

## Hardware and software requirements

This section provides information on the hardware and software requirements for a Power SCADA Operation with Advanced Reporting and Dashboards system.

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## Server CPU and RAM Requirements

Power Management software needs to be installed on dedicated machines, so that other non-Power Management software applications do not consume machine resources.

When selecting server hardware, carefully review the PassMark score and CPU Clock Speed. The required processor is defined according to an average CPU mark given by PassMark® Software. To check CPU performance, for example a Core i3 CPU, type "PassMark Core i3" in the search engine of a web browser. This will return the CPU's calculated performance as compared to other similar well-known processors.

### CPU and RAM recommendations for various system architectures

#### NOTES:

- The requirements listed in this topic are minimum requirements; we recommend that you consider doubling the RAM requirements listed.
- Power SCADA Anywhere server must have a CPU with SSE2 instruction set support.

### Power SCADA Operation

The following table lists the number of CPU cores and RAM required for a Power SCADA Operation system.

**NOTE:** Use the tag or device number that is higher of the 2 numbers. For example if you have a system using 120,000 tags with 300 devices, use 6 CPU cores and 12 GB of RAM.

Use the larger figure below	CPU PassMark Score	# CPU Cores	RAM (GB)
1,500 tags or 50 devices	1,800	1	4
50,000 tags or 200 devices	4,500	6	8
100,000 tags or 400 devices	8,000	6	12
150,000 tags or 600 devices	8,000	8	12
200,000 tags or 800 devices	8,000	8	12
250,000 tags or 1,000 devices	10,000	10	12
300,000 tags or 1,200 devices	10,000	10	16
350,000 tags or 1,400 devices	10,000	12	16
400,000 tags or 1,600 devices	10,000	12	16
450,000 tags or 1,800 devices	10,000	14	16
500,000 tags or 2,000 devices	10,000	14	20

### Power SCADA Operation and Power Monitoring Expert on the Same Machine

The following table lists the number of CPU cores and RAM required for a Power SCADA Operation and Power Monitoring Expert system on the same machine.

**NOTE:** Use the tag or device number that is higher of the 2 numbers. For example if you have a system using 120,000 tags with 300 devices, use 10 CPU cores and 28 GB of RAM.

Use the larger figure below	CPU PassMark Score	# CPU Cores	RAM (GB)
50,000 tags or 200 devices	8,000	10	16
100,000 tags or 400 devices	8,000	10	28
150,000 tags or 600 devices	8,000	12	36

For systems greater than 150,000 tags or 600 devices, we recommend a distributed architecture with separate physical machines for Power SCADA and Power Monitoring Expert.

### Power SCADA Operation and Power Monitoring Expert on separate machines

Refer to the *Power Monitoring Expert 9.0 – System Guide* for specific CPU and RAM requirements when installing Power SCADA and Power Monitoring Expert on separate machines.

## Client CPU, RAM, and disc requirements

Power SCADA Control or View Clients have the following minimum requirements:

- CPU: 2 Cores
- RAM: 4 GB
- Disk storage: 10 GB
- Screen resolution: 1920 X 1080

### Monitoring CPU for running systems

Optimal performance is achieved when all computers in your Power SCADA Operation network use approximately 40% or lower CPU in normal state. If you have any concerns about system responsiveness or its ability to handle abnormal situations, consider adding resources to lower overall CPU utilization.

### Power SCADA Graphics Adapter

128 MB of dedicated VRAM (for systems of any size)

### Power SCADA Anywhere

The Power SCADA Anywhere host requirements for disk, CPU, and RAM are negligible.

The Power SCADA Anywhere host must have CPU with SSE2 instruction set support.

## Server disk storage

### Required disk space without Advanced Reporting

When planning a Power SCADA system without Advanced Reporting (Power Monitoring Expert), you can fine tune your disk storage requirements based on how Power SCADA Operation stores data.

Power SCADA Operation has 2 major consumers of disk storage space:

1. Alarm information which is stored in a propriety database that may grow over time to a size of 1-2 GB.
2. Historical data stored in trend files; flat files on the disk. The size and number of these trend files depend on number of tags in system, logging interval, and number of years to store data.

Trend files are pre-allocated (reserved) on the hard disk the first time that Power SCADA is started. Hard disk space does not "grow" over time by acquiring trend data. In other words, if the hard drive is not big enough for the number of years of trending that you plan for, the system will tell you.

### Calculating disk storage

To calculate disk storage size for you system, use the [Power SCADA Disk Sizing Calculator](#).

**NOTE:** These values include a 2 GB alarm database size and assume that you configure trends to be stored in separate files each week.

**Scenario #1: Trend data logged every 15 minutes / Stored for 2 years**

	1,500 Tag System	5,000 Tag System	15,000 Tag System	50,000 Tag System	200,000 Tag System
TOTAL disk space required	2.95 GB	5.16 GB	11.49 GB	33.62 GB	128.50 GB

**Scenario #2: Trend data logged every 5 minutes / Stored for 2 years**

	1,500 Tag System	5,000 Tag System	15,000 Tag System	50,000 Tag System	200,000 Tag System
TOTAL disk space required	4.63 GB	10.75 GB	28.26 GB	89.53 GB	352.14 GB

## Supported Operating Systems

The following table lists the compatible operating systems for all versions of Power SCADA Operation and includes all Power SCADA Operation components (Servers, Clients, Advanced Reporting and Dashboards, etc):

