

**LYNQ**



# **System Requirements**

LYNQ | MES 2023

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# About LYNQ

LYNQ is reinventing manufacturing execution systems (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 inefficiency, productivity, and profitability.

## Introduction

This document addresses the minimum suggested requirements for deploying LYNQ on-premise and may also be used to calculate the system requirements for hosting LYNQ in a private cloud environment. Due to multiple industry changes and rapid equipment obsolescent, it is recommended that you seek the advice of a hardware specialist as well as a knowledgeable license specialist before making purchase commitments.

You must ensure that you take into consideration any third-party software products such as Microsoft Windows Server, Microsoft SQL Server as they have their own system requirements that might be different from the system requirements of LYNQ. Moreover, note that LYNQ follows a support life cycle policy. In this policy Microsoft provides guidelines for product support availability throughout a product life cycle. For more information, see the Microsoft support life cycle policy on the Microsoft Website.

LYNQ is not supplied with client access licenses for operating systems or Microsoft SQL Server. 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 make no warranties, express, implied, or statutory, as to the information in this document.

## Solution Components

LYNQ MES is a hybrid product combining web based and desktop applications to provide the best possible customer and 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 deployed just to planners, an instance of LYNQ mom is required per ERP company (database). Meaning if you have a production company and need to deploy a sandbox instance, two installations of LYNQ mom are required.

### APS – Advanced Planning and Scheduling

LYNQ aps is a desktop finite capacity-based planning and scheduling tool used by planners. The application is typically deployed to a PC. Alternatively LYNQ aps may be deployed via Windows Virtual Desktop, Remote Desktop Services or Citrix in environments where centralised deployment is required.

### API – Application Program Interface

LYNQ api is a web-based application providing connectivity to the ERP application and other third-party applications. LYNQ api supports multiple instances of ERP companies and therefore the application only needs to be installed one. LYNQ api is typically only accessed by System Administrators.

# Client Requirements

## LYNQ mom

Users access the application using one of the supported web browsers on a personal computer, laptop or tablet device.

### Minimum Software Requirements

| Operating Systems   |           |
|---|-----------|
| Operating Systems Supported                                 | Supported |
| Android & iOS   | Yes       |
| Microsoft Windows 11  | Yes       |
| Microsoft Windows 10  | Yes       |
| Microsoft Windows 8 and 8.1                                 | Yes       |
| Microsoft Windows 7 (Professional, Ultimate and Enterprise) | Yes       |
| Microsoft Windows Server 2019                               | Yes       |
| Microsoft Windows Server 2016                               | Yes       |
| Microsoft Windows Server 2012 R2                            | Yes       |
| Microsoft Windows Server 2012                               | Yes       |

| Web Browsers           |           |
|------------------------|-----------|
| Web Browsers Supported | Supported |
| Internet Explorer      | No        |
| Microsoft Edge         | Yes       |
| Google Chrome          | Yes       |
| Safari                 | Yes       |

### Minimum Hardware Requirements

- 10" high resolution screen
- Intel i5 or equivalent
- 2 GB RAM
- WIFI/100MB/1GB Network Interface
- Barcode scanners (optional)
- Mounting devices (optional)

# Client Requirements

## LYNQ aps

If there are any remote APS users, (user located on a different network to the database server) then additional consideration should be made as to how the remote user will run LYNQ aps. Running the application over a VPN is usually the preferred option as it is more secure, but it may not be the best option for performance and stability. Publishing LYNQ aps in a thin client environment may provide a better user experience, in this case.

### Minimum Software Requirements

| Operating Systems   |           |
|---|-----------|
| Operating Systems Supported                                 | Supported |
| Microsoft Windows 10  | Yes       |
| Microsoft Windows 8 and 8.1                                 | Yes       |
| Microsoft Windows 7 (Professional, Ultimate and Enterprise) | Yes       |
| Microsoft Windows Server 2019 Remote Desktop Services       | Yes       |
| Microsoft Windows Server 2016 Remote Desktop Services       | Yes       |
| Microsoft Windows Server 2012 R2 Remote Desktop Services    | Yes       |
| Microsoft Windows Server 2012 Remote Desktop Services       | Yes       |

| Web Browsers           |           |
|------------------------|-----------|
| Web Browsers Supported | Supported |
| Internet Explorer      | No        |
| Microsoft Edge         | Yes       |
| Google Chrome          | Yes       |
| Safari                 | Yes       |

