

**LYNQ**

# System Requirements

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# About LYNQ

LYNQ is reinventing manufacturing execution system (MES) software for small to midsize manufacturers looking for a configurable, plug-and-play offering to digitalise and drive their factory performance. Formed around international standard IEC62264, LYNQ’s all-in-one solution can plan, track, automate, analyse and optimise factories to increase efficiency, productivity and profitability.

## Purpose

This document explains the minimum hardware and software requirements for LYNQ software only. Please remember to take into consideration any specific hardware and software requirements for your ERP application, when calculating overall system requirements. It’s common for LYNQ to co-exist on the same servers that host your ERP application.

LYNQ is not supplied with client access licenses for operating systems or licenses for database management systems (DBMS). These must be purchased separately. This document is provided as a guideline only and LYNQ cannot guarantee the accuracy of any information presented after the date of publication. LYNQ makes no warranties, express, implied or statutory, as to the information in this document.

## Components

LYNQ mes is a hybrid product combining web based and desktop applications to provide the best possible customer and user experience.

### **MOM - Manufacturing Operations Management**

LYNQ mom is a web-based application used in production and hosted on Internet Information Services. Unlike LYNQ aps, which is a tool deployed to just planners within the organisation, an instance of LYNQ mom is required per ERP company. Meaning if you have a production company and need to deploy a test instance, two installs of LYNQ mom are required.

### **APS - Advanced Planning & Scheduling**

LYNQ aps is a desktop client application used by planners. The application is typically deployed to a PC or via Remote Desktop Services/Citrix in multi user environments where centralised deployment of the application is required. LYNQ aps supports multi companies and only one installation of LYNQ aps is required.

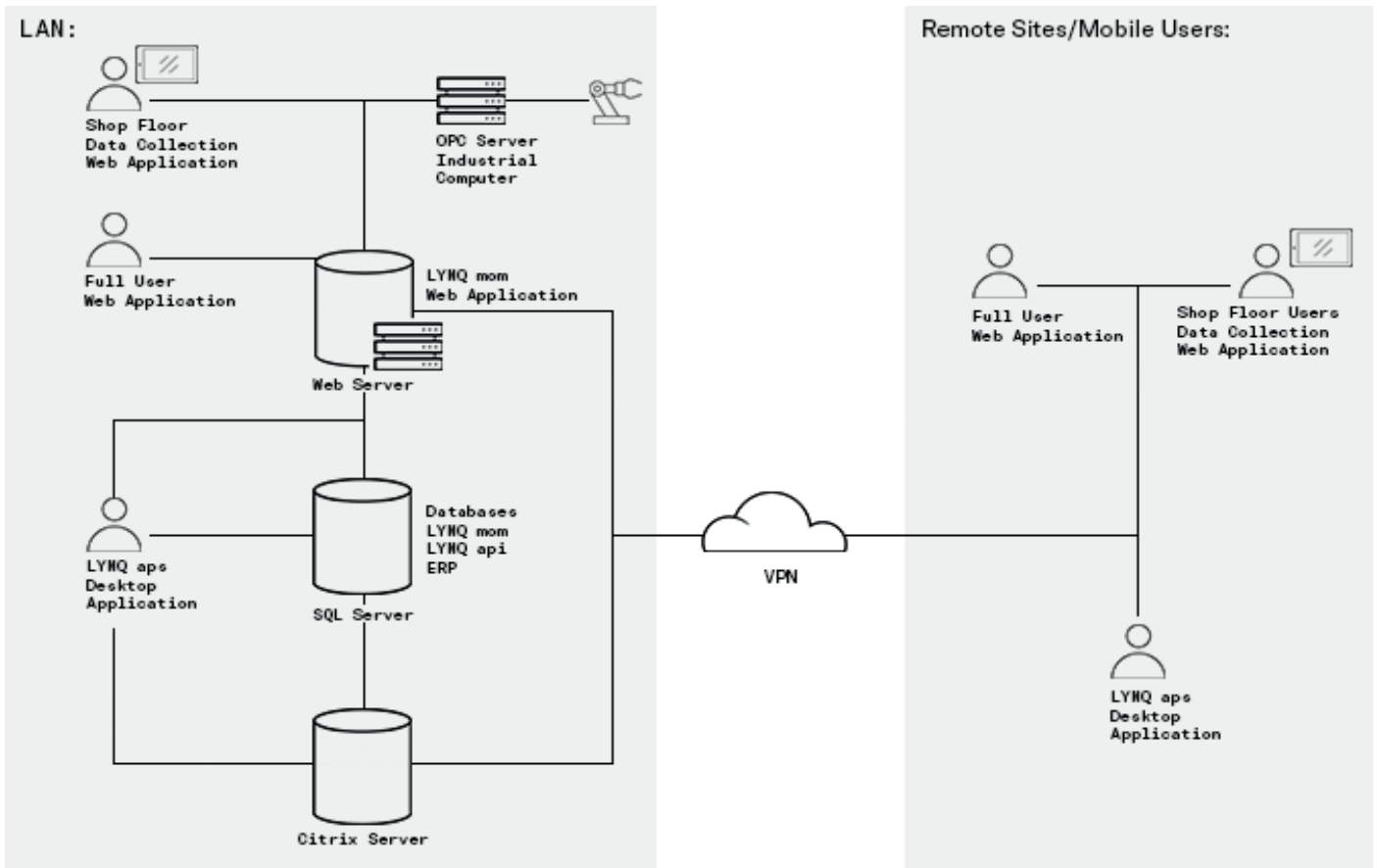
### **API - Application Program Interface**

