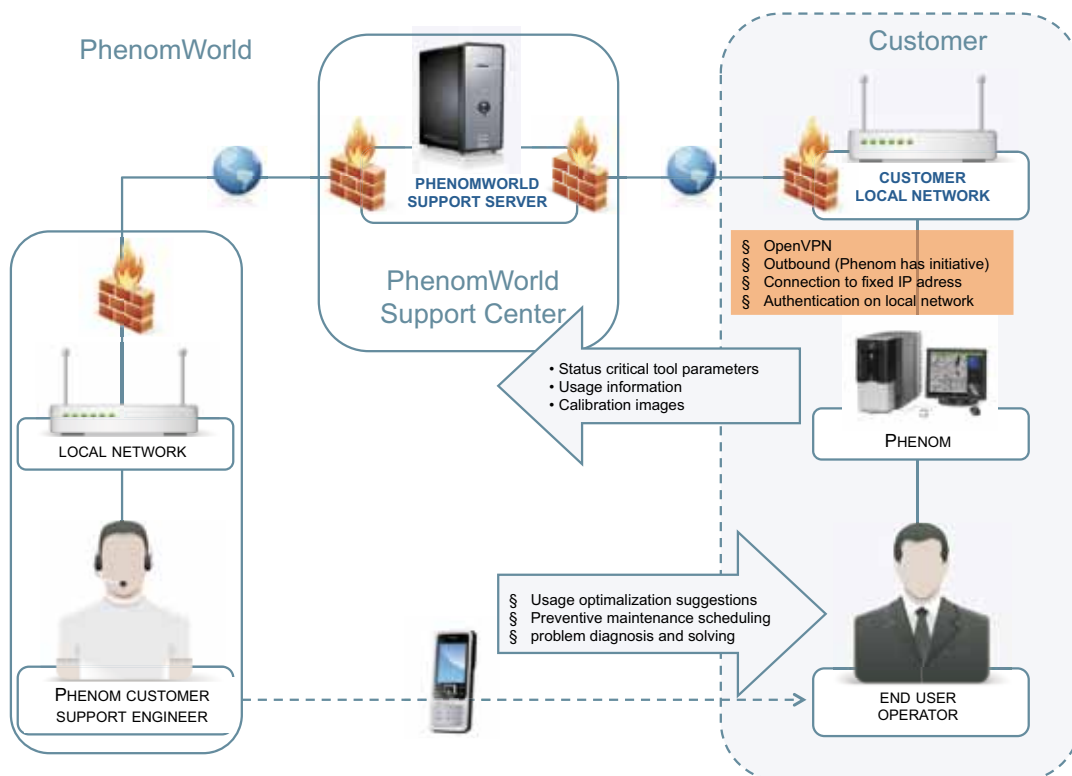
The Phenom does not require an external reachable address. It can use any local address on your internal network.

The Phenom will automatically detect whether a RJ-45 cable is connected and if an IP address can be retrieved via DHCP. It is also possible to configure a fixed IP address.

If the Phenom is unplugged from the local network, it will automatically resume the remote connection if it gets re-connected again, without the need for a system reboot.

The remote connection is only activated and used at the moments that information is exchanged from the Phenom to the Phenom-World Support Server. All transferred information is encrypted and thus not recognizable to third parties. All the information exchanged between the Phenom and the Phenom-World Support Server remains confidential.

It is NOT possible to initiate a connection from out-side to the Phenom; it's always the Phenom that takes initiative to establish the connection.



The Phenom-World Support Server has a fixed IP address, which is stored in the Phenom. This address cannot be changed by the customer. Communications to the Phenom-World Support Server use only one outgoing TCP/IP port and utilize the OpenVPN protocol. Standard, a wired Ethernet connection is assumed (CAT-5 cable, Rj-45 connector). It is possible to connect an Ethernet to Wifi client to the Phenom and thus connect via a wireless (Wifi) network.

The Phenom will support any combination of the following:

- Direct Internet access or Internet access via a proxy server.
- User authentication (via basic authentication or NTLM / Active Directory) or no authentication for gaining access to your local network.

In case of no Internet connectivity it is still possible to save the data via the **StoreSysInfo** button on the USB stick and send the data to the Phenom-World Support Server via e-mail. Also refer to chapter 4.6.6 'Storing images' of the Phenom user manual.

**Phenom™ Remote Assistant requires the Phenom to be able to access the Internet**

Phenom™ Remote Assistant requires no additional software or hardware to be installed.

- To set-up the Phenom Remote Assistant, physically connect your Phenom to a network with high-speed Internet access. A minimum of 5 Mbps-rated WAN speed is recommended. Dial-up connections are not supported.
- Next, enable Internet access to the Phenom-World Support Server. For networks protected by a firewall, this requires opening port 1194 for outbound connections--for either TCP or UPD traffic.

The Phenom-World Support Server network address is [phenom-world.com](http://phenom-world.com), or IP address 77.222.79.37.

