



THE MANUFACTURING CLOUD



MACH2

Mach2 IT Prerequisites

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(For the most recent version visit: <http://korsengineering.com/ITPrerequisites>)

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1 OVERVIEW

The intent of this document is to present the **minimum** requirements for you to successfully run, and for Kors to successfully support Mach2. It is the customer's responsibility to provide the necessary hardware, software, and network infrastructure required.

2 INSTALLATION REQUIREMENTS

2.1 SERVER REQUIREMENTS

A server is required for hosting the Mach2 application. The following are concerns Windows desktop operating systems, as opposed to server operating systems.

- You do not control the update process timing effectively. Unplanned restarts without first performing an orderly shutdown of Niagara can have unanticipated consequences. This can range from inconvenient timing (the middle of a shift) to significant loss of data.
- During some Windows updates the Host ID changes, which renders the Niagara license invalid. This does not occur with server operating systems.
- The Niagara service does not auto-start reliably.
- Many remote access applications require a monitor to be attached if running on a desktop operating system.
- Servers generally use RAM that is registered and has error correction, which dramatically improves operating system stability. Desktop PCs do not have this. This feature (or lack thereof) is one of the primary reasons desktops need to be restarted significantly more often than servers.

The following is a list of the **minimum** requirements for that server.

- It can be a physical or virtual machine that resides on the facility network. Cloud based hosting is not supported.
- It must be dedicated to the Mach2 application only. No other applications such as SQL Server can be installed on this server.
- For upgrades to be supported by Kors Engineering, a new server will be required to ensure the new system is completely set up and tested before the old one is retired. This will allow the new server to comply with any new or updated requirements.
- System Specifications
 - The processor, memory, and storage listed below are minimum starting points. There are several major factors that can increase these resource requirements for an implementation:
 - Scope: How many WorkCenters are integrated.
 - Complexity: How many functions are added or customized for those WorkCenters.
 - Efficiency: How efficiently the logic is written.
 - External Systems: Outside databases or systems that are being interacted with; the quantity and speed of those transactions are very relevant.
 - Processor: Intel Xeon CPU E5-4655 x64
 - RAM: 16 GB
 - Hard disk: 64 GB, more may be required, depending on archiving

- Operating system: Windows Server 2016 or 2019
Our application cannot be installed on prior operating systems. Overall, Kors does not recommend, support, or endorse using any product that is no longer supported by the manufacturer. Unsupported software may have unpatched critical flaws, security vulnerabilities, or unknown incompatibilities that could lead to major disruptions in your environment, and/or create a security risk for your organization.
- Ethernet Port: Wired 100 Mbit– Gigabit preferred
- IP address: A static address is required
- Kors Engineering requires an administrative account (local is preferred).
The account provided to us must be part of the built in Administrators group, which has complete and unrestricted access to the computer.
- Antivirus Considerations
 - Full system file scans cannot be run during Mach2 production hours. They must be scheduled while the Mach2 application is not in use.
 - Real time traffic analysis is not recommended due to the increase in latency that results from it. It can dramatically affect the user experience.
 - The Mach2 Application and Station directories should be excluded from real-time file monitoring. This can have a negative impact on application performance and stability.

2.2 CLIENT REQUIREMENTS

- Operating system
 - Windows 10 Pro/Enterprise (64-bit)
- Internet Browser
 - Google Chrome
- Device must be able to access the Mach2 server over the network.

2.3 ACCESS REQUIREMENTS

Access from the Mach2 server to the following devices and/or systems are required:

- The PLC(s) and/or controller(s) of the machines to be integrated
- Line printers (serial number tag printers and/or container label printers)
- Local traffic must be able to access the following ports on your Mach2 server:

User	Purpose	Port(s)
Mach2	Allows you to access the Mach2 application from other PCs within your facility	302, 443

- The server must be able to reach the following internet addresses as an anonymous user.

Required for all customers:

User	Purpose	Domain	Port(s)
Mach2	Allows software installer download	mach2demo.com	80, 443
	Critical Mach2 updates	update.korsengineering.com	80, 443, 3025
	License validation	licensing.korsengineering.com	80, 443
Kepware	License validation	licensing.kepware.com	80, 443
	License activation and renewal	my.kepware.com	80, 443
Niagara	License validation	axlicensing.tridium.com	80, 443

Required for Plex Customers:

User	Purpose	Domain	Port(s)
If you <u>are not</u> COLO	Enables the MicroClient object (SOAP API) to access the Plex production & test environments	api.plexonline.com	80, 443
		test.api.plexonline.com	80, 443
	Enables the DataSource object (HTTP API) to access the Plex production & test environments	cloud.plex.com	443
		test.cloud.plex.com	443
If you <u>are</u> COLO	Enables the DataSource object (HTTP API) to access the Plex production & test environments	yourcompanycode.on.plex.com	443
		yourcompanycode.test.on.plex.com	443

3 KORS ENGINEERING SUPPORT REQUIREMENTS

3.1 OVERVIEW

As part of the initial download and installation of Mach2, Kors Engineering configures what is referred to as a station. By default, when the Mach2 software is first loaded, the station is not running. To configure and start the station, a commissioning tool running on the Kors development PC is required.

