



RAPID — Remote Diagnostics Program

Remote Access Program for Interactive Diagnostics

Enabling RAPID: IT Infrastructure, Network Configuration & Security Features

What Is RAPID?

RAPID (Remote Access Program for Interactive Diagnostics) is an innovative service program that allows FEI's service engineers and application specialists to remotely connect and troubleshoot problems on FEI instruments. RAPID increases system availability and reduces repair times, maximizing user productivity.

Using RAPID, highly trained FEI field service engineers can perform the following actions remotely:

- Run service test software and diagnostics on your FEI instruments
- Check and modify system settings
- Patch and upgrade software
- View system images

RAPID provides a method to significantly speed repair time and improve system uptime on many of our most popular systems.

The Secure RAPID Infrastructure

FEI's network configuration (see Figure 1) maximizes security yet makes it easy to connect with FEI through your corporate or institutional network. The FEI® Secure Portal is central to the RAPID infrastructure. A highly secure Linux server manages all connections between your instruments and FEI remote service engineers. To reduce vulnerabilities, the FEI Secure Portal is located in a demilitarized zone (DMZ) outside the main FEI corporate network. It's secured with a firewall and has a minimal number of ports open to the outside world.

Additional Security Features

In addition to the FEI Secure Portal, RAPID includes important security features designed to prevent unwanted incoming connections and help you control access to RAPID sessions. These include:

Encrypted communication protocol

All RAPID connections are set up using OpenVPN, a highly secure, encrypted communication protocol that guarantees confidentiality between the client and the FEI Secure Portal.

Access controls

The tool owner always controls who participates in a RAPID session. Using the "my engineers" feature of RAPID, the user specifies which FEI personnel can connect to the instruments. The FEI tool owner can always control access authorization—and adjust it at any time.

With multiple layers of security in its infrastructure, RAPID is designed to protect users' proprietary information.

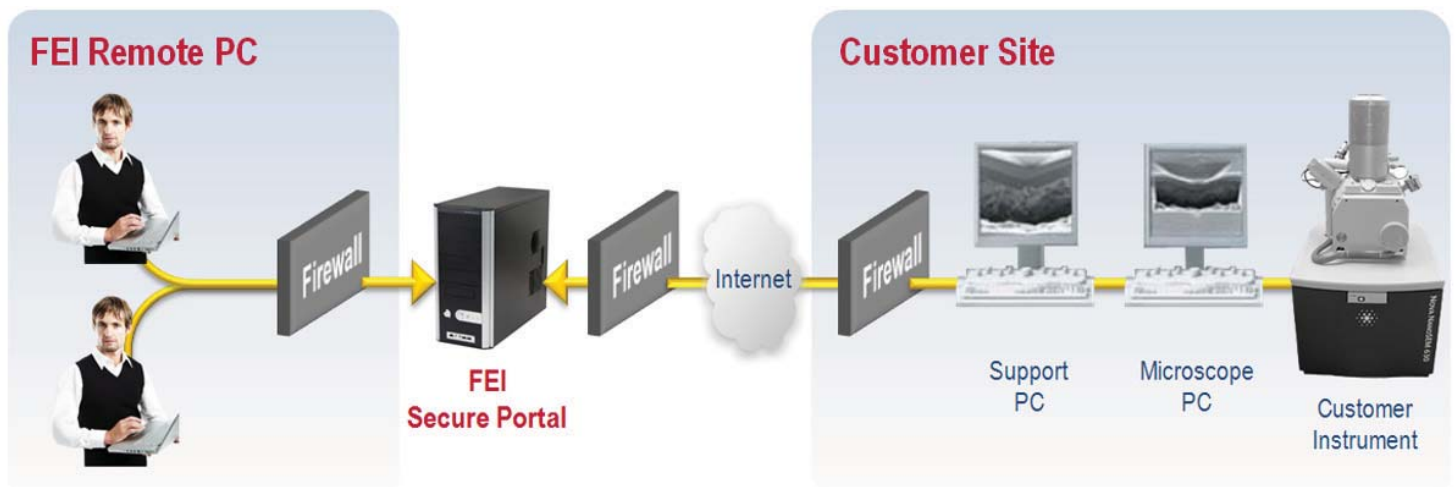


Figure 1.

