

PEL 105 IRD Server Connection

Starting with DataView Version 3.15, users now have the option of establishing a connection from a computer to a PEL 105 via the IRD (Internet Relay Device) server. The IRD server facilitates communication between a PEL 105 and a computer running the DataView PEL Control Panel on a private network connected to the internet. This enables you to connect your computer to instruments located on different private networks. The IRD server is hosted by AEMC Instruments and is made available as a free service to all PEL 105 owners.



By default, a PEL 105 is automatically registered with the IRD server when it is connected to a network that has internet access. During this process, the instrument provides the IRD server with the following information:

- Instrument serial number (a “factory” setting that cannot be changed)
- Instrument password (an original password is provided with the instrument; this can be changed by the user)
- Private network IP and port

The IRD server also identifies the public IP and port being used for communication with the instrument. Note that IRD server access can be disabled via an option in the Communication tab of the Configure dialog box in the PEL Control Panel (see “Setting up the IRD Server Connection” below).

This Application Note explains how to set up an IRD server connection. It also explains the basics of how IRD connections work. We assume you have installed DataView with the PEL Control Panel on your computer.

NOTE: IRD connections are only available for PEL 105 instruments that can access the internet without being blocked by a firewall or similar system. Otherwise the IRD server will not be able to access the PEL 105, and attempts to communicate to the instrument via the IRD server will fail. Consult your network administrator to ensure that any firewall on your PEL 105’s private network allows the instrument to access the internet.

Setting up the IRD Server Connection

If you plan to use the default IRD server connection settings, you can skip this section and proceed to “Connecting an Instrument via IRD Server.” If you need to make changes to these settings, do the following:

1. Connect the PEL 105 to your computer via a USB cable connection.
2. In the PEL Control Panel, highlight the instrument in the navigation frame. Then select Instrument in the menu bar, and click Configure (or click the  icon in the toolbar) to display the Configure dialog box.

3. Open the Communication tab.

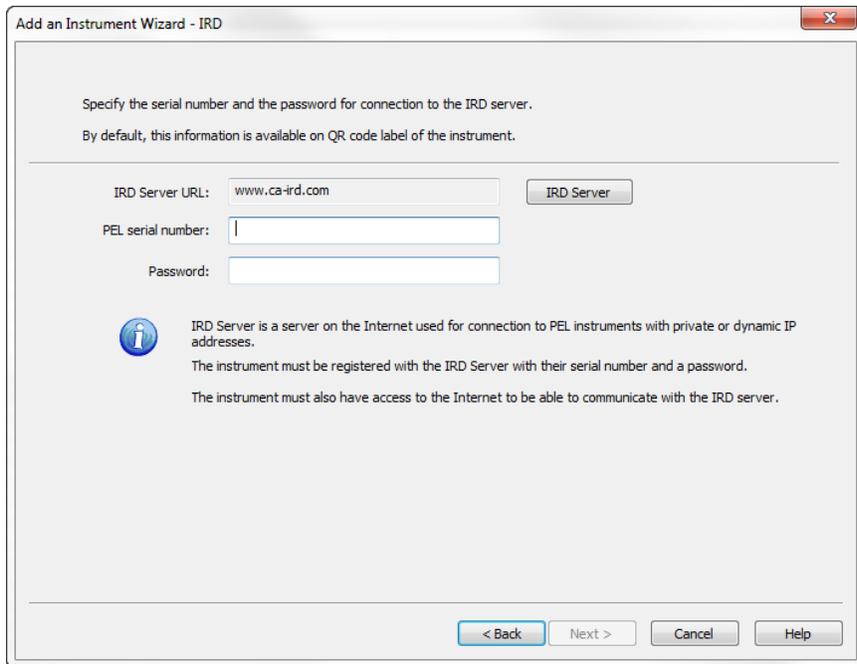
The screenshot shows the 'Configure' dialog box with the 'Communication' tab selected. The 'Bluetooth' section has 'Enable Bluetooth' checked, 'Pairing code' as 0000, 'Name' as 'PEL 105 -134463NEH', and 'Visibility' set to 'Visible'. The 'Network' section has 'Enable DHCP' checked, 'IP address' as '192 . 168 . 1 . 111', 'Subnet mask' as '255 . 255 . 255 . 0', 'Gateway address' as '192 . 168 . 1 . 1', 'Port' as '3041', and 'Protocol' set to 'UDP'. The 'Wi-Fi' section has 'Enable Wi-Fi' checked, 'Mode' set to 'Connect to a router', 'SSID' as 'NETCON', 'Password' as 'Dataview7', 'Port' as '3041', and 'Protocol' set to 'TCP'. The 'IRD Server' section has 'Enable' checked, 'Connection type' set to 'Ethernet', 'Password' as 'w734HaETC', and 'Serial number' as '134463NEH'. Buttons for 'Save To File', 'Load From File', 'OK', 'Cancel', and 'Help' are at the bottom.

