Chapter 4: NetPower DeviceServer

What is NetPower DeviceServer?

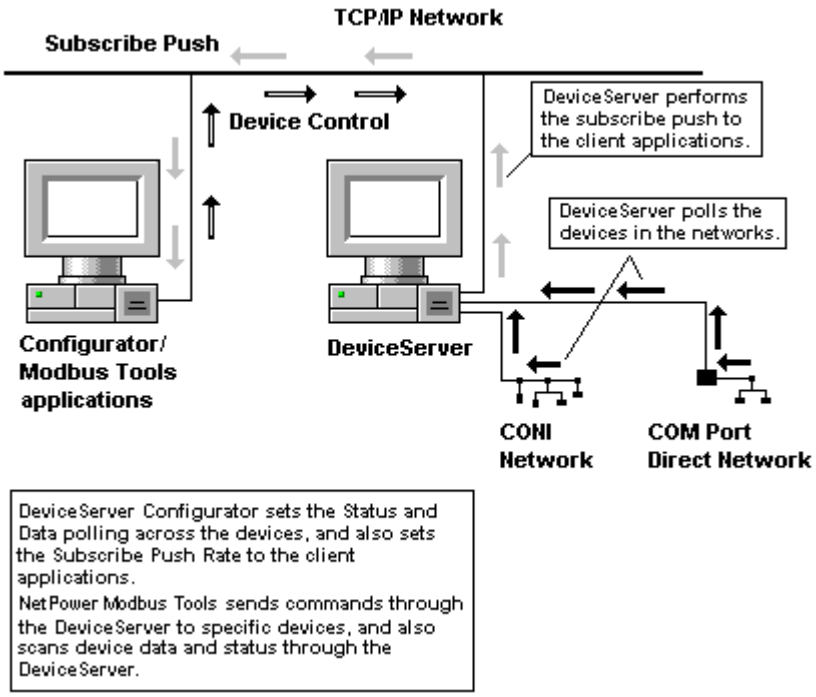
NetPower DeviceServer is the application in a PowerNet Software system that serves as the interface between the IMPACC device network and the rest of the PowerNet Software system. NetPower DeviceServer communicates to other PowerNet Software applications through a TCP/IP based communications protocol, and provides the following device network-related services:

- Manages all IMPACC device network communication.
- Polls and buffers IMPACC device data.
- Makes available real-time device data to other networks, such as a Modbus network and a TCP/IP-based Ethernet.
- Monitors for device events (such as protective trips), and records the event information.
- On a user defined schedule, polls devices for energy use (and other related data) and records this information so that it may be used by other applications.
- Allows applications to access other device data (such as waveform data), and to control devices.
- Provides security-related services to prevent unauthorized access to devices or device data.

Note
NetPower DeviceServer must run continuously to record system events, log data, and provide access for all other PowerNet Software applications.

NetPower DeviceServer supports a sophisticated device-polling algorithm, which adjusts to the changing needs of the system. NetPower DeviceServer polls device status at two user-defined rates. This ensures a quick response to events.

Other device data can be obtained on an as-needed basis, through subscription. Client applications (such as NetPower DDE Server) subscribe to the NetPower DeviceServer for data. The data is then "pushed" to the applications only when there is a change in the data. This maximizes the efficiency of the data throughput on the TCP/IP network.



Certain applications in a PowerNet Software system configure a NetPower DeviceServer so that the application may communicate with the devices associated with a NetPower DeviceServer. The following table lists the applications that configure a NetPower DeviceServer, and describes how these applications interact with a NetPower DeviceServer.