Session initiation

All RAPID sessions must be initiated at the instrument end—so the tool owner is always in control. Remote connections cannot be started by FEI, and connections can be terminated by the tool owner at any time.

Authentication

RAPID institutes multiple levels of password protection for your administrator and each of your users. For example, RAPID requires a username and password to access the VPN from the customer side. From the service side, FEI service engineers must provide an authenticated password to log into the FEI Secure Portal. Once a VPN connection has been established, an additional password is required to access the instrument. This password is created and controlled by the instrument owner.

Activity logs

Activity logs provide an audit trail of who has accessed your system. Each RAPID session is captured at the FEI Secure Portal and is available to the tool owner as a feature of your RAPID account.

Annual independent security reviews

FEI conducts annual penetration reviews on the RAPID network using an independent, third-party firm that specializes in system security reviews. The testing replicates a malicious hacker trying to break into the network, identifies possible vulnerabilities in the infrastructure, and makes recommendations for improving security.

Configuration standards

You can meet all your IT standards—such as running a certain operating system or current antivirus software—by utilizing a support PC. The support PC acts as a bridge between the network connection and the FEI system. See FAQs for more information on support PCs.

Data access controls

Tool owners can further safeguard data by only using reference samples during RAPID sessions. Sensitive data should be saved on a password-protected archive or file server (a common practice among leading research institutions), rather than on the system or support PC. This ensures that sensitive images or files are not accessible during a RAPID session.

RAPID Deployment

RAPID deployment requires five simple steps: register, verify, enable, install, and test (see Figure 2). IT support is required in Step 3.

The tool owner initiates all RAPID connections, tunneling through port 1194 to the FEI Secure Portal.

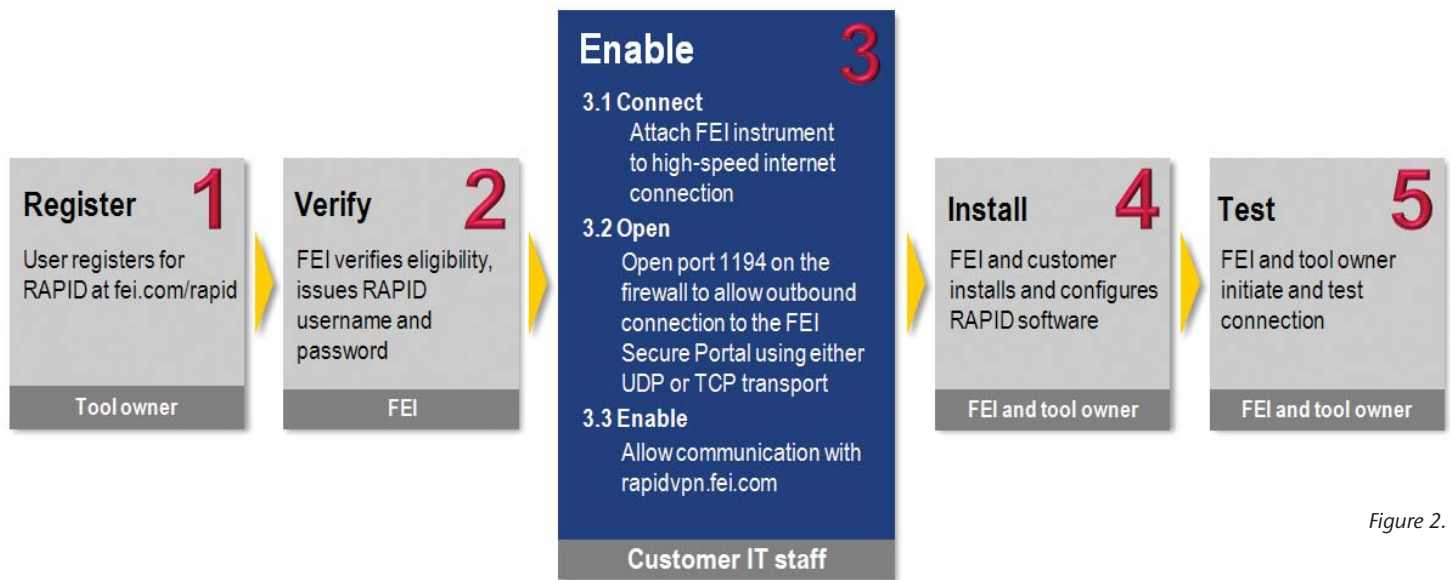


Figure 2.