**NOTE:** 64-bit operating systems are recommended for best performance.

Operating System	Power SCADA Operation Version				
	9.0	8.2	8.1	8.0	7.40
Windows Server 2016 Standard	✓	✓	–	–	–
Windows 10 Professional/Enterprise	✓ <sub>4</sub>	✓	✓ <sub>1</sub>	✓ <sub>2</sub>	–
Windows Server 2012 R2 Standard/Enterprise	✓	✓	✓	✓ <sub>3</sub>	–
Windows 8.1	–	✓	✓	✓ <sub>3</sub>	–
Windows Server 2012 Standard	✓	✓	✓	✓	✓
Windows Server 2008 R2 SP1	–	✓	✓	✓	✓
Windows 7 Professional/Enterprise	✓ <sub>4</sub>	✓	✓	✓	✓
Windows Server 2008	–	–	–	–	✓

1: Available with PowerSCADA Expert 8.1 update 6 or later

- 2: Available with PowerSCADA Expert 8.0 Service Release 1 update 3 or later
- 3: Available with PowerSCADA Expert 8.0 Service Release 1
- 4: Support for 64-bit Windows only

**NOTE:** Power SCADA Anywhere is supported on Windows Server 2012 R2, and Windows Server 2008 R2 SP1 only.

## Supported browsers

### Web client access

Power SCADA has 2 approaches to web client access:

1. Native web clients – If you do not use Power SCADA Anywhere, you will be using the native web clients for the Power SCADA runtime along with the various applications that have different native browser support capabilities.
2. Power SCADA Anywhere client— Enables an HTML5 web client experience by using 3rd party Windows Desktop Services (Terminal Services) to stream a Windows desktop application of the Power SCADA runtime to remote web browsers.

### Native web client browser support

Power SCADA Operation native web client supports the following browsers:

	IE 11	IE 10	Edge	Chrome	Firefox	Safari
Power SCADA graphics pages including one-line diagram/engine	Yes	Yes	No	No	No	No
PME reports, PME dashboards, and PME WebReach Diagrams	Yes	Yes	Yes	Yes	Yes	Yes
Power SCADA Basic Reports	Yes	Yes	No	No	No	No
LiveView (Power SCADA Real Time Tables implementation)	Yes	Yes	No	No	No	No

### NOTES:

- Limitation: Only one instance of the Power SCADA native web client can be opened at a time in a web browser. In other words, you cannot open multiple tabs with the Power SCADA native web client running.
- PME components—such as PME Real Time Tables and PME Alarms—are only supported in IE as of v8.2. In a combined Power SCADA and PME architecture, these components are not recommended to be used.

### Power SCADA Anywhere browser support

Power SCADA Anywhere supports the following browsers:

	IE 11	IE 10	Edge	Chrome	Firefox	Safari
Power SCADA Anywhere	Yes	Yes	Yes	Yes	Yes	Yes

When using Power SCADA Anywhere, we are assuming that the various components listed below are integrated into a runtime experience that is being used in a Control or View-only Client:

- Power SCADA graphics pages including one-line diagram/engine
- PME reports, PME dashboards, and PME WebReach diagrams
- Power SCADA Basic Reports
- LiveView (Power SCADA Real Time Tables implementation)
- Notification Module (configuration tools)

When these components are integrated into a runtime that is being streamed using Power SCADA Anywhere, all HTML5 client browsers listed above are supported.

Unlike the Power SCADA native web client, multiple instances of Power SCADA Anywhere can be opened at the same time in a web browser.

## Supported SQL Server Versions

Power SCADA Operation with Advanced Reporting and Dashboards requires a Microsoft SQL Server database. Power SCADA Operation with Advanced Reporting and Dashboards supports the following SQL Server versions:

- SQL Server 2017 Express/Standard/Enterprise/Business Intelligence
- SQL Server 2016 Express/Standard/Enterprise/Business Intelligence
- SQL Server 2014 Express/Standard/Enterprise/Business Intelligence
- SQL Server 2012 Express/Standard/Enterprise/Business Intelligence, SP2

**NOTE:** Power SCADA Operation 9.0 **without** Advanced Reporting and Dashboards does NOT require a SQL Server database.

Power SCADA Operation with Advanced Reporting and Dashboards installation media (DVD & ISO) includes SQL Server 2016 Express that can be used with Advanced Reporting.

## Virtualization

The following table lists the virtualization support for Power SCADA Operation with Advanced Reporting and Dashboards:

	Microsoft Hyper-V	VMWare vSphere
Power SCADA Server (including web server host)	Yes	Yes
Power SCADA Control Client & View-only Client (this refers to Windows Desktop clients)	Yes	Yes

Mobile Notifications	Yes	Yes
Power SCADA Anywhere (this refers to machine hosting Power SCADA Anywhere)	Yes	Yes
Advanced Reporting and Dashboards (ie: PME)	Yes	Yes

When using virtual environments, we recommend that you license all components with software keys, not USB dongles.

**NOTE:** Power Monitoring Expert is validated with additional virtualization systems, see the *Power Monitoring Expert 9.0 – System Guide* for additional details.

Virtualization configuration notes:

- Set all resource allocation (CPU, memory, and disk) to fixed; dynamic is not supported.
  - Do not share resources between virtual machines via over-allocation.
- You must have a dedicated hard drive used by Power SCADA only.
- You must have a fixed-size disk virtual machine.
- Set host (eg: ESX host) power management to “High Performance”.

Additional virtual machine configuration guidelines vary by hypervisor.