Application	Specific Application Function	Interaction with a NetPower DeviceServer
NetPower Configurator	Specifies the IMPACC devices that are connected to the NetPower DeviceServer.	All devices that attach to a NetPower DeviceServer must be added before the NetPower DeviceServer can be used by another application.
	Specifies the polling rates for devices.	All device attributes that are to be monitored by any application can have an associated polling rate.
	Specifies what data the NetPower DeviceServer logs for Device trending.	NetPower Monitor performs historical device trending.
	Optionally specifies device timing and scan rates for device status polling and device data polling.	NetPower Configurator communicates these settings to the NetPower DeviceServer.
NetPower Modbus Tools	Maps IMPACC devices to Modbus registers to enable transfer of device data and device control commands.	NetPower Modbus Tools informs NetPower DeviceServer which data is mapped to what registers. NetPower Modbus Tools monitors device data and performs device control.
NetPower Setpoints & Trip Curve	Views, edits, and prints device setpoints.	NetPower Setpoints & Trip Curve modifies and views device setpoints on devices associated with a NetPower DeviceServer.

Application	Specific Application Function	Interaction with a NetPower DeviceServer
NetPower Waveform	The NetPower Waveform application plots data from the NetPower Waveform buffer of a supported device.	Requests a NetPower DeviceServer to upload the NetPower Waveform buffer of a supported device.

Important
Before you can use a PowerNet Software application, you must first configure devices to a NetPower DeviceServer using NetPower Configurator. For more information, see *Chapter 9: Configuring the System*.

NetPower DeviceServer System Requirements

NetPower DeviceServer system requirements are as follows:

General Requirements

- IBM compatible computer with a Pentium II processor 266MHz or higher.
- Mouse and Keyboard.
- Ethernet card installed.
- Color monitor and video adapter capable of displaying 800 by 600 pixels.
- Font size of the Display Property set to Small Fonts.

Memory and free hard disk space, NetPower DeviceServer only

- 64 MB RAM
- 1.5 GB free hard disk space

NetPower DeviceServer Licenses

The NetPower DeviceServer application may be run with or without a license. If you run a NetPower DeviceServer without a license, you only have access to two devices on a single INCOM network.

If you run the NetPower DeviceServer application with a license, the following options are available:

- Maximum number of configurable devices.
- Device Control.
- Modbus Gateway.
- Setpoints.
- INCOM Network.

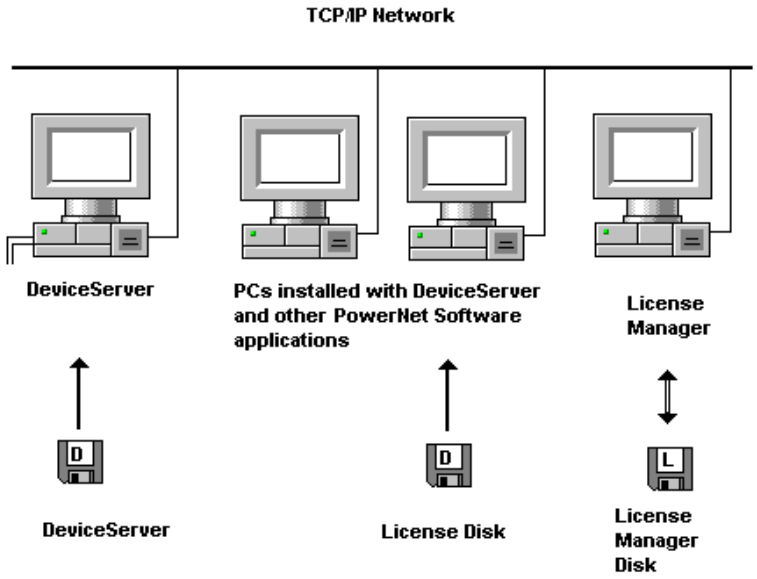
Note
The availability of these options depends on your license.

NetPower DeviceServer License Disk vs. Master License Disk

The NetPower DeviceServer License disk allows you to run the NetPower DeviceServer application across all devices in your INCOM networks.

Note
The NetPower DeviceServer license is limited to a maximum number of allowable devices.

This license disk is separate from the Master License Disk for the PowerNet Software applications. Using this NetPower DeviceServer License disk, you can import, export, or update a NetPower DeviceServer license.