Eligible FEI Instruments

Nearly all of FEI’s current platforms and systems are designed to work with RAPID technology. In addition, many older FEI instrument systems are able to take advantage of RAPID. FEI is continually testing different models and configurations to determine compatibility with RAPID. For the most up-to-date listing of qualified instruments, please consult the RAPID Instrument Support document available at fei.com/rapid.

Need More Information?

Send technical questions regarding the setup and infrastructure of the RAPID program directly to rapidsupport@fei.com. For additional information regarding the program, please visit fei.com/rapid or contact your local FEI **Service Representative**.

For technical questions about RAPID, please contact us at: rapidsupport@fei.com.

RAPID FAQs

What does RAPID cost?

RAPID is offered at no additional cost to customers whose RAPID-enabled FEI tools are covered under a current FEI 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?

FEI remote service engineers use the open source program UltraVNC to display the screen of your system PC and communicate and control the instrument. To improve performance, FEI modified the open source code, which you can obtain by going to fei.com/rapidsource.

Why is the use of port 1194 required?

The Internet Assigned Numbers Authority (IANA) has registered port 1194 for use by OpenVPN. Because RAPID relies on OpenVPN for the connection to the FEI Secure Portal, it is a requirement that the IT network allows outbound connections (UDP or TCP) over port 1194.

Do I need a support PC?

To utilize RAPID, a support PC is required for all Small Dualbeam™ and Scanning Electron Microscopes (SEM) systems, and it is recommended for all systems. Because a support PC has fewer restrictions than the system PC, it can run any antivirus program and be used for a customer’s specific internal IT protocols—such as automatic upgrades to operating systems or installing Windows service packs. A support PC can also provide additional data storage and offline reconstruction of data series. And, by using a support PC, you can link older system PCs that run Windows NT or Windows 2000 to corporate networks that require Windows XP—even while isolating them. *Note: A support PC is also required for TEM systems running Windows NT.*

What if I don’t have a support PC?

For transmission electron microscope (TEM) systems, you can run RAPID directly from a system PC. However, because FEI instruments require sophisticated software, you are limited to using McAfee and Norton antivirus software on your main system PC. Alternatively, you can purchase a support PC at minimal expense from FEI or directly from any PC manufacturer.

How do I access the FEI Secure Portal?

The Secure Portal can be accessed by going to **rapid.fei.com** with your web browser. The address of the VPN connection is: rapidvpn.fei.com. Note that the VPN connection is set up using the OpenVPN client software so you do not need to use this address yourself.

How will my current firewall setup impact RAPID?

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 RAPID connection enables communication between the FEI service engineer and the FEI system components—for example, the support PC and the system PC. 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 FEI’s VPN?

No, only the FEI VPN is set up to run through the FEI Secure Portal and can offer all the security features. You always have the option to set up your own remote access to your system for other purposes, but this would not be usable or supported by FEI. FEI does not recommend (or allow) other software to be installed on the instrument’s PC.

Does RAPID have an “auto timeout” or is it possible to set up an automatic timeout after a specific period of inactivity?

No, the connection must be terminated by the system user. In some instances, a customer will specifically enable a connection overnight so that FEI support resources in other time zones can work on a problem.

When would I use TCP vs. UDP protocol?

FEI 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.

Support PCs should meet the following requirements:

	Minimum Requirement
Processor	1 GHz
RAM	512 MB
Hard Drive	10 GB
LAN Adapters	2
Operating System	Windows 2000 or XP*

**Windows Vista is not currently supported.*

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