### Other Software Requirements

- Domain Joined for Windows Authentication
- Microsoft .NET Framework 3.5

### Minimum Hardware Requirements

- 21" – 24" high resolution screen
- Intel i5 or equivalent
- 2-4 virtual cores or 1 physical processor
- 8 GB RAM
- 100 MB/1 GB Network Interface

**Note:** LYNQ aps uses random access memory (RAM) to temporarily store data whilst processing. The amount of memory is based on the workload.

- Light to Medium Workload 8 GB RAM
- Heavy Workload 16 GB RAM

# Server Requirements

## LYNQ mom Web Server

A typical installation of LYNQ comprises of these components

- LYNQ mom Web Site (Instance installed per ERP Company)
- LYNQ api Web Site (Supports Multiple ERP Companies)

Hardware requirements are based on the number of instances installed and the number of resources configured for scheduling and data collection. In multi company scenarios, the hardware requirements are scaled up by the number of instances installed.

### Minimum Software Requirements

| Operating Systems   |           |
|---|-----------|
| Operating Systems Supported                                 | Supported |
| Microsoft Windows 10  | Yes       |
| Microsoft Windows 8 and 8.1                                 | Yes       |
| Microsoft Windows 7 (Professional, Ultimate and Enterprise) | Yes       |
| Microsoft Windows Server 2019                               | Yes       |
| Microsoft Windows Server 2016                               | Yes       |
| Microsoft Windows Server 2012                               | Yes       |
| Microsoft Windows Server 2012                               | Yes       |

**Note:** LYNQ web sites may be installed on a windows client for demonstration and training purposes only. Production environments must be installed on a Microsoft Windows Server environment.

### Other Software Requirements

- Web Server Role enabled (Internet Information Services)
- Microsoft .NET Framework 4.8
- SSL Certificate (optional and not supplied by LYNQ)

### RAM Requirements

RAM is calculated based on the number of resources licensed and the number of instances installed.

Allow for:

- 80MB per resource (Named & Automated)
- 2GB RAM per MOM instance
- 2GB RAM for the Windows Operating System

$(\text{Named Resources} + \text{Automated Resources}) \times (\text{RAM per Resource}) + (\text{Instance RAM}) + (\text{Windows RAM})$

### CPU Requirements

CPU is calculated based on the number of resources licensed.

Allow for:

- 30MHz per resource (Named & Automated)
- 2GHz for the Windows Operating System

(Named Resources + Automated Resources) x (CPU per Resource) + (Windows GHz)

#### Examples

| ERP Companies | Named Resources | Automated Resources | RAM  | CPU  | Disk Space |
|---------------|-----------------|---------------------|------|------|------------|
| 1             | 50              | 50                  | 14GB | 5GHz | 1GB        |
| 2             | 100             | 100                 | 22GB | 8GHz | 2GB        |

#### Disk Space Requirements

The default size of the program files folder following an installation of MOM, is approximately 1GB in size. Except for any media attached in MOM by using the Document Library Feature, nearly all data is stored on the SQL Server. By default, media attached using the Document Library is stored on the C drive on the Web Server. The location can be changed to a different network drive from the LYNQ api global settings menu option.

# Server Requirements

## Database Server

### Minimum Software Requirements

| Microsoft SQL Server                    |           |
|---|-----------|
| Microsoft SQL Server Editions Supported | Supported |
| SQL Server 2012                         | Yes       |
| SQL Server 2014                         | Yes       |
| SQL Server 2016                         | Yes       |
| SQL Server 2017                         | Yes       |
| SQL Server 2019                         | Yes       |

**Note:** Web, Standard and Enterprise editions are supported. SQL Server express edition may be used for training and demonstration purposes only. Due to the restrictions enforced by Microsoft, it is not recommended to use the SQL Server express edition in production environments.

### RAM Requirements

RAM is calculated based on the number of resources licensed.

