

# **Empower 3**

## **Installation, Configuration, and Upgrade Guide**

**715005266/Revision B**

**Waters**  
**THE SCIENCE OF WHAT'S POSSIBLE.®**

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We seriously consider every customer comment we receive. You can reach us at [tech\\_comm@waters.com](mailto:tech_comm@waters.com).

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Contact Waters® with enhancement requests or technical questions regarding the use, transportation, removal, or disposal of any Waters product. You can reach us via the Internet, telephone, or conventional mail.

### Waters contact information

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Internet	The Waters Web site includes contact information for Waters locations worldwide. Visit <a href="http://www.waters.com">www.waters.com</a> .
Telephone and fax	From the USA or Canada, phone 800 252-HPLC, or fax 508-872-1990. For other locations worldwide, phone and fax numbers appear in the Waters Web site.
Conventional mail	Waters Corporation Global Support Services 34 Maple Street Milford, MA 01757 USA

## Empower Software

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### Intended use

Use Waters® Empower® 3 Feature Release 4 (FR4) software for acquiring, processing, reporting, and managing your chromatographic information. This guide describes the installation and configuration process for Empower 3 (FR4) software. It also explains how to upgrade from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1 Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.to Empower 3 FR4 software.

## **Safety information**

See the operator's guides of the instruments or devices associated with this software product for information on how to safely operate and maintain them.



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# 1 Introduction

## 1.1 Waters Empower Software

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The Waters® Empower® 3 Software system includes these elements:

- Chromatographic instrumentation
- Chromatographic data acquisition and data processing computers
- Empower software, a data acquisition and management software application, with advanced integrated database architecture

The system acquires, processes, reports, and manages chromatographic information. Empower software offers easy-to-use technology and converts high-quality, accurate data into usable information while meeting security and regulatory compliance requirements. It is a complete chromatography and results management system that you can adapt to your individual requirements by using as many or as few Empower software capabilities as you require.

This release of Empower 3 Feature Release 4 (FR4) software runs in a Microsoft® Windows®-based environment. The Empower 3 FR4 software also runs on a Solaris operating system on an UNIX® server and on a Red Hat operating system on a Linux server. All other components of the system (client, LAC/E™, and file servers) must run on Windows.

## 1.2 Typical system configurations

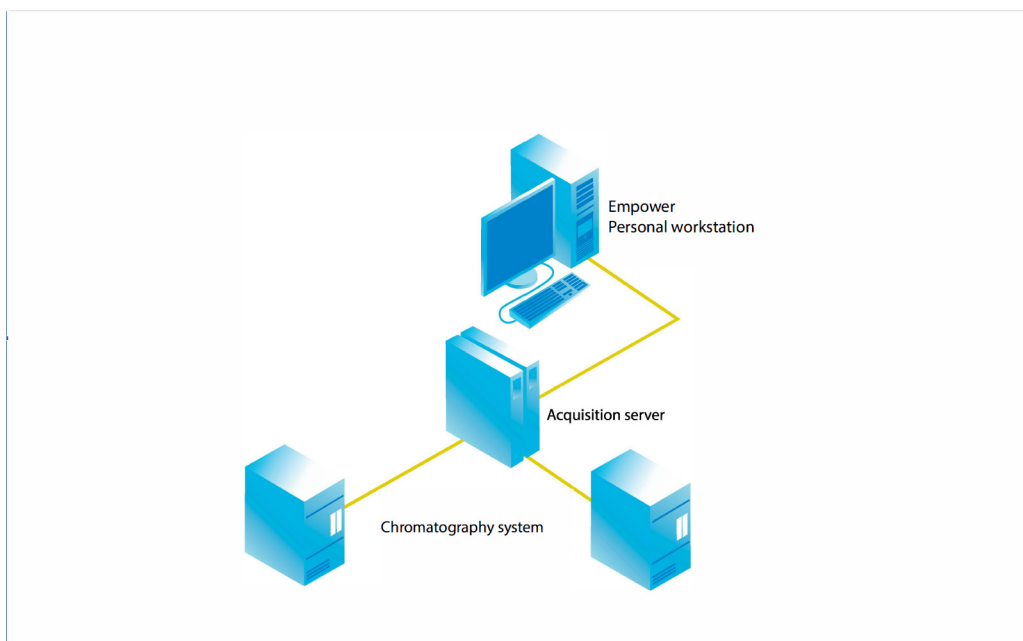
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Empower software can operate in the following configurations:

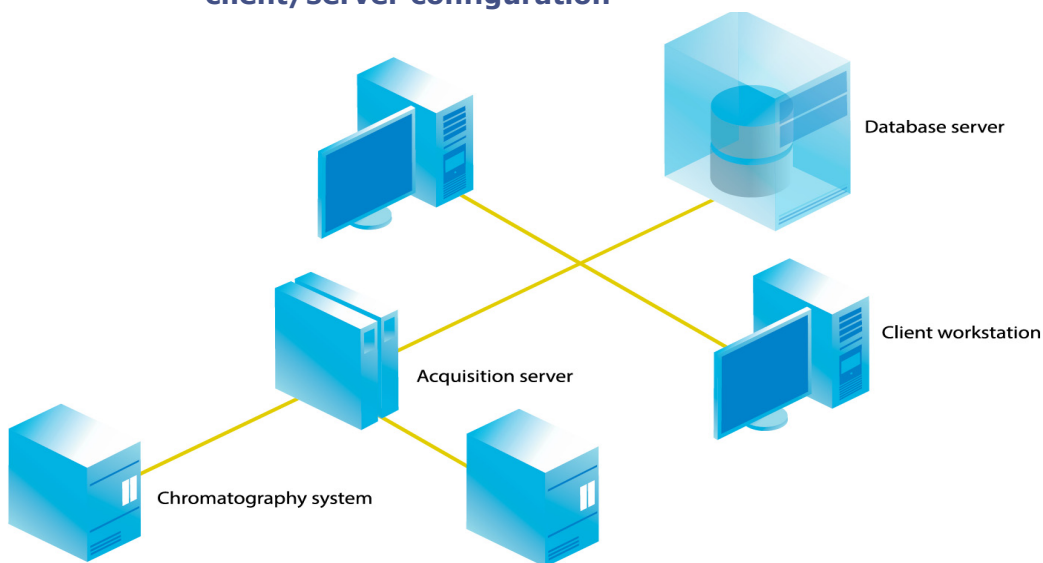
- Empower Personal workstation (see [page 16](#))
- Empower Workgroup system or Enterprise client/server (see [page 16](#))

The following figures show typical Empower Personal workstation and Empower Workgroup system or Enterprise client/server configurations. Your configuration may vary. You can identify the components of your configuration by viewing the installation log.

**Figure 1–1: Typical Empower Personal workstation configuration**



**Figure 1–2: Typical Empower Workgroup system or Enterprise client/server configuration**



### 1.2.1 Wide Area Network

**Requirement:** When running Empower software over a wide area network (WAN), a network latency of 200 millisecond (msec) or less is required. If your network latency is greater than 200 msec, system performance may be impaired. Other WAN characteristics, such as bandwidth and packet loss will contribute to the performance of Empower over a WAN.



## 1.3 Hardware and software requirements

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The following tables describe the major subsystems, hardware, and operating system configurations that Empower 3 software supports.

**Note:** You can install Empower 3 FR4 as a new installation on a system where no Chromatography Data Software (CDS) is currently installed or as an upgrade from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Table 1–1: Requirements for Empower Personal workstations:**

<b>Component</b>	<b>Minimum</b>
Operating system/ hardware	Windows 7 Enterprise or Professional, SP1, 64-bit <b>Restriction:</b> Windows 7, 32-bit operating system is not supported. Windows 10 Enterprise or Professional, 64-bit
Oracle	Oracle® version 12.1.0.2.0
CPU	<b>Minimum:</b> Intel 2 Duo, E6400 2.13GHz <b>Recommended:</b> Intel Core 2 Duo, E8400 3.0GHz
Random access memory (RAM)	<b>Minimum:</b> 8 GB <b>Recommended:</b> 16 GB
Virtual memory	4 × installed RAM
Hard disk drive	<b>Minimum:</b> 25 GB <b>Recommended:</b> Actual space recommendations depends on your usage for both new installations and upgrades to Empower software. Ensure there is plenty of space for your raw data files.
Free hard disk space	2 GB for Empower 3 FR4 application 13 GB for Oracle/Empower database (new installations) 23 GB for Oracle/Empower database (upgrades) <b>Minimum:</b> 5 GB of free disk space, to accommodate projects
DVD drive	Access to a DVD drive required
Monitor	1024 × 768 resolution, 1920 × 1080 resolution recommended
Graphics capability	svGA video at 1024 × 768 × 256 color resolution
Optional control interfaces	Waters Bus Laboratory Acquisition and Control/Environment (busLAC/E) card required  (BusLAC/E driver 7.0.1.1 required; will be installed automatically if busLAC/E detected during Empower installation) 8-port serial hub Edgeport® USB-to-serial converter cable
Application software	Empower 3 Feature Release 4
Ethernet adapters	1 Ethernet adapter, for network connectivity, and 1 Ethernet adapter, to operate Ethernet instruments. Minimum speed for either adapter must exceed 100 Mbps. Recommended speed is 1 Gbps.

**Table 1–2: Requirements for Empower client computers or LAC/E modules**

<b>Component</b>	<b>Minimum</b>
Operating system/ hardware	Windows 7 Enterprise or Professional, SP1, 64-bit <b>Restriction:</b> Windows 7, 32-bit operating system is not supported. Windows 10 Enterprise or Professional, 64-bit LAC/E configurations 12, 13, and 14 for Windows 7 only LAC/E configuration 15 for Windows 7 and 10
Oracle	For Empower client computers and LAC/E modules, Oracle client version 12.1.0.2.0 for 32-bit.
CPU	<b>Minimum:</b> CPU for Windows 7 or 10 Intel 2 Duo, E6400 2.13 GHz <b>Recommended:</b> Intel Core 2 Duo E8400 3.0 GHz
Random access memory (RAM)	<b>Minimum:</b> 4 GB <b>Recommended:</b> 8 GB
Virtual memory	Four times amount of installed RAM
Hard disk drive	25 GB
Free Hard Disk Space	2 GB for Empower 3 FR4 Application
Monitor	Required except for LAC/E modules, 1024 × 768 resolution, <b>Recommended:</b> 1920 × 1080 resolution for client
Graphics capability	svGA video at 1024 × 768 × 256 color resolution
Optional control interfaces	Waters Bus Laboratory Acquisition and Control/ Environment (busLAC/E™) card required (BusLAC/E driver 7.0.1.1 required; will be installed automatically if busLAC/E detected during Empower installation) 8-port serial hub Edgeport USB-to-serial converter cable
Application software	Empower 3 Feature Release 4 (FR4)
Ethernet adapters	1 Ethernet adapter, for network connectivity, and 1 Ethernet adapter, to operate Ethernet instruments. Minimum speed for either adapter must exceed 100 Mbps. Recommended speed is 1 Gbps. 1 Ethernet adapter, for Client. Minimum speed must exceed 100 Mbps. Recommended speed is 1Gbps.

**Table 1–3: Requirements for the Empower Enterprise and Workgroup servers**

Component	Minimum
Operating system	Windows Server 2008 R2 SP1, either Enterprise or Standard, (64-bit) or Windows Server 2012 R2, Standard edition, (64-bit)
Oracle	Oracle 12.1.0.2.0
CPU	<b>Minimum:</b> 1 × Intel Xeon 1 × E5-2620v3 (4 cores @ 1.8 GHz) <b>Recommended:</b> 2 × Intel Xeon E52620 (6 cores @2.4 GHz)
Random access memory (RAM)	<b>Minimum:</b> 8 GB <b>Recommended:</b> 24 GB
Virtual memory	4× installed RAM
Hard disk drive	Free Hard Disk space: <ul style="list-style-type: none"> <li>• 1 GB for Empower 3 FR4 application</li> <li>• 13 GB for Oracle and Empower database (new installations)</li> <li>• 20 GB for Oracle/Empower database (upgrades)</li> </ul> <b>Minimum:</b> 5 GB of free disk space, to accommodate projects Actual space recommendations depends on your usage for both new installations and upgrades to Empower software.
Backup device	Recommended
Monitor and graphics capability	Required sVGA video at 1024 × 768, 256 color resolution
Printer	Access to a printer required
Application software	Empower 3 Feature Release 4 software Google Chrome™ 35 or later. <b>Recommendation:</b> Waters recommends Google Chrome for use with Waters Database Manager (WDM)
Network interface card	1Gbps NIC Required

**Table 1–4: Requirements for Citrix server support**

Component	Minimum
Operating system	Windows Server 2008 R2 Enterprise or Standard edition 64-bit Windows Server 2012 R2 Standard edition 64-bit

**Table 1–4: Requirements for Citrix server support (Continued)**

Component	Minimum
Citrix XenApp™ software	XenApp 7.6 (running in Windows Server 2008 R2 Enterprise or Standard Edition 64-bit) XenApp 7.6 (running in Windows Server 2012 R2 64-bit)
Random access memory (RAM)	<b>Minimum:</b> 2 GB <b>Recommended:</b> 8 GB
Virtual memory	Four times amount of installed RAM

**Table 1–5: Requirements for the UNIX Server**

Component	Minimum
Operating system	Solaris® 10 (8/11), patched to 9/11
Hardware	T5240, T4-2 or equivalent
Random access memory (RAM)	<b>Minimum:</b> 8 GB <b>Recommended:</b> 24 GB
Hard disks	4local hard drives (additional SAN storage recommended)
Virtual memory	4 × installed RAM
DVD drive	Access to a DVD drive required
Backup device	Recommended (optional)
Monitor	Not required
Graphics capability	If using a local graphics card, minimum 1024x768x16 bit color resolution is required
Server software	Solaris 10 (8/11) Oracle RDBMS (Relational Database Management System) 12.1.0.2.0
Network interface card	Multiple 1 Gbps NICs, teamed

**Table 1–6: Requirements for the Linux Server**

Component	Minimum
Operating system	Red Hat Enterprise Linux 6.8
CPU	<b>Minimum:</b> 1 × 4 cores @ 1.8 GHz <b>Recommended:</b> 2 × 6cores @ 2.4 GHz
Random access memory (RAM)	<b>Minimum:</b> 8 GB <b>Recommended:</b> 24 GB
Virtual memory	4 × installed RAM
Hard disk drive	4 local hard drives (27 GB total), additional SAN storage recommended

**Table 1–6: Requirements for the Linux Server (Continued)**

Component	Minimum
Backup device	Recommended (optional)
Monitor	Not required
Graphics capability	If using a local graphics card, minimum 1024x768x16 bit color resolution is required
Server software	Red Hat Enterprise Linux 6.2 (Oracle RDBMS Relational Database Management System) 12.1.0.2.0
Network interface card	Multiple 1 Gbps NICs

**Table 1–7: Requirements for Empower Fileserver**

Component	Minimum
Operating system	Windows Server 2008 R2 SP1, Enterprise or Standard (64-bit) or Windows Server 2012 R2, Standard edition (64-bit)
Random access memory (RAM)	<b>Minimum:</b> 8 GB <b>Recommended:</b> 16 GB
Virtual memory	4 × installed RAM

**Exception:** The Empower 3 software installer (Deployment Manager) gathers information about your system and compares your system settings to the minimum required specifications. The installation can display an error message and continue, or the installation can stop and exit, depending on the following conditions:

- If the system includes an incompatible processor, the installation continues without warning messages. The processor information is recorded in the installation log.  
**Tip:** Click Start > All Programs > Empower > Empower Installation Log to view the installation log.
- If the system does not meet the memory requirement, an error message states the insufficiency, and the installation terminates. The insufficiency is recorded in the installation log.
- If a system does not meet the hard drive space requirements for the required features, an error message states the insufficiency. You must free up disk space or change installation drives before you can continue.
- If the drive hosting the Empower projects directory does not meet the 1-GB minimum requirement, a warning message states the insufficiency. The installation continues, but does not terminate.

### 1.3.1 Virtualization support

Empower 3 FR4 supports the following virtualization using VMware® vSphere ESXi 5.5 on these platforms and operating systems:

- Windows Server 2008 R2 Enterprise or Standard, Windows Server 2012 R2 Standard, 64-bit File Server and database server

- Empower 3 Client Windows 7, Windows 10 Professional or Enterprise, 64-bit
- Citrix on Windows Server 2012, 64-bit (includes the Citrix server, license server, farm controller, and web server), XenApp 7.6 with client online plug-in version 12
- Citrix on Windows Server 2008 R2 Enterprise or Standard Edition, 64-bit, XenApp 7.6 with client online plug-in version 12

**Exception:** Acquisition Clients or LAC/E modules are not supported for use in a virtual environment.

## 1.4 Devices supported by Empower

Each Empower 3 FR4 acquisition server can support these devices:

- As many as four chromatographic systems
- As many as four busSAT/IN™ modules, through an I/O distribution box on the standalone Empower Personal workstations, clients, and <sup>LAC/E</sup> modules
- Multiple RS-232-based devices (such as gas chromatographs and detectors)
- Ethernet devices
- Avocent® Ethernet multi-interface serial hub (ESP™-8 MI) [8-port serial hub]
- Edgeport USB-to-serial converter cable provides a standard PC COM port connection with the serial instrument—usually by connecting a second cable with wiring that is specific to the instrument.
- As many as 14 IEEE-488-based devices using no more than 20 meters of cable in total, and no more than 4 meters of cabling between devices.

**Table 1–8: Maximum cable lengths for IEEE-488 devices**

Number of devices connected	Maximum total cable length (meters)
1	4
2	6
3	8
4	10
5	12
6	14
7	16
8	18
Greater than 8	20

### 1.4.1 Ethernet and serial instruments

The *Empower 3 Supported Instruments Reference Guide* contains the list of supported instruments and their instrument component software (ICS) version, if it applies. This guide is available on the Waters website.

The latest version of the Waters Driver Pack 2016 Release 2 or Waters Driver Pack 2017 Release 1 Installation and Configuration Guide contains information regarding instrument driver compatibility.

The instruments in the following table are no longer supported.

**Table 1–9: Instruments no longer supported**

<b>Instrument</b>	<b>As of:</b>
410 RI detector	Empower 3
486 TUV detector	Empower 3
996 PDA detector	Empower 3
474 Fluorescence detector	Empower 3
Waters ZQ 2000 Mass Detector	Empower 3 FR3
Waters ZQ 4000 Mass Detector	Empower 3 FR3
Waters EMD1000 Mass Detector	Empower 3 FR3



# 2 Installing and configuring the hardware

## 2.1 Preparing for Empower 3 FR4 software

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For all configurations, except an Empower Personal workstation, a network is required in your facility so that the Workgroups or the Empower Enterprise system can function. Waters personnel do not run or install network cabling.

**Requirement:** You must use a computer connected to the Internet in order to install and activate Waters licenses and options. This computer does not need to be running Empower software. See ["Activating Empower 3 FR4 software licenses and options"](#).

**Tip:** If your Waters technical service representative has already installed and configured the system for you, proceed to ["Powering-on the chromatographic system"](#).

**Recommendation:** Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer). After installation, back up your Empower 3 FR4 data regularly.

## 2.2 Selecting the site

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Locate the Empower 3 FR4 system in a clean area free from shock, vibration, and extremes of temperature and humidity.

### 2.2.1 Environmental requirements

Operate Empower 3 FR4 system within the following temperature and humidity ranges:

- Temperature: 10 to 31°C
- Humidity: 20 to 80% relative humidity, noncondensing, maximum wet bulb of 25°C and minimum dew point of 2°C

Acceptable temperature and humidity ranges vary according to the model of computer and printer, and the instruments and devices that are part of the chromatographic systems.

Protect equipment from direct sunlight, heat registers, or air conditioning vents.

## 2.2.2 Bench space

Allow sufficient bench space for the Empower Personal workstation, Workgroup, or client computers (keyboard, monitor, system unit, and printer) as recommended in the documentation supplied with the computer. You can place the computers on the lab bench or on a desktop near the chromatography instrumentation. The total bench space required depends upon the number of devices you plan to configure (pumps, detectors, autosamplers, eSAT/IN modules, and so on).

## 2.2.3 Cable lengths

Arrange the components of your chromatographic system to minimize cable lengths. Use optimal cable lengths to ensure proper signal transmission. Maximum cable lengths are listed in the table on [page 23](#).

## 2.2.4 Instrument arrangement

Make sure the ventilation slots on all instruments are not blocked. Allow at least 15 cm of space on all sides of each instrument to ensure adequate air flow.

For information on the best arrangement of your Empower system and connected instruments, consult your Waters technical service representative.

# 2.3 Installing and configuring computer systems

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This section describes the process for installing and configuring the Empower computer systems and other components.

## 2.3.1 Empower Personal workstation

The Empower Personal workstation supports these optional interfaces:

- A second network interface card for Ethernet instruments
- A busLAC/E (IEEE-488 interface) card for connecting Waters IEEE-488 devices
- 8-port serial hub
- USB-to-Serial Converter Cable

### To install and set up the Empower Personal workstation:

1. Unpack and place the workstation in the desired location.
2. Attach the keyboard, mouse, and monitor to the workstation.
3. To install other computer peripherals such as printers or storage devices, see the installation documentation supplied with the device.
4. If applicable, install and connect the optional network devices:
  - Connect and configure the Ethernet devices (see ["Connecting and configuring Ethernet chromatographic devices"](#)).

- Connect and configure the serial devices (see ["Connecting serial chromatographic devices"](#)).
  - Ensure that the busLAC/E (IEEE-488 interface) card is installed in the workstation and set up correctly (see ["busLAC/E card"](#)).
  - Connect the IEEE-488 chromatography instruments to the busLAC/E card in the workstation using the IEEE-488 cable (see ["Connecting IEEE-488 chromatographic devices"](#)).
5. Power-on the workstation (see ["Powering-on the chromatographic system"](#)).

## 2.3.2 Empower Workgroup or Enterprise system

The Empower Workgroup or Empower Enterprise system consists of one or more servers, one or more clients, and one or more LAC/E modules. Each computer in the Empower Workgroup or Enterprise system requires at least one network interface card.

Chromatographic devices in an Empower Workgroup or Enterprise system are connected to the LAC/E module or an acquisition client. The LAC/E module or acquisition client provides distributed acquisition for the Workgroup and Enterprise configuration, providing:

- Data acquisition
- Instrument control
- Remote access to instruments
- Remote data processing and printing in Run and Report modes

The LAC/E modules and clients support these optional interfaces:

- A second network interface card or multiple cards in a MACPort bridge configuration
- A busLAC/E (IEEE-488 interface) card for connecting Waters IEEE-488 devices
- 8-port serial hub
- USB-to-Serial Converter Cable

### To install and set up the Empower Workgroup or Enterprise server:

1. Unpack and place the server in the desired location.
2. Attach the keyboard, monitor, and mouse to the server.
3. To install other computer peripherals such as a printer or storage devices, see the installation documentation supplied with the device.
4. Ensure that the network interface card is installed in the server.
5. Set up the clients.

### To install and set up an Empower Workgroup or Enterprise client:

1. Unpack and place the client computer in the desired location.
2. Attach the keyboard, mouse, and monitor to the computer.

3. Ensure that the network interface card is installed in the client and set up correctly.  
**Requirement:** If you are using Ethernet instruments, ensure a second network interface card is present. If you are using serial instruments, ensure a serial hub or serial card is present.
4. Repeat [step 1](#) through [step 3](#) for each client in the Enterprise system.
5. Connect the client to the network.
6. Set up the LAC/E modules.

#### **To install and set up a LAC/E module:**

1. Unpack and place the LAC/E module in the desired location.
2. Ensure that the network interface card is installed in the LAC/E module and set up correctly, as well as the serial device and the busLAC/E card.  
**Requirement:** If you are using Ethernet instruments, ensure at least one additional network card is present. If you are using serial instruments, ensure a USB-to-serial cable is present.
3. Connect the LAC/E module to the network.
4. Connect the chromatographic instruments to the LAC/E module.

### **2.3.3 Optional interface connectors**

You can directly connect to the COM port on an Empower Personal workstation or an acquisition client without a busLAC/E card when you are acquiring data from a SAT/IN2 Module.

#### **2.3.3.1 Network interface card for Ethernet instruments**

A client, LAC/E module, or Personal workstation must use an additional network interface card (NIC) in order to communicate with Ethernet instruments (such as an ACQUITY or e-SAT/IN or 2475 detector). You must assign an IP address to this network card (also called an instrument network card) so that it can assign IP addresses to your Ethernet instruments. To set the IP address, Empower software must first be installed on the client, LAC/E module, or workstation. To configure the instrument LAN, access the Waters DHCP Server Configuration wizard. In Configuration Manager, right-click an Empower Node, and then select Properties. From the Node Properties dialog box, click Configure DHCP, and then click the Configure DHCP button. From the Waters DHCP Server Configuration dialog box, click Server, and then click Configuration Wizard. In the Select Network Connection dialog box, select the Instrument LAN, and then follow the steps of the wizard. Assign the NIC an IP address that is different from the subnet in use already by current corporate network. For more details, see the *Ethernet Instrument Getting Started Guide* or the topic "Configuring chromatographic instruments" in the Empower Help.

#### **2.3.3.2 Bridging multiport network cards for Ethernet instruments**

An acquisition client, LAC/E module, or Personal workstation supports both single port network cards and bridging multiport network cards. If you are using a single network card, refer to the Empower Help topic: "Configuring DHCP settings".

If you are using a multiport network card and bridging ports for those computers (acquisition client, LAC/E module, or Personal workstation) running on Windows 7, use the default settings within the operating system. When bridging ports for computers running on Windows 10, you must configure the instrument LAN as described below.

**Note:** This procedure was tested using Waters hardware. If you are using non-Waters computers, you may notice differences in this procedure. Contact Waters for assistance.

#### **To configure the instrument LAN for bridging multiport network cards in Windows 10:**

1. From Control Panel > Network and Internet> Network Connections, right-click the Local Area Connection to be used for the bridge.
2. In the Local Area Connection Properties dialog box, click Configure.
3. In the Properties dialog box, click the Advanced tab.

**Requirement:** You must change these settings for every Local Area Connection that comprises the instrument LAN bridge.

From the Property list box, select these items, change the value to "Disabled", and then click OK:

- IPv4 Checksum Offload
- TCP Checksum Offload (IPv4)
- UDP Checksum Offload (IPv4)

4. From the Windows Network Connections page, select all the Local Area Connections that comprise the bridge, and then right-click and select Bridge Connections.

**Note:** A Network Bridge message appears while the bridging occurs.

5. After the bridge is created, right-click it, select Rename, and then type "Instrument LAN".
6. From Windows Control Panel > Device Manager > Network Adapters, select Microsoft Multiplexor Driver, and then right-click Properties.
7. In the Microsoft Network Adapter Multiplexor Driver Properties dialog box, click the Advanced tab.

From the Property list box, select these items, change the value to "Disabled", and then click OK:

- IPv4 Checksum Offload
- TCP Checksum Offload (IPv4)
- UDP Checksum Offload (IPv4)

**Result:** The network card is properly configured; however, you must perform additional steps as described in the Empower Help topic: "Configuring DHCP settings".

### **2.3.3.3 busLAC/E card**

The busLAC/E card is a microprocessor-based interface card that transmits commands from Empower software to detectors, autosamplers, pumps, and other devices over

the IEEE-488 interface via an IEEE-488 cable. Data from the devices are transmitted through the busLAC/E card to the computer for analysis.

The Empower Personal workstation, as well as clients and LAC/E modules, can use a busLAC/E card to function with Empower software. IEEE-488 chromatographic devices connect to the busLAC/E card.

The busLAC/E card performs two primary functions:

- Controls chromatographic devices
- Acquires data from a detector and transmits the data to the computer

A maximum total aggregate data rate of 400 points per second applies to all detectors connected to the busLAC/E card per four systems per four projects, except in configurations including a PDA detector or configurations with a combination of LC and GC instrumentation. The following table describes the exceptions to the data rate for each instrument type.

**Table 2–1: Data rates for busLAC/E card connections**

<b>Instrument</b>	<b>Data rate</b>
busSAT/IN	Maximum total aggregate data rate of 100 points per second for each busSAT/IN™ module (50 points per channel).
Split busSAT/IN	Control of as many as two split busSAT/INs (each channel resides in a separate system) for a total of four channels in four separate systems. Each channel must be at a maximum of 50 points per second. (The busSAT/IN channels can be split only when the busSAT/IN module is connected to a busLAC/E.)
Gas Chromatograph	Maximum total data rate of 200 points per second for each 6890 GC system. Maximum total data rate of 20 points per second for the control of two 5890 GC systems and 5 points per second on two additional LC systems.

**Table 2–1: Data rates for busLAC/E card connections (Continued)**

<b>Instrument</b>	<b>Data rate</b>
PDA (Personal)	<p>Two systems allowed, each with a 2996 PDA detector running at 300-nm maximum range for each system, 1.2-nm resolution, and 5 spectra per second.</p> <p>You can operate one 2996 PDA detector at half-spectrum range at 4.8-nm resolution and 5 spectra per second, or half-spectrum range at 1.2-nm resolution and 1 spectrum per second, and run three other LC systems at a maximum aggregate data rate of 30 points per second.</p> <p>Empower software supports the use of one 2996 PDA Detector at a full wavelength range and data rate of 10 spectra/sec.</p> <p>At that rate, the software can support one additional chromatographic system with a data rate of 10 points/sec.</p> <p>If you use a 2996 PDA detector at half spectra range and a data rate of 5 spectra/sec, you can run three additional chromatographic systems whose aggregate data rates are 30 points/sec.</p>
PDA (Workgroup or Enterprise)	<p>Two systems allowed, each with a 2996 PDA detector running at a 1000-nm combined wavelength range, 1.2-nm resolution, and 10 spectra per second.</p>
Two-System Acquisition	<p>When you perform a two-system acquisition (one system being a 600/717/2487 and the other a 2695 or 2695/2996), the maximum data rate for the 600-based system must be 2 points per second and for the 2996-based system, 5 spectra per second, with 1.2-nm resolution and a wavelength range of 190 to 800 nm.</p>

#### **2.3.3.4 8-port serial connections**

The 8-port serial hub transmits commands from Empower to the serial instrument. Data from the chromatograph are transmitted to Empower for analysis through a single port on the serial hub (or card).

There are eight possible serial connections. Each instrument type requires one connection. The 8-port serial hub (or card) can be connected to the following supported instruments, with the restrictions as indicated:

- 5890S/7673S systems (maximum of four)
- 6890 instruments (maximum of four)
- 6890/SAT/IN2 systems (maximum of four)
- SAT/IN2 instruments (maximum of eight; to be used as four multi-channel systems)

To install the 8-port serial hub or 8-port serial card, see the release notes or installation instructions provided for each device.

**Restriction:** Do not use the serial hub or serial card drivers provided by Microsoft Windows during the first power-up after installing the serial hub or card.

Edgeport USB-to-serial converter cable provides a standard PC COM port connection with the serial instrument—usually by connecting a second cable with wiring that is specific to the instrument.

**Requirement:** You must update the Windows-installed driver to a supported version. See [page 110](#) for instructions.

## 2.4 Connecting and configuring Ethernet chromatographic devices

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Ethernet instruments connect directly to a computer's network interface card. If you are connecting multiple Ethernet instruments, use a Waters-supplied switch and connect the Ethernet cable from the computer to the switch, then plug each instrument into the switch.

### Tips:

- The network interface card (NIC) used for instrument connections is additional to the NIC used to communicate with your corporate network.
- A single direct Ethernet connection requires a crossover cable to control your A1100, 6850, or eSAT/IN module.

Power on Ethernet devices after powering on the client or LAC/E modules. See the *Ethernet Instrument Getting Started Guide* for more information on connecting and configuring Ethernet devices.

## 2.5 Connecting serial chromatographic devices

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### 2.5.1 8-Port serial connector instruments

**Restriction:** For Windows 7, use the 8-port serial hub.

See the *Waters 8-Port Serial Hub Support Release Notes* for more information.

### 2.5.2 busLAC/E I/O distribution box

The I/O distribution box connects to the busLAC/E card. The busSAT/IN module communicates with the busLAC/E card through the I/O distribution box over serial cables. The I/O distribution box allows you to connect as many as four busSAT/IN modules.