For station configuration, development efficiency, and support of the Mach2 project by the Kors Engineering staff, remote access to the Mach2 server is required. This remote access allows Kors Engineering to download, set-up, configure, and troubleshoot the Mach2 application quickly without being physically at the facility.

A screen sharing connection does NOT allow the Kors engineers the ability to complete the necessary set-up, configuration, and troubleshooting functions. Only some functions are possible using a screen sharing connection and using them is extremely slow and cumbersome so it should only be used in extreme emergency conditions such as production is down, and all other connection options are unavailable.

3.2 CONNECTION REQUIREMENTS

- RDP (Remote Desktop Protocol) must be enabled to manage the installation, licensing, and support of Niagara and Kepware.
- Ports 3011 & 5011 must allow traffic to manage the Niagara platform, which includes station backups, copying, saving, etc.
- Ports 1911 & 4911 must allow traffic to manage the Mach2 station, which includes access to create and modify functionality.
- Because proxy servers typically cause issues and prevent the above functions from operating properly, they are not supported.
- Intrusion Prevention or Detection Systems (IPS/IDS) can interfere with or totally prevent communication with the Mach2 server. Exceptions must be created for the traffic described above.
- The ability to transfer files directly between the Kors development PC and the Mach2 server must not be inhibited by any method either hardware or software.
- The connection account credential should be valid for enough time to complete the project, or at least 90 days.

3.3 CONNECTION QUALITY

- Stable & Reliable

For the connection to be stable and reliable, it needs to have as few nodes or components as possible. This means it cannot have multiple hops, multiple remote desktops, or multiple VPN links. It must be one connection from the network that contains the Mach2 server to the Kors Engineering network.

- Speed

The connection needs to be fast enough to support the connection protocols below, load web pages without timeouts, and transfer files in reasonable period of time.

- Latency

The connection needs to have low enough latency to ensure no loading delays, no input lags, and no mouse cursor "shadow" when in use.

3.4 CONNECTION OPTIONS

3.4.1 TeamViewer

Kors has selected TeamViewer as its primary connection method. We need a direct connection to the Mach2 server, so TeamViewer needs to be installed on that server. It must be configured for “Unattended Access” and have the “VPN Driver” installed. Here is the required installation link: <https://get.teamviewer.com/mach2>

If you have installed using a different link, please uninstall and reinstall using this link.

3.4.2 Alternative Options

- A. A VPN connection provided by the customer to the facility network providing access to the Mach2 server. This cannot be just an RDP connection; it must provide unrestricted access to the ports on the server.
- B. A NAT route setup in the facility firewall to the Mach2 server on the TCP ports listed above to route the appropriate traffic. It is suggested to only allow access from the Kors external IP address (216.234.118.66).

4 PRINTER ACCESS

If label printing is a requirement of the project, then Kors Engineering will need access to the printers located on the production line from the Mach2 server.

These printers must be connected directly to the facility network via an Ethernet cable and accessible using a static IP address.

Any routing, set-up, and/or networking will need to be completed such that Kors Engineering can print a label using a print string from the Mach2 server.

5 CONTROLLER ACCESS

A controller is defined as but not limited to a PLC, torque tool, loop controller, or IO module used for operation of the machine and capable of interfacing with the Mach2 application. The controller(s) used for the operation of the machine(s) associated with the workcenter to be integrated needs to be connected to the network and assigned a static IP address. Any routing or setup required needs to be completed by the customer to allow unrestricted network communication between the Mach2 server and the controller.

6 EMAIL

If email notifications from the Mach2 application are required for the project, a dedicated email account must be setup. The username, password and configuration information for that account must be provided.

7 IP ADDRESSES

The IP addresses for the controllers, printers, and the Mach2 server must be provided.

8 ACRONYM GLOSSARY

Acronym	Definition
IP	Internet Protocol
NAT	Network Addressing Translation
IDS	Intrusion Detection System
IPS	Intrusion Prevention System
PLC	Programmable Logic Controller
Mach2	The engine used to create the integration system. Responsible for local storage and data collection from factory floor equipment and automated data transportation to/from POL
TCP	Transmission Control Protocol
VPN	Virtual Private Network