Importing NetPower DeviceServer Licenses

To import a NetPower DeviceServer license from the NetPower DeviceServer License disk, do the following:

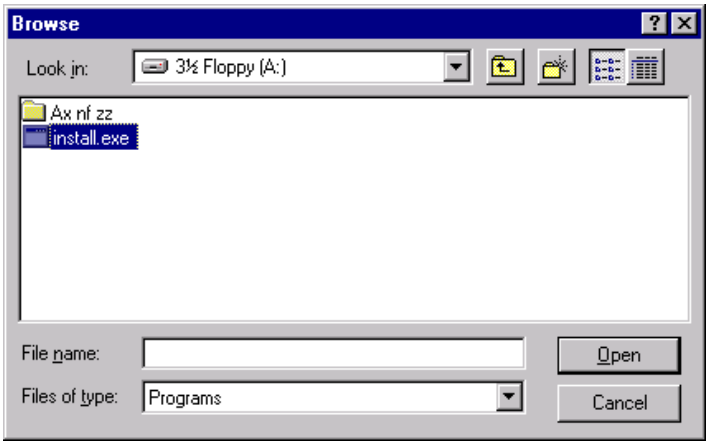
> **Note**
> If you are running a NetPower DeviceServer without a license, you must exit NetPower DeviceServer to import the license. To shut down a NetPower DeviceServer, see the section *Exiting the NetPower DeviceServer*.

1. Place the NetPower DeviceServer License disk in the floppy drive of your computer.
2. From the Windows Start menu, choose Run.

   The Run dialog box displays.

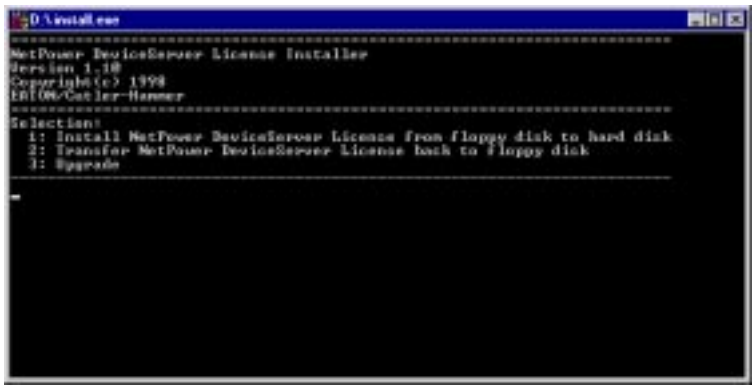
3. In the Open field, type A:
4. Click the Browse Button.

   The Browse dialog box displays.



5. Select Install.exe, and press Open.

   The A:\Install.exe DOS window displays, where “A” represents the drive on which the license is located.



   This window is used to install a license, transfer a license back to a master disk, or upgrade the software license disk.

6. Type **1** and press [Enter].

   The system prompts you for the name of the floppy drive that holds the license.

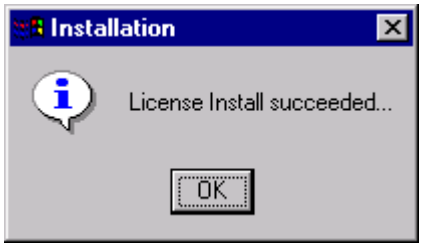
7. Type the letter of the appropriate drive, then press [Enter].

   The system prompts you for the name of the drive to which the NetPower DeviceServer license is to be imported.

Important
Always import the NetPower DeviceServer license to the same drive on which you installed the NetPower DeviceServer software.

8. Type the letter of the drive on which the NetPower DeviceServer software is located and press [Enter].

   The Installation dialog box displays, indicating that the NetPower DeviceServer license has been imported.



9. Click OK to complete the procedure.

The NetPower DeviceServer license is now installed.

Important
Keep the NetPower DeviceServer License Disk in a safe location. You can only transfer (export) the NetPower DeviceServer license to the NetPower DeviceServer License Disk.