## 2.5.3 USB-to-Serial Converter Cable

The USB-to-serial converter cable provides a standard PC COM port connection with the serial instrument—usually by connecting a second cable with wiring that is specific to the instrument.

## 2.5.4 Ethernet and serial device connections

The following table lists Ethernet and 8-port serial device connections supported by Empower software.

**Table 2–2: Ethernet and serial device connections**

Device	Ethernet	8-port serial hub	busLAC/E card	PC COM port/USB-to-serial connector cable
busSAT/IN	No	Yes <ul style="list-style-type: none"><li>Split-channel operation <b>not</b> supported</li></ul>	Yes <ul style="list-style-type: none"><li>Split-channel operation <b>is</b> supported</li><li>In split-channel operation, each of the two available channels are in separate systems</li></ul>	Yes <ul style="list-style-type: none"><li>Split-channel operation <b>not</b> supported</li></ul>
eSATIN	Yes	No	No	No
5890/7673 GC and Controller	No	Yes <ul style="list-style-type: none"><li>Requires two serial cables</li><li>Dual-tower configuration is supported</li></ul>	No	No
6890/6890+/ 6890N GC	No	Yes <ul style="list-style-type: none"><li>Requires one serial cable</li><li>Dual-tower configuration is supported</li></ul>	No	Yes <ul style="list-style-type: none"><li>Requires one serial cable</li><li>Dual-tower configuration is supported</li></ul>
6850 GC	Yes (SN $\geq$ 10243001)	Yes	No	Yes (SN $\leq$ 10243001)
7890 GC Dual Tower ALS	Yes	No	No	No

**Table 2–2: Ethernet and serial device connections (Continued)**

<b>Device</b>	<b>Ethernet</b>	<b>8-port serial hub</b>	<b>busLAC/E card</b>	<b>PC COM port/USB-to-serial connector cable</b>
Headspace G1888A	Yes	No	No	No
Waters 3100 Mass Detector	Yes	No	No	No
Waters ACQUITY QDa Detector	Yes	No	No	No
Waters Single Quad (SQD) Detector	Yes	No	No	No
Waters Single Quad (SQD2)	Yes	No	No	No
Waters Triple Quad (TQD) Detector	Yes	No	No	No
Agilent 1100 LC Modules using Waters ICS v 1.06	Yes	Yes	No	No
Agilent 1100/1200/1260/1290 Modules using Agilent ICF support.	Yes	No	No	No

**Note:** For other instruments not listed in this table, refer to the Instrument Control Guide (USRM134905487).

## **2.6 Connecting IEEE-488 chromatographic devices**

Consult this section when connecting the IEEE-488 components of your chromatographic system to the busLAC/E card in an Empower Personal workstation or a LAC/E module.

## 2.6.1 busLAC/E card connections

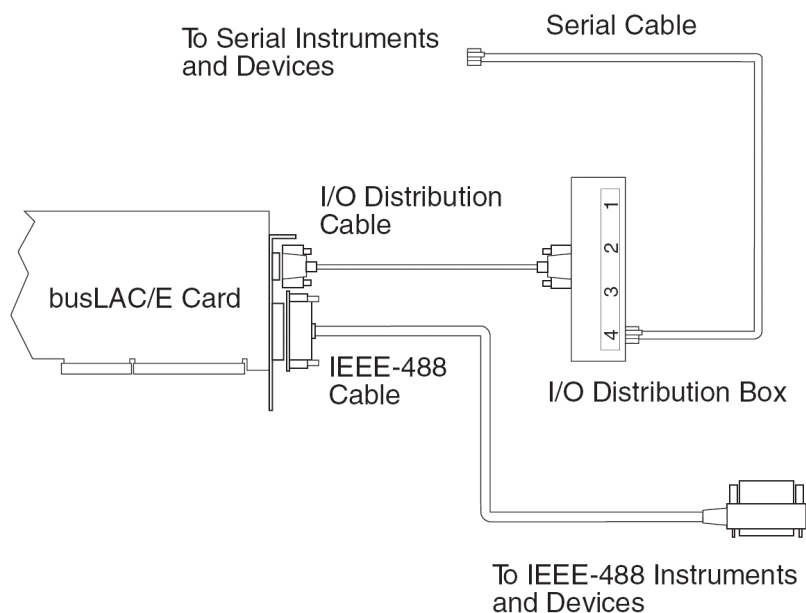
The busLAC/E card connects to peripheral devices through two ports on the rear edge of the card as follows:

- IEEE-488 port – Used for connecting to IEEE-488-controlled devices such as these:
  - Waters 2690/2695 Separations Module
  - Waters 2996 PDA Detector
  - Waters 717plus Autosampler
  - Waters 2487 Dual  $\lambda$  Absorbance Detector
- I/O distribution port – Used for connecting the Waters busSAT/IN Module

An IEEE-488 cable connects the 2690/2695 Separations Modules, 2996 PDA Detectors, 2487 Absorbance Detectors, and other IEEE-488 devices to the busLAC/E card.

An I/O distribution cable connects the I/O distribution box to the I/O distribution port of the busLAC/E card. The busSAT/IN Module connects to the busLAC/E card through the I/O distribution box.

**Figure 2–1: busLAC/E card port connections**



## 2.6.2 Interface overview

The IEEE-488 bus is an instrument interface that connects devices using the IEEE-488 communication protocol. In the Empower system, Waters IEEE-488 chromatography devices connect to the busLAC/E card and use the IEEE-488 bus for communication.

The busLAC/E card is an instrument controller, assigning the role of active talker or listener to each attached device on the IEEE-488 bus. Each instrument designated as

an active talker supplies information to the other devices on the IEEE-488 bus. Each device designated as a listener receives information from an active talker device. Only one active talker is allowed at a time, but several listeners can be active simultaneously.

### 2.6.3 Interface guidelines

According to IEEE-488 protocol specifications, the following guidelines apply to the interface system:

- Always keep all devices powered-on while using the system.
- The maximum number of devices that you can connect to from one interface system is 15 (14 instruments plus the busLAC/E card).
- The maximum total cable length connecting the devices and the busLAC/E card in one interface system is 2 meters multiplied by the number of devices, or 20 meters, whichever is smaller.
- The maximum cable length between two devices is 4 meters.
- The minimum cable length between two devices is 1 meter.



**Warning:** Cable lengths greater than the maximum values or less than the minimum values can cause IEEE-488 communication failures.

- Use addresses 2 through 29 for instruments.

**Recommendation:** Use IEEE addresses 9 and above, spacing the addresses by a difference of 2. Example: 9, 11, 13, and so on.

**Tip:** For details on setting IEEE-488 device addresses, see [page 37](#).

- While a system is active on the IEEE-488 bus, do not power-on or power-off any device on the bus.

### 2.6.4 Making cable connections

**To connect IEEE-488 devices:**

1. Connect the single-receptacle end of the IEEE-488 cable (supplied with the chromatographic system) to the busLAC/E card.  
**Important:** Connect only the single-receptacle end of the cable to the busLAC/E card. Do not use the stackable connector for this first connection. Connect the other end of the IEEE-488 cable (with the stackable connector for daisy-chaining additional instruments) to the IEEE-488 connector on an instrument.
2. Use one end of another IEEE-488 cable to connect to the stackable connector on the first instrument. Connect the other end of the cable to the IEEE-488 port on the next instrument.

3. Repeat [step 2](#) for each additional instrument, up to 14 IEEE-488 instruments. See [page 23](#) for cable-length limitations.

**Tip:** The order in which you connect IEEE-488 devices to the busLAC/E card is not important. For example, you can connect the injector before or after the detector.

4. Ensure that all IEEE-488 cable connector screws are fastened finger-tight.

## 2.6.5 Device connections for specific instruments

### 2.6.5.1 Pump connections

If you are using a 2690/2695, 600-series pump (Waters 600E, 616, 625 LC, 626, 650E, ActION Analyzer, Delta Prep, and Prep LC), you can connect to the busLAC/E card through the IEEE-488 port or to other IEEE-488 devices in a stacked configuration (see [page 35](#)).

**Requirement:** If you are using a PowerLine™/Gradient version of software on your 600-series multisolvent delivery system, configure the controller software as a Gradient controller via the front panel keypad (not via Empower software). See the appropriate operator's guide for information on configuring the controller.

### 2.6.5.2 Injector connections

Detectors and system controllers that are not controlled by an Empower system (for example, 2690/2695, 600-series controller, and GC) require an inject-start trigger signal (contact closure) from the injector as each injection occurs. The inject-start trigger signal instructs detectors and system controllers to initiate data acquisition or run methods.

Waters autosamplers transmit the inject-start signal over the IEEE-488 bus or by trigger wire. If you connect a Waters 2690/2695, 717, or 717plus to an IEEE-488 interface, you need not make additional connections for an inject-start signal.

When under IEEE-488 control, the 2690/2695 Sample Management System, 717, and 717plus Autosamplers transmit the inject-start signal directly over the IEEE-488 bus during data acquisition. All controlled devices are triggered simultaneously when an injection is made by these instruments. Trigger wires are not required when all instruments in a chromatographic system are controlled over the IEEE-488 bus.

**Requirement:** Any instrument not controlled by Empower software or when the Empower system has mixed connectivity, for example IEEE or Ethernet, an inject-start trigger wire connection is required.

## 2.6.6 Setting IEEE-488 device addresses

You must set a unique address for each device connected on the IEEE-488 bus so that the busLAC/E card recognizes each device. Valid IEEE-488 instrument addresses are 2 through 29. Set the IEEE-488 addresses of the Waters instruments in your system through either the software or DIP switches.

**Recommendation:** Use IEEE addresses 9 and above, spacing the addresses by a difference of 2. Example: 9, 11, 13, and so on.

**Table 2–3: Setting IEEE-488 addresses**

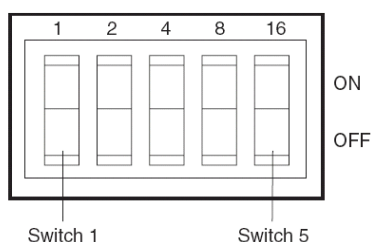
Instrument	Method of setting IEEE-488 address
2487 detector	Software (front panel of instrument)

**Table 2–3: Setting IEEE-488 addresses (Continued)**

Instrument	Method of setting IEEE-488 address
717 autosampler	Software (front panel of instrument)
717plus autosampler	Software (front panel of instrument)
600-series controller: 600E and 650E systems (v. 3.0 or later) 616 and 626 systems (v. 4.2 or later)	DIP switches Software (front panel of instrument) Software (front panel of instrument)
PCM, TCM, and 2996	DIP switches <sup>1</sup>

1. See [page 39](#)

The following figure shows the arrangement of DIP switches on a DIP switch block (on the rear panel of a device).

**Figure 2–2: DIP switch block**

### 2.6.6.1 Setting IEEE-488 addresses using software

To set an IEEE-488 address using software, set the address from the front panel of the device. See the operator's guide for a particular device for detailed instructions on setting the IEEE-488 address.

### 2.6.6.2 Setting IEEE-488 addresses using DIP switches

#### To set an address:

1. Ensure that no instruments are connected to the busLAC/E card.
2. Power-off the IEEE-488 device.
3. Using the DIP switches on the rear panel of the device, set a unique IEEE-488 address for the device.

#### Tips:

- Although there are 28 valid addresses (2 through 29), IEEE-488 protocol allows as many as 14 devices.
- To set the IEEE-488 address for a Waters 600-series controller, 2996 detector, PCM, or TCM, see [Table titled "Settings for the Waters 600, 2996, PCM, and TCM" on page 39](#).

4. Power up the device.

**Table 2-4: Settings for the Waters 600, 2996, PCM, and TCM**

IEEE-488 address	DIP switch settings <sup>1</sup>				
	1	2	4	8	16
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF
16	OFF	OFF	OFF	OFF	ON
17	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON
19	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	ON	OFF	OFF	ON	ON
26	OFF	ON	OFF	ON	ON
27	ON	ON	OFF	ON	ON
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON

1. ON=Closed or 1. OFF=Open or 0.

The operator's guide for each device provides additional information on setting the IEEE-488 address.

### 2.6.6.3 Scanning the IEEE-488 bus

After you set the IEEE-488 address for a device, the busLAC/E card must scan the IEEE-488 bus. To scan the IEEE-488 bus, see "Configuring chromatographic instruments" in the Empower Help.

## 2.7 Connecting mass spectrometers

---

You can connect an ACQUITY QDa Detector, and SQD, TQD, or 3100 mass spectrometers to an Empower Personal workstation or to an acquisition client (a client connected directly to one or more chromatographic systems).

**Note:** Examples in this section reflect the current system configuration. The specific type of network card that is shipped from Waters is subject to change at any time.

The computer requires two network cards:

- MS network card for connecting the Mass Spectrometer to the computer
- Network card for connecting to your facility's network

**Requirement:** If you want to switch between using a QDa, SQD, TQD, or 3100, you must perform these actions:

- Uninstall the existing instrument component software (ICS) for all mass detectors.
- Install the ICS for the mass detector you want to use. This will be the active mass detector. If you want to install the ICS for more than one detector, select all the mass detectors you want to install, and then choose the active mass detector.
- Configure the new system.

If you obtain the computer (Empower Personal workstation or acquisition client) from Waters, the network cards are installed and configured before the computer is shipped to you. If you installed your own network cards, use the following instructions as a guideline.

### 2.7.1 Connecting mass spectrometers to the Empower system

**Restriction:** Except for the Waters ACQUITY QDa Detector, mass spectrometers cannot be connected to a LAC/E module. **To connect a mass spectrometer to the Empower system:**

1. Locate the computer within 5 m of the instrument.
2. Ensure that the computer has two network cards:
  - Network card for connecting to the mass spectrometer
  - Network card for connecting to your facility's network
3. When using a switch, connect it to the computer's MS network card, and then connect the mass spectrometer to the switch. Use a Waters-supplied switch for this connection. Connect the other end of the network cable to the port labeled MS on the rear panel of the Empower workstation.
4. Power-on the system (see ["Powering-on the chromatographic system"](#)).
5. Continue with ["Powering-on the chromatographic system"](#).



## 2.8 Powering-on the chromatographic system

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Powering-on the Empower chromatographic system entails powering-on the individual instruments and devices in a particular sequence.

This section contains the startup sequence for the Empower chromatographic system and its peripheral equipment.

**!** **Notice:** Ensure that the computer's power supply is set to the correct voltage for your site. If it is set incorrectly, your computer can be damaged.

### To power-on instruments and devices:

1. Power-on all equipment controlled through the IEEE-488 bus, waiting until any internal diagnostic tests finish. Check your instrument's operator guides for power-on instructions.
2. Power-on the computer.
3. Power-on all equipment controlled by the Empower system that is not under IEEE-488 control; that is, all Ethernet devices, all serial equipment, and all third-party USB devices.
4. Power-on all equipment not controlled by the Empower system (for example, computer peripherals such as printers).



# 3

## Installing an Empower Personal workstation

**Restriction:** Empower 3 FR4 Personal is supported only in Windows 7 Professional or Enterprise edition with SP1, Windows 10 Professional, or Enterprise edition (both 64-bit).

**Recommendation:** Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer). After the installation, back up your Empower 3 FR4 data regularly.

To upgrade from a previous version of Empower (prior to Empower 3 FR2), back up all your projects and uninstall any instrument component software. Next, deactivate the licenses and options, and then uninstall the previous version of Empower. Then, follow the procedures in this chapter to install Empower 3 FR4 software. After that, you can restore your projects into Empower 3 FR4. You will need to recreate your chromatographic systems, users, and libraries.

### 3.1 Preparing the Personal workstation

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Installing Empower 3 FR4 software on a Personal workstation requires the hardware and software specified in the table on [page 19](#).

You can install Empower 3 FR4 as a new installation on a system where no Chromatography Data Software (CDS) is currently installed or as an upgrade from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the name of the computer after Empower is installed.
- The name of the computer must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z) and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a computer name, but not 123Empower.

**Note:** An upgrade to Empower 3 FR4 from Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1 is an in-place upgrade that retains all data. Complete these tasks before you begin the installation or upgrade:

- Ensure the workstation has the required hardware and software, as specified in the table on [page 19](#).
- Log in to the operating system using an account with local Administrator privileges.
- Back up and defragment the hard drive (see the Microsoft documentation and Help system) to ensure a smooth installation and optimum performance from Empower.
- Configure the system so that the virtual memory setting automatically manages the paging file size. See ["Changing the virtual memory setting"](#).
- Close all applications, including Web browsers, and then restart the workstation.
- If the workstation does not have a network connection, follow the procedure given in ["Activating Empower 3 FR4 software licenses and options"](#).
- Disable IPv6 in Windows. See [page 45](#)
- Configure the system power options. See [page 46](#).
- Enable MSI logging in Windows, via the registry. See [page 45](#).
- Verify that the disk drive allows enough space to install Empower 3 FR4 software (see the tables below).

**Table 3–1: Minimum disk space requirements**

Purpose	Minimum free space
Empower application	2 GB
Oracle application and Empower database	13 GB (new) 23 GB (upgrade)
Empower projects	5 GB (recommended)

**Table 3–2: Minimum and recommended CPU and RAM requirements**

Hardware requirement	Minimum	Recommended
Processor (CPU)	Intel 2 Duo, E6400 2.13GHz	Intel Core 2 Duo, E8400 3.0GHz
Memory (RAM)	8 GB	16 GB

The Empower 3 FR4 installer (Deployment Manager) gathers information about your system and compares its settings to the minimum required specifications. The installation can display an error message and continue, or the installation can stop and exit, depending on the following conditions:

- If a system does not meet the hard drive space requirements for the required features, an error message states the insufficiency. You must free up disk space or change installation drives before you can continue.
- If the drive hosting the Empower projects directory does not meet the 5-GB minimum requirement, a warning message states the insufficiency, and the installation continues.

**Recommendation:** If you install Empower on multiple drives, ensure at a least 1 GB of free space remains on the drive hosting the projects directory.

- If the system includes an incompatible processor, the installation continues without warning messages. The processor information is recorded in the installation log.
- If the system does not meet the memory requirement, an error message states the insufficiency, and the installation terminates. The insufficiency is recorded in the installation log.

For workstations running on Windows 10, .NET 4.6 is pre-installed and the .NET 4.6 is backward compatible with all versions back to 4.0. You do not need to install .NET 4.0 on Windows 10.

### 3.1.1 Configuring Microsoft .NET 3.5 Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10. Microsoft .NET 4.0 Framework is installed and enabled by default on Windows 10.

#### To install .Net 3.5 Framework on Windows 10:

1. From Control Panel, select Programs > Programs and Features > Installed Updates.  
**Tip:** To access the Control Panel in Windows 10, type "Control Panel" in the Cortana Search box.
2. Click "Turn Windows features on or off".
3. Select the check box for ".NET Framework 3.5 (includes .NET 2.0 and 3.0)", and click OK.
4. On the Windows Features page, click Close when the installation is complete.

### 3.1.2 Disabling Internet Protocol version 6

You must disable the Internet Protocol Version 6 before you install Empower software. Disabling this feature ensures that Oracle listener works properly.

#### To disable IP version 6 (IPv6) in Windows:

1. Click Start > Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings.  
**Tip:** To access the Control Panel in Windows 10, position the pointer in the bottom-left corner of the screen, right-click Start, and click Control Panel.
2. Right-click Local Area Connection, Instrument LAN, and then click Properties.
3. On the Networking tab, clear the Internet Protocol Version 6 (TCP/IPv6) check box, and then click OK.

### 3.1.3 Enabling MSI logging

Windows Installer has an option to log events during the installation of software packages. You enable MSI logging by adding a key and value to the registry. Once MSI logging is enabled, installation log files are written to the user's Temp folder.

#### To enable MSI logging:

1. Open the Windows registry with Regedit.

2. Create the path  
HKEY\_LOCAL\_MACHINE\Software\Policies\Microsoft\Windows\Installer.
3. Create the string value name Logging.
4. Set the value to voicewarmupx.
5. Close Regedit.

### 3.1.4 Configuring power options

You must configure the power management settings for the workstation to disable the power saving feature.

#### To configure the power options in Windows:

1. From Windows Control Panel, click System and Security, and then Power Options.  
**Alternate:** From the Search Programs and Files, type Power Options.
2. **Tip:** To access the Control Panel in Windows 10, position the pointer in the bottom-left corner of the screen, right-click Start, and click Control Panel. On the Power Options page, click Show additional plans, select High performance, and then click "Change plan settings".
3. On the Edit Plan Settings page, perform these tasks, and then click Save changes:
  - Select Never from the "Turn off the display" field.
  - Select Never from the "Put the computer to sleep" field.
4. On the Edit Plan Settings page, click "Change advanced power settings".
5. In the Power Options dialog box, complete these tasks, and then click OK.

**Table 3–3: Power option settings**

Power options	Settings
Expand Hard Disk and "Turn off hard disk after"	Type Never in the Setting(Minutes) field
Expand Sleep settings	
Sleep after	Never
Allow hybrid sleep <b>Note:</b> Windows 7 only	Off
Hibernate After <b>Note:</b> Windows 7 only	Never
Allow wake timers	Disable
Expand USB settings and "USB selective suspend"	Disabled
Expand Display and "Turn display after"	Never

### 3.1.5 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

#### To start the required services:

1. From Control Panel, System and Security (when in Category view) > Administrative Tools > Services.  
**Tip:** To access the Control Panel in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.
2. Change the startup type to Automatic, and start these services:
  - DNS Client
  - Function Discovery Resource Publication
  - SSDP Discovery
  - UPnP Device Host

**Tip:** When all services are running, you can modify the network discovery and printer sharing settings.

#### To turn on the network discovery and file and printer sharing functions:

1. From the Start menu, select Control Panel > Network and Internet (when in Category view) > Network and Sharing Center.  
**Tip:** To access the Control Panel in Windows 10/Windows Server 2012, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.
2. Click "Change advanced sharing settings", and turn on these functions:
  - Network discovery
  - File and printer sharing

### 3.1.6 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal, not comma, formatting, which is important when displaying numeric values ("12.56", not "12,56").

#### To confirm that the regional settings are correct:

1. Click the Windows Start menu and then type "Regional Settings" in the search text box.
2. Click "Change date, time, or number formats".
3. In the Region and Language dialog box, ensure "English (United States)" is selected as the format in the Formats tab.

### 3.1.7 Synchronizing Empower and Windows Clock Time

Synchronize the Waters Empower software time and the clock time on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

#### To Synchronize Empower and Windows clock time:

1. Click Start > Control Panel > Clock, Language, and Region (when in Category view) > Date and Time.
2. In the Date and Time tab, click Change time zone.  
**Note:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
3. In Time Zone Settings, select the check box "Automatically adjust clock for daylight saving time", and click OK in each open dialog box.

## 3.2 Installing Empower 3 FR4 software (new installation)

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If this is a new installation of Empower 3 FR4 software, follow the instructions in this section. If you are upgrading, follow the instructions starting on [page 54](#).

You install Empower 3 FR4 software from the Empower 3 FR4 software media. You can perform a typical installation of the software on the C drive or a default location. Alternatively, you can perform a custom installation specifying different drives. Allow approximately 60 minutes to install the software.

**Restriction:** Empower 3 FR4 Personal is supported only in Windows 7 Professional, Enterprise with SP1, Windows 10 Professional, or Enterprise (both 64-bit).

**Requirement:** If you are using real-time virus scanning, after the installation, exclude all Empower-related directories and their subdirectories, and all raw data directories or shares, from the scans. Some real-time virus scanners mistake normal Empower functionality for virus activity and can therefore interfere with data buffering or cause the run to stop.

**Important:** SmartBear® TestExecute™ software is installed with Empower 3 FR4 software during the Empower 3 FR4 installation. Do not uninstall TestExecute, even though it appears in the Control Panel. Uninstalling TestExecute invalidates the Empower 3 FR4 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

### 3.2.1 Starting the installation

#### To install Empower 3 FR4 software:

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. If the installation menu does not automatically appear, browse to the main folder on the software media and double-click the setup.exe file.



**Tip:** A `dism.exe` window opens after you click `setup.exe`. You need not close this window; it closes automatically after appearing for several seconds.

3. On the Choose Setup Language page, select the language you want from the list, if different from the default language shown, and click OK.
4. On the Main page, select Install Empower Software.
5. On the Select Product Type page, select Personal.
6. On the Customer Information page, enter your user name, organization, and Software Support ID number, and then click Next.
7. On the End-User License Agreement page, read and accept the license agreement, and then click Next.
8. On the Setup Type page, select one of the following options:
  - Typical: Select and then proceed to [step 10](#). All Empower and Oracle files and projects will be installed on the system drive, which is typically C:\.
  - Custom: Select and then proceed to [step 9](#). The Empower Application, Projects, and Oracle files will be installed on different drives.
9. On the Destination folders page, select the appropriate drives from the list for the Empower Application, Empower Projects and Empower Oracle with Database, and then click Next.
10. On the Ready to Install page, click Next to begin the installation.

**Tip:** If any Windows Security Alert messages appear, click Allow Access.

**Result:** The software installation begins. This process requires approximately 60 minutes, but it can vary depending on the computer and environment.
11. On the Status page, click Finish.
12. When the restart message appears, click Yes.

**Result:** The computer reboots.
13. Continue with ["Completing the installation"](#).

### 3.2.2 Completing the installation

After the computer restarts, perform the following tasks to complete the installation:

- Log in to the operating system using an account with local Administrator privileges. (The account must be the same one that you logged in to when you installed the software.)
- If you want to install instrument drivers for one or more instruments, use the Empower 3 Instrument Driver Pack media. Refer to the appropriate installation guide and release notes for the driver. Visit the Waters Web site ([www.waters.com](http://www.waters.com)) for the most recent instrument drivers.
- Activate the Empower 3 FR4 software license and option licenses. See ["Activating Empower 3 FR4 software licenses and options"](#) for instructions.
- The first time you log in to Empower 3 FR4, you must select the time zone you want to use.
- Verify the installed files. See ["Verifying your Empower 3 FR4 software installation"](#) for instructions.

**Note:** Empower 3 FR4 software comes with a default system user account that does not require a named user license. This administrator account can be disabled but not removed from Empower 3 FR4 software. The default user name is "system" and the default password is "manager". Both the user name and the password are not case sensitive.

**Tip:** If you experience instrument communication problems, review the firewall exceptions list. To do so, in Control Panel, double-click Windows Firewall, and then click the Exceptions tab. Ensure the following exceptions are checked in the Programs and Services list:

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:
  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server
  - ACQUITY MDServer
  - ACQUITY FLR Server
  - ACQUITY PDA Server
  - ACQUITY SM Server
  - ACQUITY SQ Server
  - ACQUITY TQ Server
  - ACQUITY TUV Server
  - Local Console Controller (LCC Handheld Controller)
  - Trinity UI (if applicable)
  - W2489 Server
  - W2707 Server
  - W2998 Server

### 3.2.3 Installing and configuring busLAC/E drivers

If your system includes a busLAC/E card, you must install and configure the busLAC/E driver after you install Empower 3 FR4 software. The required busLAC/E driver version is 7.0.1.1.

**Exception:** Installing and configuring a busLAC/E driver is necessary only if the busLAC/E card was installed after the installation of the Empower 3 FR4 software. If the card was installed before the software was installed, then the driver is installed automatically, and the necessary settings are applied. In such a case, you can skip these instructions.

#### To install and configure the busLAC/E driver in Windows:

1. Right-click Computer, and then select Manage.  
**Tip:** In Windows 10, position the pointer in the bottom-left corner of the screen, right-click Start, and click Computer Management.
2. On the Computer Management page, click Device Manager (under Computer Management (Local) > System Tools).
3. In the right-hand pane, right-click Other Devices > PCI Device, and then select Update Driver Software.
4. On the Update Driver Software - PCI Device page ("How do you want to search for driver software?"), select "Browse my computer for driver software", to manually install the busLAC/E drivers.
5. On the Update Driver Software - PCI Device page ("Browse for driver software on your computer"), click Browse.
6. In the Browse for Folder dialog box, browse to X:\Empower\BuslaceDrivers64, where X:\ is the drive where you installed Empower, and click OK.
7. On the Update Driver Software - PCI Device page ("Browse for driver software on your computer"), ensure the path is correct, and then click Next.  
**Result:** Doing so starts the driver installation.
8. When the "Windows has successfully updated your driver software" screen appears, click Close.

**Result:** The Device Manager now shows the BusLACE PCI card listed under Waters Instrument Control Devices.

#### 3.2.3.1 Bridging multiport network cards for Ethernet instruments

A Personal workstation supports both single port network cards and bridging multiport network cards. If you are using a single network card, refer to the Empower Help topic: "Configuring DHCP settings".

If you are using a multiport network card and bridging ports for Personal workstations running on Windows 7, use the default settings within the operating system. When bridging ports for computers running on Windows 10, you must configure the instrument LAN as described in ["Bridging multiport network cards for Ethernet instruments" on page 28](#).

### 3.2.4 Activating Empower 3 FR4 software licenses and options

You must activate the Empower 3 FR4 base software license first to access Empower 3 FR4 software. You can activate licenses other than the Empower 3 FR4 base software license at the same time as or after the Empower 3 FR4 base software license. You cannot, however, activate another license before you activate the Empower 3 FR4 base license.

License serial numbers purchased from Waters or the order numbers of the purchased licenses are necessary for activating the Empower licenses and option licenses. If you must transfer a software license or option license from one Empower Personal workstation to another, you must deactivate it from the original Personal workstation before you activate it on a new Personal workstation.

The Empower 3 FR4 base software license includes 5 Named User licenses plus either one system license (single system) or 4 system licenses (multisystem). The number of named users that can be created in the software is based on the number of Named User licenses you installed. You can create multiple user accounts; however, you can only have as many accounts active at one time as you have licenses. (The number of active accounts cannot exceed the number of Named User licenses you purchased.)

The number of allowed online chromatographic systems is based on the configuration you purchased (single system or multisystem).

**!** **Notice:** To avoid rendering licenses and options unusable, deactivate all licenses and options before uninstalling Empower software. If you do render the licenses and options unusable, call Waters Technical Support for assistance.  
If you must uninstall Empower 3 software, first uninstall any instrument component software, deactivate the licenses and options, and then uninstall Empower software.

Software option licenses are available for optional software functionality such as System Suitability, Dissolution, GPC/SEC, or Method Validation Manager. These options are project-configurable options. When you activate an option license following the procedures in this section, you can enable each option in projects as needed. You can disable an option for specific projects (see "Modifying project properties" in the Empower Help).

**Exception:** You cannot activate a license labelled for an Enterprise or Workgroup system on an Empower Personal workstation, nor can you activate a license labelled for an Empower Personal workstation on an Enterprise or Workgroup system.

**Restriction:** You can activate Empower 3 FR4 software licenses only by using the serial numbers provided with the Empower 3 licenses and options. You cannot use any Empower 2 license serial numbers; they will not work for Empower 3 FR4.

**Note:** You may also have to install third-party control licenses for certain other systems, such as Agilent LC, Agilent GC, Hitachi LC, Shimadzu LC, etc.

### 3.2.5 Activating licenses and options using the Waters Licensing Wizard

#### To activate the Empower Personal base software license and option licenses:

1. From the Start menu, click Start > All Programs > Empower > Waters Licensing Wizard.

**Tip:** To access Empower utilities in Windows 10, click the Windows icon, select Empower, and then select the Waters Licensing Wizard.

2. On the Waters Licensing Wizard logon page, enter the default user name and password, leaving Local as the database parameter.

**Note:** Empower software provides a default system user account that you can disable but not remove from the software. The default user name for the account is "system", and the default password is "manager". When logging in to Empower software and using the licensing wizard for the first time, enter the default user name and password. Subsequently, any user with the administrator privilege can access the Waters Licensing Wizard.

3. Click Log On.

4. On the task page, click "Request software registration".

5. On the "Request software registration – Create registration file" page, enter a valid name and location for your software registration file, and then click Next.

**Tip:** This file stores your software registration information.

6. When the "Request software registration – Registration file created" page appears, click the address link.

**Result:** If your computer has Internet access, it connects to the Waters License Activation Center Web site, where you complete the request process and receive your license activation file.