LYNQ api is web-based application program providing connectivity to ERP and third-party applications. Only one installation of LYNQ api is required as multi company support is provided. This application should be made available to system administrators and to any user that will maintain the integration between your ERP application and LYNQ.



# Configuration

In the example below, components of LYNQ are installed on a separate Web and SQL Server. LYNQ mom and LYNQ api are installed on the Web Server and the databases required by these components reside on the SQL Server. LYNQ may co-exist on either the same web server that hosts your ERP application or on a separate dedicated LYNQ web server. The databases for LYNQ must however be deployed to the same SQL instance as your ERP application. LYNQ supports both Hyper-V and VMWare virtualised platforms.



You may optionally choose to install LYNQ aps on a dedicated Application Server instead of on the user's PC. The application server should not host Microsoft SQL Server or Internet Information Services due to performance concerns. The application server will require a certain amount of RAM to be set aside for the operating system, leaving the rest for client sessions. LYNQ aps is processor intensive therefore a dedicated processor (core) for each LYNQ aps session is recommended.

This type of setup is suitable for organisations where performance and security of the application is an important consideration.

# Minimum Server Hardware Requirements SQL Server

The following hardware requirements should be considered for production environments.

## Hardware requirements

Company Size	Users	RAM	Cores (virtual)	Cores (physical)
Small	1 to 10	8GB	2 to 4	1 processor
Medium	11 to 100	16GB	4 to 6	2 processors
Large	100+	24GB	6 to 8	2 processors

## Database sized by component

Component	SQL Database(s)	Initial DB Size	Growth Expectations
LYNQ aps	No separate database. LYNQ aps tables are stored in the ERP database	N/A	Minimal change to table sizes
LYNQ mom	4 databases <ul style="list-style-type: none"> <li>• Data</li> <li>• Config</li> <li>• Logic</li> <li>• Statistic</li> </ul>	400MB	The data and logic databases will increase significantly from their initial size. The percentage of growth is dependant upon the volume of data tracked. Minimal change to the config database size.
LYNQ api	1 database	100MB	Minimal change to database size

## SQL Disk and Database Configuration

LYNQ mom maintains separate databases for the application logic, application, application configuration and application statistics. NOTE: Remember to include in any disk capacity calculations adequate space for storing transaction logs, incremental and full SQL backups as required.

Unless you can tolerate any downtime, you should add protection to your servers against unexpected drive failures by using RAID. Hardware RAID implementations are always preferred over software RAID implementations. RAID 0 (disk striping without parity) offers optimal read/write performance, but if a drive fails, IIS/SQL won't be able to continue operation until the drive is replaced and its contents are restored from backup. Because of this, RAID 0 isn't the recommended choice. RAID 1 (disk mirroring) creates duplicate copies of data on separate physical drives, allowing the server to remain operational when a drive fails, and even while the RAID controller rebuilds a replacement drive in a failed mirror. RAID 5 (disk striping with parity) offers good protection against single-drive failure but has poor write performance. RAID 1+0 (disk striping and mirroring with parity) offers the best level of performance and protection.

For the best network throughput, all servers should be configured with a 1GB Network Interface.

**NOTE:** Hardware requirements for both the Database and Web Server should be periodically reviewed to ensure LYNQ's response times are within acceptable levels for your organisation. To maintain read/write times it is recommended that Microsoft SQL Server Database Maintenance plans are configured to rebuild and reorganise data on a regular basis.

## Supported editions of Microsoft SQL Server

Database Management System (DBMS)	Support Versions
Microsoft SQL Server (Standard & Enterprise Editions)	<ul style="list-style-type: none"> <li>• 2008 R2</li> <li>• 2012</li> <li>• 2014</li> <li>• 2016</li> <li>• 2017</li> </ul>

# Minimum Server Hardware Requirements

## Web Server

### Hardware requirements

No. of LYNQ Instances	RAM	Cores (virtual)	Cores (physical)	Hard Disk*
1 to 2	4GB - 8GB	2 to 4	1 processor	2GB
3 to 4	8GB - 16GB	2 to 4	1 processor	4GB
5+	4GB Per Instance	2 to 4	2 processors	5GB+

\*Allow 1GB of Disk Space per LYNQ instance and add any additional space requirements for storing attachments in the document library.