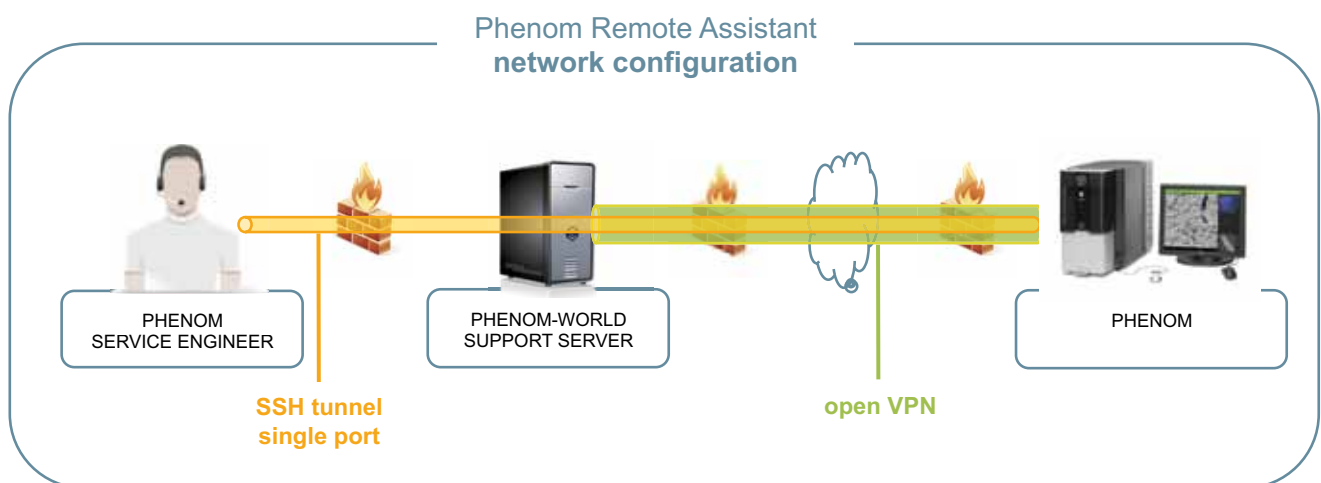
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**Phenom™ Remote Assistant Security**

Security is of paramount concern when enabling a network connection between Phenom-World and a Phenom. Phenom-World uses multiple security layers in its remote service infrastructure to accomplish this. Phenom-World has its security architecture independently audited on a regular basis. At the center of the network configuration is the Phenom-World Support Server. This is a secure server with a minimum number of ports open to the outside world. The Phenom-World Support Server manages all connections between customer instruments and Phenom-World remote service engineers.

Connections between Phenom-World Support Server and Phenoms are set up using OpenVPN, a highly secure, encrypted communication protocol that guarantees confidentiality. On top of the openVPN connection, specific tunnels between a field service engineer PC and a Phenom are set up using SSH, another highly secure, encrypted communication protocol.

This guarantees that only the port that is actually required by the service engineer is made available remotely and all other ports of a Phenom are inaccessible. See figure.



To establish an active link, all parties connect to the Phenom-World Support Server with user name and password authentication. Customers need only establish an outgoing connection through their firewall. The routing information for the VPN is set so that only the Phenom-World Support Server is accessible from all connected Phenoms. This means that computers on the VPN are isolated from each other.

An authorization database on the Phenom-World Support Server checks that the customer instrument and Phenom-World service client are both authorized.

Once all authorizations have been verified, an active connection is enabled. OpenVPN is used to enable this virtual private network connection. This is a well-known, open source program in common use for such applications. Network traffic on the VPN is encrypted so even if outsiders are eavesdropping on the communication lines the information collected is not compromised.

Once an active link has been established, the remote service engineer (RSE) uses the open source webbased UltraVNC client to communicate and control the instrument. The engineer can view logs, run diagnostics, upgrade software, check tool settings and view microscope images.

## Phenom™ Remote Assistant - FAQ's

### What does Phenom™ Remote Assistant cost?

Phenom™ Remote Assistant is offered at no additional cost to customers whose Phenoms are covered under a current Phenom-World service contract or new system warranty.

### What Internet connection speed is required?

A minimum connection speed of 1 Mbps is required, but 5 Mbps is recommended to support full capabilities of remote diagnostics.

### How does the service engineer control the instrument?

Phenom remote service engineers use the open source program UltraVNC to display the screen of your system PC and communicate and control the instrument.

### Why is the use of port 1194 required?

The Internet Assigned Numbers Authority (IANA) has registered port 1194 for use by OpenVPN. Because Phenom™ Remote Assistant relies on OpenVPN for the connection to the Phenom-World Support Server, it is a requirement that the IT network allows outbound connections (UDP or TCP) over port 1194.

### How will my current firewall setup impact Phenom™ Remote Assistant?

Your network firewall needs to be opened to allow outbound UDP or TCP traffic on port 1194 to pass.

### Will the remote engineer have access to everything on our network?

No. The Phenom™ Remote Assistant connection enables communication between the Phenom-World service engineer and the Phenom system components. However, because the remote user has the same access rights as the person currently logged in at the system, any network resources accessible locally are also accessible remotely.

### Can I use my existing corporate VPN instead of Phenom-World's VPN?

No, only the Phenom-World VPN is set up to run through the Phenom-World Support Server and can offer all the security features.

### Does Phenom™ Remote Assistant have an 'auto timeout' or is it possible to set up an automatic timeout after a specific period of inactivity?

Yes, the connection will automatically be closed after 5 minutes of inactivity.

### When would I use TCP vs. UDP protocol?

Phenom-World recommends using UDP, as it is slightly more efficient. The TCP protocol may be required if the local IT infrastructure uses a proxy server to access the Internet. This may also require reconfiguring the proxy server to allow the through connection.