**Alternative:** If your computer does not have Internet access, move the software registration file that you just created to a computer with Internet access, and then connect to the Waters License Activation Center Web site (<https://www.waters.com/activate/licenseintro.htm>).

**Note:** Follow the instructions to obtain your license activation file. You must enter your license and option serial numbers or the order numbers of the purchased licenses and options in order to obtain this file.

7. The License Activation Center Web site provides the license activation file. Put the file in a location accessible to your Empower 3 computer, log in to the Waters Licensing Wizard (see step 1), and select Activate Licenses.

8. Browse to and select the license activation file you downloaded from the Waters License Activation Center Web site, and then click Next.

**Requirement:** You must complete the activation process using the same computer on which you initially created the software registration file.

**Result:** On the License Activation Complete page, a list of successfully activated licenses and options appears.

9. Click Finish.

**Tip:** To view active licenses and options, use the Show Licenses option in the Waters Licensing Wizard.

### 3.2.6 Deactivating Empower licenses and options

Before uninstalling Empower 3, or if a license or option is currently activated on a different Personal workstation from the one you want to use, you must first deactivate the license or option on the current workstation using the Waters Licensing Wizard and License Activation Center Web site. Having done so, you can reactivate the license or option in the new system.

**Restriction:** If you deactivate the base software license, the Licensing Wizard software automatically deactivates and removes all user licenses, system licenses, and option licenses.

#### To deactivate a license or option:

1. From the Start menu, click Start > All Programs > Empower > Waters Licensing Wizard.

**Tip:** To access Empower utilities in Windows 10, click the Windows icon, select Empower, and then select the Waters Licensing Wizard.

2. On the Waters Licensing Wizard log on page, enter the default user name and password, leaving Local as the database parameter.
3. Click Log On.
4. On the task page, click Deactivate Licenses.
5. On the "Deactivate Licenses – Select Licenses" page, check the options you want to deactivate, and then click Next.
6. On the "Deactivate Licenses – Create deactivation file" page, enter a valid name and location for your license deactivation file, and click Next.

**Tip:** This file stores license deactivation information.

7. When the "Deactivate Licenses – Deactivation file created" page appears, note the file location, and then click the address link.

**Tip:** If your computer has Internet access, it connects to the Waters License Activation Center Web site, where you complete the deactivation process.

**Alternative:** If your computer does not have Internet access, move the license deactivation file that you just created to a computer with Internet access, and then connect to the Waters License Activation Center Web site (<https://www.waters.com/activate/licenseintro.htm>).

8. Follow the instructions to deactivate your license or licenses.

**Result:** When the process is complete, a confirmation page appears that lists all deactivated licenses and options.

## 3.3 Upgrading from earlier versions of Empower

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Follow the instructions in this section to upgrade to Empower 3 FR4. If you are not upgrading, follow the instructions for a new Empower 3 FR4 installation on page [page 48](#).

You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix

1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Note:** Allow enough time to perform the upgrade. An upgrade from any of the versions listed above to Empower 3 FR4 can potentially require one to two hours or more.

#### **Requirements:**

- You must upgrade to Empower 3 FR2 before you can upgrade to Empower 3 FR4.  
**Note:** If you are using a version of Empower prior to Empower 3 FR2 software, you can either upgrade to Empower 3 FR2 as a minimum requirement, or completely uninstall the earlier version of Empower, and ensure that your system meets the hardware and software requirements detailed in Chapter 1 of this guide.
- Follow the instructions at the beginning of this chapter to install Empower 3 FR4 as a new installation.
- Ensure that you perform a project backup all of your projects to a separate drive location before upgrading to Empower 3 FR4.

**Note:** While performing an upgrade of Empower software, you will be prompted to enter the Oracle Sys password if the Oracle Sys password was changed or the Oracle Listener is not up and running. Oracle Listener may not be up and running for these reasons: IPv6 is enabled, the Empower database is in an idle state, or there is a conflict with the host name. Resolve these issues and then restart Oracle Listener.

#### **To start the Oracle Listener service:**

1. Click Start > Administrative Tools > Computer Management.
2. In the Computer Manager window, expand Services and Applications, and then click Service.
3. In the list of service, right-click OracleEmpowerOracle12c TNSListener, and then select Properties.
4. Click Start.

### **3.3.1 Upgrading to Empower 3 Feature Release 4 (FR4) software**

You can upgrade to Empower 3 FR4 from Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

#### **To upgrade to Empower 3 FR4:**

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. On the "Maintenance Mode: Empower 3 Personal" page, select Upgrade Empower Software.
3. On the Ready to Upgrade page, click Next.
4. When the Windows Security Alert appears, select Domain networks, and click "Allow access", to continue the installation.

**Note:** An upgrade from Empower 3 FR2 or SR2 to Empower 3 FR4 can require one to two hours or more.

5. On the Status page, when the upgrade is complete, and the Success message appears, click Finish.
6. When the restart message appears, click Yes.

## 3.4 Verifying your Empower 3 FR4 software installation

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### 3.4.1 Viewing the installation log

The installation log records information about your Empower installations. You can read the log file, to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log, to check for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value displayed is 0, then the installation was successful. If the value displayed is anything other than 0, record the value and contact Waters Technical Support.

#### To view the installation log:

1. Click Start > All Programs> Empower > Empower Installation Log.  
**Tip:** To access Empower utilities in Windows 10, click the Windows icon, select Empower, and then select the Empower Installation Log.  
**Result:** The Empower.log file opens in Notepad.
2. Review the contents of the Installation Log file.
3. Click File > Exit.

### 3.4.2 Using the Verify Files Utility

The Verify Files utility ensures the integrity of the installed Empower program files and Oracle program files (installed by Empower).

After the Empower 3 FR4 installation, run the Verify Files Utility to verify the Empower and Oracle program files (not the database or data files) did not change since installation.

#### To run the file verification utility:

1. Click Start > All Programs or All Apps> Empower > Verify Files.  
**Tip:** To access Empower utilities in Windows 10 click the Windows icon, select Empower, and then select Verify Files.  
**Result:** The Verify Files utility compares the installed Empower files’ checksum with a previously stored checksum and then creates a file verification results log, named checksum.txt.



2. Review the contents of the file to ensure that no installation changes were detected. Print or save a copy of the results.

#### To view the file verification results:

1. Click Start > All Programs or All Apps > Empower > View Verify Files.  
**Tip:** To access Empower utilities in Windows 10, click the Windows icon, select Empower, and then select View Verify Files.  
**Result:** The checksum.txt file opens in Notepad.
2. Review the contents of the checksum file.

Your Empower 3 FR4 software installation passes the verification check if all files have a status of "OK" and the installation qualification summary on the final page states "No installation changes were detected". If the checksum.txt file indicates any files marked as "changed", contact Waters Technical Support.

## 3.5 Empower programs and logs

The Empower program folder (in the Start menu) contains these items:

**Table 3–4: Empower programs and logs**

Item	Description
Configure ICS for 64-bit OS	Use this utility if Instrument Component Software (ICS) was installed from a source other than Empower 3 Instrument Driver Pack media.
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see "Starting and exiting from Empower" in the Empower Help.
Remove Waters Instrument Component Software	Use this utility to uninstall instrument component software (ICS). You see this item only if instrument component software is installed.
Verify Files	Verifies the integrity of the Empower software files on your hard disk.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation and deactivation.
Manage Waters Email Center	The Email Center facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to check the Message Center throughout the day. See Empower online Help information about configuring the Waters Email Center.

## 3.6 Empower feature releases and service releases

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Waters periodically issues feature releases to provide enhanced software functionality and service releases to address existing issues. Available for downloading from the Waters Elite Web site (to customers with a software support plan), the releases must be installed according to instructions set forth in their associated release notes. If you want physical media, note the part number from the Web site, and contact your local Waters subsidiary to place an order for a nominal fee.

To determine which feature releases or service releases are installed, view the installation log, or select Help About from any Empower 3 FR4 application window.

## 3.7 Uninstalling Empower 3 software

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When you want to uninstall Empower 3 software, use Windows Control Panel Programs and Features utility to remove the software.

### To uninstall Empower 3 software:

1. Open Windows Control Panel, click Programs and Features, and then double-click Empower 3 Personal.  
**Tip:** From Windows 10, click Start > All apps > right-click Empower 3 Personal and then click Uninstall.  
**Result:** Empower Deployment Manager opens in maintenance mode.
2. Follow the steps in the Deployment Manager wizard to uninstall Empower software.
3. Restart the workstation.

# 4 Installing an Empower Enterprise workgroup or server

**Recommendation:** Backup your computer before installing any hardware or software (see the instructions provided by the manufacturer of your computer). After the installation, back up your Empower data regularly.

## 4.1 Introduction

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You can choose one of these options for installing Empower 3 Feature Release 4 (FR4) software: perform a fresh, new installation of Empower 3, upgrade from an older version of Empower software, or perform a system object import upgrade.

For any installation option, the first step is to prepare the server. Then you can install or upgrade to Empower 3.

## 4.2 Preparing the server

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As the table shows, the database server runs two applications:

**Table 4–1: Database server applications**

Application	Description
Waters Service	Responsible for writing raw data files from Empower nodes, copying raw data from project to project (through the Empower application), and creating new projects.
Oracle Database	Stores methods, audit trails, and specific, raw-data file parameters (the data points are stored as external files controlled by Waters Service).

**Note:** The default Empower server installation places the Waters Service and the Oracle database on the same server. Empower also supports placing the Waters Service on a Windows server, separate from the Oracle database.

The Empower server installation program gauges the extent of the system's physical memory and then automatically configures the Oracle initialization parameters according to available resources.

The installation program assumes that the server is used exclusively as the Empower database server. Other applications running on the server can necessitate your adjusting the initialization parameters accordingly.

To assist with any potential troubleshooting, ensure that MSI logging is enabled in Windows. See [page 45](#) for further information.

**Important:** If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the computer name after Empower is installed.
- The computer name must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z), and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a computer name, but not 123Empower.

## 4.2.1 Network considerations

The Empower Enterprise/Workgroup system requires a domain-based network infrastructure. You must synchronize Empower-related computers (clients, LAC/E modules, and servers) with a time server.

In domains based on Windows Server 2008 R2 Enterprise, the domain controllers are automatically configured to act as time servers to the domain. In a Windows Server 2012 R2-based domain, the domain controllers are automatically configured as time servers for the domain.

To maximize service time and minimize issues related to the network environment, Waters recommends you follow these requirements:

- All Empower-related user accounts and computers must reside within the same domain.
- If you are using real-time virus scanning, after installation, exclude all Empower-related directories and their sub-directories, and all raw data directories or shares, from the scans. Some real-time virus scanners mistake normal Empower operations for virus activity and can therefore interfere with data buffering or cause the run to stop.
- After you install Empower software, do not change the name and IP (Internet Protocol) address on the Enterprise server or the Personal workstation. The host name should not contain more than 15 characters, dashes, or symbols. A static IP address is recommended for Empower servers. If you are using DHCP (Dynamic Host Configuration Protocol) instead of a static IP, ensure that the host name remains the same.

**Requirement:** The server name must begin with an alphabetic character (A to Z) and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a server name, but not 123Empower.

- Configure preferences in Waters Database Manager (WDM) to notify you by email when tablespaces reach a user-defined size. Doing so helps you monitor database space usage. See the *Waters Database Manager Online Help* or the *Empower 3 FR4 System Administrator's Guide* for more information.
- When you add an server, LAC/E module, or client to a domain, ensure that the Windows network discovery functionality is turned on for these computers.

### 4.2.1.1 Group policy objects

System administrators use Group Policy Objects (GPOs) to define and enforce settings in an Active Directory network. Administrators can apply settings to users and computers based on locally defined group and site membership criteria. Before defining GPOs in an Empower network, keep in mind that Empower software is a distributed chromatography data acquisition system that relies on remote access and the Distributed Component Object Model (DCOM) configuration to carry out its activities. Empower software makes use of information stored in the database and in individual flat files, such as instsrv.dat (instrument configuration information) and channel\_id.dat (raw data files).

If GPOs are used in an Empower network, Waters recommends that you follow these guidelines:

- Place Empower nodes in their own Organization Unit (OU). For the OU, define GPOs that minimize allowable changes: for example, test Microsoft hot fixes and service packs before applying them to the environment.
- Grant administrators full access to the registry and file system so that they can properly install software.
- Limit changes to the file system protections expected by the Empower application.

GPOs can interfere with successful Empower operations. For example, data buffering can occur if the anonymous access to the raw data share is altered, or the editors for the COM instruments can sometimes operate improperly if the access control list for the HTML directories is altered.

### 4.2.1.2 Configuring Microsoft .NET 3.5 Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10 and Windows Server 2012. .NET 4.0 Framework is installed and enabled by default.

The Empower 3 FR4 Deployment Manager installs the .NET 4.0 Framework on supported operating systems, if necessary, except on Windows 2012 since .NET 4.0 is already enabled on this operating system.

Windows 10 has .NET 4.6 pre-installed and the .NET 4.6 is backward compatible with all versions back to 4.0, so there is no need to install .NET 4.0 on Windows 10.

#### **Installing .Net 3.5 Framework on Windows Server 2012:**

1. Click Start > Server Manager and in the Manage menu, and then click Add Roles and Features.
2. Click Next in the Wizard, select "Role-based or feature-based installation", and then click Next.
3. Select "Select the server from the server pool", select the target server, and then click Next.
4. In Server Roles, skip this section, and then click Next.
5. In Features, select ".NET Framework 3.5 Features", and then click Next.
6. In the Confirm installations selections page, select "Restart the destination server automatically if required", and then click Install.

### 4.2.1.3 Disabling Internet Protocol version 6

You must disable the Internet Protocol Version 6 before you install Empower software. Disabling this feature ensures that Oracle listener works properly.

#### To disable IP version 6 (IPv6) in Windows:

1. Click Start > Control Panel > Network and Internet (with Category view selected) > Network and Sharing Center > Change adapter settings.
2. Right-click Local Area Connection, Instrument LAN, and then click Properties.
3. On the Networking tab, clear the Internet Protocol Version 6 (TCP/IPv6) check box, and then click OK.

### 4.2.1.4 Add IPv4 IP address to Hosts file

You must also add the IPv4 IP address to the Hosts file before you install Empower software on a server. Adding the IP address ensures that Oracle Enterprise Manager completes its installation.

#### To locate the IPv4 IP address:

1. Open a Command window.  
**Tip:** To run a command window in Windows Server 2012, right-click Start > click Run > type "cmd", and then click OK.
2. Type "ipconfig".
3. Under Ethernet adapter Local Area Connection, find the IP address that is associated with IPv4.
4. In Windows Explorer, browse to <SystemRoot>\System32\drivers\etc, and then open the Hosts file in Notepad with Administrator privileges.
5. Add the IP address with the host name to the Hosts file and then click Save.

**Example:** 10.4.106.194 AS2008ENT.evaluation.waters.com AS2008ENT

### 4.2.1.5 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal, not comma, formatting, which is important when displaying numeric values ("12.56", not "12,56").

#### To confirm that the regional settings are correct:

1. Click the Windows Start menu and then type "Regional Settings" in the search text box.
2. Click "Change date, time, or number formats".
3. In the Region and Language dialog box, ensure "English (United States)" is selected as the format in the Formats tab.

### 4.2.1.6 Synchronizing Empower and Windows clock time

Synchronize the Waters Empower software time and the clock time on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

#### To Synchronize Empower and Windows clock time:

1. Click Start > Control Panel > Clock, Language, and Region (with Category view selected) > Date and Time.

**Tip:** To access the Control Panel in Windows Server 2012, right-click the Windows icon, and click Control Panel.

2. In the Date and Time tab, click Change time zone.

**Note:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

3. In Time Zone Settings, select the check box "Automatically adjust clock for Daylight Saving Time", and click OK in each open dialog box.

### 4.2.2 Memory considerations

The server in an Enterprise system or workgroup requires sufficient memory for Oracle 12.1.0.2 and Empower software to operate. The amount of required memory depends on the number of applications, users, and the operating system. The largest quantity of memory is used by Oracle. When Oracle initializes, it creates a space in memory for most of the Oracle functions. The space is called the System Global Area (SGA). (For more information about the SGA, see the Oracle documentation or your database administrator.) The server must have adequate memory, and the memory must be configured correctly. The amount of required memory depends on the number of client and LAC/E modules, users, chromatograms per project, and the number of integrated peaks per channel.

**Requirement:** Set the server's virtual memory to at least four times the amount of installed physical memory. See ["Changing the virtual size settings"](#).

### 4.2.3 Disk space considerations

Each Workgroup or Enterprise system requires sufficient disk space for Oracle 12.1.0.2.0 and Empower 3 software.

**Table 4–2: Minimum disk space requirements**

Purpose	Minimum Free Space	Drive
Empower 3 application	1 GB	Program-drive
Oracle application	5 GB	Program-drive
Empower raw data	1 GB	RawData-drive
Empower 3 database	3 GB	Database-drive
Empower 3 projects	1 GB	Database-drive
Oracle database	3 GB (assuming you use the Waters Empower 3 software media to install Oracle)	Database-drive

**Table 4–2: Minimum disk space requirements (Continued)**

Purpose	Minimum Free Space	Drive
Archive Log Dest1	10 GB (Each archive log is 200 MB. The 10.0 GB minimum allows 50 archive logs)	RawData-drive
Archive Log Dest2	10 GB	Program-drive
Mirrored Redo and Control files	1 GB	RawData-drive

You must install the various software components on multiple drives, to maximize performance and also to be able to recover from disk failures. The minimum disk space requirements table (above) reflects the minimum requirements at installation. Nevertheless, you must account for additional disk space when the system is operational.

You must consider the following items when sizing drives for future use:

- Empower program files
- Empower raw data files
- Empower database

**Recommendation:** To avoid installation failure, ensure a total of 10 GB is available on the program disk drive. If you install Empower on multiple drives, ensure at a least 1 GB of free space remains on the drive hosting the projects directory.

#### 4.2.3.1 Empower program files

These are suggested storage requirements.

- Empower and Oracle application files – Fixed size at installation, approximately 6 GB.
- Archive log files – 200 MB each; allow space for at least 50 logs (10 GB total disk space). The number of archive logs you generate will depend on the level of database activity. The number of archive logs maintained on the server depends on how often the database is backed up as well as overall activity. If you perform daily backups, the archive log files are deleted after they are backed up.

**Tip:** Each of the two locations for archive logs contains a full set of logs. Archive logs are essential for recovering databases. If you fill the space for archive logs, the database “hangs” until you provide more space for the logs.

#### 4.2.3.2 Empower raw data files

The size of the Empower chromatography raw data files varies according to sampling rates, run times, and number of samples. PDA and MS files are bigger because they are 3-dimensional data (wavelength and mass range must be included). The total space requirement depends on how often you archive and how many systems are creating raw data files.



**Tip:** Raw data files can grow very quickly. Hundreds of GB may be needed for raw data. If you use up too much space, you can backup and then remove older projects to regain space on the raw data drive.

### 4.2.3.3 Empower database

The database datafiles (tablespace files) are configured to “autoextend”. As projects, raw data files, and results are created, the initial database datafile must autoextend to store all information.

**Tip:** The amount of free disk space limits the extension of the database files. You can add additional tablespace files to other hard drives, space permitting, or free space on the original drive, to allow for adequate extension. Contact Waters for more information about this. See [“Contacting Waters”](#).

Most information stored in the database consists of results. The actual tablespace used for each result is related to the number of integrated peaks (named or unknowns). Additional space is required when you enable an option such as System Suitability, which produces the calculation of additional results, or when the data originates with a 3D detector and additional processing calculations are requested (for example, a PDA channel for which you enabled multi-pass purity).

### 4.2.3.4 Empower database backups

When you install Empower 3 software on a server, database backups are installed and enabled. An initial database backup runs after installation. In addition, RMAN daily (hot) database backups are enabled and run as a scheduled task at 2:59 a.m. You can disable the database backups jobs, modify the time and other backup settings, in the Waters Database Manager application.

The Fast Recovery Area is the location where database backups are stored. This location must be able to accommodate two backups simultaneously. The software does not delete an obsolete backup until it confirms that a current one is completed. Online, hot backups also include archive logs. The default directory for the fast recovery area is [drive used for the installation]:\Empower\Oracle\Fast\_Recovery\_Area.

You must specify the location of your raw data files in Waters Database Manager.

For information about how to change the location of your database backups and specify the location of your raw data files, see the *Empower 3 FR4 System Administrator’s Guide*.

Before moving the location of the database backups, consider the location, size, and number of backups that you want to retain:

- Choose a network location or storage array that can accommodate the number of database backups that you want to retain.
- Copy the database backup folders daily to a network share or storage array. If you schedule a task to copy the database backup folders, ensure that the task runs at a time other than the scheduled backup (2:59 a.m.). The folder location where you copy database backups must not contain spaces in the path name.

A database backup generates a time-stamped log file that includes details about individual steps of the backup process. This log file is located in: [drive used for the installation]:\Waters\tmp\scripts\logs.

One full backup set remains in the FRA. Archive logs are removed when a new backup is made. When a new, full database backup (level-0) runs, previous backups older than one week are removed from the FRA.

The database is backed up using backup jobs that are automatically created and run in Waters Database Manager. You can restore the database by using scripts stored in this location: [drive used for the installation]:\Waters\Oracle\scripts\BackupRecoveryScripts folder.

The database backup process typically compresses a database, reducing its size by 50 percent.

## 4.3 Installing Empower 3 software (new installation)

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Follow the instructions in this section if this is a new installation of Empower 3 software. If you are upgrading, follow the instructions starting on [page 77](#) to upgrade your current version of Empower software to Empower 3.

**Important:** TestExecute software is installed with Empower 3 software during the Empower 3 installation. Do not uninstall TestExecute, even though it appears in the Control Panel. Uninstalling TestExecute invalidates the Empower 3 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

### 4.3.1 Oracle software installation

Waters supplies Oracle software and Empower 3 software on the Empower 3 software media. Procedures in this chapter assume that you want to install Oracle automatically using default settings. Allow approximately 60 minutes to install the software.

By default, during a full installation, the Empower installer (Deployment Manager) installs both Oracle 12.1.0.2.0 and Empower 3 software. If your site has its own Oracle license and prefers to install Oracle 12.1.0.2.0 software as a separate application, consider these installation issues:

- Install Oracle 12.1.0.2.0 software only (that is, without a database) before installing Empower 3 software.
- Change the language registry key value in HKEY\_LOCAL\_MACHINE\Software\Wow6432Node\Oracle\KEY\_EmpowerOracle12cClient\NLS\_LANG to AMERICAN\_AMERICA.WE8ISO8859P1
- During installation, a dialog box appears inquiring whether you want to use your installed Oracle software. Click Yes, and enter the location of the Oracle program files.

- Waters Database Manager application is not installed during a custom installation.

## 4.3.2 Starting the installation

### To start the Empower 3 software installation:

1. Log in to the computer as a local administrator user.
2. Insert the Empower 3 software media into the DVD drive.
3. If the installation menu does not automatically appear, browse to the main folder on the software media and double-click the setup.exe file.  
**Tip:** A dism.exe window opens after you click setup.exe. You need not close this window; it closes automatically after appearing for several seconds.
4. Select a language from the list, and click OK.
5. On the main page, select Install Empower Software.
6. On the Select Product Type page, select Enterprise or Workgroup, depending on your environment.
7. On the Select Installation Type page, select Server.
8. On the Customer Information page, enter your user name, organization, and Software Support ID number, and then click Next.
9. On the End-User License Agreement page, accept the terms in the license agreement, and then click Next.
10. On the Option page, select Full, and then click Next.
11. On the Destination Folders page, specify where you want the program features installed by selecting a drive letter from the list.  
**Tip:** By default, all locations point to drive C:\.  
**Requirement:** Do not install all the features on drive C:\.  
**Recommendation:** For best performance and for fault tolerance reasons, spread the components across multiple drives.
12. On the Database Option page, specify the locations of the archive and mirror directories (by changing the drive letter of the provided paths), and then click Next.

#### Tips:

- Typically, the mirror directory (containing mirrored control files and redo logs) and the first archive directory are installed to the raw data drive. The second archive directory is installed to the program file drive. These are the recommended locations.
- By default, all locations point to drive C:\.

**Important:** If you are installing a server with fewer than 4 physical drives, ensure the path to the EmpowerMirrorDB directory is to a drive other than the physical drive selected for the Empower Oracle Database. If the location of the mirrored files is on the same physical drive as the database, database recovery in the event of a disk malfunction can be impossible.

13. On the Database Identification page, take the following actions:

- a. Enter the Oracle Service Identifier (SID).  
**Requirement:** The database SID can be any combination of alphanumeric characters, up to 8 characters; however, it must start with WAT.  
**Result:** Doing so automatically changes the identifier in the Global Database Name box.
  - b. Enter the Global Database Name, and click Next.  
**Tip:** The global database name typically consists of SID.<computer name>.domain (for example, WATN.EMPSRVR1.WATERS.COM, where the SID is WATN, the computer name is EMPSRVR1, and the domain is WATERS.COM).
14. On the Ready to Install page, click Next to start the Installation.  
**Tip:** If any Windows Security Alert messages appear, click Allow Access.  
**Result:** The software installation begins. This process usually requires approximately 40 minutes, but it can vary depending on the computer and environment.
  15. On the Status page, click Finish.
  16. When the restart message appears, click Yes.  
**Result:** The computer reboots.

### 4.3.3 Activating Empower 3 software licenses and options

You must activate the Empower 3 base software license to access Empower 3 software. Licenses other than the Empower 3 base software license must be activated at the same time as, or after, the Empower 3 base software license is activated, but not before.

**Note:** The licensing strategy for Empower 3 Workgroup represents a change from previous versions of Empower. The Workgroup configuration is identical to that of the Enterprise configuration except that the Workgroup license restricts the installation to 10 or fewer Named User licenses.

#### Requirements:

- The Waters Licensing Wizard provides an online form where you enter your serial numbers for activation. If you are performing a workgroup to enterprise upgrade, the upgrade license is activated by entering the serial number for this license in the Base Software License field (at the top of the form). You must enter the workgroup to enterprise upgrade license in this field.
- If you are using LAC/E modules that you purchased from Waters, you must register them by entering their serial numbers in the LAC/E Acquisition Server field of the online form. Doing so activates the system licenses that were purchased with each LAC/E module.

License serial numbers purchased from Waters or the order numbers of the purchased licenses are required for activating the Empower licenses and option licenses. If you must transfer a software license or option license from one Empower server to another, you must deactivate it from the original Enterprise system before you activate it on a new Enterprise system.

The Empower 3 base software license includes 5 Named User licenses. The number of named users that can be created in the software is based on the number of Named User licenses you installed. You can create multiple user accounts; however, you can only have as many accounts active at one time as you have licenses. (The number of active accounts cannot exceed the number of Named User licenses you purchased.)

The number of allowed online chromatographic systems is based on the number of system licenses you purchased.

**Important:** Do not uninstall Empower 3 software until after you deactivate the licenses and options. To do otherwise renders them unusable. If this happens, call Waters Technical Support for assistance. See ["Contacting Waters"](#).

If you must uninstall Empower 3 software, first uninstall any instrument component software, then uninstall service releases and updates, deactivate the licenses and options, and then uninstall Empower 3.

Software option licenses are available for optional software functionality such as System Suitability, Dissolution, GPC/SEC, or Method Validation Manager. These options are project-configurable. When you activate an option license following the procedures in this section, you can enable each option in projects as needed. You can disable an option for specific projects (see "Modifying project properties" in the Empower Help).

**Exception:** You cannot activate a license labelled for an Enterprise or Workgroup system on an Empower Personal workstation, nor can you activate a license labelled for an Empower Personal workstation on an Enterprise or Workgroup system.

**Restriction:** You can activate Empower 3 software licenses only by using the serial numbers provided with the Empower 3 licenses and options. You cannot use any Empower 2 license serial numbers; they will not work for Empower 3.

For project configurable options, once you install an option following the procedures in this section, the option is enabled for all projects. You can disable the option for specific projects (see "Modifying project properties" in the Empower Help).

#### 4.3.3.1 Activating Empower licenses or options using Waters Licensing Wizard

##### To activate Empower licenses or options:

1. From the Start menu, click Start > All Programs or All Apps> Empower > Waters Licensing Wizard.
2. On the Waters Licensing Wizard logon page, enter a user name (one that has administrator privileges), a password, and then select the database to use.

**Note:** Empower software provides a default system user account that you can disable, but not remove, from the software. The default user name for the account is "system", and the default password is "manager". When logging in to Empower software and using the licensing wizard for the first time, enter the default user name and password. Subsequently, any user with the administrator privilege can access the Waters Licensing Wizard.

3. Click Log On.
4. On the task page, click "Request software registration".

5. On the "Request software registration – Create registration file" page, enter a valid name and location for your license registration file, or accept the defaults, and then click Next.

**Tip:** This file stores your license registration information.

6. When the "Request software registration – Registration file created" page appears, click the address link.

**Result:** If your computer has Internet access, it connects to the Waters License Activation Center Web site, where you complete the request process and receive your license activation file.

**Alternative:** If your computer does not have Internet access, move the software registration file that you just created to a computer with Internet access, and then connect to the Waters License Activation Center Web site (<https://www.waters.com/activate/licenseintro.htm>). For best results, use Google Chrome as a browser.

**Note:** Follow the instructions to obtain your license activation file. You must have either your license and option serial numbers or the order numbers of the purchased licenses and options in order to complete this step.

7. The License Activation Center Web site provides the license activation file. Put the file in a location accessible to your Empower 3 computer, log in to the Waters Licensing Wizard (see [step 1](#)), and select Activate Licenses.

**Requirements:**

- The Waters Licensing Wizard provides an online form where you enter the serial numbers for activation. If you are performing a workgroup-to-enterprise upgrade, activate the upgrade's license by entering its serial number in the Base Software License field (at the top of the form).
- If you using LAC/E modules that you purchased from Waters, you must register them by entering their serial numbers in the System Control field of the online form. Doing so activates the system licenses that were purchased with each LAC/E module.

8. Browse to and select the license activation file you downloaded from the Waters License Activation Center Web site, and then click Next.

**Requirement:** You must complete the activation process on the same database on which you initially created the software registration file or on a client that accesses the same database.

9. On the License Activation Complete page, click Finish.

**Result:** A list of successfully activated licenses and options appears.

**Tip:** To view active licenses and options, use the Show Licenses option in the Waters Licensing wizard.

### 4.3.4 DCOM settings installed by Empower 3

Empower 3 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

**Table 4–3: DCOM settings and permissions set during installation**

Path	Allow
Local Security Policy > Local Policies > Security Options > DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	Local Access and Remote Access permissions for: <ul style="list-style-type: none"><li>Everyone <b>Note:</b> You must change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a>.</li><li>Domain Users</li><li>Performance Log Users</li><li>Distributed COM Users</li><li>Anonymous Logon</li></ul>
Local Security Policy > Local Policies > Security Options > DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	Local Launch, Local Activation, and Remote Activation for <ul style="list-style-type: none"><li>Everyone (Remote Launch not required; Remote Activation required) <b>Note:</b> You must change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a>.</li></ul> All permissions for: <ul style="list-style-type: none"><li>Domain Users</li><li>Administrators</li><li>Performance Log Users</li></ul>
Local Security Policy > Local Policies > Security Options > Network Access: Let Everyone permissions apply to anonymous users	Enable
Component Services > Computers > Properties of My Computer > COM Security > Access Permission	Local Access and Remote Access for: <ul style="list-style-type: none"><li>SELF</li><li>System</li><li>Administrators</li></ul>

**Table 4–3: DCOM settings and permissions set during installation**

Path	Allow
Component Services > Computers > Properties of My Computer > COM Security > Launch and Activation Permissions	Local Launch and Local Activation permissions for: <ul style="list-style-type: none"><li>Everyone: <b>Note:</b> You must change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a></li></ul> All permissions for: <ul style="list-style-type: none"><li>System</li><li>Administrator</li><li>INTERACTIVE</li></ul>

### 4.3.5 Windows Firewall settings for Empower

After Empower 3 is installed on the server, open the Windows Firewall setting and verify the following exceptions appear in the Windows Firewall Exceptions List:

- Empower-related ports and processes:
  - DCOM Port (135)
  - Oracle.exe
  - TNSLSNR.exe
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:
  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server
  - ACQUITY FLR Server
  - ACQUITY MD Server
  - ACQUITY PDA Server
  - ACQUITY SM Server



- ACQUITY SQ Server
- ACQUITY TQ Server
- ACQUITY TUV Server
- Local Console Controller (LCC Handheld Controller)
- Trinity UI (if applicable)
- W2489 Server
- W2707 Server
- W2998 Server

### 4.3.6 Configuring a database net service name

You must configure a database net service name (previously called a database alias) on each client to connect to the Empower database, unless you are using the TNS\_ADMIN environment variable. A database net service name is a name for an individual Empower database. This name appears in the Database field of the Empower login page.