4. In the IRD Server section, ensure the Enable field is checked. If not, check it now. When this option is checked, the Password and Serial number fields appear. (To disable IRD server connection capability, remove the check from the Enable field.)
5. Connection type identifies the connection medium (Ethernet or Wi-Fi) through which the PEL 105 communicates with its private network. Ensure this setting matches the connection type used by your instrument.
6. To change the password, enter the new password in the Password field.
7. Clicking the Edit IRD Server button displays the IRD Server Settings dialog box. This lets you change the IRD server URL and port number. The U.S. default settings for these are as follows and in normal operation should not be changed:

URL: www.ca-ird.com
Port number: 80
8. If you have made any changes to the IRD server settings, you must re-register the instrument with the server. To do this, click the Register button. Then click OK to save your changes and exit the Configure dialog box.

Connecting an Instrument via IRD Server

When setting up a connection to a PEL 105 instrument in the Control Panel via Instrument -> Add an Instrument, users have the option of choosing “IRD server” as the connection type in the Add an Instrument Wizard dialog box. This displays the Add an Instrument Wizard – IRD dialog box:



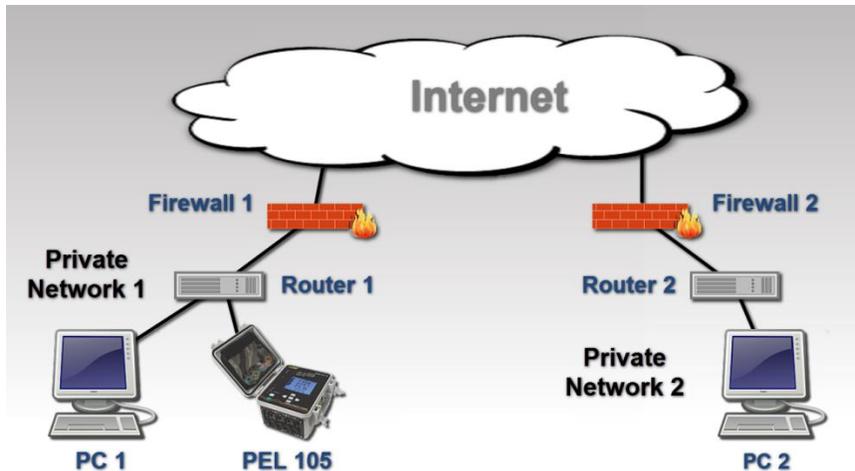
This dialog box displays the IRD server address, which is www.ca-ird.com for North America, South America, and Australia; and www.ca-ird.eu for the rest of the world. To complete this dialog box, fill in the PEL serial number and Password fields. These identify the instrument to which you want to connect. This information is provided with the PEL 105 when you receive it. (Note that you can change the password from its original setting via the PEL Control Panel. If this has been done, be sure to enter the correct password here.)

After you complete these fields, click Next. The IRD server then attempts to find the specified instrument, which by default was registered with the IRD server when the instrument was first connected to its network. When finished, a message appears indicating whether or not the connection was successful. If the connection has been made, click Finish.

Note that in addition to creating a new IRD connection from scratch, you can change an existing connection to an IRD connection. To do this, connect to the instrument. Then click the Modify Connection Setting  button in the data frame. This displays the Add an Instrument Wizard dialog. Choose IRD Server as the connection type and proceed as instructed above.