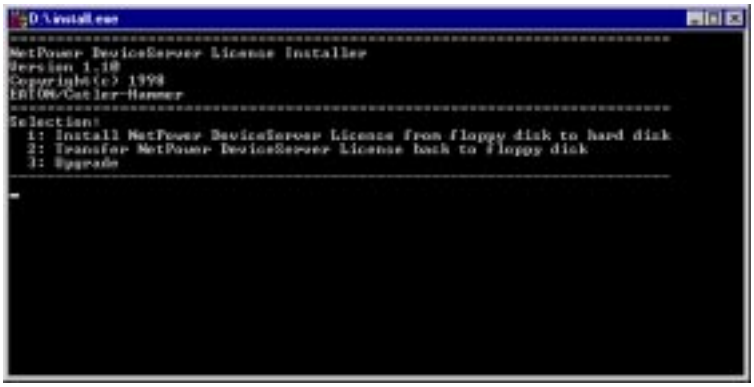
Exporting NetPower DeviceServer Licenses

Exporting the license transfers the NetPower DeviceServer license from the computer on which it is installed to the NetPower DeviceServer License Disk.

To export a NetPower DeviceServer license, do the following:

1. Place the NetPower DeviceServer License disk in the floppy drive of your computer.
2. Browse for and start the application Install.exe, which is located on the NetPower DeviceServer License disk.

   The A:\Install.exe DOS window displays, where “A” represents the floppy drive on which the license is located.



   This window is used to install a license, transfer a license back to a master disk, or upgrade the software license disk.

3. Type **2** and press [Enter].

   The system prompts you for the location to which the license is to be transferred.

4. Type the letter of your floppy drive and press [Enter].

   The system prompts you for the location where the license is currently located.

5. Type the letter of the drive where the license resides and press [Enter].

   A message displays, indicating that the export completed.

6. Click OK.

The NetPower DeviceServer license is transferred to the NetPower DeviceServer License disk.

Starting NetPower DeviceServer

To start NetPower DeviceServer, do the following:

1. From the Windows Start menu, click Programs.

   The Programs pop-up menu displays.

2. Click IMPACC PowerNet Suite.

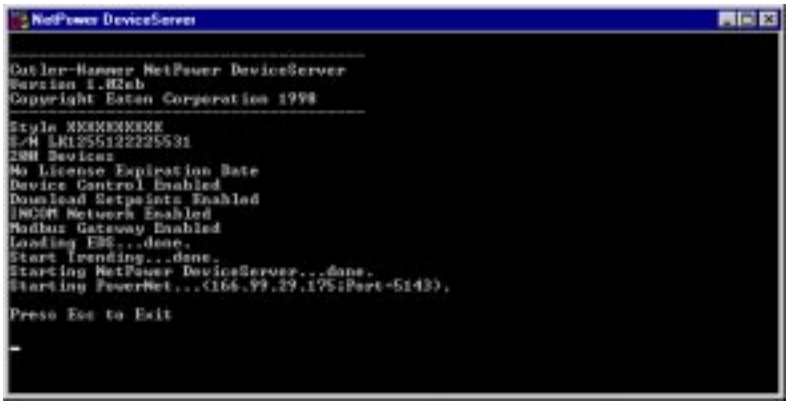
   The IMPACC PowerNet Suite menu displays.

3. Click NetPower DeviceServer.

   NetPower DeviceServer starts, indicated by the minimized window that displays on the Windows task bar.

4. If you wish to view the NetPower DeviceServer DOS window, click on the minimized NetPower DeviceServer window.

The NetPower DeviceServer DOS window displays.



When you open the NetPower DeviceServer DOS window, the NetPower DeviceServer displays the following:

Note
NetPower DeviceServer always checks for specific applications and systems (which are available through licensing), and displays whether those applications and systems are enabled.