**Tip:** The TNS\_ADMIN variable is set during installation, and a tnsnames.ora file is created. The TNS\_ADMIN variable points to the tnsnames.ora file. A tnsnames.ora file contains the list of Empower databases that can be accessed by the client or LAC/E module.

Use the following procedure to create a new database net service name, or modify an existing net service name. You must define the same database net service name on each client or LAC/E module.

**Tip:** If you created the tnsnames.ora file previously in another client or server, you can copy the master file and add it to the designated folder, for example, C:\Empower\oracle\oracle12cClient\network\admin.

#### To configure a database net service name:

1. Select Start > All Programs or All Apps> Empower > Waters Net Configuration Assistant.

**Alternative:** Click Start, and type Waters Net Configuration Assistant.

**Tip:** In Windows 2012, from Start > click the down arrow (↓), to display the Apps page > point to Empower > select Waters Net Configuration Assistant.

2. On the Waters Net Configuration Assistant utility, click the first row to edit the column details.
3. In the Alias column, type the alternative name for the database service.

**Example:** WATWIN2008R2

**Rule:** The database service identifier must begin with a character, not a number, and there must be no blank spaces.

4. In the Server Name column, type the computer name or IP address of the database server.

**Requirement:** The computer name must begin with an alphabetic character (A to Z), and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a computer name, but not 123Empower.

5. In the Service Name column, type the database service name in this format: <SID.ServerName.domain>.
  - where the SID is the Oracle Service Identifier.  
**Note:**
    - The SID must start with "WAT" followed by alphanumeric characters up to 8 characters in length.
    - The default is "WAT12".
  - where the ServerName is the value you entered in the Server Name column.
  - where the domain refers to the domain of the server as well as the client or LAC/E machines.  
**Tip:** If you do not know the Service name, you can find the name using the Listener Configuration on the database server. The Listener configuration is disabled on the client. To do so, click Configuration > Listener Configuration. The Waters Net Configuration Assistant displays the service name (Service = "servicename").
6. In the Port Number column, ensure that the default port selection is 1521.
7. Click Save.  
**Result:** The tnsnames.ora file is created.
8. Select the row, right-click, and then select Test.
9. In the Change Login dialog box, verify that the username "System" and password "empower" are prepopulated, and then click OK.  
**Tip:** "empower" is the default password for the Oracle System account in Empower 3 software. The password is not case-sensitive.
10. When the connection test is successful, click OK.  
**Result:** When you log on to Empower 3 software from a client, the database alias name is automatically populated in the Login dialog box.

### 4.3.7 Configuring a shared tnsnames.ora file

A tnsnames.ora file uses the net service name to define the list of Empower databases that can be accessed by clients and LAC/Emodules.

Use the Empower 3 client/LACE module installer (Deployment Manager) to create an environmental variable named TNS\_ADMIN. The value for this variable is the path to the location of a shared folder containing a preconfigured tnsnames.ora file.

Using the TNS\_ADMIN variable on client and LAC/E modules removes the need to manually configure and maintain individual tnsnames.ora files. If you use this feature, be sure to place the tnsnames.ora file in a share on a server accessible to Empower 3 users.

**Recommendation:** Place the shared tnsnames.ora file, on which normal Empower 3 functionality depends, in the \Empower\Projects directory so that it is automatically shared with the applied security settings.

### 4.3.7.1 Configuring a Windows Server for a shared tnsnames.ora file

To use the TNS\_ADMIN environment variable with Empower database servers running Windows Server 2008 R2 SP1, either Enterprise or Standard, (64-bit) or Windows Server 2012 R2, Standard edition, (64-bit), you must modify the default Local Security Policy.

**Tip:** The appropriate security settings are typically set by the Empower 3 installer (Deployment Manager). Otherwise, you must configure the settings manually.

#### To configure a Windows Server local security settings:

1. Log on to the Empower database server as an administrator.
2. Access Administrative Tools > Local Security Policy.  
**Tip:** In Windows Server 2012, select Server Manager > Tools > Local Security Policy.
3. In the tree, click Security Settings > expand Local Policies, and then click Security Options.
4. In the right-hand pane, double-click the policy "Network Access: Let Everyone permissions apply to anonymous users," and then select Enabled.
5. Click Apply, and then click OK.
6. Exit the Local Security Policy.

#### To configure a shared tnsnames.ora file:

1. On the Empower database server, browse to the <oracle program drive>:\Empower\Oracle\Oracle12cClient\network\admin directory.
2. Locate the tnsnames.ora file, right-click the file, and then click Copy.  
**Requirement:** If you have multiple Empower Database servers, add them to the tnsnames.ora file using the Net Configuration Assistant (see ["Logging in to Empower 3"](#)) before copying the tnsnames.ora file.
3. Browse to the <raw data drive>:\Empower\Projects directory, and paste the tnsnames.ora file into the folder.

**Recommendation:** Put the share in the same directory that will store Empower raw data. If you use a custom directory, set the share permissions as described in the next section.

## 4.3.8 Configuring the Empower Projects directory

The Empower projects directory is the location where raw data are stored.

**Note:** If you performed a system object import as part of your Empower 3 installation and want to use the \Empower\Projects folder on the server as a raw data share, you must manually configure the share in Empower 3.

#### Requirement:

To ensure the proper level of access and security for the projects directory, you must grant your Empower users read-only access to the share so that they can view the

raw data. An easy way to perform this task is to create a user group (for example, "Empower Users"). You can also assign permission to individual users to the share. If you create the user group, set the share file access to Read-Only Access for Empower Users and Full Access for System users. You must share this folder and configure the access settings in the Security tab on the Share Properties page.

**To create an Empower Users group:**

1. Right-click the Projects folder, and select Properties.
2. Launch the Server Manager, and select Tools > Computer Management.
3. Expand Local Users and Groups > right-click Groups, and select New Group.
4. In the New Group dialog box, type a name for the group, such as "Empower Users", in the Group name field.
5. Add user names, as necessary, and then click Create.

**To configure settings on the Sharing tab:**

1. Click the Sharing tab.
2. Click Advanced Sharing.
3. Click "Share this folder".
4. Enter the share name (typically Waters\_Projects\$, but you can change the share name to anything you want).
5. Click Permissions.
6. On the Share Permissions tab, click Add, type SYSTEM, and then click OK.
7. On the Share Permissions tab, ensure SYSTEM is selected and click Full Control.
8. Click Apply, and then click OK.
9. On the Advanced Sharing tab, click OK.

**To configure settings on the Security tab:**

1. Click the Security tab.
2. Click Advanced.
3. On the Advanced Security settings page, click Change Permissions.
4. Remove the check mark beside "Include inheritable permissions from this object's parent", and, in the Windows security box, click Add.
5. Use Remove to remove all users except SYSTEM.
6. Click Add, perform one of these tasks, and then click OK:
  - Type a name, such as "Empower Users". This group can include anyone to whom you want to give permissions. You can name them individually or by group.
  - If stronger security is required, add individual user names or groups that are allowed to access the data. When using groups, any user who is not part of the group cannot access the data.
7. Select the check boxes for the following "Permissions for Empower Users", and then click OK:

- Traverse folder/execute file
  - List folder/read data
  - Read attributes
  - Read extended attributes
  - Read Permissions
8. Select "Replace all child object permissions with inheritable permissions from this object", and click Apply.
  9. On the Windows Security message, click Yes, and then click OK.
  10. On the Permissions tab, click OK and then Close.

**Note:** If using an Empower Users group instead of Everyone, you must update the DCOM and COM settings to include this user group with the same permissions assigned for Everyone instead. (Otherwise, you will have no access to any task that must read raw data files like reviewing chromatograms or processing data, etc.)

## 4.4 Upgrading from earlier versions of Empower

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Follow the instructions in this section to upgrade to Empower 3 FR4. If you are not upgrading, follow the instructions for a new Empower 3 FR4 installation on [page 66](#) of this guide.

You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Note:** Allow enough time to perform the upgrade. An upgrade from any of the versions listed above to Empower 3 FR4 can potentially require more than two hours.

### Requirements:

- You must upgrade to Empower 3 FR2 before you can upgrade to Empower 3 FR4.  
**Note:** If you are using a version of Empower prior to Empower 3 FR2 software, you can either upgrade to Empower 3 FR2 as a minimum requirement, or completely uninstall the earlier version of Empower, and ensure that your system meets the hardware and software requirements detailed in Chapter 1 of this guide.
- Follow the instructions at the beginning of this chapter to install Empower 3 FR4 as a new installation.

**Important:** If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- The computer name must be less than 16 characters in length.

- The computer name must begin with an alphabetic character (A to Z), and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a computer name, but not 123Empower.

**Note:** While performing an upgrade of Empower software, you will be prompted to enter the Oracle Sys password if the Oracle Sys password was changed or the Oracle Listener is not up and running. Oracle Listener may not be up and running for these reasons: IPv6 is enabled, the Empower database is in an idle state, or there is a conflict with the host name. Resolve these issues and then restart Oracle Listener.

#### To start the Oracle Listener service:

1. Click Start > Administrative Tools > Computer Management.
2. In the Computer Manager window, expand Services and Applications, and then click Service.
3. In the list of service, right-click OracleEmpowerOracle12c TNSListener, and then select Properties.
4. Click Start.

### 4.4.1 Upgrade considerations

When you upgrade Empower software on a server from Empower 3 Feature Release 3 to Empower 3 Feature Release 4, database backups are automatically installed but not enabled.

Recommendation: Open the Waters Database Manager application and perform these tasks:

- In the Manage Backup settings tab, select the check box to enable "Backup Empower Raw Data Shares" option, specify the location where the Raw data files will be backed up (the location must be local drive on database server), and then click "Submit".
- In the Scheduled Backups tab, open First full backup job in edit mode and click "Enable" to run a full backup of database and the raw data files. View these logs to ensure there were no errors: the backup job log in Waters Database Manager and the raw data files log, which is located in the <database drive>:\Empower\tmp\scripts\logs folder.
- In the Scheduled Backups tab, open Full and Incremental backup jobs in edit mode, select "Enable" to run jobs in their scheduled time. Incremental job runs daily once except on Monday, whereas, full backup are performed weekly on Monday early hours.

For more information see, the *Empower 3 FR4 System Administrator's Guide*.

### 4.4.2 System object export

**Restriction:** In-place upgrades from previous versions of Empower software, such as Empower 1154 or Empower 2154 prior to FR5. are not available. If you want to upgrade an installation previous to Empower 3 FR2, you can perform a system object export.

You can export system objects from these versions:

- Empower 2 Feature Release 5, including service releases and updates
- Empower 3 Feature Release 1 (FR1)
- Empower 3 Feature Release 2 (FR2)
- Empower 3 FR2 Hotfix 1
- Empower 3 Service Release 1 (SR1)
- Empower 3 Service Release 2 (SR2)
- Empower 3 SR2 Hotfix 1
- Empower 3 SR2 Hotfix 2
- Empower 3 Feature Release 3 (FR3)
- Empower 3 FR3 Hotfix 1

A system object export captures most objects from within Configuration Manager, such as chromatographic systems, users, user groups, libraries, and so on.

**Note:** Empower projects and licenses are not included in the system object export.

Perform a system object export before you install Empower 3 software. Then, during the Empower 3 installation, you can perform a system object import of the system objects to bring them into your Empower 3 installation.

#### **To perform a system object export:**

1. Back up all projects.
2. Log in to the computer as a local administrator user.
3. Insert the Empower 3 software media into the DVD drive.
4. Browse to Optional Components\Export Utility\WATEXP.exe.
5. On the Welcome screen, click Next.
6. On the Found Waters Application screen, click Next.
7. Enter the password for the Oracle user System, and click Verify Password.
8. Click OK on the Valid Password message.

**Requirement:** If you are exporting a system object from a client, you must also enter the database net service name (previously called a database alias). The only password required for the system object export is the System password.

**Note:** The default password for System is "empower". The password is not case-sensitive.

9. Click the Browse button, select a directory in which to place the system object export (\*.Exp), and click Next.

**Result:** The system object export starts.

10. After the object export has finished, click Finish.
11. Copy the export file to the Empower 3 server.

### 4.4.3 Installing base Empower 3 software with system object import

**Important:** TestExecute software is installed with Empower 3 software during the Empower 3 installation. Do not uninstall the TestExecute software, even though it appears in the Control Panel. Uninstalling the TestExecute software invalidates the Empower 3 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

**Recommendation:** Make sure you have a complete backup of all your projects before performing this procedure.

#### To start the Empower 3 software installation:

1. Log in to the computer as a local administrator user.
2. Insert the Empower 3 software media into the DVD drive.
3. If the installation menu does not automatically appear, browse to the main folder on the software media and double-click the setup.exe file.  
**Tip:** A dism.exe window opens after you click setup.exe. You need not close this window; it closes automatically after appearing for several seconds.
4. Select a language from the list, and click OK.
5. On the main page, select Install Empower Software.
6. On the Select Product Type page, select Enterprise or Workgroup, depending on your environment.
7. On the Select Installation Type page, select Server.
8. On the Customer Information page, enter your user name, organization, and Software Support ID number, and then click Next.
9. On the End-User License Agreement page, accept the terms in the license agreement, and then click Next.
10. On the Option page, select Full, and then click Next.
11. On the Import System Object page, do the following:
  - Click the Import System Object check box.
  - You can exclude nodes and chromatographic systems, system audit trail, and messages from the Message Center, by clicking the appropriate check box.
  - Browse to the location of the system objects file (\*.exp) that you want to import into your Empower database, and then click Next.
12. On the Destination Folders page, specify where you want the program features installed by selecting a drive letter from the list.

**Tip:** By default, all locations point to drive C:\.

**Requirement:** Do not install all the features on drive C:\.

**Recommendation:** For best performance and for reasons of fault tolerance, spread the components across multiple drives by selecting them from the list.

13. On the Database Option page, specify the locations of the archive and mirror directories (by changing the drive letter of the provided paths), and then click Next.



**Tips:**

- The recommended location for installing the mirror directory (containing mirrored control files and redo logs) and the first archive directory is the raw data drive. The recommended location for the second archive directory is the program file drive.
- By default, all locations point to drive C:\.

**Important:** If you are installing a server with fewer than 4 physical drives, ensure the path to the EmpowerMirrorDB directory is to a drive other than the physical drive selected for the Empower Oracle Database. If the location of the mirrored files is on the same physical drive as the database, database recovery in the event of a disk malfunction can be impossible.

14. On the Database Identification page, take the following actions:

- a. Enter the Oracle Service Identifier (SID).

**Requirement:** The database SID can be any combination of as many as eight alphanumeric characters. Note, however, that the initial three characters of the sequence must be "WAT".

**Result:** Doing so automatically changes the identifier in the Global Database Name box.

- b. Enter the Global Database Name, and click Next.

**Tip:** The global database name typically consists of SID.<computer name>.domain (for example, WATN.EMPSRVR1.WATERS.COM, where the SID is WATN, the computer name is EMPSRVR1, and the domain is WATERS.COM).

15. On the Ready to Install page, click Next to start the Installation.

**Tip:** If any Windows Security Alert messages appear, click Allow Access.

**Result:** The software installation begins. This process usually requires approximately 60 minutes, but it can vary depending on the computer and environment.

16. On the Status page, click Finish.

17. When the restart message appears, click Yes.

**Result:** The computer reboots.

#### 4.4.4 Upgrading to Empower 3 software

You can perform an upgrade to Empower 3 FR4 from Empower 3 Feature Release (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1. The upgrade installs a new version of Oracle software (12.1.0.2).

**Recommendation:** Before upgrading, make sure you have a complete backup of all your projects.

**To upgrade to Empower 3:**

1. Insert the Empower 3 software media into the DVD drive.
2. On the Maintenance Mode page, select Upgrade Empower Software.
3. On the Ready to Upgrade page, click Next.

4. On the Status page, when the upgrade is complete and the Success message appears, click Finish.  
**Note:** The upgrade process can require between one and two hours, depending on the size of the database.
5. When the restart message appears, click Yes.  
**Result:** The computer reboots.

### 4.4.5 Logging in to Empower 3

After you install Empower 3, you must log in to Empower 3 to update the database.

#### **To log in and update the database after a system object import:**

1. Log in to the computer as a user with local Administrator privileges.
2. Log in to Empower 3 as an administrator user.
3. In the Password box on the C/S Update Server Database screen, enter the following password: EMPOWER3CSUPDATE.
4. At the Database Update message, click OK.
5. A message appears stating that the Empower 3 base package option has not been installed. Click OK.
6. Click Cancel to close the Login window. Proceed with the next section ("Activating licenses and options").

#### **To log in and update the database after upgrading to Empower 3 (no system object import):**

1. Log in to the computer as a user with local Administrator privileges.
2. Log in to Empower 3 as an administrator user.
3. In the Password box on the C/S Update Server Database screen, enter the following password: EMPOWER3CSUPDATE.
4. At the Database Update message, click OK.

**Requirement:** Ensure the update is complete before you activate your Empower 3 licenses and options.

## 4.5 Verifying your Empower 3 software installation

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### 4.5.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to check for errors.

The "Installation success or error status" value appears at the end of the installation log. If the value displayed is 0, then the installation was successful. If the value

displayed is anything other than 0, record the number, and contact Waters Technical Support.

#### **To view the installation log:**

1. Select Start > All Programs > Empower > Installation Log.

**Tip:** In Windows Server 2012, from Start > click the down arrow (⌵) to display the Apps page > point to Empower, and click Empower Installation Log.

**Result:** The Empower.log file displays in Notepad.

2. Review the contents of the file.

**Tip:** You can print a copy by selecting File > Print.

3. Click File > Exit.

## **4.5.2 Using the Verify Files Utility**

The Verify Files Utility ensures the integrity of the installed Empower program, data, and database files.

After the Empower 3 installation, run the Verify Files Utility to verify the Empower and Oracle program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option
- To ensure that the Empower files did not change since installation

#### **To run the file verification utility:**

1. Select Start > All Programs > Empower > Verify Files.

**Tip:** In Windows Server 2012, from Start > click the down arrow (⌵) to display the Apps page > point to Empower, and click Verify Files.

**Result:** The Verify Files Utility compares the installed Empower files' checksum with a previously stored checksum and then creates a file verification results log, named checksum.txt.

2. Review the contents of the file, and print or save a copy of the results.
3. Click File > Exit.

#### **To view the file verification results:**

1. Click Start > All Programs > Empower > View Verify Files.

**Tip:** In Windows Server 2012, from Start > click the down arrow (⌵) to display the Apps page > point to Empower, and click View Verify Files.

**Result:** The checksum.txt file displays in Notepad.

2. Review the contents of the checksum file.

Your Empower 3 software installation passes the verification check if all files have a status of "OK" and the installation qualification summary on the final page states "No installation changes were detected." If the checksum.txt file indicates any files marked as "changed", contact Waters Technical Support.

## 4.6 Empower programs and logs

The Empower program folder (in the Start menu) contains these items in Windows:

**Tip:** To access Empower utilities in Windows Server 2012, from Start > click the down arrow (↓) to display the Apps page > point to Empower, and click the Empower utility.

**Recommendation:** From Start, right-click the program, and click Pin to Start to create a shortcut to this program on the Start page.

**Table 4–4: Empower programs and logs**

Item	Description
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see “Starting and exiting from Empower” in the Empower Help.
Configure ICS for 64 bit OS	Use this utility if Instrument Component Software (ICS) was installed from a source other than Empower 3 Instrument Driver Pack media.
Register Empower Node printers	Registers printers so you can print Empower reports.
Verify Files	Verifies the integrity of the Empower software files on your hard disk.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Database Manager	Opens the Waters Database Manager web application, which you can use to manage and monitor your database.
Waters Net Configuration Assistant	Opens the Waters Net Configuration Assistant. This utility allows you to configure the Empower database connection.
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation and deactivation or view Waters licenses and their serial numbers.
Manage Waters Email Center (Optional)	If installed, the Waters Email Center option facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to check the Message Center throughout the day.

## 4.7 Managing raw data files

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If you performed a system object import and want to use the Empower\Projects folder on the server as a raw data share, you must manually configure the share in Empower 3. For additional details, see "Managing raw data files in an Enterprise Client/Server configuration" in Empower Help or "[Configuring raw data directory permissions](#)".

## 4.8 Restricting access to the Message Center properties

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In Empower 3 software, the Message Center properties are global for Enterprise/Workgroup environments. You must secure them before your server goes into production mode. Enable password protection of the Message Center properties immediately after installing the database, thus ensuring that only authorized persons can modify the properties.

### To restrict access to Message Center properties:

1. Log in to Empower software with the username 'system' and password 'manager' (this is the default password for the pre-configured Empower 3 administrator user).  
**Alternative:** Log in as a user that has access to the Message Center.
2. Right-click the Message Center icon in the System Tray (the task bar/notification area, usually in the lower right-hand corner), and select Open.

**Tip:** Set the Message Center icon to appear permanently in the notification area. To do so, click Start > Control Panel > Notification Area Icons:

- On the taskbar, select Customize icons, and then next to MSGCENTER MFC APPLICATION, select "Show icon and Notifications" from the drop-down list, and click OK.
- Select Navigation properties > Taskbar tab, clear the "Auto-Hide the taskbar" check box, and then click OK.

3. In the Message Center, select View > Properties.
4. Click the Passwords tab, enable Password Protection, and then enter and confirm a password.

**Requirement:** Once you enable password protection, you must supply the correct password to access the Message Center properties.

## 4.9 Registering printers

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To print Empower reports, you must first register the printers you want to use.

### To register printers for Empower reports:

1. Select Start > All Programs > Empower > Register Empower Node Printers.

**Tip:** In Windows Server 2012, from Start, click the down arrow (⌵) to display the Apps page > point to Empower > and then select Register Empower Node Printers.

**Requirement:** You must be logged in to the Empower node as a local administrator or a user whose privileges allow you to write to the registry.

2. In the Register Empower Node Printers page, review the list of printers that are currently registered.

**Tip:** The Register Empower Node Printers page shows only printers added using the Add a printer function. To add a new printer, click Start > Devices and Printers > Add a printer.

3. If you must register additional printers, click Get Printers, select the printers, and then click OK.
4. Click OK, to save the changes, and close the page.

## 4.10 Empower feature releases and service releases

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Waters periodically issues feature releases to provide enhanced software functionality and service releases to address existing issues. These feature releases and service releases, available for downloading from the Waters Elite Web site (to customers with a software support plan), must be installed according to instructions set forth in their associated release notes. If you want physical media, note the part number from the Web site, and contact your local Waters subsidiary to place an order for a nominal fee.

To determine which feature releases or service releases are installed, view the installation log, or select Help About from any Empower 3 application window.

## 4.11 Uninstalling Empower 3

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Before uninstalling Empower 3, or if you installed a license or option on a different Empower Enterprise Server or Workgroup, and you want to transfer it to another, you must first uninstall the license or option from its current location. To do so, you must use the Waters Licensing Wizard and License Activation Center Web site.

**Note:** If you must uninstall Empower 3 software, first uninstall any instrument component software, deactivate the licenses and options, and then uninstall Empower 3.

**Restriction:** If you deactivate the base software license, the Licensing Wizard software automatically deactivates and removes all user licenses, system licenses, and option licenses.

## 4.11.1 Deactivating Empower 3 licenses or options

### To deactivate a license or option:

1. From the Start menu, click Start > All Programs > Empower > Waters Licensing Wizard.

**Tip:** In Windows Server 2012, from Start, click the down arrow (↓) to display the Apps page > point to Empower > and then select Waters Licensing Wizard.

2. On the Waters Licensing Wizard logon page, enter a user name (one that has administrator privileges) and a password, and select the database to use.

**Note:** Empower software provides a default system user account that you can disable, but not remove, from the software. The default user name for the account is "system", and the default password is "manager". When logging in to Empower software and using the licensing wizard for the first time, enter the default user name and password. Subsequently, any user with the administrator privilege can access the Waters Licensing Wizard.

3. Click Log On.
4. On the task page, click Deactivate Licenses.
5. On the "Deactivate Licenses – Select Licenses" page, check the options you want to deactivate, and then click Next.
6. On the "Deactivate Licenses – Create Deactivation file", enter a valid name and location for your license deactivation file, and then click Next.

**Tip:** This file stores your license deactivation information.

7. When the "Deactivate Licenses – Deactivation file created" page appears, note the file location, and then click the address link.

**Tip:** If your computer has Internet access, it connects to the Waters License Activation Center Web site, where you complete the deactivation process.

**Alternative:** If your computer does not have Internet access, move the license deactivation file that you just created to a computer with Internet access, and then connect to the Waters License Activation Center Web site (<https://www.waters.com/activate/licenseintro.htm>).

8. Follow the instructions to deactivate your licenses.

**Result:** When the process is complete, a confirmation page appears that lists all deactivated licenses and options.

## 4.11.2 Uninstalling Empower 3 software

When you want to uninstall Empower 3 software, use Windows Control Panel Programs and Features utility to remove the software.

### To uninstall Empower 3 software:

1. Open Windows Control Panel, click Programs and Features, and then double-click Empower 3 server.

**Tip:** From Windows 10, click Start > All apps > right-click Empower 3 Server and then click Uninstall.

**Result:** Empower Deployment Manager opens in maintenance mode.

2. Follow the prompts in the Empower's Deployment Management wizard to uninstall Empower software.
3. Restart the server.

When you uninstall Empower 3 software on a server, the Projects directory and the Empower Database directory are not deleted. If you reinstall Empower software on the server, you must delete these directories before reinstalling the software.



# 5 Installing an Empower client

Follow the instructions in this chapter to install the Empower 3 FR4 software on a client (or an acquisition client) in an Empower Enterprise or workgroup system, or to upgrade a current Empower client to an Empower 3 FR4 client.

- **Recommendation:** Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer).

## 5.1 Preparing the client

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Empower 3 FR4 software on a client requires the hardware and software specified in the table on [page 19](#).

You can install Empower 3 FR4 as a new installation (on a client where no Chromatography Data Software [CDS] is currently installed) or as an upgrade from Empower 3 Feature Release 2 (FR2), Empower 3 Feature Release 2 Hotfix 1, Empower 3 Service Release 2, Empower 3 Service Release 2 Hotfix 1, Empower 3 Service Release 2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Important:** If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the name of the computer after Empower is installed.
- The name of the computer must start with a letter (A through Z) and be less than 16 characters in length.

Follow these procedures to prepare a process or acquisition client:

- (On acquisition clients only) Installing or updating the 8-port serial hub driver, if the client will be used to control a serial device with this hub (see ["Updating the 8-port serial hub driver"](#)).
- Changing the page file size (see ["Changing the virtual memory setting"](#)).
- Configuring the event viewer to overwrite events as needed (see ["Configuring Event Viewer"](#)).
- Configure the system power options.
- Disable IPv6 in Windows.
- Enable MSI logging in Windows (see ["Enabling MSI logging"](#)).
- Ensuring the client is a member of the domain in which Empower software is running (see ["Verifying the Empower domain"](#)).

**Requirements:**

- If you change domains after installing Empower and any ICS, you must manually change the firewall exceptions list, in case firewall settings do not carry over from one domain to another.
- If you are using real-time virus scanning, after installation, exclude all Empower-related directories and their sub-directories, and all raw data directories or shares, from the scans. Some real-time virus scanners mistake normal Empower functionality for virus activity and can therefore interfere with data buffering or cause the run to stop.

### 5.1.1 Configuring Microsoft .NET 3.5 Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10. Microsoft .NET 4.0 Framework is installed and enabled by default on Windows 10.

**To install .Net 3.5 Framework on Windows 10:**

1. From Control Panel, select Programs > Programs and Features > Installed Updates.  
**Tip:** To access the Control Panel in Windows 10, type "Control Panel" in the Cortana Search box.
2. Click "Turn Windows features on or off".
3. Select the check box for ".NET Framework 3.5 (includes .NET 2.0 and 3.0)", and click OK.
4. On the Windows Features page, click Close when the installation is complete.

Windows 10 has .NET 4.6 pre-installed and the .NET 4.6 is backward compatible with all versions back to 4.0, so there is no need to install .NET 4.0 on Windows 10.

### 5.1.2 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

**To start the required services:**

1. From Control Panel, System and Security (when in Category view) > Administrative Tools > Services.  
**Tip:** To access the Control Panel in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.
2. Change the startup type to Automatic, and start these services:
  - DNS Client
  - Function Discovery Resource Publication
  - SSDP Discovery
  - UPnP Device Host

**Tip:** When all services are running, you can modify the network discovery and printer sharing settings.

#### **To turn on the network discovery and file and printer sharing functions:**

1. From the Start menu, select Control Panel > Network and Internet (when in Category view) > Network and Sharing Center.

**Tip:** To access the Control Panel in Windows 10/Windows Server 2012, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.

2. Click "Change advanced sharing settings", and turn on these functions:
  - Network discovery
  - File and printer sharing

### **5.1.3 Disabling Internet Protocol version 6**

You must disable the Internet Protocol Version 6 before you install Empower software. Disabling this feature ensures that the Oracle listener works properly.

#### **To disable IP version 6 (IPv6) in Windows:**

1. Click Start > Control Panel > Network and Internet (when in Category view) > Network and Sharing Center > View network status and tasks > Change adapter settings.

**Tip:** To access Control Panel in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.

2. Right-click Local Area Connection, Instrument LAN, and then click Properties.
3. On the Networking tab, clear the Internet Protocol Version 6 (TCP/IPv6) check box, and then click OK.

### **5.1.4 Configuring power options**

You must configure the power management settings for the workstation to disable the power saving feature.

#### **To configure the power options on a computer with Windows:**

1. From the Start menu, select Control Panel > System and Security (when in category view), and then Power Options.

**Alternate:** From the Search Programs and Files, type Power Options.

**Tip:** To access Control Panel on Windows 10, hover the mouse in the bottom-left corner of the screen, right-click the Windows icon and click Control Panel.

2. On the Power Options page, click Change plan settings for the currently selected plan.
3. On the Edit Plan Settings page, click Change advanced power settings.
4. In the Power Options dialog box, complete these tasks, and then click OK.
  - In Sleep, click plus (+) to show the Sleep after spin box, and enter Never in the field.

- In Display, click plus (+) to show the Turn off display after spin box, and enter Never in the field.

**Table 5–1: Power option settings**

Power options	Settings
Expand Hard Disk and "Turn off hard disk after"	Type Never in the Setting(Minutes) field
Expand Sleep settings:	
Sleep after	Never
Allow hybrid sleep <b>Note:</b> Windows 7 only	Off
Hibernate After <b>Note:</b> Windows 7 only	Never
Allow wake timers	Disable
Expand USB settings and "USB selective suspend"	Disabled
Expand Display and "Turn display after"	Never

### 5.1.5 Updating the 8-port serial hub driver

Empower 3 FR4 software supports only version 6.0.0.3 of the 8-port serial hub driver. If the Empower node has an 8-port serial hub, Windows detects it during the first power-up after installing the serial hub and automatically installs a driver for it. Verify the driver version, and install v. 6.0.0.3, if needed. If your Empower node does not have an 8-port serial hub driver, continue with ["Changing the virtual memory setting"](#).

For instructions on installing, configuring, and updating the 8-port serial hub, see the "Waters 8-port Serial Hub Support Release Notes". Visit the Waters Web site ([www.waters.com](http://www.waters.com)) for the most recent version of the release notes.