### Software Requirements

Software	Requirements
Operating Systems	<ul style="list-style-type: none"> <li>• Windows 7</li> <li>• Windows 8</li> <li>• Windows 10</li> <li>• Windows Server 2008 R2</li> <li>• Windows Server 2012</li> <li>• Windows Server 2012 R2</li> <li>• Windows Server 2016</li> <li>• Windows Server 2019</li> <li>• Microsoft .NET Framework 4.0 and above</li> </ul>
Internet Information Services	<ul style="list-style-type: none"> <li>• IIS 7.0+</li> </ul>
Browser	<ul style="list-style-type: none"> <li>• Microsoft Edge</li> <li>• Google Chrome</li> </ul>
Optional Software	<ul style="list-style-type: none"> <li>• SSL Certificate</li> </ul>

# Minimum Client Requirements

## LYNQ mom

Hardware	Requirements
Device	<ul style="list-style-type: none"> <li>• PC</li> <li>• Laptop</li> <li>• Tablet PC</li> <li>• iPad</li> </ul>
Screen Resolution/Size	<ul style="list-style-type: none"> <li>• 10" screen minimum for tablet devices FHD resolution or higher</li> </ul>
CPU	<ul style="list-style-type: none"> <li>• Intel i5 or equivalent</li> </ul>
RAM	<ul style="list-style-type: none"> <li>• 2GB</li> </ul>
Network	<ul style="list-style-type: none"> <li>• 100MB/1GB Network Interface</li> </ul>
Optional Hardware	<ul style="list-style-type: none"> <li>• High quality touchscreen device ISO, VESA wall mounting devices</li> </ul>
Operating System	<ul style="list-style-type: none"> <li>• Android and iOS</li> <li>• Windows 7</li> <li>• Windows 8</li> <li>• Windows 10</li> </ul>
Browser	<ul style="list-style-type: none"> <li>• Microsoft Edge</li> <li>• Google Chrome</li> <li>• Safari</li> </ul>

## Minimum Client Requirements - LYNQ aps

Hardware	Requirements
Device	<ul style="list-style-type: none"> <li>• PC</li> <li>• Laptop</li> <li>• Server</li> </ul>
Screen Resolution/Size	<ul style="list-style-type: none"> <li>• 21" - 24" screen</li> <li>• FHD screen resolution or higher</li> </ul>
CPU	<ul style="list-style-type: none"> <li>• Intel i5 or equivalent</li> <li>• 2-4 Virtual Cores or 1 physical processor</li> </ul>
RAM	<ul style="list-style-type: none"> <li>• 8GB</li> </ul>
Network	<ul style="list-style-type: none"> <li>• 100MB/1GB Network Interface</li> </ul>
Operating System	<ul style="list-style-type: none"> <li>• Windows 7</li> <li>• Windows 8</li> <li>• Windows 10</li> <li>• Windows Server 2008 R2</li> <li>• Windows Server 2012</li> <li>• Windows Server 2012 R2</li> <li>• Windows Server 2016</li> <li>• Windows Server 2019</li> </ul>
Disk Space	<ul style="list-style-type: none"> <li>• 1GB</li> </ul>

Supplying additional cores will provide faster performance of the application. LYNQ aps uses Random Access Memory (RAM) to temporarily store data whilst processing. The amount of memory required is based on the amount of data to process. You should consider 4GB/8GB RAM per LYNQ aps session depending on the complexity of scheduling requirements and volume of data.

# Factory Automation System Requirements

## Minimum Hardware and Software Requirements - OPC Server

Hardware	Requirements
Device	<ul style="list-style-type: none"> <li>Industrial Fanless PC</li> <li>Mounting: VESA or wall brackets</li> </ul>
CPU	<ul style="list-style-type: none"> <li>Intel i3 or equivalent</li> </ul>
RAM	<ul style="list-style-type: none"> <li>4GB and above</li> </ul>
Operating System	<ul style="list-style-type: none"> <li>Windows Server 2008 R2</li> <li>Windows Server 2012</li> <li>Windows Server 2012 R2</li> <li>Windows Server 2016</li> <li>Windows Server 2019</li> </ul>
Ports and Connectivity	<ul style="list-style-type: none"> <li>2Gb LAN ports</li> <li>2 COM ports (RS-232/422/485)</li> <li>4 USB ports</li> </ul>
Audio jacks: line-out, mic-in	<ul style="list-style-type: none"> <li>2 HDMI ports</li> <li>1 VGA port</li> </ul>

Lynq Limited, Lancaster Court, 8 Barnes Wallis Road  
Fareham PO15 5TU