- NetPower DeviceServer version and copyright.
- NetPower DeviceServer serial number.
- The maximum allowable number of devices for the NetPower DeviceServer (available through licensing).
- NetPower DeviceServer license expiration date.
- NetPower DeviceServer device control is enabled (available through licensing).
- Download Setpoints is enabled (available through licensing).
- INCOM Network is enabled (available through licensing).
- Modbus is enabled (available through licensing).
- Loading EDS (Electronic Data Sheet).
- Starting NetPower Trend.
- Starting NetPower DeviceServer.
- Starting PowerNet.
- The NetPower DeviceServer IP address and its TCP/IP port number.

Note
If any errors occur, DeviceServer closes and records the errors in the error log.

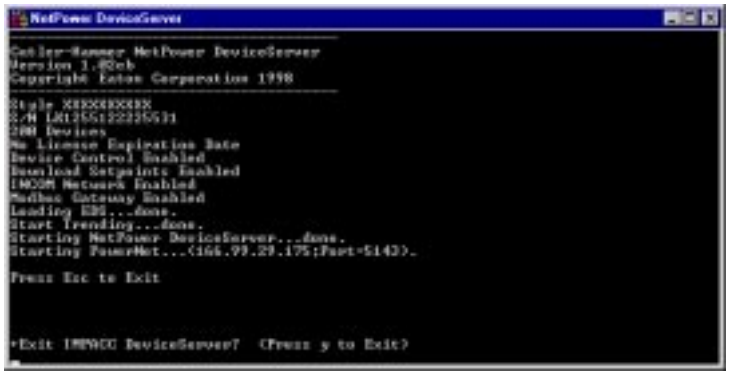
Exiting NetPower DeviceServer

To exit NetPower DeviceServer, do the following:

1. If necessary, open the NetPower DeviceServer DOS window.

2. Press [Esc] to exit.

   The window updates, verifying the request to exit.



3. Type **y** to exit.

NetPower DeviceServer exits.

NetPower DeviceServer Features

Accepting Connection and Disconnecting from a Client

A NetPower DeviceServer recognizes requests from PowerNet Software applications to connect to the NetPower DeviceServer. If the user running an application has a sufficient security privilege, then the NetPower DeviceServer accepts the connection. Several applications have the option to maintain this connection, but temporarily disconnect and subsequently reconnect communications. These options are listed in the following table.

Option	Description
Open	Open and Connect (either on-line or off-line) to a configured NetPower DeviceServer.
Connect	Reconnect (begin communications) with a NetPower DeviceServer.
Disconnect	Disconnect (terminate communications) with a NetPower DeviceServer.
Close	Close and Disconnect from a NetPower DeviceServer (allows you to open another NetPower DeviceServer).

Device Polling and Control

Polling is the process of communicating with an item (subnetwork master or device) to determine its status or collect data from it. To optimize throughput on a device network, you can set individual polling rates across these devices, which minimizes NetPower DeviceServer wait states and timeouts.

A scan is the process of acquiring specific data (with a defined frequency) from selected devices on a device network. The frequency of a scan is called the Scan Rate or Polling Rate. Scan rates are defined using the NetPower Configurator application.

NetPower DeviceServer supports six user-adjustable scans, which are described in the following table.

Option	Description
High Priority Status Scan	For (high priority) polling device status values.
Low Priority Status Scan	For (low priority) polling device status values.

Option	Description
E-Log Polling Scan	For polling device settings.
Data Scan Rate 1	For polling (highest priority) device data values. If data throughput defined at this priority level reaches the time limit, then only data within that time limit is polled, and data values defined at lower data polling priority levels may not get polled.
Data Scan Rate 2	For polling (medium priority) device data values. If data throughput defined at the Medium and High priority levels reaches the time limit, then only data within that time limit is polled, and data values defined at the lower priority level may not get polled.
Data Scan Rate 3 (Lowest)	For polling (low priority) device data values.

You specify the device status and data polling rates using the NetPower Configurator application. For more information, see *Chapter 9: Configuring the System*.