USB-to-serial converter cable provides a standard PC COM port connection with the serial instrument—usually by connecting a second cable with wiring that is specific to the instrument. For instructions on how to use the USB-to-serial converter cable, refer to the instructions that are included with the cable.

### 5.1.6 Changing the virtual memory setting

Configure the system so that the virtual memory setting is at least four times the amount of installed physical memory.

#### To configure virtual memory in Windows:

1. In Windows Explorer, right-click Computer, and then click Properties.  
**Tip:** To access Computer Properties in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon and then click File Explorer. Right-click This PC, and then click Properties.
2. Click Advanced System Settings.

**Tip:** If a Permission screen appears, click Continue.

3. On the System Properties page, click the Advanced tab.
4. On the Performance panel, click Settings.
5. Click the Advanced tab.
6. On the Virtual Memory page, click Change.
7. Deselect the check box for "Automatically manage paging file size for all drives".
8. Click Customize, assign Initial and Maximum to the same value (four times more than the installed RAM), and then click OK.

### 5.1.7 Configuring Event Viewer

#### To configure Event Viewer for Windows:

1. Click Start > Administrative Tools > Event Viewer.  
**Alternative:** If Event Viewer is not in the Start list, click Start, type Event Viewer in the box, and then click Event Viewer.  
**Tip:** To access Event Viewer on Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Event Viewer.  
**Recommendation:** Search for the Event Viewer and then right-click it and then select Pin to Start to place a shortcut to this program on the Start page or Pin to Taskbar for future use.
2. On the Event Viewer page, expand the Windows Logs.
3. Right-click Application, and then select Properties.
4. On the Log Properties - Application page, for the instruction "When maximum event log size is reached:", select "Overwrite events as needed".
5. Click Apply, and then click OK.
6. Repeat step 3 through step 5 for Security, Setup, System, and Forwarded Events.
7. Close the Event Viewer page.

### 5.1.8 Verifying the Empower domain

#### To view the domain currently used for Empower in Windows:

1. Click Start.
2. Right-click Computer, and select Properties.  
**Tip:** To access Computer Properties in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon and then click File Explorer. Right-click This PC, and then click Properties.
3. Note the full computer name.

## 5.1.9 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal, not comma, formatting, which is important when displaying numeric values ("12.56", not "12,56").

### To confirm that the regional settings are correct:

1. Click the Windows Start menu and then type "Regional Settings" in the search text box.
2. Click "Change date, time, or number formats".
3. In the Region and Language dialog box, ensure "English (United States)" is selected as the format in the Formats tab.

## 5.1.10 Synchronizing Empower and Windows clock time

Synchronize the Waters Empower software time and the clock time on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

### To Synchronize Empower and Windows clock time:

1. Click Start > Control Panel > Clock, Language, and Region (with Category view selected) > Date and Time.  
**Tip:** To access the Control Panel in Windows Server 2012, right-click the Windows icon, and click Control Panel.
2. In the Date and Time tab, click Change time zone.  
**Note:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
3. In Time Zone Settings, select the check box "Automatically adjust clock for Daylight Saving Time", and click OK in each open dialog box.

## 5.2 Installing Empower 3 FR4 software (new installation)

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Follow the instructions in this section if this is a new installation of Empower 3 FR4 software. If you are upgrading, follow the instructions starting on [page 102](#), to upgrade your current version of Empower software to Empower 3 FR4.

Waters supplies Empower 3 FR4 software on the Empower 3 FR4 software media.

You can perform a typical installation of the software on drive C or a default location, or a custom installation specifying a different drive.

By default, the Empower 3 installer (Deployment Manager) installs both the Oracle 12.1.0.2.0 client and Empower 3 FR4 software. If your site has its own Oracle license

and prefers to install Oracle 12.1.0.2.0 as a separate application, the following considerations apply:

- Install Oracle 12.1.0.2.0 Enterprise Client software prior to installing Empower 3 FR4 software.
  - Install the 32-bit client only. The 64-bit client is not supported.
- Change the language registry key value to AMERICAN\_AMERICA.WE8ISO8859P1  
The path to this key value depends on your environment:
  - For 32-bit environments, the path is  
HKEY\_LOCAL\_MACHINE\Software\Oracle\KEY\_EmpowerOracle12cClient\NLS\_LANG.
  - For 64-bit environments, the path is  
HKEY\_LOCAL\_MACHINE\Software\WOW6432Node\Oracle\KEY\_EmpowerOracle12cClient\NLS\_LANG.
- The permissions on the Oracle Home directory (and sub-directories) must be changed to allow the Group Users all privileges except for Full Control.
- During installation of Empower 3, you are asked whether you want to use your installed Oracle software. Select Yes and enter the location of the Oracle program files.

**Important:** TestExecute software is installed with Empower 3 FR4 software during the Empower 3 installation. Do not uninstall TestExecute, even though it appears in the Control Panel. Uninstalling TestExecute invalidates the Empower 3 FR4 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

## 5.2.1 Installing Empower 3 FR4 software

### To start the Empower 3 FR4 software installation:

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. If the installation menu does not automatically appear, browse to the main folder on the software media and double-click the setup.exe file.  
**Tip:** A dism.exe window opens after you click setup.exe. You need not close this window; it closes automatically after appearing for several seconds.
3. Select a language from the list, and click OK.
4. On the main page, select Install Empower Software.
5. On the Select Product Type page, select Enterprise or Workgroup, depending on your environment.
6. On the Select Installation Type page, select Client.
7. On the Customer Information page, enter your user name, organization, and Software Support ID number, and then click Next.
8. On the End-User License Agreement page, accept the terms in the license agreement, and then click Next.
9. On the TNS\_Admin Environment variable page, you can choose to set the TNS\_ADMIN environment variable, which adds an environmental variable to the

client that points to a preconfigured tnsnames.ora file located in a network-accessible share. (A tnsnames.ora file contains the list of Empower databases that can be accessed by the client.) This option allows large installations to maintain a single tnsnames.ora file in a share, eliminating the need to configure a tnsnames.ora files on each client computer.

- If you do not intend to use this option, do not check the box, and click Next.
- If you want to enable the TNS\_ADMIN variable, select the check box and enter the network path to the share containing the pre-configured tnsnames.ora file (for example: \\servername\sharename\$), and then click Next.

**Tip:** Use the TNS\_ADMIN directory that was set in ["Configuring a shared tnsnames.ora file"](#).

**Rule:** If the TNS\_ADMIN variable is set, the client disregards local tnsnames.ora files.

10. On the setup page select one of the following options:
  - Typical – Select and then proceed to [step 12](#), installing all Empower and Oracle files on the system drive, which is typically C:\.
  - Custom – Select and then proceed to [step 11](#), installing the Empower and Oracle files on different drives.
11. On the Destination Folders page, select the appropriate drives from the list for the Empower Application and Empower Oracle files, and then click Next.
12. On the Ready to Install page, click Next to begin the installation.

**Tip:** If any Windows Security Alert messages appear, click Allow Access.
13. On the Status page, click Finish.
14. When the restart message appears, click Yes.

**Result:** The computer reboots.
15. After the computer restarts, log in using an account with local Administrator privileges.

**Tip:** If a Windows Security Alert message appears, click Allow Access or Unblock.
16. If you are not using the TNS\_ADMIN environmental variable, see ["Configuring a database net service name"](#) to configure a local tnsnames.ora file.

If you want to use the same client for your Empower 3 FR4 software installation that you used for a previous version of Empower, copy the instsrv.dat file and the dhcp.xml file from the secure location where you stored them (before you started the installation) and use them to replace the files installed by Empower software. (Replace instsrv.dat in \Empower\InstrumentServer, and replace dhcp.xml in \Empower\Instruments.)

**Note:** Empower 3 FR4 software comes with a default system user account that does not require a named user license. This administrator account can be disabled but not removed from Empower 3 FR4 software. The default user name is "system" and the default password is "manager". Both the user name and the password are not case sensitive.

If you want to install software support for one or more instruments, visit the Waters Web site ([www.waters.com](http://www.waters.com)) for a list of the most recent instrument drivers.



**Tip:** If you experience instrument communication problems, review the firewall exceptions list. To do so, in Control Panel, double-click Windows Firewall, and then click the Exceptions tab. Ensure the following exceptions are checked in the Programs and Services list:

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:
  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server
  - ACQUIRY MDServer
  - ACQUITY FLR Server
  - ACQUITY PDA Server
  - ACQUITY SM Server
  - ACQUITY SQ Server
  - ACQUITY TQ Server
  - ACQUITY TUV Server
  - Local Console Controller (LCC Handheld Controller)
  - Trinity UI (if applicable)
  - W2489 Server
  - W2707 Server
  - W2998 Server

### 5.2.1.1 DCOM settings installed by Empower 3

Empower 3 FR4 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

**Table 5–2: DCOM settings and permissions set during installation**

Path	Allow
Local Security Policy > Local Policies > Security Options > DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	Local Access and Remote Access permissions for: <ul style="list-style-type: none"><li>• Everyone</li></ul> <b>Note:</b> You can change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a> . <ul style="list-style-type: none"><li>• Domain Users</li><li>• Performance Log Users</li><li>• Distributed COM users</li><li>• Anonymous Logon</li></ul>
Local Security Policy > Local Policies > Security Options > DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	<ul style="list-style-type: none"><li>• Local Launch, Local Activation, and Remote Activation permissions for Everyone.</li></ul> <b>Note:</b> You can change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a> . <ul style="list-style-type: none"><li>• All permissions for Administrators</li></ul>
Local Security Policy > Local Policies > Security Options > Network Access: Let Everyone permissions apply to anonymous users	Enable
Component Services > Computers > Properties > COM Security > Access Permission	Local Access and Remote Access for: <ul style="list-style-type: none"><li>• SELF</li><li>• System</li><li>• Administrators</li></ul>

**Table 5–2: DCOM settings and permissions set during installation**

Path	Allow
Component Services > Computers > Properties > COM Security > Launch and Activation Permissions	Local Launch and Local Activation permissions for: <ul style="list-style-type: none"><li>Everyone: <b>Note:</b> You can change this to a custom group of Empower users instead of the Everyone group. See <a href="#">“Configuring the Empower Projects directory”</a></li></ul> All permissions for: <ul style="list-style-type: none"><li>System</li><li>Administrator</li><li>INTERACTIVE</li></ul>

## 5.2.2 Installing and configuring a busLAC/E driver

If your system includes a busLAC/E card, you must install and configure the busLAC/E driver after you install Empower 3 FR4 software. The procedure differs slightly between Windows 7 and Windows 10.

**Exception:** Installing and configuring a busLAC/E driver is necessary only if the busLAC/E card was installed after Empower 3 FR4 software. If the card was installed before the software, then the driver is installed automatically and the necessary settings applied. In such a case, you can skip these instructions.

**Tip:** If the Found New Hardware Wizard dialog box appears automatically, start with step 4. If the dialog box fails to appear, follow the procedure below to access the Wizard manually.

### To install and configure the busLAC/E driver:

1. Right-click Computer, and then select Manage to display the Computer Management page.  
**Tip:** To access Computer Management in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon and then click Computer Management.
2. In Computer Management (Local) > System Tools nodes, click Device Manager.
3. In the right-hand pane, right-click PCI Devices, and select Update Driver Software.
4. On the Update Driver Software - PCI Device page (“How to you want to search for driver software?”), select “Browse my computer for driver software”, to manually install the busLAC/E drivers.
5. On the Update Driver Software - PCI Device page (“Browse for driver software on your computer”), click Browse.
6. In the Browse for folder dialog box, browse to C:\Empower\BuslaceDrivers64, and then click OK.

7. On the Update Driver Software - PCI Device page ("Browse for driver software on your computer"), ensure the path is correct, and then click Next.

**Result:** Doing so starts the driver installation.

**Tip:** Acknowledge any Windows security messages.

8. When the "Windows has successfully updated your driver software" screen appears, click Close.

**Result:** The Device Manager now shows the BusLACE PCI card listed under Waters Instrument Control Devices.

### 5.2.2.1 Bridging multiport network cards for Ethernet instruments

An acquisition client supports both single port network cards and bridging multiport network cards. If you are using a single network card, refer to the Empower Help topic: "Configuring DHCP settings".

If you are using a multiport network card and bridging ports for those computers running on Windows 7, use the default settings within the operating system. When bridging ports for computers running on Windows 10, you must configure the instrument LAN as described in ["Bridging multiport network cards for Ethernet instruments" on page 28](#)

### 5.2.3 Configuring a database net service name

You must configure a database net service name (previously called a database alias) on each client to connect to the Empower database, unless you are using the TNS\_ADMIN environment variable. A database net service name is a name for an individual Empower database. This name appears in the Database field of the Empower Login page.

**Tip:** The TNS\_ADMIN variable is set during installation, and a tnsnames.ora file is created. The TNS\_ADMIN variable points to the tnsnames.ora file. A tnsnames.ora file contains the list of Empower databases that can be accessed by the client or LAC/E module.

Use the following procedure to create a new database net service name, or modify an existing net service name. You must define the same database net service name on each client or LAC/E module.

**Tip:** If you created the tnsnames.ora file previously in another client or server, you can copy the master file and add it to the designated folder, for example, C:\Empower\oracle\Oracle12cClient\network\admin.

#### To configure a database net service name:

1. Select Start > All Programs > Empower > Waters Net Configuration Assistant.  
**Alternative:** Click Start, and type Waters Net Configuration Assistant.  
**Tip:** In Windows 10, click the Windows icon, expand Empower, and then select Waters Net Configuration Assistant.
2. On the Waters Net Configuration Assistant utility, click the first row to edit the column details.
3. In the Alias column, type the alternative name for the database service.

- **Example:** WATWIN2008R2
  - **Rule:** The database service identifier must begin with a character, not a number, and there must be no blank spaces.
4. In the Server Name column, type the computer name or IP address of the database server.
  5. In the Service Name column, type the database service name in this format: <SID.ServerName.domain>.
    - where the SID is the Oracle Service Identifier.

**Notes:**

- The SID must start with "WAT" followed by alphanumeric characters up to 8 characters in length.
- The default is "WAT12".
- where the ServerName is the value you entered in the Server Name column.
- where the domain refers to the domain of the server as well as the client or LAC/e machines.

**Tips:**

- If you do not know the Service name, you can find the name using the Listener Configuration on the database server. The Listener configuration is disabled on the client. Perform the check on the database server as follows: Click Configuration > Listener Configuration. The Waters Net Configuration Assistant displays the service name (Service = "<servicename>").
  - The global database name is the combination of the Oracle Service Identifier (SID) and the database domain name, as supplied during installation. For example, if the SID is WAT12 and the database domain name is Empower1.Waters.com, the global database name is WAT12.Empower1.Waters.com.
6. In the Port Number column, ensure the default port selection is 1521.
  7. Click Save.

**Result:** The tnsnames.ora file is created.

8. Select the row, right-click, and then select Test.
9. In the Change Login dialog box, verify that the username "System" and password "empower" are prepopulated, and then click OK.

**Tip:** "empower" is the default password for the Oracle System account in Empower 3. The password is not case-sensitive.

10. When the connection test is successful, click OK.

**Result:** When you log on to Empower 3 FR4 from a client, the database alias name is automatically populated in the Login dialog box.

## 5.3 Upgrading from earlier versions of Empower

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Follow the instructions in this section to upgrade to Empower 3 FR4. If you are not upgrading, follow the instructions for a new Empower 3 FR4 installation on [page 94](#) of this guide.

You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Note:** Allow enough time to perform the upgrade. An upgrade from any of the versions listed above to Empower 3 FR4 can potentially require more than two hours.

### Requirements:

- You must upgrade to Empower 3 FR2 before you can upgrade to Empower 3 FR4.

**Note:** If you are using a version of Empower prior to Empower 3 FR2 software, you can either upgrade to Empower 3 FR2 as a minimum requirement, or completely uninstall the earlier version of Empower, and ensure that your system meets the hardware and software requirements detailed in Chapter 1 of this guide.

- Follow the instructions at the beginning of this chapter to install Empower 3 FR4 as a new installation.

### 5.3.1 Upgrading to Empower 3 Feature Release 4 (FR4) software

You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

#### To upgrade to Empower 3 FR4:

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. On the Maintenance Mode: Empower 3 Client page, select Upgrade Empower Software.
3. On the Ready to Upgrade page, click Next.
4. When the Windows Security Alert appears, select Domain networks and click Allow access to continue the installation.
5. On the Status page, when the upgrade is complete and the Success message appears, click Finish.
6. When the restart message appears, click Yes.

## 5.4 Verifying your Empower 3 FR4 software installation

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### 5.4.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to check for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value displayed is 0, then the installation was successful. If the value displayed is anything other than 0, record the number, and contact Waters Technical Support.

#### To view the install log:

1. Select Start > All Programs or All Apps> Empower > Empower Installation Log.  
**Tip:** In Windows 10, from Start > click the Windows icon, select Empower and then select Empower Installation log.  
**Result:** The program displays the empower.log file in Notepad.
2. Review the contents of the file. You can print a copy by selecting File > Print.
3. Click File > Exit.

### 5.4.2 Using the Verify Files Utility

The Verify Files Utility checks the integrity of the installed Empower program files and Oracle program files (installed by Empower).

After the Empower 3 FR4 installation, run the Verify Files Utility to verify the Empower and Oracle program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option
- To ensure that the Empower files did not change since installation

#### To run the file verification utility:

1. Click Start > All Programs or All Apps > Empower > Verify Files.  
**Tip:** In Windows 10, click the Windows icon, select Empower, and then > select Verify Files.  
**Result:** The Verify Files Utility compares the installed Empower files’ checksum with a previously stored checksum and then creates a file verification results log, named checksum.txt.
2. Review the contents of the file, and print or save a copy of the results.
3. Click File > Exit.

#### To view the file verification results:

1. Click Start > All Programs or All Apps> Empower > View Verify Files.  
**Tip:** In Windows 10, click the Windows icon, select Empower, and then select Verify Files.
2. **Result:** The checksum.txt file displays in Notepad. Review the contents of the checksum file.

Your Empower 3 FR4 software installation passes the verification check if all files have a status of "OK" and the installation qualification summary on the final page states "No installation changes were detected." If the checksum.txt file indicates any files marked as "changed", contact Waters Technical Support.

## 5.5 Setting the client module time zone

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Empower records the date and time of data acquisition and processing for different countries and time zones.

**Requirement:** Always restart the client after the following conditions:

- You change the time zone of the operating system.
- The client loses its network connection.

If either of these conditions occurs, and you do not restart the client, the time stamps on all injections acquired during buffering can be displayed incorrectly. Changes made to the operating system time zone setting do not take effect until the module is restarted.

#### To specify the time zone for the client:

1. Log in to Empower software as an administrator from any client.
2. Access Configuration Manager, and click Empower Nodes.
3. Right-click the client, and select Empower Node Properties.
4. Select the appropriate time zone for the client, and then click OK.

## 5.6 Empower programs and logs

---

The Empower program contains these items:

**Note:** In Windows 7, these Empower programs and logs are listed in a folder in the Start menu. In Windows 10 and Windows Server 2012, these programs are listed under Empower in Start > Apps.



**Table 5–3: Empower programs and logs**

Item	Description
Configure ICS for 64-bit OS	Use this utility if Instrument Component Software (ICS) was installed from a source other than Empower 3 Instrument Driver Pack media.
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see “Starting and exiting from Empower” in the Empower Help.
Waters Net Configuration Assistant	Runs the Waters Net Configuration Assistant so you can configure a database net service name.
Register Empower Node Printers	Registers printers so you can print Empower reports.
Remove Waters Instrument Component Software	Use this utility to uninstall instrument component software (ICS). You see this item only if instrument component software is installed.
Verify Files	Verifies the integrity of the Empower software files on the hard disk.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation and deactivation.
Manage Waters Email Center. (Optional)	If installed, the Waters Email Center facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to check the Message Center throughout the day.

## 5.7 Registering printers

---

### To register printers for Empower reports:

1. Select Start > All Programs or All Apps> Empower > Register Empower Node Printers.

**Requirement:** You must be logged in to the Empower node as a local administrator or a user whose privileges enable you to write to the registry.

2. On the Register Empower Node Printers page, review the list of printers that are currently registered.

**Tip:** The Register Empower Node Printers page shows only printers added using the control panel. To add a new printer, click Start > Settings > Printers.

3. If you must register additional printers, click Get Printers, select the printer(s), and then click OK.
4. Click OK, to save the changes, and close the page.

## 5.8 Empower feature releases and service releases

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Waters periodically issues feature releases to provide enhanced software functionality and service releases to address existing issues. These feature releases and service releases, available for downloading from the Waters Elite Web site (to customers with a software support plan), must be installed according to instructions set forth in their associated release notes. If you want physical media, note the part number from the Web site, and contact your local Waters subsidiary to place an order for a nominal fee.

To determine which feature releases or service releases are installed, view the installation log, or select Help About from any Empower 3 application window.

## 5.9 Uninstalling Empower 3 software

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When you want to uninstall Empower 3 software, use Windows Control Panel Programs and Features utility to remove the software.

### To uninstall Empower 3 software:

1. Open Windows Control Panel, click Programs and Features, and then double-click Empower 3 client.  
**Tip:** From Windows 10, click Start > All apps > right-click Empower 3 Client and then click Uninstall.  
**Result:** Empower Deployment Manager opens in maintenance mode.
2. Follow the prompts in the Empower's Deployment Management wizard to uninstall Empower software.
3. Restart the client.

# 6 Installing a LAC/E Module

Follow the instructions in this chapter to install the Empower 3 FR4 software on a Waters LAC/E module, or to upgrade a current Empower LAC/E module to an Empower 3 FR4 LAC/E module. To install Empower 3 FR4 software on an acquisition client, follow the instructions in [Chapter 5](#).

## Recommendations:

- Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer). After installation, back up your Empower 3 data regularly.

## 6.1 Preparing a LAC/E module

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You can install Empower 3 FR4 as a fresh, new installation (on a LAC/E module where no Chromatography Data Software [CDS] is currently installed) or as an upgrade from Empower 3 Feature Release 2, Empower 3 Feature Release 2 Hotfix 1, Empower 3 Service Release 2, Empower 3 Service Release 2 Hotfix 1, Empower 3 Service Release 2 Hotfix 2, Empower 3 Feature Release 3, or Empower 3 Feature Release 3 Hotfix 1.

**Important:** If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower.
- Do not change the name of the computer after Empower is installed.
- The name of the computer must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z), and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a computer name, but not 123Empower.

Each LAC/E module requires the hardware and software in the table on [page 19](#). Normally, Waters installs the software before shipping the system to you.

**Important:** Your LAC/E module is considered structurally validated by Waters when it is installed and configured per the instructions in this chapter. Configuring a LAC/E module otherwise can result in unknown operational behavior.

Follow these procedures to prepare a LAC/E module:

- Connecting remotely to a LAC/E module (see [Appendix A](#)).
- Installing or updating the 8-port serial hub driver, if the LAC/E module will be used to control a serial device with this hub (see ["Updating the 8-port serial hub driver"](#)).
- Changing the page file size (see ["Changing the virtual size settings"](#)).

- Configuring the event viewer to overwrite events as needed (see ["Configuring Event Viewer"](#)).
- Configure the system power options.
- Disable IPv6 in Windows.
- Enable MSI logging in Windows, (see ["Enabling MSI logging"](#)).

**Requirement:** If you use LAC/E modules that you purchased from Waters, you must register them by entering their serial numbers in the LAC/E Acquisition Server field of the Waters Licensing Wizard online form. Doing so activates the system licenses that were purchased with each module.

**Requirement:** If you are using real-time virus scanning, after installation, exclude all Empower-related directories and their sub-directories, and all raw data directories and shares, from the scans. Some real-time virus scanners mistake normal Empower functionality for virus activity and can therefore interfere with data buffering or cause the run to stop.

### 6.1.1 Configuring Microsoft .NET 3.5 Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10. Microsoft .NET 4.0 Framework is installed and enabled by default on Windows 10.

#### To install .Net 3.5 Framework on Windows 10:

1. From Control Panel, select Programs > Programs and Features > Installed Updates.  
**Tip:** To access the Control Panel in Windows 10, type "Control Panel" in the Cortana Search box.
  2. Click "Turn Windows features on or off".
  3. Select the check box for ".NET Framework 3.5 (includes .NET 2.0 and 3.0)", and click OK.
  4. On the Windows Features page, click Close when the installation is complete.
- Windows 10 has .NET 4.6 pre-installed and the .NET 4.6 is backward compatible with all versions back to 4.0, so there is no need to install .NET 4.0 on Windows 10.

### 6.1.2 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

#### To start the required services:

1. From Control Panel, System and Security (when in Category view) > Administrative Tools > Services.  
**Tip:** To access the Control Panel in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.
2. Change the startup type to Automatic, and start these services:
  - DNS Client

- Function Discovery Resource Publication
- SSDP Discovery
- UPnP Device Host

**Tip:** When all services are running, you can modify the network discovery and printer sharing settings.

**To turn on the network discovery and file and printer sharing functions:**

1. From the Start menu, select Control Panel > Network and Internet (when in Category view) > Network and Sharing Center.

**Tip:** To access the Control Panel in Windows 10/Windows Server 2012, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.

2. Click "Change advanced sharing settings", and turn on these functions:
  - Network discovery
  - File and printer sharing

### 6.1.3 Connecting remotely

Use the Remote Desktop feature to access your LAC/E module from a remote location. See [Appendix A](#) for details.

### 6.1.4 Disabling Internet Protocol version 6

You must disable the Internet Protocol Version 6 before you install Empower software. Disabling this feature ensures that the Oracle listener works properly.

**To disable IP version 6 (IPv6) in Windows:**

1. Click Start > Control Panel > Network and Internet (when in Category view) > Network and Sharing Center > View network status and tasks > Change adapter settings.  
**Tip:** To access Control Panel in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.
2. Right-click Local Area Connection, Instrument LAN, and then click Properties.
3. On the Networking tab, clear the Internet Protocol Version 6 (TCP/IPv6) check box, and then click OK.

### 6.1.5 Configuring power options

You must configure the power management settings for the workstation to disable the power saving feature.

**To configure the power options on a computer with Windows:**

1. From the Start menu, select Control Panel > System and Security (when in category view), and then Power Options.

**Alternate:** From the Search Programs and Files, type Power Options.

**Tip:** To access Control Panel on Windows 10, hover the mouse in the bottom-left corner of the screen, right-click the Windows icon and click Control Panel.

2. On the Power Options page, click Change plan settings for the currently selected plan.
3. On the Edit Plan Settings page, click Change advanced power settings.
4. In the Power Options dialog box, complete these tasks, and then click OK.
  - In Sleep, click plus (+) to show the Sleep after spin box, and enter Never in the field.
  - In Display, click plus (+) to show the Turn off display after spin box, and enter Never in the field.

**Table 6–1: Power option settings**

Power options	Settings
Expand Hard Disk and "Turn off hard disk after"	Type Never in the Setting(Minutes) field
Expand Sleep settings:	
Sleep after	Never
Allow hybrid sleep <b>Note:</b> Windows 7 only	Off
Hibernate After <b>Note:</b> Windows 7 only	Never
Allow wake timers	Disable
Expand USB settings and "USB selective suspend"	Disabled
Expand Display and "Turn display after"	Never

### 6.1.6 Updating the 8-port serial hub driver

Empower 3 FR4 software supports only version 6.0.0.3 of the 8-port serial hub driver. If the Empower node has an 8-port serial hub, Windows detects it during the first power-up after installing the serial hub and automatically installs a driver for it. Verify the driver version, and install v. 6.0.0.3, if needed. If your Empower node does not have an 8-port serial hub driver, continue with ["Changing the virtual size settings"](#).

For instructions on installing, configuring, and updating the 8-port serial hub, see the "Waters 8-port Serial Hub Support Release Notes". Visit the Waters web site ([www.waters.com](http://www.waters.com)) for the most recent version of the release notes.

### 6.1.7 Edgeport USB-to-Serial converter cable

Edgeport USB-to-serial converter cable provides a standard PC COM port connection with a serial instrument—usually by connecting a second cable with wiring that is specific to the instrument. For instructions, refer to the document *Serial Communications Support Using the Edgeport® USB-to-Serial Converter Cable*.

## 6.1.8 Changing the virtual size settings

Configure the system so that the virtual memory setting is at least four times the amount of installed physical memory.

### To configure virtual memory in Windows:

1. In Windows Explorer, right-click Computer, and then click Properties.  
**Tip:** To access Computer Properties in Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon and then click File Explorer. Right-click This PC, and then click Properties.
2. Click Advanced System Settings.  
**Tip:** If a Permission screen appears, click Continue.
3. On the System Properties page, click the Advanced tab.
4. On the Performance panel, click Settings.
5. Click the Advanced tab.
6. On the Virtual Memory page, click Change.
7. Deselect the check box for "Automatically manage paging file size for all drives".
8. Click Customsize, assign Initial and Maximum to the same value (four times more than the installed RAM), and then click OK.

## 6.1.9 Configuring Event Viewer

### To configure Event Viewer for Windows:

1. Click Start > Administrative Tools > Event Viewer.  
**Alternative:** If Event Viewer is not in the Start list, click Start, type Event Viewer in the box, and then click Event Viewer.  
**Tip:** To access Event Viewer on Windows 10, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Event Viewer.  
**Recommendation:** Search for the Event Viewer and then right-click it and then select Pin to Start to place a shortcut to this program on the Start page or Pin to Taskbar for future use.
2. On the Event Viewer page, expand the Windows Logs.
3. Right-click Application, and then select Properties.
4. On the Log Properties - Application page, for the instruction "When maximum event log size is reached:", select "Overwrite events as needed".
5. Click Apply, and then click OK.
6. Repeat step 3 through step 5 for Security, Setup, System, and Forwarded Events.
7. Close the Event Viewer page.

## 6.1.10 Synchronizing Empower and Windows clock time

Synchronize the Waters Empower software time and the clock time on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

### To Synchronize Empower and Windows clock time:

1. Click Start > Control Panel > Clock, Language, and Region (with Category view selected) > Date and Time.

**Tip:** To access the Control Panel in Windows Server 2012, right-click the Windows icon, and click Control Panel.

2. In the Date and Time tab, click Change time zone.

**Note:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

3. In Time Zone Settings, select the check box "Automatically adjust clock for Daylight Saving Time", and click OK in each open dialog box.

## 6.2 Installing Empower 3 FR4 software (new installation)

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Follow the instructions in this section if this is a new installation of Empower 3 FR4 software. If you are upgrading, follow the instructions starting on [page 119](#) to upgrade your current version of Empower software to Empower 3 FR4.

By default, the Empower 3 installer (Deployment Manager) installs both the Oracle 12.1.0.2 client and Empower 3 FR4 software. If your site has its own Oracle license and prefers to install Oracle 12.1.0.2 as a separate application, consider these installation issues:

- Install Oracle 12.1.0.2 software only (without a database) prior to installing Empower 3 FR4 software.
  - Install the 32-bit Oracle client only. The 64-bit Oracle client is not supported.
- Change the language registry key value to AMERICAN\_AMERICA.WE8ISO8859P1

The path to this key value depends on your environment:

- For 32-bit environments, the path is  
HKEY\_LOCAL\_MACHINE\Software\Oracle\KEY\_EmpowerOracle12cClient\NLS\_LANG.
- For 64-bit environments, the path is  
HKEY\_LOCAL\_MACHINE\Software\WOW6432Node\Oracle\KEY\_EmpowerOracle12cClientNLS\_LANG.
- During installation, when asked whether you want to use your installed Oracle software, select Yes, and enter the location of the Oracle program files.

Waters supplies Empower 3 FR4 software on the Empower 3 FR4 software media.