Allow for:

- 80MB per resource (Named & Automated)
- 8GB RAM for the Windows Operating System

$(\text{Named Resources} + \text{Automated Resources}) \times (\text{RAM per Resource}) + (\text{Windows RAM})$

### CPU Requirements

CPU is calculated based on the number of resources licensed.

Allow for:

- 30MHz per resource (Named & Automated)
- 2GHz for the Windows Operating System

$(\text{Named Resources} + \text{Automated Resources}) \times (\text{CPU per Resource}) + (\text{Windows GHz})$

### Examples

| ERP Companies | Named Resources | Automated Resources | RAM  | CPU  | Disk Space    |
|---------------|-----------------|---------------------|------|------|---------------|
| 1             | 50              | 50                  | 16GB | 5GHz | See Microsoft |
| 2             | 100             | 100                 | 24GB | 8GHz | See Microsoft |

### Disk Space Requirements

Refer to the SQL Server System Requirements documentation.



## Minimum Database Size by Component

The following table provides a guide for the initial size and expected database growth over a 3-year period.

| Component | SQL Database(s)         | Initial Size | Purpose   | Growth Expectations  |
|-----------|-------------------------|--------------|---|--|
| LYNQ aps  | ERP or Staging Database | 100 MB       | Refer to the Integration Whitepaper to understand where LYNQ aps data is stored. Depending upon the ERP integrated ERP application, data may be stored in the ERP database or in a staging database | The tables created in the ERP/Staging database will be minimal in size and minimal in growth.  |
| LYNQ mom  | MOM Data                | 100 MB       | Stores all LYNQ mom application transactional data  | Expected growth over a 3-year period 1 GB to 100 GB. Largely dependent upon the number of transactions generated in the workbench feature. |
|           | MOM Data Live           | 100 MB       | Stores live statistics for reporting purposes   | Expected growth over a 3-year period 1 GB to 5 GB. Largely dependent upon the number of transactions generated in the workbench feature.   |
|           | MOM Config              | 100 MB       | Stores all LYNQ mom configuration data  | Expected growth over a 3-year period 100 MB to 1 GB.   |
|           | MOM Logic               | 100 MB       | Stores all LYNQ mom logic data  | Expected growth over a 3-year period 1 GB to 50 GB. Largely dependent upon the number of transactions generated in the workbench feature.  |
|           | MOM FA                  | 100 MB       | Stores all data relating to Factory Automation, if in use   | Expected growth over a 3-year period 1 GB to 100 GB. Largely dependent upon the number machines automated and the level of data collected. |
| LYNQ api  | LYNQ api                | 100MB        | Stores all configuration data related to the integration with ERP   | The LYNQ api database is unlikely to increase in size over time.   |