You specify the E-Log scan rates using NetPower Tools. For more information, see *Chapter 11: NetPower Tools.*

Subscription Handler

The NetPower DeviceServer performs the Subscribe Push, which sends device attribute values (current, voltage, etc.) from the NetPower DeviceServer to a TCP/IP-networked application. The Subscribe Push Rate defines the frequency with which these device attribute values are supplied. Data is sent or “pushed” to the application by the NetPower DeviceServer, rather than being “pulled” from the NetPower DeviceServer by the application. The attribute values are sent to the client only if they have changed from their previous values (for a maximum rate of the user-specified Subscribe Push Rate). For more information on the Subscribe Push Rate, see *Chapter 9: Configuring the System*.

NetPower DeviceServer Advanced Features

Scan Types and Priorities

In addition to performing the scans of device status and data, the NetPower DeviceServer has control over data transfer across its CONI card. Because the CONI card may receive a large amount of data over a

certain time interval during device status and data scanning, a time limit can be set for each scan type to optimize the data transfer across the CONI card. This time limit governs the amount of data that is received by the CONI for each data poll. The following table lists the scan types in decreasing order of priority. Device Control has the highest priority level for data transfer across the CONI card, and Background Poll has the lowest priority level.

Scan Type	Description
Device Control Polling	Time limit for Device Control scan (which applies to setting a relay, motor control, etc.).
Event Polling	Time limit for Event Data scan (which applies to Time Stamp events or trips).
High Priority Status Scan	Time limit for the user-defined high priority status scan.
Low Priority Status Scan	Time limit for the user-defined low priority status scan.
E-Log Polling Scan	Time limit for the Energy Log scan.
High Priority On Demand Data Polling	Time limit for On Demand Data poll (which applies to one-time data requests, such as NetPower Setpoints & Trip Curve).
Data Scan Rate 1	Time limit for the user-defined high priority data scan.
Data Scan Rate 2	Time limit for the user-defined medium priority data scan.
Data Scan Rate 3	Time limit for the user-defined low priority data scan.
Trend Scan	Time limit for the Device Trending data scan.
Low Priority On Demand Data Polling	Time limit for On Demand data scan (applicable to low priority, one-time data requests, such as NetPower Waveform).
Background Polling	Time limit for background data polling (for data that is not being scanned as part of the user-defined data scans).

The CONI performs any and all requested device controls at the expense of lower priority polling or scans. The CONI performs background polls only when requests for higher priority polls or scans have been performed. These priority levels are built-in and cannot be changed.

NetPower DeviceServer System Directories and Files

The following table describes the default directories and file names that are installed when you first start NetPower DeviceServer. These directories and files are stored in the \DeviceServer directory (where you have installed the PowerNet Software applications).

Important
These directories and files are required to run the NetPower DeviceServer and associated applications. Do not modify or delete these folders or associated files.
Twenty Mbytes is the default amount of free disk space remaining that will cause a warning. If you are at or below this amount, a system event is logged into the System Event file.
Five Mbytes is the default amount of free disk remaining that will cause an error. If you are at or below this amount, a system event is logged into the System Event file, and no E-Log, System Event, Alarm, Delay Event, TSEvent, NetPower Trend, or NetPower Waveform data files are created.

Folder/ File	Description
\E-Log (folder)	E-Log configuration and data files.
\Event (folder)	Daily system event files. The System Event files are deleted after 45 days (default value).
\Modbus (folder)	Modbus configuration and data files for running the NetPower Modbus Tools application.
\Trend (folder)	Trending and configuration data files. The default number of attributes that can be trended for one NetPower DeviceServer is 40,000.
\TSEvent (folder)	Time Stamp Event data files.
\Waveform (folder)	NetPower Waveform data files for running the NetPower Waveform application.
\Alarm (folder)	Daily historical device alarm files.
\Debug Ev (folder)	Daily debug event files. The debug event files are deleted after 45 days (default value). The logging of debug event files is disabled by default.
.INI (files)	Any file in the root directory with this suffix is a critical system file and must not be modified.