**Important:** TestExecute software is installed with Empower 3 FR4 software during the Empower 3 installation. Do not uninstall the TestExecute software, even though it appears in the Control Panel. Uninstalling the TestExecute software invalidates the Empower 3 FR4 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

## 6.2.1 Installing Empower 3 FR4 software on the LAC/E module

### To install the software:

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. If the installation menu does not automatically appear, browse to the main folder on the software media and double-click the setup.exe file.  
**Tip:** In Windows 7 systems, a dism.exe window opens after you click setup.exe. You need not close this window; it closes automatically after appearing for several seconds.
3. Select a language from the list, and click OK.
4. On the main page, select Install Empower Software.
5. On the Select Product Type page, select Enterprise or Workgroup, depending on your environment.
6. On the Select Installation Type page, select LAC/E.
7. On the Customer Information page, enter your user name, organization, and Software Support ID number, and then click Next.
8. On the End-User License Agreement page, accept the terms in the license agreement, and click Next.
9. On the TNS\_Admin Environment variable page, you can choose to set the TNS\_ADMIN environment variable, which adds an environmental variable to the client that points to a preconfigured tnsnames.ora file located in a network-accessible share. (A tnsnames.ora file contains the list of Empower databases that can be accessed by the LAC/E module.) This option allows large installations to maintain a single tnsnames.ora file in a share, eliminating the need to configure a tnsnames.ora files on each client computer.
  - If you do not intend to use this option, do not check the box and click Next.
  - If you want to enable the TNS\_ADMIN variable, select the check box, and enter the network path to the share containing the preconfigured tnsnames.ora file (for example \\servername\sharename\$), and then click Next.**Tip:** Use the TNS\_ADMIN directory that was set in ["Configuring a shared tnsnames.ora file"](#).  
**Rule:** If the TNS\_ADMIN variable is set the client disregards local tnsnames.ora files.
10. On the setup page, select one of the following options:
  - Typical – Select and then proceed to [step 12](#), installing all Empower and Oracle files to the system drive, which is typically C:\.
  - Custom – Select and then proceed to [step 11](#), installing the Empower and Oracle files on different drives.

11. On the Destination Folders page, select the appropriate drives from the list for the Empower Application and Empower Oracle files, and then click Next.
12. On the Ready to Install page, click Next to begin the installation.  
**Tip:** If any Windows Security Alert messages appear, click Allow Access.
13. When the restart message appears, click Yes.
14. After the computer restarts, log in using an account with local Administrator privileges.
15. If you are not using the TNS\_ADMIN environmental variable, see "[Configuring a database net service name](#)" to configure a local tnsnames.ora file.

**Tips:**

- If you created the tnsnames.ora file previously in another client or server, you can copy the master file and add it to the designated folder, for example, C:\Empower\oracle\oracle12cClient\network\admin.
- If you want to install software support for one or more instruments, use the Empower 3 FR4 Instrument Driver Pack media. Visit the Waters Web site ([www.waters.com](http://www.waters.com)) for the most recent instrument drivers.
- If you experience instrument communication problems, review the firewall exceptions list. To do so, in Control Panel, double-click Windows Firewall, and then click the Exceptions tab. Ensure the following exceptions are checked in the Programs and Services list.

**Note:** Empower 3 FR4 software comes with a default system user account that does not require a named user license. This administrator account can be disabled but not removed from Empower 3 FR4 software. The default user name is "system" and the default password is "manager". Both the user name and the password are not case sensitive.

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:
  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server

- ACQUITY FLR Server
- ACQUITY MD Server
- ACQUITY PDA Server
- ACQUITY SM Server
- ACQUITY SQ Server
- ACQUITY TQ Server
- ACQUITY TUV Server
- Local Console Controller (LCC Handheld Controller)
- Trinity UI (if applicable)
- W2489 Server
- W2707 Server
- W2998 Server

### 6.2.1.1 DCOM settings installed by Empower 3

Empower 3 FR4 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

**Table 6–2: DCOM settings and permissions set during installation**

Path	Allow
Local Security Policy > Local Policies > Security Options > DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	<ul style="list-style-type: none"> <li>• Local Access and Remote Access permissions for Everyone <b>Note:</b> You can change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a>.</li> <li>• Local Access and Remote access permissions for: Domain Users Performance Log Users Distributed COM users Anonymous Logon</li> </ul>
Local Security Policy > Local Policies > Security Options > DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	<ul style="list-style-type: none"> <li>• Local Launch, Local Activation, and Remote Activation permissions for Everyone. <b>Note:</b> You can change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a>.</li> <li>• All permissions for administrators</li> </ul>

**Table 6–2: DCOM settings and permissions set during installation**

Path	Allow
Local Security Policy > Local Policies > Security Options > Network Access: Let Everyone permissions apply to anonymous users	Enable
Component Services > Computers > Properties > COM Security > Access Permission	Local Access and Remote Access for: <ul style="list-style-type: none"><li>• SELF</li><li>• System</li><li>• Administrators</li></ul>
Component Services > Computers > Properties > COM Security > Launch and Activation Permissions	Local Launch and Local Activation permissions for: <ul style="list-style-type: none"><li>• Everyone: <b>Note:</b> You can change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a></li></ul> All permissions for: <ul style="list-style-type: none"><li>• System</li><li>• Administrator</li><li>• INTERACTIVE</li></ul>

## 6.2.2 Installing and configuring a busLAC/E driver

If your system includes a busLAC/E card, you must install and configure the busLAC/E driver after you install Empower 3 FR4 software.

**Exception:** Installing and configuring a busLAC/E driver is necessary only if the busLAC/E card was installed after Empower 3 FR4 software. If the card was installed before the software, then the driver is installed automatically and the necessary settings applied during the installation of Empower 3. In such a case, you can skip these instructions.

If the Found New Hardware Wizard dialog box appears automatically, start with step 4. If the dialog box fails to appear, follow the procedures below to access the Wizard manually.

### To install and configure the busLAC/E driver in Windows 7:

1. Right-click Computer, and then select Manage.
2. On the Computer Management page, click Device Manager (under Computer Management (Local) > System Tools).
3. In the right-hand pane, right-click PCI Devices, and then select Update Driver Software.

4. On the Update Driver Software - PCI Device page ("How do you want to search for driver software?"), select "Browse my computer for driver software", to manually install the busLAC/E drivers.
5. On the Update Driver Software - PCI Device page ("Browse for driver software on your computer"), click Browse.
6. In the Browse for folder dialog box, browse to C:\Empower\BuslaceDrivers64, and then click OK.
7. On the Update Driver Software - PCI Device page ("Browse for driver software on your computer"), ensure the path is correct, and then click Next.

**Result:** Doing so starts the driver installation.

8. When the "Windows has successfully updated your driver software" screen appears, click Close.

**Result:** The Device Manager now shows the BusLACE PCI card listed under Waters Instrument Control Devices.

### 6.2.2.1 Bridging multiport network cards for Ethernet instruments

A LAC/E module supports both single port network cards and bridging multiport network cards. If you are using a single network card, refer to the Empower Help topic: "Configuring DHCP settings".

If you are using a multiport network card and bridging ports for LAC/E modules running on Windows 7, use the default settings within the operating system. When bridging ports for computers running on Windows 10, you must configure the instrument LAN as described in ["Bridging multiport network cards for Ethernet instruments" on page 28](#)

### 6.2.3 Configuring a database net service name

You must configure a database net service name (previously called a database alias) on each client to connect to the Empower database, unless you are using the TNS\_ADMIN environment variable. A database net service name is a name for an individual Empower database. This name appears in the Database field of the Empower login page.

**Tip:** The TNS\_ADMIN variable is set during installation, and a tnsnames.ora file is created. The TNS\_ADMIN variable points to the tnsnames.ora file. A tnsnames.ora file contains the list of Empower databases that can be accessed by the client or LAC/E module.

Use the following procedure to create a new database net service name, or modify an existing net service name. You must define the same database net service name on each client or LAC/E module.

**Tip:** If you created the tnsnames.ora file previously in another client or server, you can copy the master file and add it to the designated folder, for example, C:\Empower\oracle\oracle12cClient\network\admin.

#### To configure a database net service name:

1. Select Start > All Programs > Empower > Waters Net Configuration Assistant.

**Alternative:** Click Start, and type Waters Net Configuration Assistant.

**Tip:** In Windows 10, search for Empower in All Apps > select Waters Net Configuration Assistant.

2. In the Waters Net Configuration Assistant utility, click the first row to edit the details.
3. In the Alias column, type the alternative name for the database service.

**Example:** WATWIN2008R2

**Rule:** The database service identifier must begin with a character (A to Z), not a number, and there must be no blank spaces.

4. In the Server Name column, type the computer name or IP address of the database server.
5. In the Service Name column, type the database service name in this format: <SID.ServerName.domain>.
  - where the SID is the Oracle Service Identifier.

**Note:**

- The SID must start with "WAT" followed by up to 8 alphanumeric characters.
- The default is "WAT12".
- where the ServerName is the value you entered in the Server Name column.
- where the domain refers to the domain of the server as well as the client or LAC/e machines.

**Tip:** If you do not know the Service name, you can find the name using the Listener Configuration on the database server. The Listener configuration is disabled on the client. Perform the check on the database server as follows: Click Configuration > Listener Configuration. The Waters Net Configuration Assistant displays the service name (Service = "servicename").

6. In the Port Number column, ensure that the default port selection is 1521.
7. Click Save.

**Result:** The tnsnames.ora file is created.

8. Select the row, right-click, and then select Test.
9. In the Change Login dialog box, verify that the username "System" and password "empower" are prepopulated, and then click OK.

**Tip:** "empower" is the default password for the Oracle System account in Empower 3. The password is not case-sensitive.

10. When the connection test is successful, click OK.

**Result:** When you log on to Empower 3 FR4 from a client, the database alias name is automatically populated in the Login dialog box.

## 6.3 Upgrading from earlier versions of Empower

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Follow the instructions in this section to upgrade to Empower 3 FR4. If you are not upgrading, follow the instructions for a new Empower 3 FR4 installation earlier in this chapter.

You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Note:** Allow enough time to perform the upgrade. An upgrade from any of the versions listed above to Empower 3 FR4 can potentially require more than two hours.

### Requirements:

- You must upgrade to Empower 3 FR2 before you can upgrade to Empower 3 FR4.

**Note:** If you are using a version of Empower prior to Empower 3 FR2 software, you can either upgrade to Empower 3 FR2 as a minimum requirement, or completely uninstall the earlier version of Empower, and ensure that your system meets the hardware and software requirements detailed in Chapter 1 of this guide.

- Follow the instructions at the beginning of this chapter to install Empower 3 FR4 as a new installation.

### 6.3.1 Upgrading to Empower 3 Feature Release 4 (FR4) software

You can perform an upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 with Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 with Hotfix 1, Empower 3 SR2 with Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

#### To upgrade to Empower 3 FR4:

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. On the Maintenance Mode: Empower 3 LAC/E page, select Upgrade Empower Software.
3. On the Ready to Upgrade page, click Next.
4. When the Windows Security Alert appears, select Domain networks and click Allow access to continue the installation.
5. On the Status page, when the upgrade is complete and the Success message appears, click Finish.
6. When the restart message appears, click Yes.

## 6.4 Setting the LAC/E module time zone

---

Empower records the date and time of data acquisition and processing for different countries and time zones.

**Requirement:** Always restart the LAC/E module after the following conditions:

- You change the time zone of the operating system
- The LAC/E module loses its network connection

If either of these conditions occurs, and you do not restart the LAC/E module, the time stamps on all injections acquired during buffering can be displayed incorrectly. Changes made to the operating system time zone setting do not take effect until the module is restarted.

**To specify the time zone for the LAC/E module:**

1. Log in to Empower software as an administrator from any client.
2. Access Configuration Manager, and click Empower Nodes.
3. Right-click the LAC/E module, and select Empower Node Properties.
4. Select the appropriate time zone for the LAC/E module, and then click OK.

## 6.5 Verifying your Empower 3 FR4 software installation

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### 6.5.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to check for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value displayed is 0, then the installation was successful. If the value displayed is anything other than 0, record the number, and contact Waters Technical Support.

**To view the install log:**

1. Select Start > All Programs > Empower > Empower Installation Log.  
**Tip:** In Windows 10, from Start > All Apps page > select Empower > select Empower Installation log.  
**Result:** The program displays the empower.log file in Notepad.
2. Review the contents of the file. You can print a copy by selecting File > Print.
3. Click File > Exit.



## 6.6 Empower programs and logs

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The Empower program contains these items:

**Note:** In Windows 7, these Empower programs are listed in a folder in the Start menu. In Windows 10, these programs are listed under Empower in Start > Apps.

**Table 6–3: Empower programs and logs**

Item	Description
Configure ICS for 64-bit OS	Use this utility if Instrument Component Software (ICS) was installed from a source other than Empower 3 Instrument Driver Pack media.
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see “Starting and exiting from Empower” in the Empower Help.
Waters Net Configuration Assistant	Runs the Waters Net Configuration Assistant so you can configure a database net service name.
Register Empower Node Printers	Registers printers so you can print Empower reports.
Remove Waters Instrument Component Software	Use this utility to uninstall instrument component software (ICS). You see this item only if instrument component software is installed.
Verify Files	Verifies the integrity of the Empower software files on the hard disk.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation, deactivation, and show licences.
Manage Waters Email Center. (Optional)	If installed, the Waters Email Center option facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to check the Message Center throughout the day.

## 6.7 Registering printers

---

### To register printers for Empower reports:

1. Select Start > All Programs > Empower > Register Empower Node Printers.  
**Tip:** In Windows 10, from Start > All Apps > select Empower > select Register Empower Node Printers.  
**Requirement:** You must be logged in to the Empower node as an administrator or a user whose privileges enable you to write to the registry.
2. On the Register Empower Node Printers page, review the list of printers that are currently registered.  
**Tip:** The Register Empower Node Printers page shows only printers added using the control panel. To add a new printer, click Start > Devices and Printers > Add a printer. In Windows 10, click Start > Settings > Devices > Add a printer.
3. If you must register additional printers, click Get Printers, select the printer(s), and then click OK.
4. Click OK, to save the changes, and close the page.

## 6.8 Empower feature releases and service releases

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Waters periodically issues feature releases to provide enhanced software functionality and service releases to address existing issues. These feature releases and service releases are available for downloading from the Waters Elite Web site (to customers with a software support plan), must be installed according to instructions set forth in their associated release notes. If you want physical media, note the part number from the Web site, and contact your local Waters subsidiary to place an order for a nominal fee.

To determine which feature releases or service releases are installed, view the installation log or select Help About from any Empower 3 application window.

## 6.9 Uninstalling Empower 3 software

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When you want to uninstall Empower 3 software, use Windows Control Panel Programs and Features utility to remove the software.

### To uninstall Empower 3 software:

1. Open Windows Control Panel, click Programs and Features, and then double-click Empower 3 LAC/E.  
**Tip:** From Windows 10, click Start > All apps > right-click Empower 3 LAC/E and then click Uninstall.  
**Result:** Empower Deployment Manager opens in maintenance mode.

2. Follow the prompts in the Empower's Deployment Management wizard to uninstall Empower software.
3. Restart the LAC/E.



# 7 Installing an Empower file server

Follow the instructions in this chapter to install the Waters Service as a separate service on a server other than the Empower 3 database server.

**Recommendation:** Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer). After installation, back up your Empower 3 data regularly.

## 7.1 Considerations and requirements

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### 7.1.1 Considerations

An Empower 3 FR4 file server allows you to store and retrieve Empower raw data on a computer other than the Empower 3 FR4 server.

The Waters Service allows computers on which it is installed to act as a file server. The file server contains the raw data shares which are configured within the Empower 3 FR4 software. Users can store project raw data on these file shares. The service provides secure access to Empower software raw data files via the Empower application. While the operating system permissions on the files can be set to Read-Only for the Empower users group that you created, in the procedure on [page 75](#) of this guide, write privileges are granted to these same users only through the Waters Service and only when they run Empower software.

If you plan to change the computer name, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the computer name after Empower software is installed.
- The name of the computer must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z), and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a computer name, but not 123Empower.

**Note:** If you are upgrading from a previous version of Empower 3, you need not reinstall Waters Service.

**Requirement:** If you are using real-time virus scanning, after installation, exclude all Empower-related directories and their sub-directories, and all raw data directories and shares, from the scans. Some real-time virus scanners mistake normal Empower functionality for virus activity and can therefore interfere with data buffering or cause the run to stop.

## 7.1.2 Requirements

- Valid client and server network connections
- Windows Server 2008 R2 SP1, Enterprise or Standard Edition
- Windows Server 2012 R2, Standard Edition
- Configure firewall settings for Waters Service

## 7.1.3 Configuring .Net 3.5 Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10 and Windows Server 2012. .NET 4.0 Framework is installed and enabled by default.

The Empower 3 FR4 Deployment Manager installs the .NET 4.0 Framework on supported operating systems, if necessary, except on Windows 2012 since .NET 4.0 is already enabled on this operating system.

Windows 10 has .NET 4.6 pre-installed and the .NET 4.6 is backward compatible with all versions back to 4.0, so there is no need to install .NET 4.0 on Windows 10.

### Installing .Net 3.5 Framework on Windows Server 2012:

1. Click Start > Server Manager and in the Manage menu, and then click Add Roles and Features.
2. Click Next in the Wizard, select "Role-based or feature-based installation", and then click Next.
3. Select "Select the server from the server pool", select the target server, and then click Next.
4. In Server Roles, skip this section, and then click Next.
5. In Features, select ".NET Framework 3.5 Features", and then click Next.
6. In the Confirm installations selections page, select "Restart the destination server automatically if required", and then click Install.

## 7.1.4 Synchronizing Empower and Windows clock time

Synchronize the Waters Empower software time and the clock time on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

### To Synchronize Empower and Windows clock time:

1. Click Start > Control Panel > Clock, Language, and Region (with Category view selected) > Date and Time.  
**Tip:** To access the Control Panel in Windows Server 2012, right-click the Windows icon, and click Control Panel.
2. In the Date and Time tab, click Change time zone.  
**Note:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
3. In Time Zone Settings, select the check box "Automatically adjust clock for Daylight Saving Time", and click OK in each open dialog box.

## 7.2 Installing Waters Service

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Before beginning the installation procedure, verify that all logs in the Event Viewer are set to "Overwrite events as needed". (See ["Configuring Event Viewer"](#).) Also, ensure that MSI logging is enabled in Windows (see ["Enabling MSI logging"](#)).

**To install the Waters Service on a server on which Empower software is not loaded:**

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. If the installation menu does not automatically appear, browse to the main folder on the software media and double-click the setup.exe file.
3. Select a language from the list, and click OK.
4. On the main page, select Install Optional Components.
5. On the Select optional component page, select Waters Service.
6. On the Ready to Install page, click Next.

**Tip:** If any Windows Security Alert messages appear, click Allow Access.

7. On the Welcome page, click Next.
8. On the Custom Setup page, keep the default installation location, and click Next.

**Alternative:** Click Change to change the installation location. Change the drive letter only. Click OK, and then click Next.

**Note:** If you change anything in the location other than the drive letter, the installation path is lost.

9. On the Empower Raw Data Share page, keep the default name (Waters\_Projects\$), or customize the name, and then click Next.

**Requirement:** If you customize the name, you must use the same share name for the raw data files share (see ["Configuring raw data directory permissions"](#)). You must also put a "\$" on the end of the name, to hide the share from network browsing.

10. On the Ready to Install the Program page, click Install.

**Tip:** If any Windows Security Alert messages appear, click Allow Access.

11. On the InstallShield Wizard Completed page, click Finish.
12. On the Status page, click Finish. (It takes several seconds for this page to appear.)
13. When the restart message appears, click Yes.

**Result:** The computer reboots.

## 7.3 Configuring firewall settings for Waters Service

---

To avoid communication problems while using Empower 3, Waters Service and the Distributed Component Object Model (DCOM) Port (135) must be added to the Windows Firewall exceptions list. In order to add these items to the exceptions list, you must add them to Inbound Rules.

### 7.3.1 Adding Waters Service and DCOM port to Inbound Rules

#### To add Waters Service to Inbound Rules:

1. Open Windows Firewall with Advanced Security.  
**Tip:** In Windows Server 2012, open Server Manager, and click Tools menu > Windows Firewall with Advanced Security.
2. Click Inbound Rules, right-click, and select New Rule.
3. On the New Inbound Rule Wizard > Rule Type page, select Program. Click Next, then take the following actions:
  - a. On the Program page, select "This program path" and click Browse.
  - b. On the Open page, select Waters Service from Empower\Bin and click OK.
  - c. On the Program page, ensure the path with Empower\Bin\WatersService.exe appears, then click Next.
4. On the Action page, select "Allow the connection", and then click Next.
5. On the Profile page, select all options for "When does this rule apply?" and click Next.
6. On the Name page, enter the desired name (e.g., WatersService), and then click Finish.

**Result:** You are returned to the Windows Firewall with Advanced Security page.

#### To add the DCOM port to Inbound Rules:

1. Click Inbound Rules, right-click, and select New Rule.
2. On the New Inbound Rule Wizard > Rule Type page, select Port. Click Next.
3. On the Protocol and Ports page, select TCP and Specific local ports. In the Specific local ports field, enter 135, and then click Next.
4. On the Action page, select Allow the connection, and then click Next.
5. On the Profile page, select all options for "When does this rule apply?" and click Next.
6. On the Name page, enter a name (e.g., DCOM port), and then click Finish.

**Result:** The Windows Firewall with Advanced Security page displays the DCOM Port and Waters Service in the Inbound Rules list.



## 7.3.2 Updating DCOM access and launch permissions

### To update the DCOM access and launch permission:

1. From the Start menu, select Administrative Tools > Local Security Policy.  
**Tip:** In Windows Server 2012, open Server Manager, and click Tools menu > Local Security Policy.
2. On the Local Security Policy page, select Local Policies > Security Options.
3. Right-click "DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax" and select Properties.
4. Click Edit Security and ensure the Allow boxes for both Local Access and Remote Access are checked for all users.
5. Click OK.
6. Click OK.
7. Right-click "DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax" and select Properties.
8. Ensure the Allow boxes for all permissions are checked for all users, and then click OK.
9. Click OK.

## 7.4 Updating Waters Service and DCOM application settings

---

### To update the Waters Service and DCOM application settings:

1. From the Start menu, select Administrative Tools > Component Services.  
**Tip:** In Windows Server 2012, open Server Manager, and click Tools menu > Component Services.
2. On the Component Services page, navigate to Component Services > Computers > My Computer, and then double-click DCOM config.
3. Scroll down to locate Waters Service. Right-click Waters Service and select Properties.
4. Click the Security tab.
5. On the Security tab of the Waters Service Properties page, under Launch and Activation Permissions, select Customize and click Edit.
6. On the Launch and Activation Permission page, click Add.
7. On the Select Users or Groups page, enter "domain users" in the "Enter the object names to select" field, and then click OK.
8. Select all four permissions, and then click OK.
9. On the Launch and Activation Permission page, and then click Add.

10. On the Select Users or Groups page, type the name of the Empower users group that you created, in the procedure on [page 75](#) of this guide, in the "Enter the object names to select" field, and click OK.
11. Select all four permissions, and then click OK.
12. On the Launch and Activation Permission page, select all permissions for SYSTEM and INTERACTIVE.
13. Click OK to exit the Launch and Activation Permission page.
14. Click OK to exit the Waters Service Properties page.
15. Close Component Services.

## 7.5 Configuring raw data directory permissions

---

You specify which raw data share will store your Empower data on a per-project basis. You can specify the raw data share when creating projects, using the Name Entry page of the New Project Wizard.

The raw data share on the file server is created with default security settings provided by the installed operating system. To ensure the proper level of access and security, set the security permissions exactly as described on [page 75](#) of this guide.

## 7.6 Creating the raw data share in Empower

---

**Note:** Perform this procedure on the server or from a client, not on the file server.

**Note:** Empower 3 FR4 software comes with a default system user account that does not require a named user license. This administrator account can be disabled but not removed from Empower 3 FR4 software. The default user name is "system" and the default password is "manager". Both the user name and the password are not case sensitive.

### To create the raw data share:

1. Log in to Empower 3 FR4 software as an administrator user and access Configuration Manager.
2. In Configuration Manager, click View > Manage Raw Data Files.
3. Click Add File Service.
4. In the Node Name field, enter the name or IP address of the file server on which you installed Waters Service in the previous section.
5. Click Test File Service to verify that the file server is reachable and properly configured.
6. Click OK in the "File server valid" message box. Click OK on the "Add File Service" page.

**Tip:** If the test reported the file server is invalid, check your entry in the Node Name field. Make any necessary corrections, and repeat the test. If the file

server is still reported invalid, the cause can be configuration errors on the file server.

7. Click Add Raw Data Share.
8. On the Add Empower Raw Data Share page, enter the name of the raw data share (Waters\_Projects\$), which you created in [step 9](#) of the procedure you used to install the Waters Service (starting on [page 127](#)), and then click OK.  
**Note:** If the share name you entered was not pre-configured on the file server, you are prompted to enter a directory path for the raw data share (for example, C:\QALab\Projects). Do so, and then click OK.
9. Click Test Share to verify that the file share is reachable and properly configured.

**Tip:** For additional details, see “Managing raw data files in an Enterprise Client/Server configuration” in Empower Help.

**Requirement:** Always reboot the computer after installing Waters Service. If you install Waters Service from the Optional Components folder (on the Empower 3 FR4 software media) and you do not reboot the computer, subsequent installations can fail.

## 7.7 Uninstalling Waters Service

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Use the Add/Remove feature to uninstall Waters Service.



# 8

## Configuring Empower software in a Citrix environment

Refer to this chapter when installing or upgrading to Empower 3 FR4 software in a Citrix XenApp™ Server 7.6 environment.

### 8.1 Introduction

---

To access Empower 3 FR4 software in a Citrix XenApp server environment, the Empower 3 FR4 client is loaded onto the Citrix server. Client computers can then connect to the Citrix server to access and run Empower 3 FR4 software. Clients access Empower using the Independent Computing Architecture (ICA®) protocol developed by Citrix.

You can also use the Citrix Web Interface Server to provide Web-based access to Citrix Empower servers.

**Requirement:** Empower 3 FR4 software must be the only application running on your Citrix server. Do not attempt to run other applications on the server.

For information on how to install and configure Citrix servers, contact Citrix Systems, Inc.

If you plan to change the computer name, follow these guidelines:

- Change the name before you install Empower software.
- The computer name must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z) and cannot begin with a numeric character (0 to 9). Empower123 is acceptable for a computer name, but not 123Empower.

### 8.2 Preparing the Citrix server for Empower 3 FR4

---

To use the Citrix server with Empower 3 FR4 clients, first verify that you are using the Microsoft Windows Server 2008 R2 Enterprise or Standard 64-bit operating systems, or the Windows 2012 R2 Standard 64-bit operating system, on the Citrix server, and ensure that Citrix XenApp Server 7.6 software is installed.

Set up the system as follows:

- Configure .NET 3.5 Framework.
- Configure Network discovery.
- Configure the Event Viewer utility.
- Confirm regional settings.
- Synchronize Empower and Windows clock time.
- Disable User Access Control (UAC).
- Enable Windows MSI logging for troubleshooting purposes (see ["Enabling MSI logging"](#)).
- Install the Empower 3 FR4 client on the Citrix server.
- Disable Waters Service and Waters DHCP Server.
- Configure database net service names.
- Publish Empower software in Citrix.

## 8.2.1 Configuring .NET 3.5 Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10 and Windows Server 2012. .NET 4.0 Framework is installed and enabled by default.

The Empower 3 FR4 Deployment Manager installs the .NET 4.0 Framework on supported operating systems, if necessary, except on Windows 2012 since .NET 4.0 is already enabled on this operating system.

Windows 10 has .NET 4.6 pre-installed and the .NET 4.6 is backward compatible with all versions back to 4.0, so there is no need to install .NET 4.0 on Windows 10.

### Installing .Net 3.5 Framework on Windows Server 2012:

1. Click Start > Server Manager and in the Manage menu, and then click Add Roles and Features.
2. Click Next in the Wizard, select "Role-based or feature-based installation", and then click Next.
3. Select "Select the server from the server pool", select the target server, and then click Next.
4. In Server Roles, skip this section, and then click Next.
5. In Features, select ".NET Framework 3.5 Features", and then click Next.
6. In the Confirm installations selections page, select "Restart the destination server automatically if required", and then click Install.

## 8.2.2 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

### To start the required services:

1. From Control Panel, select System and Security (when in Category view) > Administrative Tools > Services.

**Tip:** To access the Control Panel in Windows Server 2012, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.

2. Change the startup type to Automatic, and start these services:

- DNS Client
- Function Discovery Resource Publication
- SSDP Discovery
- UPnP Device Host

**Tip:** When all services are running, you can modify the network discovery and printer sharing settings.

**To turn on the network discovery and file and printer sharing functions:**

1. From the Start menu, select Control Panel > Network and Internet (when in Category view) > Network and Sharing Center.

**Tip:** To access the Control Panel in Windows 10/Windows Server 2012, position the pointer in the bottom-left corner of the screen, right-click the Windows icon, and then click Control Panel.

2. Click "Change advanced sharing settings", and turn on these functions:

- Network discovery
- File and printer sharing

## 8.2.3 Configuring the Event Viewer utility

**To configure the Event Viewer utility:**

1. Click Start > Administrative Tools > Event Viewer.

**Tip:** In Windows Server 2012, open Server Manager, and click Tools menu > Event Viewer.

**Alternative:** Click Start, and then type Event Viewer.

2. On the Event Viewer page, click the + sign beside Window Logs.

3. Right-click Application, and then select Properties.

4. On the Application Log Properties page, select "Overwrite events as needed", select Apply, and then click OK.

5. Repeat [step 1](#) through [step 4](#) for Security, Setup, System, and Forwarded Events.

6. Close the Event Viewer page.

## 8.2.4 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal, not comma, formatting, which is important when displaying numeric values ("12.56", not "12,56").

**To confirm that the regional settings are correct:**

1. Click the Windows Start menu and then type "Regional Settings" in the search text box.
2. Click "Change date, time, or number formats".
3. In the Region and Language dialog box, ensure "English (United States)" is selected as the format in the Formats tab.

## 8.2.5 Synchronizing Empower and Windows clock time

Synchronize the Waters Empower software time and the clock time on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

**To Synchronize Empower and Windows clock time:**

1. Click Start > Control Panel > Clock, Language, and Region (with Category view selected) > Date and Time.

**Tip:** To access the Control Panel in Windows Server 2012, right-click the Windows icon, and click Control Panel.

2. In the Date and Time tab, click Change time zone.

**Note:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

3. In Time Zone Settings, select the check box "Automatically adjust clock for Daylight Saving Time", and click OK in each open dialog box.

## 8.2.6 Disabling User Access Control

**To disable User Access Control (UAC) on the Server:**

1. Click Start > Control Panel > System and Security > Action Center > Change User Account Control settings.

**Tip:** To access Control Panel in Windows Server 2012, right-click the Windows icon, and click Control Panel.

2. Drag the slider down to the lowest setting (Never notify), and click OK.

**Alternative:** Set VerifyOpt.exe to run as administrator, in the Waters\_Projects\$ share, under Empower > Bin. Right-click the file, click Properties > Compatibility, and then select Run this program as an administrator. Click Apply, and then click OK.

## 8.3 Installing Empower 3 FR4 client on Citrix server (new install)

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You can install Empower 3 FR4 as a fresh, new installation (as a client on a Citrix server where no Chromatography Data Software [CDS] is currently installed) or as an upgrade from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1,



Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, and Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

Follow the instructions in this section if this is a new installation of Empower 3 FR4 software. If you are upgrading, follow the instructions starting on [page 143](#) to upgrade your current version of Empower software to Empower 3 FR4.

#### **Restrictions:**

- Do not attempt to install the Empower 3 FR4 client on the Citrix server from a staged network location. Install the client on the Citrix server using the Empower 3 FR4 media from a local or mapped drive.
- Do not use Add/Remove programs (Uninstall or Change a program) to install Empower 3 FR4. You must put the Citrix server into Install mode (see [step 1](#) in the Empower 3 FR4 installation procedure, on [page 137](#)).

Waters supplies Oracle software and Empower 3 FR4 software on the Empower 3 FR4 software media.

Procedures in this chapter assume that you want to install Oracle automatically using default settings. Allow approximately 30 minutes or more to install the software.