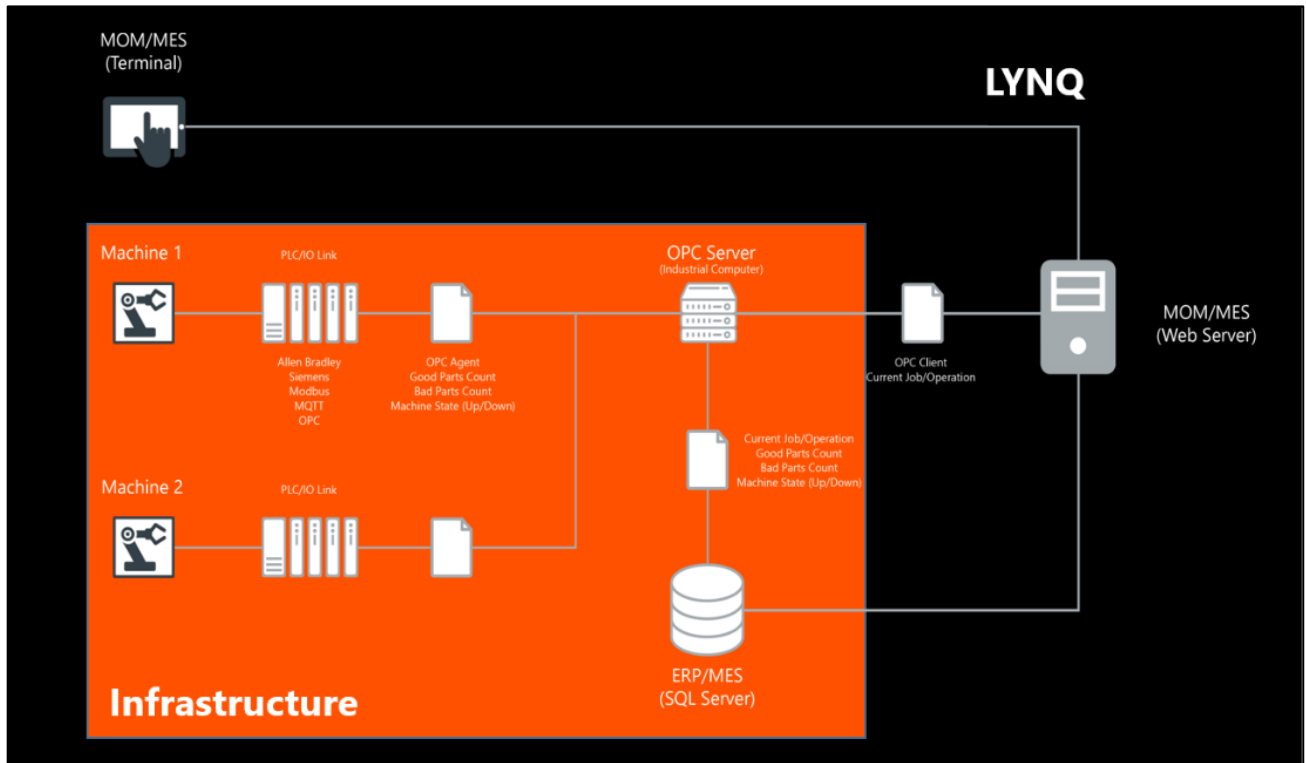
# Server Requirements

## OPC Server (Optional Factory Automation)

Factory automation is entirely dependent on the infrastructure illustrated in the Factory Automation Topology Diagram. You must have LYNQ implemented to utilise factory automation.

Machines that will be configured as automated devices in LYNQ must already be connected to a PLC or IO device and communicating with the OPC Server.

Factory Automation Topology Diagram



## Minimum Software Requirements

| Operating Systems                |           |
|----------------------------------|-----------|
| Operating Systems Supported      | Supported |
| Microsoft Windows Server 2019    | Yes       |
| Microsoft Windows Server 2016    | Yes       |
| Microsoft Windows Server 2012 R2 | Yes       |
| Microsoft Windows Server 2012    | Yes       |

## Minimum Hardware Requirements

- Industrial Fanless PC
- Intel i3 or equivalent
- 4 GB RAM
- 2 GB LAN ports
- 2 COM ports (RS-232/433/485)
- 2 HDMI ports / 1 VGA port

# Shared Server Infrastructure

## ERP Infrastructure


To minimise licensing, hardware, and operating costs, LYNQ may share all or some of the server infrastructure required by your connected ERP application. In cases where the ERP application is hosted and provided in a SaaS deployment, this may not be possible. However, if the ERP application is deployed on-premise and sharing of the infrastructure is a possibility, LYNQ may be deployed on the same Microsoft SQL Server and the same IIS Web Server.

- **Microsoft SQL Server** This could be the same SQL server where the ERP databases are hosted.
- **IIS Web Server** (Windows Server with the Web Server (IIS) Role enabled). The web server does not have to be dedicated to LYNQ, it can be shared with other applications. LYNQ do suggest following Microsoft best practice and advise that the Web Server (IIS) Role is separated from the database services. This will provide better security and performance, but LYNQ do not enforce this recommendation and the application can be installed on the same server that hosts the SQL Database Services.

**Note:** In a shared infrastructure environment, the overall combined minimum hardware requirements specified in this document for LYNQ and the hardware requirements for the ERP application, may be lower than adding both requirements together. The servers should be monitored to ensure the combined hardware requirements are not over or under specified.

## Cloud Hosting of LYNQ

When LYNQ uses the ERP's API for integration purposes, it is possible to host LYNQ in the cloud whilst the ERP application is hosted in a separate cloud hosting location. Refer to the Integration Topology diagram in the Integration Whitepaper for further information.



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