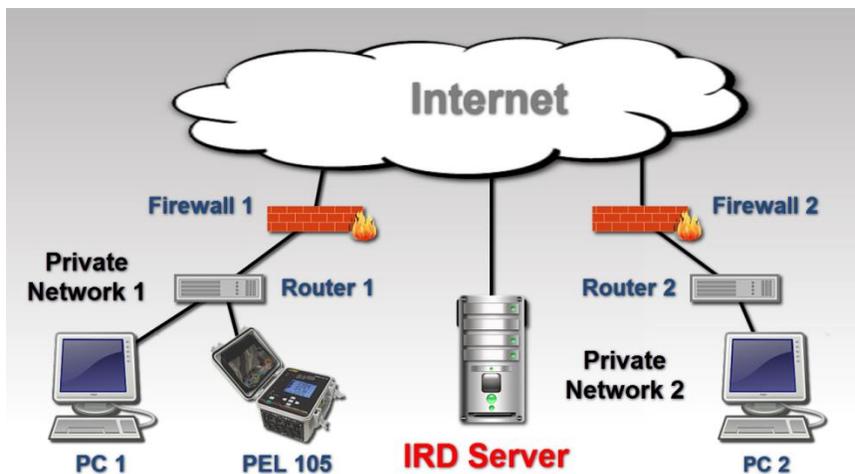
How IRD Server Connections Work

To understand how the IRD server enables connections between different private networks, consider the following typical network topography:



In the preceding example there are two private networks, each connected to the internet through a firewall. In this setup, the “PC 2” computer cannot directly access the PEL 105 because Firewall 1 prevents public access to Private Network 1. Without an IRD server, the typical way PC 2 can access the PEL 105 is for the network administrator to configure Router 1 to perform port forwarding. This can be a complicated procedure, especially when a single computer attempts to connect to multiple PEL 105 instruments on different private networks – the router for each of these networks must be appropriately configured to allow access.

The IRD server significantly simplifies this process:



Assuming that:

- the IRD server option is enabled for this PEL 105
- a connection of type “IRD” has been configured for this instrument via the Add an Instrument Wizard dialog in the PEL Control Panel
- any firewall (if present) allows access between the internet and the PEL 105

...PC 2 can now communicate with the PEL 105 without any special configuration of Router 1. The basic steps in this process are as follows:

1. When PC 2 attempts to connect to the PEL 105, the computer requests a directory lookup by the IRD server to find a PEL 105 with the serial number and password supplied by the user in the Add an Instrument Wizard dialog box.
2. If a PEL 105 matching the serial number and password is located, the IRD server returns the instrument's public and private network information to PC 2. (Note that unlike some other connection types, the IRD server does not provide a list of connected instruments from which to choose; it only informs the user whether or not a match is found for the requested serial number/password. This helps maintain the security of other instruments registered with the IRD server.)
3. PC 2 attempts to directly connect to the PEL 105 using the network information provided by the IRD server. Since the PEL 105 is not on PC 2's private network, the computer cannot make a direct connection to the PEL 105; therefore the direct connection attempt will be unsuccessful. When this happens, the connection request is automatically relayed to the IRD server, asking the server to forward the data to the PEL105.
4. The IRD server passes the data to the PEL 105. The IRD server can communicate with the PEL 105 because the instrument maintains a connection with the server through Firewall 1. This connection remains in place as long as the "IRD Server" feature is enabled in the PEL 105. Without this connection, Firewall 1 would block all access to the PEL 105.
5. The PEL105 sends the response to the IRD server, which forwards it back to PC 2.

If the computer and PEL 105 are on the same private network, a direct connection is established. For example, if PC 1 in the preceding illustration attempts to connect to the PEL 105, the process starts as described in steps 1 and 2 above. However, using the private network information returned by the IRD server, the computer can connect directly to the instrument. The user does not need to know the IP address assigned to the PEL105. And even if the IP address assigned to the PEL105 changes in the future, the IRD server lookup will resolve the change and allow a direct connection. (The IRD server is not used beyond the directory lookup.)

Conclusion

This concludes our overview of IRD connections for the PEL 105. For more information about this instrument, visit its product page at <http://www.aemc.com/products/html/minfindex.asp?id=110607&dbname=products>.