By default, the Empower installer (Deployment Manager) installs both Oracle 12.1.0.2 and Empower 3 FR4 software. If your site has its own Oracle license, and prefers to install Oracle 12.1.0.2 software as a separate application, consider these installation issues:

- Install Oracle 12.1.0.2 software only before installing Empower 3 FR4 software.
  - Install the 32-bit Oracle client only. The 64-bit client is not supported.
- Change the language registry key value in  
HKEY\_LOCAL\_MACHINE\Software\WOW6432Node\Oracle\  
KEY\_EmpowerOracle12cClient\NLS\_LANG to  
AMERICAN\_AMERICA.WE8ISO8859P1
- During installation, you are asked whether you want to use your installed Oracle software. Select Yes, and enter the location of the Oracle program files.

### **8.3.1 Installing Empower 3 FR4 software**

**Important:** TestExecute software is installed with Empower 3 FR4 software during the Empower 3 FR4 installation. Do not uninstall the TestExecute software, even though it appears in the Control Panel. Uninstalling the TestExecute software invalidates the Empower 3 FR4 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

#### **To install the Empower 3 FR4 client software:**

1. Put the server into Install mode by opening a command prompt and typing "Change user /install".

**Result:** The response should indicate "User session is ready to install applications".

2. Insert the Empower 3 FR4 software media into the DVD drive.

3. If the installation menu does not automatically appear, browse to the main folder on the software media and double-click the setup.exe file.  
**Tip:** A dism.exe window opens after you click setup.exe. You need not close this window; it closes automatically after appearing for several seconds.
4. Select a language from the list, and click OK.
5. On the main page, select Install Empower Software.
6. On the Select Product Type page, select Enterprise or Workgroup, depending on your environment.
7. On the Select Installation Type page, select Client.
8. On the Customer Information page, enter your user name, organization and Software Support ID number, and then click Next.
9. On the End-User License Agreement page, accept the terms in the license agreement, and then click Next.
10. On the TNS\_Admin Environment variable page, you can choose to set the TNS\_ADMIN environment variable, which adds an environmental variable to the Citrix server that points to a preconfigured tnsnames.ora file located in a network-accessible share.  
**Note:** A tnsnames.ora file contains the list of Empower databases that can be accessed by a client. This option allows large installations to maintain a single tnsnames.ora file in a share, eliminating the need to configure a tnsnames.ora files on each client computer.
  - If you do not intend to use this option, leave the checkbox clear, and click Next.
  - If you want to enable the TNS\_ADMIN variable, select the check box. Enter the network path to the share containing the preconfigured tnsnames.ora file (for example: \\servername\sharename\$), and then click Next.**Tip:** Use the TNS\_ADMIN directory set in "[Configuring a shared tnsnames.ora file](#)".  
**Rule:** If the TNS\_ADMIN variable is set, the Citrix server disregards local tnsnames.ora files.
11. On the Installation Type page, select one of the following options:
  - Typical – Select and then proceed to [step 13](#), installing all Empower and Oracle files to the system drive, which is typically C:\.
  - Custom – Select and then proceed to [step 12](#), installing the Empower and Oracle files on different drives.
12. On the Destination Folders page, select the appropriate drives from the list for the Empower Application and Empower Oracle files, and then click Next.
13. On the Ready to Install page, click Next, to begin the installation.  
**Tip:** If any Windows Security Alert messages appear, click Allow Access.
14. On the Status page, click Finish.
15. When the restart message appears, click Yes.  
**Result:** The computer reboots.
16. After the computer restarts, log in using an account with local Administrator privileges.

**Tip:** If any Windows Security Alert messages appear, click Allow Access.

17. If you are not using the TNS\_ADMIN environmental variable, see ["Configuring a database net service name"](#) to configure a local tnsnames.ora file.

If you want to install software support for one or more instruments, put the server into Install mode, and use the Empower 3 Instrument Driver Pack media. Visit the Waters Web site ([www.waters.com](http://www.waters.com)) for the most recent instrument drivers and instructions.

**Note:** Empower 3 FR4 software comes with a default system user account that does not require a named user license. This administrator account can be disabled but not removed from Empower 3 FR4 software. The default user name is "system" and the default password is "manager". Both the user name and the password are not case sensitive.

### 8.3.1.1 Firewall exceptions

If you experience communication problems, review the firewall exceptions list. To do so, click Start, type Windows Firewall, select Windows Firewall with Advanced Security, and then click Inbound Rules.

Ensure the following exceptions are listed.

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:
  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server
  - ACQUITY FLR Server
  - ACQUITY MD Server
  - ACQUITY PDA Server
  - ACQUITY SM Server
  - ACQUITY SQ Server
  - ACQUITY TQ Server

- ACQUITY TUV Server
- Local Console Controller (LCC Handheld Controller)
- W2489 Server
- W2707 Server
- W2998 Server

### 8.3.1.2 DCOM settings installed by Empower 3 FR4

Empower 3 FR4 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

**Table 8–1: DCOM settings and permissions set during installation**

Path	Allow
Local Security Policy > Local Policies > Security Options > DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	Local Access and Remote Access permissions for <ul style="list-style-type: none"> <li>Everyone <p><b>Note:</b> You must change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a>.</p> </li> <li>Domain users</li> <li>Performance Log users</li> <li>Distributed COM users</li> <li>Anonymous Logon</li> </ul>
Local Security Policy > Local Policies > Security Options > DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax > Properties	Local Launch, Local Activation, and Remote Activation for <ul style="list-style-type: none"> <li>Everyone <p><b>Note:</b> You must change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a>.</p> </li> </ul> All permissions for Administrators
Local Security Policy > Local Policies > Security Options > Network Access: Let Everyone permissions apply to anonymous users	Enable
Component Services > Computers > Properties > COM Security > Access Permission	Local Access and Remote Access for: <ul style="list-style-type: none"> <li>SELF</li> <li>System</li> <li>Administrators</li> </ul>

**Table 8–1: DCOM settings and permissions set during installation**

Path	Allow
Component Services > Computers > Properties > COM Security > Launch and Activation Permissions	Local Launch and Local Activation permissions for: <ul style="list-style-type: none"><li>Everyone: <b>Note:</b> You must change this to a custom group of Empower users instead of the Everyone group. See <a href="#">"Configuring the Empower Projects directory"</a></li></ul> All permissions for: <ul style="list-style-type: none"><li>System</li><li>Administrator</li><li>INTERACTIVE</li></ul>

### 8.3.2 Disabling Waters Service and Waters DHCP Server Service

By default, Waters Service and Waters DHCP Server Service are installed with the startup type set to automatic. For better performance, disable Waters Service and Waters DHCP Server Service. Leaving them running, queues processing jobs for execution, causing slower performance.

#### To disable Waters Service and Waters DHCP Server:

1. From the Start menu, type Services, and then select Services.  
**Tip:** In Windows Server 2012, open Server Manager, and click Tools menu > Services.
2. Right-click Waters Service, and then select Properties.
3. On the Properties page, click Stop.
4. On the Properties page, change the Startup type to Disabled. Click Apply, and then click OK.
5. Repeat step 2 through step 4 to disable Waters DHCP Server Service.

### 8.3.3 Configuring the database net service names

To configure the database net service names, see ["Configuring a database net service name"](#). On the Net Service Name page, remember that you must define the same net service name on both the Citrix server and the LAC/E modules, as well as any clients with Empower 3 FR4 software installed (FAT, or traditional, clients).

If you are using multiple databases and multiple Citrix servers configured in a server farm, you can configure roaming profiles to ensure that each Windows user's default database is set correctly. The last database a user successfully logged in to is the default database.

## 8.3.4 Publishing Empower 3 FR4 software in Citrix

To publish Empower 3 FR4 on Citrix XenApp 7.6, you must create a machine catalog and a delivery group:

- The machine catalog contains the name of the machine's servers where the Empower client is installed and accessed through Citrix after publishing.
- The delivery group identifies the users that can use the machines added in the machine catalog and specifies the applications that are available to those users.

### Creating a machine catalog

1. From the Citrix Studio console main menu, right-click Machine Catalog.
2. On the Machine Catalog Setup Wizard, select the Windows Server OS, and then click Next.
3. On the Machine Management page, select the appropriate settings for your environment, and then click Next.
4. On the Machines page, click Add Computers.
5. In the Select computers dialog box, select the Citrix application servers, and then click OK.
6. On the Machines page, click browse (...) to locate the Computer AD account for each Citrix application server.
7. On the Summary page, type a name and description for the Machine Catalog, and then click Finish.

**Result:** The machine catalog is created and configured. You can view it from the Machine Catalogs page.

### Creating a delivery group:

1. On the Citrix Studio Console Main Menu, right-click Deliver group, and then select "Create Delivery Group".
2. When the Create Delivery Group Wizard displays, click Next.
3. From the Machines page, do the following:
  - Select the Machine Catalog you want to add into the Delivery Group.
  - Chose the number of machines from the Machine Catalog that will be used in the Delivery Group and then click Next.
4. On the Delivery Type page, select Applications, and then click Next.
5. On the Users page, select the users or groups that will access the application, and then click Next.
6. On the Applications page, select the applications you want to publish, and then click Next.
7. On the Summary page, enter a name and description for the Delivery Group and then click Finish

**Result:** The delivery group is created, configured, and accessible from the Delivery Groups screen. From the Applications tab, you can view all the applications you selected to be published.

## 8.4 Upgrading from earlier versions of Empower

---

Follow the instructions in this section to upgrade your client to Empower 3 FR4. If you are not upgrading, follow the instructions starting on [page 136](#) for a new Empower 3 FR4 installation.

You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, and Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Note:** Allow enough time to perform the upgrade. An upgrade from any of the versions listed above to Empower 3 FR4 can potentially require about 30 minutes.

### Requirements:

- You must upgrade to Empower 3 FR2 before you can upgrade to Empower 3 FR4.  
**Note:** If you are using a version of Empower prior to Empower 3 FR2 software, you can either upgrade to Empower 3 FR2 as a minimum requirement, or completely uninstall the earlier version of Empower, and ensure that your system meets the hardware and software requirements detailed in Chapter 1 of this guide.
- Follow the instructions at the beginning of this chapter to install Empower 3 FR4 as a new installation.

### 8.4.1 Upgrading to Empower 3 Feature Release 4 (FR4) software

You can perform an upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

#### To upgrade to Empower 3 FR4:

1. Insert the Empower 3 FR4 software media into the DVD drive.
2. On the Maintenance Mode: Empower 3 Client page, select Upgrade Empower Software.
3. On the Ready to Upgrade page, click Next.
4. When the Windows Security Alert appears, select Domain networks, and click Allow access to continue the installation.  
**Note:** An upgrade from Empower 3 FR2 or SR2 to Empower 3 FR4 can require approximately 30 minutes.
5. On the Status page, when the upgrade is finished, and the Success message appears, click Finish.
6. When the restart message appears, click Yes.

## 8.5 Verifying your Empower 3 FR4 software installation

---

**Requirement:** PDF viewer software must be installed on the Citrix server for viewing Empower reports.

### 8.5.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to check for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value displayed is 0, then the installation was successful. If the value displayed is anything other than 0, record the number, and contact Waters Technical Support.

#### To view the install log:

1. Select Start > All Programs > Empower > Empower Installation Log.

**Tip:** In Windows Server 2012, from Start > click the down arrow (⌵) to display the Apps page > point to Empower, and click the Empower Installation Log.

**Result:** The program displays the empower.log file in Notepad.

2. Review the contents of the file.

**Tip:** You can print a copy by selecting File > Print.

3. Click File > Exit.

### 8.5.2 Using the Verify Files Utility

The Verify Files Utility checks the integrity of the installed Empower program files and Oracle program files (if installed by Empower).

After the Empower 3 FR4 installation, run the Verify Files Utility to verify the Empower and Oracle program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option
- To ensure that the Empower files did not change since installation

#### To run the file verification utility:

1. Click Start > All Programs > Empower > Verify Files.

**Tip:** In Windows Server 2012, from Start > click the down arrow (⌵) to display the Apps page > point to Empower > select Verify Files.

**Result:** The Verify Files Utility compares the installed Empower files’ checksum with a previously stored checksum and then creates a file verification results log (for example, checksum\_date\_timestamp.txt).



2. Review the contents of the file, and print or save a copy of the results.
3. Click File > Exit.

#### **To view the file verification results:**

1. Click Start > All Programs > Empower > View Verify Files.

**Tip:** In Windows Server 2012, from Start > click the down arrow (⬇) to display the Apps page > point to Empower > select Verify Files.

**Result:** The checksum.txt file displays in Notepad.

2. Review the contents of the checksum file.

Your Empower 3 FR4 software installation passes the verification check when all files have a status of "OK" and the installation qualification summary on the final page states "No installation changes were detected". If the checksum.txt file indicates any files marked as "changed", contact Waters Technical Support.

## **8.6 Empower feature releases and service releases**

---

Waters periodically issues feature releases to provide enhanced software functionality and service releases to address existing issues. These feature releases and service releases, available for downloading from the Waters Elite Web site (to customers with a software support plan), must be installed according to instructions set forth in their associated release notes. If you want physical media, note the part number from the Web site, and contact your local Waters subsidiary to place an order for a nominal fee.

To determine which feature releases or service releases are installed, view the installation log, or select Help About from any Empower 3 FR4 application window.



# 9

## Installing Empower Enterprise database on a UNIX server

You use the Oracle Sun server SPARC to host the Empower database. For information on Sun server or Solaris 10 operating system installation, see the Oracle Corporation product documentation. For detailed information, see the *Oracle Database Installation Guide, 12c Release 1 (12.1) for Oracle Solaris E50818-10* and the *Oracle Database Installation Guide, Release 1 (12.1) for Linux E41491-15*. Refer to this chapter when installing the Empower 3 FR4 Enterprise database on a UNIX server. Follow the procedures to perform the standard installation of the Oracle software and the Empower database.

**Recommendation:** Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer).

### 9.1 Installing Empower 3 FR4 on UNIX

---

Waters supplies the Empower database software on a DVD. Procedures in this chapter assume that you want to configure the database using default settings.

If the server on which you are installing Empower is not fitted with a DVD drive, share the DVD drive of a network-accessible workstation, and mount a drive to the share from the server on which you will be installing Empower.

**Important:** If you plan to change the name of the computer, do so before you install Empower. Do not change the name of the computer after Empower is installed.

**Tip:** If your environment has an installed supported version of Oracle, you can only create and configure the database.

The Empower 3 FR4 UNIX product includes two installers for proper installation and configuration of the Oracle 12.1.0.2 database and the Empower 3 FR4 database instance on a UNIX server. You must set certain environmental conditions before each installation.

To install Oracle 12.1.0.2 and create an Empower 3 FR4 database instance on a UNIX server, you must perform these tasks, in the order presented:

- Prepare the Solaris 10 operating environment using the *Oracle Database Quick Installation Guide 12c Release 1 (12.1) for Oracle Solaris on SPARC (64-Bit) E55100-04* as a reference.

- Configure the system to create the Empower 3 FR4 database instance.
- Install the Empower 3 FR4 database instance (Installation Part 2).
- Configure the database (set up a Listener and enter the ORACLE\_SID).
- Set the database to start on reboot.

## 9.2 Preparing the Solaris 10 operating system

---

Install the Solaris 10 operating system and all required service packs according to the documentation provided by the manufacturer and your IT department.

Prepare the Solaris 10 operating system for the Oracle 12.1.0.2 database installation according to the procedures outlined in the *Oracle Database Quick Installation Guide 12c Release 1 (12.1) for Oracle Solaris on SPARC (64-Bit) E55100-04*.

## 9.3 Configuring the system before installing the database instance

---

Before you install the database instance, ensure no instances of ORACLE\_SID are in the .profile file and that ORACLE\_HOME is set properly in your environment. The .profile *must* be correct for the installation to work.

**Note:** If you have more than one ORACLE\_SID, ensure each is set up properly.

**To verify that no ORACLE\_SID exists and that Oracle home is set properly:**

1. In a terminal window, enter the following command:

```
echo $ORACLE_SID
```

**Rationale:** This command will return either a blank value, indicating no SID is set, or the value of the database on which to install. If an SID does exist, remove it from the file.

2. Enter the following command to ensure that ORACLE\_HOME is set properly:

```
echo $ORACLE_HOME
```

**Rationale:** This command should display the correct path for your Oracle home.

**Tip:** The default path is the path to the /u01/app/oracle/product/12.1.0.2/db\_1.

3. Restart the server.

### 9.3.1 Default Oracle parameters

The following table lists the default Oracle parameters that are set for the Solaris environment.

**Note:** These are the values used in the Waters test environment.

**Table 9–1: Default Oracle parameters for Solaris environment**

Parameter Name	Begin value (if different)
audit_file_dest	u01/app/oracle/admin/WATB/aduMP
audit_trail	DB
cluster_database	FALSE
compatible	12.1.0.2.0
control_files	u01/app/oracle/oradata/WATB/control01.ctl
db_block_size	8192
db_create_file_dest	
db_domain	
db_name	WATB
db_recovery_file_dest	u01/app/oracle/fast_recovery_area
db_recovery_file_dest_size	41943040000
deferred_segment_creation	FALSE
diagnostic_dest	/u01/app/oracle
dispatchers	(PROTOCOL=TCP) (SERVICE=emp1
instance_number	1
local_listener	(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=10.X.X.X)(PORT=1521))))
log_archive_format	%t_%s_%r.dbf
memory_target	6878658560
open_cursors	3000
processes	1500
remote_listener	
remote_login_passwordfile	EXCLUSIVE
sec_case_sensitive_logon	FALSE
service_names	WAT12
sessions	1700
spfile	u01/app/oracle/product/12.1.0.2/db_1/dbs/spfileemp1.ora
thread	1
undo_tablespace	UNDOTBS1

## 9.4 Creating an Empower instance

---

Before you begin, ensure these conditions are met:

- Your operating system is configured for Empower Oracle High Availability.
- The appropriate version of Oracle software is installed.
- You possess adequate knowledge of the platform and Oracle software working on this platform.

### To create the Empower instance:

1. Install Oracle Enterprise 12.1.0.2 on the server.  
**Note:** Select Enterprise Edition and software only. Do not create a database instance at this time.
2. Apply the Oracle July CPU (.160719), as required, according to the Oracle patch documentation.
3. Log in to the Oracle account, and run the DBCA tool.
4. On the Database Configuration Assistant: Operations page, select "Create a Database", and click Next.
5. On the Database Configuration Assistant: Creation Mode page, select "Advanced Mode" and click next.
6. On the Database Configuration Assistant page, select a "Custom Database" option, and click Next to create the database.
7. On the Database Configuration Assistant: Database Identification page, enter the database name and the SID prefix, and then click Next.
8. On the Database Configuration Assistant: Management Options page, both "Configure Enterprise Manager (EM) Database Express" and "Register with Enterprise Manager (EM) Cloud Control" are optional.
9. On the Database Configuration Assistant: Database Credentials page, supply the passwords for both accounts.

### Requirements:

- Ensure you note the passwords, which you will later need for configuring the Empower database instance.
  - Set the SYSTEM password to Empower, which will be required later.
10. On the Database Configuration Assistant: Network Configuration page, configure a new listener. Provide a name and set "1521" as the listening port. If you have already have a listener configured, select it from the list and proceed to the next step.
  11. On the Database Configuration Assistant: Storage Locations page, select "Use Common Location for All Database Files" and browse to the location of database files. Increase the size for the Fast Recovery Area (FRA) to at least 1.5 times your database estimated size. The FRA should be on a different hard drive than the database. Enable archiving, and then click Next.

12. On the Database Configuration Assistant: Database Options page, mandatory options are Oracle JVM and Oracle Application Express; others are optional.
13. On the Database Configuration Assistant: Initialization Parameters page, perform the following tasks, and then click Next:
  - On the Memory tab, select Typical. Slide the cursor to 66%, and then select Custom settings with Automatic Shared Memory Management. Values will be inherited under this option.
  - On the Sizing tab, increase the number of processes to a minimum of 1,700.
  - On the Character Sets tab, select "Choose from the list of character sets", and ensure the database character set is WE8ISO8859P1.

**Required:** Ensure that the "Show recommended character sets only" check box is cleared.

  - Select the default National Character Set and set to AL16UTF16.
  - On the Connection Mode tab, select "Dedicated Server mode".
14. On the Database Configuration Assistant: Creation Options page, access Customize Storage Locations, perform the following tasks, and then click Next:
  - Click the plus sign next to Tablespaces to view the tablespace names. The names must be as follows:
    - Index tablespace must be named INDEX\_DATA
    - Temporary tablespace must be named TEMPORARY\_DATA
    - Users tablespace must be named USER\_DATAFor TEMPORARY\_DATA only:
    - Table space type must be temporary
    - Select the checkbox to set this table space as the default temporary table

**Requirement:** These tablespaces are used by Empower and must be named exactly as listed.
  - For USER\_DATA and INDEX\_DATA, click Create and create nine data files of 100 MB and these files should automatically extend.  
If you are using ASM, use a bigfile tablespace (BFT) for USER\_DATA and INDEX\_DATA.
  - Increase the size of the Redo Logs as follows:
    - Select each of the three files under Redo Log Groups and increase the size to 200 MB.
    - A Redo log files mirror can be created by additional datafiles if you are using at least one other hard drive; if you are using only one hard drive performance will be highly diminished and cannot be used to ensure hard drive failure recovery.
15. On the Database Configuration Assistant: Creation Options page, select "Save as a Database Template", enter a name, and then click Finish.
16. When the Database Configuration Assistant: Summary page appears, review the options to ensure they are correct, and then click OK.

**Result:** The Database Configuration Assistant displays the progress of the database creation. When database creation is complete, the Database Configuration Assistant displays the new database information.

17. On the Password Management page, click Exit.

## 9.5 Configuring the Empower schema

---

Run the `fillempowerdb.sh` script directly on the server to create the Empower schema and add the standard data to the instance with these parameters:

```
./fillempowerdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <Database Language>  
<SystemPwd> <SysPassword>
```

- \* ORACLE\_SID
- \* ORACLE\_HOME
- \* Path to AdministratorScripts directory
- \* Database language (en, ja, ko, zh-CHS)
- \* Oracle System password
- \* Oracle Sys password

### Example:

```
./fillempowerdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <Database Language>  
<SystemPwd> <SysPassword>  
./fillempowerdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <en> <empower> <oracle>  
./fillempowerdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <en> <empower> <oracle>  
> fillempowerdb.log
```

When the execution of FillEmpowerDB is complete, the Empower database is ready for the first client connection.

## 9.6 Setting the database to start on reboot

---

### To set up the database to start on reboot:

1. Open the `.profile` file, and set the Oracle SID and ORAENV variables.

### Example:

```
ORACLE_SID=WATB export ORACLE_SID  
ORAENV_ASK=NO
```



```
export ORAENV_ASK  
. oraenv
```

**Tip:** WATB is an example SID. Your Oracle SID can differ.

2. Change the oratab file to say Yes to the Oracle SID in your environment.  
For example:

```
WATB:/u01/app/oracle/product/12.1.0.2/db_1:Y
```

**Tip:** The oratab file is located in the /var/opt/oracle folder.

3. Include dbora in the /etc/init.d folder, and run the following commands to link the start/shutdown actions:

```
ln -s /etc/init.d/dbora /etc/rc0.d/K01dbora
```

```
ln -s /etc/init.d/dbora /etc/rc2.d/S99dbora
```

**Requirement:** You must type the commands exactly as indicated.

**Tips:**

- A sample dbora file is provided in the sample scripts folder on the product DVD.
- K01 in front of the dbora name kills the Oracle processes first on shutdown.
- S99 in front of the second command starts the Oracle processes last on reboot.

4. Log out and log in again, and then verify that you can log on to the server.

## 9.7 Setting up Waters Service and raw data share

---

Follow the instructions in [Chapter 7](#) to install Waters Service and the raw data share on a separate Windows server.



# 10 Installing Empower

## Enterprise database on a RedHat server

Install the Red Hat® operating system on a Linux Enterprise 6.8 server and all required service packs according to the documentation provided by the manufacturer and your IT department. For detailed information about configuring the environment for the Oracle Enterprise Edition 12.1.0.2 installation, refer to *Oracle Database Installation Guide 12c Release 1 (12.1) for Linux E41491-15* and *Oracle Database Quick Installation Guide 12c Release 1 (12.1) for Linux x86-64 E54543-08*.

Refer to this chapter when installing the Empower 3 FR4 Enterprise database on a Linux server. Follow the procedures to perform the standard installation of the Oracle software and the Empower database.

**Recommendation:** Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer).

### 10.1 Installing the Empower 3 FR4 on Linux

---

Install the Linux operating system on a Linux Red Hat Enterprise 6.8 server and all required service packs according to the documentation provided by the manufacturer and your IT department.

Prepare the Linux server environment for the Oracle 12.1.0.2 database installation according to the procedures outlined in the documents listed above.

#### 10.1.1 Before you install Empower 3 FR4 Enterprise database on Linux

Waters supplies the Empower database software on a DVD. Procedures in this chapter assume that you want to install Empower using default settings.

If the server on which you are installing Empower is not fitted with a DVD drive, share the DVD drive of a network-accessible workstation, and mount a drive to the share from the server on which you will be installing Empower.

**Important:** If you plan to change the name of the computer, do so before you install Empower. Do not change the computer name or IP address after Empower is installed.

## 10.1.2 Oracle installation

If your environment already supports an installed version of Oracle, you can install only the Empower 3 FR4 database instance. To do so, you start the installation at Part 2, skipping Part 1.

Waters supplies the Empower database software on a DVD. Procedures in this chapter assume that you want to install Empower using default settings.

If the server on which you are installing Empower is not fitted with a DVD drive, share the DVD drive of a network-accessible workstation, and mount a drive to the share from the server on which you will be installing Empower.

**Important:** If you plan to change the name of the computer, do so before you install Empower. Do not change the computer name or IP address after Empower is installed.

The Empower 3 FR4 Linux product includes two installers for proper installation and configuration of the Oracle 12.1.0.2 database and the Empower 3 FR4 database instance on a Linux server. You must set certain environmental conditions before each installation.

To install Oracle 12.1.0.2 and create an Empower 3 FR4 database instance on a Linux server, you must perform these tasks, in the order presented:

- Prepare the Red Hat operating system using the guides listed in the first section as references.
- Configure the system to create the Empower 3 FR4 database instance.
- Create the Empower 3 FR4 database instance. Include the Oracle Listener during installation.
- Set the database to start on reboot.

## 10.2 Configuring the system before installing the database instance

---

Before you install the database instance, ensure no instances of ORACLE\_SID are in the .bash\_profile file and that ORACLE\_HOME is set properly in your environment. The .bash\_profile must be correct for the installation to work.

**Note:** If you have more than one ORACLE\_SID, ensure each is set up properly.

**To verify that no ORACLE\_SID exists and that Oracle home is set properly:**

1. In a terminal window, enter the following command:

```
echo $ORACLE_SID
```

**Rationale:** This command will return either a blank value, indicating no SID is set, or the value of the database on which to install. If an SID does exist, remove it from the file.

2. Enter the following command to ensure that ORACLE\_HOME is set properly:

```
echo $ORACLE_HOME
```

**Rationale:** This command should display the correct path for your Oracle home.

**Tip:** The default path is the path to u01/app/oracle/product/12.1.0.2/db\_1.

3. Restart the server.

## 10.2.1 Default Oracle parameters

The following table lists the default Oracle parameters that are set for the Red Hat environment.

**Note:** These are the values used in the Waters test environment.

**Table 10–1: Default Oracle parameters for Red Hat environment**

Parameter Name	Begin value (if different)
audit_trail	DB
cluster_database	FALSE
compatible	12.1.0.2
control_files	u01/app/oracle/oradata/WATB/control01.ctl
db_block_size	8192
db_name	WAT12
db_recovery_file_dest	/u01/app/oracle/fast_recovery_area Note: Match with database creation
db_recovery_file_dest_size	41943040000
deferred_segment_creation	FALSE
diagnostic_dest	/u01/app/oracle
dispatchers	(PROTOCOL=TCP) (SERVICE=WATBXD)
instance_number	1
local_listener	(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=10.X.X.X)(PORT=1521))))
log_archive_format	%t_%s_%r.dbf
memory_target	6878658560
open_cursors	3000
processes	1500
remote_listener	
remote_login_passwordfile	EXCLUSIVE
sec_case_sensitive_logon	FALSE
service_names	WAT12
sessions	1700
spfile	[oracle home]/product/12.1.0.2/db_1/dbs/spfileemp1.ora
thread	1
undo_tablespace	UNDOTBS1

## 10.3 Creating an Empower instance

---

Before you begin, ensure these conditions are met:

- Your operating system is configured for Empower Oracle High Availability.
- The appropriate version of Oracle software is installed.
- You possess adequate knowledge of the platform and Oracle software working on this platform.

### To create the Empower instance:

1. Install Oracle Enterprise 12.1.0.2 on the server.  
**Note:** Select Enterprise Edition and software only. Do not create a database instance at this time.
2. Apply the Oracle July CPU (.160719), as required, according to the Oracle patch documentation.
3. Log in to the Oracle account, and run the DBCA tool.
4. On the Database Configuration Assistant: Operations page, select "Create a Database", and click Next.
5. On the Database Configuration Assistant: Creation Mode page, select "Advanced Mode", and click next.
6. On the Database Configuration Assistant page, select a "Custom Database" option, and click Next to create the database.
7. On the Database Configuration Assistant: Database Identification page, enter the database name and the SID prefix, and then click Next.
8. On the Database Configuration Assistant: Management Options page, both "Configure Enterprise Manager (EM) Database Express" and "Register with Enterprise Manager (EM) Cloud Control" are optional.
9. On the Database Configuration Assistant: Database Credentials page, supply the passwords for both accounts.

### Requirements:

- Ensure you note the passwords, which you will later need for configuring the Empower database instance.
  - Set the SYSTEM password to Empower, which will be required later.
10. On the Database Configuration Assistant: Network Configuration page, configure a new listener. Provide a name and set "1521" as the listening port. If you have already have a listener configured, select it from the list and proceed to the next step.
  11. On the Database Configuration Assistant: Storage Locations page, select "Use Common Location for All Database Files" and browse to the location of database files. Increase the size for the Fast Recovery Area (FRA) to at least 1.5 times your database estimated size. The FRA should be on a different hard drive than the database. Enable archiving, and then click Next.
  12. On the Database Configuration Assistant: Database Options page, the mandatory options are Oracle JVM and Oracle Application Express; others are optional.

13. On the Database Configuration Assistant: Initialization Parameters page, perform the following tasks, and then click Next:
  - On the Memory tab, select Typical. Slide the cursor to 66%, and then select Custom settings with Automatic Shared Memory Management. Values will be inherited under this option.
  - On the Sizing tab, increase the number of processes to a minimum of 1,700.
  - On the Character Sets tab, select "Choose from the list of character sets", and ensure the database character set is WE8ISO8859P1.

**Requirement:** Ensure that the "Show recommended character sets only" check box is cleared.

- Select the default National Character Set and set to AL16UTF16.
  - On the Connection Mode tab, select "Dedicated Server mode".
14. On the Database Configuration Assistant: Creation Options page, access Customize Storage Locations, perform the following tasks, and then click Next:
    - Click the plus sign next to Tablespaces to view the tablespace names. The names must be as follows:
      - Index tablespace must be named INDEX\_DATA
      - Temporary tablespace must be named TEMPORARY\_DATA
      - Users tablespace must be named USER\_DATAFor TEMPORARY\_DATA only:
      - Table space type must be temporary
      - Select the check box to set this table space as the default temporary table

**Requirement:** These tablespaces are used by Empower and must be named exactly as listed.

    - For USER\_DATA and INDEX\_DATA, click Create and create nine data files of 100 MB and these files should automatically extend.  
If you are using ASM, use a bigfile tablespace (BFT) for USER\_DATA and INDEX\_DATA.
    - Increase the size of the Redo Logs as follows:
      - Select each of the three files under Redo Log Groups and increase the size to 200 MB.
      - A Redo log files mirror can be created by additional datafiles if you are using at least one other hard drive; if you are using only one hard drive performance will be highly diminished and cannot be used to ensure hard drive failure recovery.

15. On the Database Configuration Assistant: Creation Options page, select "Save as a Database Template", enter a name, and then click Finish.
16. When the Database Configuration Assistant: Summary page appears, review the options to ensure they are correct, and then click OK.

**Result:** The Database Configuration Assistant displays the progress of the database creation. When database creation is complete, the Database Configuration Assistant displays the new database information.

17. On the Password Management page, click Exit.

## 10.4 Configuring the Empower schema

---

Run the FillemPOWERdb.sh script to create the Empower schema and add the standard data to the instance with these parameters:

```
./fillemPOWERdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <Database Language>  
<SystemPwd> <SysPassword>
```

- \* ORACLE\_SID
- \* ORACLE\_HOME
- \* Path to AdministratorScripts directory
- \* Database language (en, ja, ko, zh-CHS)
- \* Oracle System password
- \* Oracle Sys password

### Example:

```
./fillemPOWERdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <Database Language>  
<SystemPwd> <SysPassword>  
./fillemPOWERdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <en> <empower>  
<oracle>  
./fillemPOWERdb.sh <ORACLE_SID> <ORACLE_HOME>  
<path_to_the_AdministratorScriptsdir> <en> <empower>  
<oracle> > fillemPOWERdb.log
```

**Requirement:** You can run FillEmpowerDB only from the database server. Set the local environment variable to the database, enter the Empower script directory, and execute the FillEmpDB.sh file. Open this script for execution instructions.

When the execution of FillEmpowerDB is complete, the Empower database is ready for the first client connection.

## 10.5 Setting the database to start on reboot

---

### To set up the database to start on reboot:

1. Open the .bash\_profile file, and set the Oracle SID and ORAENV variables.

### Example:

```
ORACLE_SID=WATB export ORACLE_SID  
ORAENV_ASK=NO  
export ORAENV_ASK  
. oraenv
```



**Tip:** WATB is an example SID. Your Oracle SID can differ.

2. Change the oratab file to say Yes to the Oracle SID in your environment.

For example:

WATB:/u01/app/oracle/product/12.1.0.2/db\_1.Y

**Tip:** The oratab file is located in the /var/opt/oracle folder.

3. Include dbora in the /etc/init.d folder, and run the following commands to link the start/shutdown actions:

```
ln -s /etc/init.d/dbora /etc/rc0.d/K01dbora
```

```
ln -s /etc/init.d/dbora /etc/rc2.d/S99dbora
```

**Requirement:** You must type the commands exactly as indicated.

**Tips:**

- A sample dbora file is provided in the sample scripts folder on the product DVD.
- K01 in front of the dbora name kills the Oracle processes first on shutdown.
- S99 in front of the second command starts the Oracle processes last on reboot.

4. Log out and log in again, and then verify that you can log on to the server.

## **10.6 Setting up Waters Service and raw data share**

---

Follow the instructions in the [Chapter 7](#) to install Waters Service and the raw data share on a separate Windows server.



# 11 Administrative (push) installation instructions

Follow the instructions in this chapter to silently deploy Empower 3 FR4 software to clients, LAC/E modules, and Citrix servers, or to upgrade to Empower 3 FR4 using push or silent installations.

You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix 1, Empower 3 SR2 Hotfix 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1.

**Restriction:** Push installation is not supported on clients, LAC/E modules, and Citrix servers where Oracle is already installed.

## 11.1 Preparing for push installation

---

### 11.1.1 Introduction

Empower 3 FR4 software can accommodate push installations of the Empower 3 FR4 software and instrument component software onto clients, LAC/E modules, and Citrix servers. To accomplish this, the Empower 3 FR4 Deployment Manager (installation program) supports silent installation. (Silent, or unattended, installation does not require user interaction.) During a silent installation, no interactive user interface is displayed. Instead, user or installation information is stored as predefined properties in a response file, which can then be called by a command line or from a batch file.

You can use silent installation to install Empower 3 FR4 software on a single machine on the same computer you are using, with no user interaction. You can also use silent installation to install Empower 3 FR4 software on several machines (different computers, with no user interaction), but you must use a host computer to “push” the installation silently onto the other machines.

### 11.1.2 Requirements

Empower 3 FR4 software supports push installations using a Microsoft tool called PsExec.exe. This utility is not included in the Empower 3 FR4 media, but you can download it using the following link:

<http://technet.microsoft.com/>

**Important:** This link points to the latest version of PsExec.

Using PsExec in Empower 3 FR4 requires the following tasks:

- Creating the Empower 3 FR4 response file
- Installing the PsExec.exe tool
- Creating a text file containing the node information (one line for each computer)
- Obtaining local administrator privilege on each client and LAC/E module
- Executing the silent installation, using the system account only (specify the option -s)
- Running the PsExec command in DOS or from a batch file

**Restriction:** When you perform a push installation on multiple computers, you must use the same type of computer for each installation (all clients, all LAC/E modules, or all Citrix servers). You cannot push installations onto a mix of computer types.

**Note:** If you are using a busLAC/E card in any of your computers, the busLAC/E driver will be installed automatically when the Empower 3 FR4 software is installed. The necessary settings are applied during installation. If you install a busLAC/E card after Empower 3 FR4 is installed, then the busLAC/E driver must be installed manually. See “Installing and configuring a busLAC/E driver” on [page 99](#) and [page 116](#) for details. The required busLAC/E driver version is 7.0.1.1.

**Important:** If you plan to change the name of the computer, do so before you install Empower. Do not change the name of the computer after Empower is installed.

### 11.1.3 Creating the response file

To perform a push installation of Empower 3 FR4 software, you must first create a response file. The response file must be in XML format, using correct XML syntax. A template file is available on the Empower 3 FR4 software media, in \Push Install\Empower3\E3\_Response.config.

The parameters in the response file define how the Empower 3 FR4 software will be installed. These settings apply to all of the computers that are installed during the push installation.

The template response file provided on the Empower 3 FR4 media accepts the Waters Software License Agreement by default.

**Note:** You can rename the response file, but the file extension must be .config.

The response file must contain the following information.

**Table 11–1: Contents of the response file**

Option	Description	Valid value	Default value
Property			
USERNAME	Name of the system user	Optional; enter desired name or leave default	Windows system user
COMPANYNAME	Name of the company	Optional; enter desired name or leave default	OS registered organization
PIDKEY	Software support ID number	Required for validation of support plan; enter number supplied	None
AGREETOLICENSE	Agree to Waters software license	Yes or No <b>Note:</b> If you select No, Empower 3 FR4 will not install.	Do not agree to the license
ORACLE_MEDIA	Path to Oracle media	Optional; provide desired path or leave blank	Root directory of the Empower 3 FR4 software media
INSTALL_TYPE	Empower 3 FR4 install type (client or LAC/E module)	C/S or LACE32	None
USE_TNS	Use tns_admin	True or False <ul style="list-style-type: none"> <li>If True, use the TNS_ADMIN variable. See <a href="#">page 74</a>, <a href="#">page 95</a>, and <a href="#">page 113</a>.</li> <li>If False, this variable will be ignored, but you must create a tnsnames.ora file. See <a href="#">page 74</a>.</li> </ul>	False (do not configure; ignore variable)
TNS_ADMIN_PROPERTY	Path to the tnsname.ora file	Optional; If used, provide path. Use format /TNS_ADMIN_PROPERT	None
LANGID	Installation and Empower 3 FR4 language	English Japanese Korean Chinese	English

**Table 11–1: Contents of the response file (Continued)**

Option	Description	Valid value	Default value
EMPOWER_APP_DIR	Destination path for Empower 3 FR4 software	Optional; If used, supply only the drive letter for the path	C:\ If drive is not specified or does not exist, installation will be Windows drive
ORACLE_CLIENT_DIR	Destination path for Oracle client	Optional; If used, supply only the drive letter for the path	C:\ If drive is not specified or does not exist, installation will be Windows drive
LOG_FILE_NETWORK_LOCATION	Network destination for copying the Empower 3 FR4 installation log file. (Places a copy of the log into the network share. This share must be writable by Everyone.)	Optional; Use format computername_datet ime_empower3.log	None
Command Line			
ACTION	Installation, upgrade, or removal	Install, Upgrade, or Remove <b>Note:</b> You can upgrade to Empower 3 FR4 from Empower 3 Feature Release 2 (FR2), or Empower FR2 Hotfix1, Empower 3 Service Release 2 (SR2), Empower SR2 Hotfix 1 or 2, Empower 3 Feature Release 3 (FR3), or Empower 3 FR3 Hotfix 1	None

**Table 11–1: Contents of the response file (Continued)**

Option	Description	Valid value	Default value
SkipRequirements	Skip the system requirement check	True or False	False (do not skip)
RESTART	Restart the system after installation or removal	True or False	False (do not restart system)
VerboseMode	Enable the verbose logging	No	No verbose logging

The following is a sample response file:

```
<?xml version="1.0" encoding="utf-8" ?>
<Configuration>
<Properties>
<!--May be left blank. It defaults to the windows user on the
client-->
<USERNAME></USERNAME>
<!--May be blank. Default is the OS registered Organization-->
<ORGANIZATION></ORGANIZATION>
<!--Software Support ID-->
<PIDKEY></PIDKEY>
<!--You must agree for installation to proceed - Agreed by
default-->
<AGREETOLICENSE>Yes</AGREETOLICENSE>
<!--Path to the oracle media - May be blank.-->
<ORACLE_MEDIA></ORACLE_MEDIA>
<!--C/S OR LACE32-->
<INSTALL_TYPE>C/S</INSTALL_TYPE>
<!--false ignore, true use the location and set tns-admin
property-->
<USE_TNS>>true</USE_TNS>
<!--Path to tnsnames.ora-->
<TNS_ADMIN_PROPERTY></TNS_ADMIN_PROPERTY>
!--English Japanese Korean Chinese-->
<LANGID>English</LANGID>
<!--Destination path for Empower 3 Application - Drive letter
only-->
<EMPOWER_APP_DIR>C:\</EMPOWER_APP_DIR>
<!--Destination path for Oracle Client - Drive letter only-->
<ORACLE_CLIENT_DIR>C:\</ORACLE_CLIENT_DIR>
```

```

<!--Network destination for Empower 3 log file to be copied-->
<LOG_FILE_NETWORK_LOCATION></LOG_FILE_NETWORK_LOCATION>
</Properties>
<CommandLine>
<!--Install/Upgrade/Remove-->
<ACTION>Install</ACTION>
<!--true/false-->
<SkipRequirements>>false</SkipRequirements>
<!--true/false-->
<RESTART>False</RESTART>
</CommandLine>
<Product>
</Product>
</Configuration>

```

**Tip:** Entering a LOG\_FILE\_NETWORK\_LOCATION places a copy of the installation log for each individual installation into the network share.

- For a successful installation, the log file name is:  
computername\_datetime\_empower3.log
- If the installation is not successful, the name is:  
ERR\_computername\_datetime\_empower3.log
- If the share is not accessible for any reason, this is noted in the local installation log (in the Windows directory).
- If no LOG\_FILE\_NETWORK\_LOCATION is supplied, then the log is only created on each computer where Empower 3 FR4 software is installed.

## 11.1.4 Installing PsExec.exe

**To install PsExec.exe:**

1. Download PsExec.exe using the following link:  
<http://technet.microsoft.com/>
2. On the site, type "psexec" in the search box, and click Search.
3. Click the PsExec link, and follow the instructions for downloading and installing PsExec.
4. Install PsExec on the computer from which the push or silent installation will be executed.

## 11.1.5 Creating the client text file

Create a text file that contains the names or IP addresses of all the clients, LAC/E modules, or Citrix servers where you want to install Empower 3 FR4. Place the text file on the computer from which the push installation will be executed. Use a separate line in this file for each computer. A sample text file is available on the Empower 3 FR4 media, in \Push Install\Empower3\Node\_List.txt.



The following is a sample client list:

Client1  
Client2  
10.3.7.142  
Client77  
Client23  
ResearchLab1  
ResearchLab2  
10.3.7.77

## 11.2 Empower 3 FR4 push installation (clients, LAC/E modules)

---

You can install Empower 3 FR4 as a fresh, new installation (on a client or LAC/E module where no Chromatography Data Software [CDS] is currently installed) or as an upgrade from Empower 3 Feature Release 2 (FR2), Empower FR2 Hotfix1, Empower 3 Service Release 2 (SR2), Empower SR2 Hotfix 1, Empower SR2 Hotfix 2, Empower Feature Release (FR3), or Empower 3 FR3 Hotfix 1.

**Important:** If your system is running an earlier version of Empower, you must first install Empower 3 FR2.

**Important:** TestExecute software is installed with Empower 3 FR4 software during the Empower 3 FR4 installation. Do not uninstall the TestExecute software, even though it appears in the Control Panel. Uninstalling the TestExecute software invalidates the Empower 3 FR4 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

### 11.2.1 Silent installation (on one computer)

Begin silent installation from the computer where you are installing Empower 3 FR4 (destination computer). You can install the following files locally or to a network share: <path to media> and <path to response file>.

**Note:** If you are performing a silent installation on a Citrix server, see [page 172](#).

#### To perform a silent installation from a command line:

1. Modify the response file, and set all the appropriate properties, see [page 164](#).

**Tip:** Ensure that the ACTION command line property in the response file is set to Installation (for a new installation) or Upgrade (for an upgrade from Empower 3 FR2, Empower FR2 Hotfix 1, Empower 3 SR2, Empower 3 SR2 Hotfix1, Empower 3 SR2 Hotfix2, Empower FR3, or Empower 3 FR3 Hotfix 1), and modify the install type to c/s.

2. Run Setup.exe from a DOS command line or in a batch file that includes the response file.

#### Use the following syntax:

```
<path to media>\Setup.exe /responseFile<path to response  
file>\E3_Response.config
```

Where,

- <path to media> is the location of the Empower 3 media installer files on a local machine or a network share.
- <path to response file> is the path to the location of the E3\_Response.config file or a local machine or a network share.

Requirement:

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>  
\\10.1.105.123\Push\E3_Response.config
```

Where,

- 10.1.105.123 is the computer hosting the push installation
- "Push" is the name of the shared folder
- "E3\_Response.config" is the name of the file that you want to execute.

Examples:

```
C:\E3FR4\Setup.exe /responseFile c:\PushE3FR4\E3_Response.config  
\\10.1.105.123\E3FR4\Setup.exe /responseFile  
\\10.1.105.123\PushE3FR4\E3_Response.config
```

**Result:** Empower 3 FR4 installs on the computer.

3. When the restart message appears, click Yes.

**Result:** The computer reboots.

**Tip:** The computer reboots automatically if Restart is set to True in the response file.

## 11.2.2 Push installation (to multiple computers from a host)

### Requirements:

- The push installation must be executed from a host machine. Empower 3 should not be installed on the host.
- All computers must be in the same domain.

The administrator must have local administrator privileges or must be a domain administrator on all the computers to which they will push the Empower 3 FR4 installation. The response file can be on a different network share. Create a client list (in a file named Node\_List.txt) that contains the names of appropriate client or LAC/E modules where you want to install Empower 3 FR4.

**Tip:** When you run PsExec, the response file is called as a command line argument, after the setup.exe file.

### To perform a push installation using PsExec:

1. Modify the Node\_List file to include all the appropriate client or LAC/E module names.

2. Modify the response file, and set all the appropriate properties.

**Tip:** Ensure that the ACTION command line property in the response file is set to Installation (for a new installation) or Upgrade (for an upgrade from Empower 3 Feature Release 2 (FR2), Empower 3 FR2 with Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 with Hotfix 1, or Empower 3 SR2 with Hotfix 2, Empower 3 Feature Release (FR3), or Empower 3 FR3 Hotfix 1.

3. Run the following command from a DOS command line or in a batch file and ensure that the path in the DOS prompt is set to the location of the psexec executable file.

Use the following syntax:

```
psexec @<path to node list>\Node_List.txt -s -d <path to  
media>\Setup.exe /responseFile<path to response  
file>\E3_Response.config
```

Where,

- <path to node list> is the network location where the node list text file resides (this file contains the names of the destination clients or LAC/E modules that will be installed).

**Tip:** If using the IP address results in an "Access Denied" error, use the machine name instead.

- File is the name of the node list text file.
- "-s" specifies to run the remote process using the System account; only the System account can be used for push installs; must be specified.

"-d" specifies to not wait for the process to terminate, allowing the installation to launch simultaneously on multiple systems.

- <path to media> is the location of the Empower 3 FR4 media installer files <Empower response file> is the path to the location of the E3\_Response.config file.

Requirement:

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>  
\\10.1.105.123\Push\E3_Response.config
```

Where,

- 10.1.105.123 is the computer hosting the push installation
- "Push" is the name of the shared folder
- "E3\_Response.config" is the name of the file that you want to execute.

Example:

```
c:\PushE3FR4\psexec @C:\PushE3FR4\Node_list.txt -s -d  
\\10.1.105.123\E3FR4\Setup.exe /responseFile  
\\10.1.105.123\PushE3FR4\E3_Response.config
```

**Result:** Empower 3 FR4 installs on the specified computers.

**Tip:** After starting the push installations, if you view the installation in Windows 7 computers, a dism.exe window may open after the installation starts. You need not close this window; it closes automatically after appearing for several seconds.

## 11.3 Empower 3 FR4 push installation (Citrix servers)

---

You can install Empower 3 FR4 as a fresh, new installation (on a Citrix server where no Chromatography Data Software [CDS] is currently installed) or as an upgrade from Empower 3 FR2, Empower FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2 Hotfix1, Empower 3 SR2 Hotfix 2, Empower 3 FR3, or Empower 3 FR3 Hotfix 1.

**Restriction:** If your system is running an earlier version of Empower, you must first install Empower 3 FR2.

**Important:** TestExecute software is installed with Empower 3 FR4 software during the Empower 3 FR4 installation. Do not uninstall the TestExecute software, even though it appears in the Control Panel. Uninstalling the TestExecute software invalidates the Empower 3 FR4 installation, causing the Verify Files utility to fail and requiring a complete reinstallation of the software.

### 11.3.1 Silent installation (on one Citrix server)

**Requirement:** The Citrix server must be in Install mode.

**To perform a silent installation from a command line:**

1. Put the server into Install mode by opening a command prompt and typing "Change user /install".
2. Modify the response file, and set all the appropriate properties.

**Tip:** Ensure that the ACTION property in the response file is set to Installation (for a new installation) or Upgrade (for an upgrade from Empower 3 FR2, Empower FR2 Hotfix 1, Empower 3 Service Release 2 (SR2), Empower 3 SR2

Hotfix1, Empower 3 SR2 Hotfix2, Empower 3 Feature Release 3, or Empower 3 FR3 Hotfix 1).

3. Run Setup.exe from a DOS command line or in a batch file that includes the response file. Ensure that the path in the DOS prompt is set to the location of the Empower 3 FR4 media.

**Use this syntax:**

```
<path to media>\Setup.exe /responseFile <path to response file>\E3_Response.config
```

Where,

- <path to media> is the location of the Empower 3 media installer files
- <path to response file> is the path to the location of the E3\_Response.config file.

Examples:

```
\\10.1.105.123\E3FR4\Setup.exe /responseFile  
\\10.1.105.123\PushE3FR4\E3_Response.config  
C:\E3FR4\Setup.exe /responseFile  
c:\PushE3FR4\E3_Response.config
```

Requirement:

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>  
\\10.1.105.123\Push\E3_Response.config
```

Where,

- 10.1.105.123 is the computer hosting the push installation
- "Push" is the name of the shared folder
- "E3\_Response.config" is the name of the file that you want to execute.

Examples:

```
\\10.1.105.123\E3FR4\Setup.exe /responseFile  
\\10.1.105.123\PushE3FR4\E3_Response.config  
C:\E3FR4\Setup.exe /responseFile  
c:\PushE3FR4\E3_Response.config
```

**Result:** Empower 3 FR4 installs on the server.

4. When the restart message appears, click Yes.

**Result:** The computer reboots.

**Tip:** The computer reboots automatically if the Restart option is set to True in the response file.

## 11.3.2 Push installation (to multiple Citrix servers from a host)

### Requirements:

- The Citrix server must be put in install mode before any installation of Empower 3 FR4; therefore, a push installation must be performed slightly differently than a regular push installation to a client or LAC/E module.
- All computers must be in the same domain.
- The administrator must have local administrator privileges or must be a domain administrator on all the computers to which they will push the Empower 3 FR4 installation.

The response file can be on a different network share. Create a client list (in a file named Node\_List.txt) that contains the names of the Citrix servers where you want to install Empower 3 FR4.

### To perform a push installation on Citrix servers:

1. Modify the Node\_List file to include all the appropriate Citrix sever names or IP addresses.
2. Modify the response file and set all of the appropriate properties.
3. Create and save a batch file (for example, PushCitrix.bat) that contains the following information:

Use this syntax:

```
change user /install
<path_to_media>\Setup.exe /responseFile <path to response
file>\E3_Response.config
change user /execute
```

Where,

- <path to media> is the path to the Empower 3 FR4 software media, and must be accessible by the Citrix server.
- <path to response file> is the path to the location of the E3\_Response.config file.

Example:

```
change user /install
\\10.1.105.123\E3FR4\Setup.exe /responseFile
\\10.1.105.123\PushE3FR4\E3_Response.config
change user /execute
```

Requirement:

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>
\\10.1.105.123\Push\E3_Response.config
```

Where,

- 10.1.105.123 is the computer hosting the push installation

- "Push" is the name of the shared folder
  - "E3\_Response.config" is the name of the file that you want to execute.
4. Run the following command from a DOS command line. Ensure the path in the DOS prompt is set to the location of the psexec executable file.

Use this syntax:

```
PSEXEC @\\local_machine or IP address\File<path to node
list>\Node_List.txt -s -d CMD /C <path to
PushCitrix.bat>\PushCitrix.bat
```

Where,

- local\_machine or IP address is where the node list text file resides (this file contains the names of the destination Citrix servers that you will install to).

**Tip:** If using the IP address results in an "Access Denied" error, use the machine name instead.

- 
- "-s" specifies to run the remote process using the System account; only the System account can be used for push installs; must be specified.
- "-d" specifies to not wait for the process to terminate, allowing the installation to launch simultaneously on multiple systems.
- <path to PushCitrix.bat> is the network location where the batch file resides (this is the file created in step 3).

Example:

```
c:\PushE3FR4\psexec @C:\PushE3FR4\Node_list.txt -s -d CMD /C
\\10.1.105.123\PushE3FR4\PushCitrix.bat
```

**Result:** Empower 3 FR4 installs on the specified Citrix servers.

## 11.4 Empower 3 FR4 push uninstallation (clients, LAC/E modules)

---

### 11.4.1 Silent uninstallation (from one computer)

**Note:** If you are performing a silent uninstallation on a Citrix server, see [page 177](#).

**To perform a silent uninstallation from a command line:**

1. Modify the response file, and set all the appropriate properties.
 

**Tip:** Ensure that the ACTION command line property in the response file is set to Remove.
2. Run Setup.exe from a DOS command line or in a batch file that includes the response file.

**Requirements:**

- Ensure the command is executed using a local administrator account by specifying the options -u (user name) and -p (password).

- Ensure the path in the DOS prompt is set to the location of the Empower 3 media.

**Example:**

```
<path to media>\Setup.exe /responseFile <path to response file>\E3_Response.config
```

Where,

- <path to media> is the location of the Empower 3 media installer files
- <path to response file> is the path to the location of the E3\_Response.config file.

Requirement:

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>
```

```
\\10.1.19.25\Push\E3_Response.config
```

Where,

- 10.1.19.25 is the computer hosting the push installation
- "Push" is the name of the Shared folder
- "E3\_Response.config" is the name of the file that you want to execute.

**Result:** Empower 3 is removed from the computer, and the computer restarts.

## 11.4.2 Push uninstallation (from multiple computers via a host)

**To uninstall Empower 3 software using push uninstallation:**

1. Modify the Node\_List file to include all the appropriate computer names and IP addresses from which you want to uninstall Empower 3.
2. Modify the response file to specify the INSTALL\_TYPE property (Empower 3 clients or LAC/E modules) where you want to uninstall Empower 3 software.
3. Modify the response file to specify that the ACTION command line property is set to Remove.
4. Run one of the preceding push installation commands in DOS or in a batch file, ensuring the command is executed using a local administrator account by specifying the options -u (user name) and -p (password).

```
<path to media>\Setup.exe /responseFile <path to response file>\E3_Response.config
```

Where,

- <path to media> is the location of the Empower 3 media installer files
- <path to response file> is the path to the location of the E3\_Response.config file.

Requirement:

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.



For example:

```
\\host or IP\Share\<file to execute>  
\\10.1.105.123\Push\E3_Response.config
```

Where,

- 10.1.105.123 is the computer hosting the push installation
- "Push" is the name of the Shared folder
- "E3\_Response.config" is the name of the file that you want to execute.

**Example:**

```
c:\PushE3FR4\psexec @C:\PushE3FR4\Node_list.txt -s -d  
\\10.1.105.123\E3FR4\Setup.exe /responseFile  
\\10.1.105.123\PushE3FR4\E3_Response.config
```

**Result:** Empower 3 FR4 is removed and the computer restarts.

## **11.5 Empower 3 push uninstallation (Citrix servers)**

---

### **11.5.1 Silent uninstallation (from one Citrix server)**

**Requirement:** The Citrix server must be put in install mode before you can perform a silent uninstallation.

**To perform a silent uninstallation from a command line:**

1. Put the server into Install mode by opening a command prompt and typing "Change user /install".
2. Modify the response file and set all the appropriate properties.  
**Tip:** Ensure the ACTION command line property in the response file is set to Remove.
3. Run Setup.exe from a DOS command line or in a batch file that includes the response file. Ensure the path in the DOS prompt is set to the location of the Empower 3 media.

For example:

```
<path to media>\Setup.exe /responseFile <path to response  
file>\E3_Response.config
```

Where,

- <path to media> is the location of the Empower 3 media installer files
- <path to response file> is the path to the location of the E3\_Response.config file.

**Requirement:**

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>  
\\10.1.105.123\Push\E3_Response.config
```

Where,

- 10.1.105.123 is the computer hosting the push installation
- "Push" is the name of the shared folder
- "E3\_Response.config" is the name of the file that you want to execute.

**Result:** Empower 3 is removed and the computer restarts.

## 11.5.2 Push uninstallation (from multiple Citrix servers via a host)

**Requirement:** The Citrix server must be put in install mode before you can perform a push uninstallation.

### To perform a push uninstallation from Citrix servers:

1. Modify the Node\_List file to include all the appropriate Citrix server names and IP addresses from which you want to uninstall Empower 3.
2. Modify the response file to specify that the ACTION command line property is set to Remove.
3. Create and save a batch file (for example, PushCitrix.bat) that contains the following information:

```
change user /install
<path_to_media>\Setup.exe /responseFile <path to response
file>\E3_Response.config
change user /execute
```

Where,

- <path to media> is the path to the Empower 3 FR4 software media, and must be accessible by the Citrix server.
- <path to response file> is the path to the location of the E3\_Response.config file.

**Requirement:**

The universal naming convention (UNC) must be used to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>
\\10.1.105.123\Push\E3_Response.config
```

Where,

- 10.1.105.123 is the computer hosting the push installation
  - "Push" is the name of the shared folder
  - "E3\_Response.config" is the name of the file that you want to execute.
4. Run the following command from a DOS command line. Ensure the path in the DOS prompt is set to the location of the psexec executable file.

```
PSEXEC @<path to node list>\Node_List.txt -s -d CMD /C <path
to PushCitrix.bat>\PushCitrix.bat
```

Where,

- <path to node list> is the network location where the node list text file resides (this file contains the names of the destination Citrix servers that you will un install to).  
**Tip:** If using the IP address results in an "Access Denied" error, use the machine name instead.
- "-s" specifies to run the remote process using the System account; only the System account can be used for push installs; must be specified.
- "-d" specifies to not wait for the process to terminate, allowing the installation to launch simultaneously on multiple systems.
- <path to PushCitrix.bat> is the network location where the batch file resides (this is the file created in step 3).

**Result:** Empower 3 uninstalls from all the specified Citrix servers.



# A Connecting from a remote location to a LAC/E module

## A.1 Connecting to LAC/E modules

---

The LAC/E module includes Remote Desktop Connection administration software, which is installed by default with Windows 7 or Windows 10 operating system. Use the Remote Desktop application to control the LAC/E module remotely.

## A.2 Remote Desktop Connection

---

For the LAC/E module to accept incoming remote connections, it must be enabled in System Properties.

**Tip:** Enabling remote connections for the LAC/E module is already set when it is delivered from Waters.

### A.2.1 Configuring Remote Desktop Connection on the host computer

**To allow Remote Desktop connections on a host computer:**

1. Right-click Computer and select Properties.  
**Tip:** In Windows 10, position the pointer in the lower-left corner of the screen, right-click Start > click System > Remote Settings.
2. Click the Remote Settings tab.
3. In the Remote Assistance field, select "Allow Remote Assistance Connections to this computer".
4. In the Remote Desktop field, select one of the following options, and then click OK:
  - Allow connections from computers running any version of Remote Desktop (less secure)
  - Allow connections only from computers running Remote Desktop with Network Level Authentication (more secure)

System administrators can use Remote Desktop Connection by default. It is also possible to add remote connection capability for other users or groups. To do so, on the LAC/E module, use the Select Users button on the Remote tab of the System Properties page.

## A.2.2 Starting Remote Desktop connection on the viewer computer

### To start a Remote Desktop connection:

1. On the client viewer computer, perform one of the following actions:
  - In Windows 7, click Start > All Programs > Accessories > Remote Desktop Connection.
  - In Windows 10, swipe in to the lower-right corner of the screen, click Search, type "remote desktop connection", and then select the option.
2. Enter the name or IP address of the remote host computer, and then click Connect.
3. In the Windows Security dialog box, enter your operating system user name and password, and then click OK.

**Tip:** If the viewer client and the Remote LAC/E module are configured in the same domain using the same IP address range and Subnet mask, you can connect to the remote LAC/E module using the remote system's computer name.

**Exception:** If the computer is not found, an error message appears. If the computer name was used to connect to the computer, then try again using the IP address.

## A.2.3 Considerations

Keep these considerations in mind when working with Remote Desktop Connection:

- In full screen mode, a connection bar appears at the top of the remote LAC/E module Host screen. (The host computer is called the remote computer in Remote Desktop Connection terminology.)  
The connection bar has the remote computer name or IP address that you entered, so it shows which <sup>LAC/E</sup> module you are remotely controlling. In addition, the connection bar offers the following controls:
  - Minimize button (-) – Minimizes the remote host desktop and returns you to the viewer computer desktop, with the remote host session minimized on the task bar.
  - Close button (x) – Disconnects the remote host session. You can also disconnect from the remote host by clicking Start > Disconnect.
  - Restore/Maximize button – Allows the remote host desktop to become a window on the viewer computer's desktop. When the remote desktop is a window, the Connection bar is no longer necessary and is no longer displayed.
- If you change the IP address at the remote LAC/E module during a remote connection session, and then click the OK button in Local Area Connection Properties, the session is immediately disconnected. You can then reestablish the connection using the new IP address for the computer name (or the computer name if the systems are in the same domain/IP address range/subnet mask).
- To disconnect from the remote system yet keep your Empower 3 logon session active, click the "x" on the connection bar in full-screen mode. Alternatively, at

the remote system desktop, click Start > Disconnect. When the Disconnect Windows Session message box appears, click OK.

When you disconnect from the LAC/E module, the remote Empower 3 session is still active and you are still actively logged on to the system. If you want to end your remote session, you must log off from the Empower 3 system.

- To log off and end a remote Empower 3 session, at the remote system desktop, click Start > Log Off. The Log Off Windows page appears. Click the Log Off Button. The LAC/E module shows the logon screen, ready to initiate another Remote Desktop Connection session.

**Tip:** Empower 3 services will run on the LAC/E module while it is at the logon screen.

If a system restart occurs at the remote host during a remote session, (for example, after a program installation and restart) you are automatically logged off from the remote system and returned to the viewer computer's desktop.

#### **To initiate a system restart or power-down:**

1. Click Start > Windows Security.

**Tip:** Doing so opens the same menu as pressing Control > Alt > Delete at the LAC/E module Desktop when using a local logon.

2. Click the Shutdown button.

**Tip:** Doing so opens the Shut Down Windows page.

3. Select Restart or Shutdown, and then click OK.

