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Experion LX

Control Hardware and I/O Module Firmware Upgrade Guide

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About This Document

This document provides procedures for upgrading Experion LX control hardware and I/O modules to current firmware versions.

Release Information

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Intended Audience

Personnel who are responsible for maintaining system hardware and upgrading hardware firmware versions to current and/or compatible levels.

Prerequisite Skills

- Familiar with working in a Windows operating environment.
- Familiar with using Experion LX Engineering Tools Control Builder application.

References

The following list identifies all documents that may be sources of reference for material discussed in this publication.

Document Title
Control Building Guide
Software Change Notice (SCN)

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Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user, often in terms of performing a task.
	REFERENCE -EXTERNAL: Identifies an additional source of information outside of the bookset.
	REFERENCE - INTERNAL: Identifies an additional source of information within the bookset.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. **CAUTION** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death. **WARNING** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.

Symbol	Definition
	WARNING, Risk of electrical shock: Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible.
	ESD HAZARD: Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	Protective Earth (PE) terminal: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	Functional earth terminal: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	Earth Ground: **Functional earth connection.** NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	Chassis Ground: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

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1. Introduction

1.1 Planning for Experion LX control hardware and I/O module upgrades

Use the following checklist to plan the tasks you need to complete to upgrade your given Experion LX control hardware.

Upgrade consideration	Is associated task applicable? (Yes or No)	Topic Reference
Do you Have C300 Process Controllers?		*Upgrading Firmware in Series 8*
Do you have Series 8 I/O Modules?		*Upgrading Firmware in Series 8*

2. Upgrading Firmware in Series 8 Modules

This section covers the tasks associated with upgrading the firmware in Series 8 modules. The Series 8 Firmware Load Tool (CTool) utility supports the upgrade of firmware in Series C form factor components.

2.1 Upgrading Firmware in Multiple Series 8 Devices

Use the following instructions to upgrade the firmware in these Series 8 devices:

- C300 Controller (C300)
- Series 8 I/O Modules

Prerequisites

- Ensure you have installed the Experion LX R110 software, configured the base IP address as well as addresses for time servers through the **System Preferences** selection in the Control Builder's **Tools** menu, and set the Device Index number for each C300 through the Binary Coded Decimal switches on its input/output termination assembly (IOTA).
- Ensure all Series 8 devices are set to their corresponding **IDLE** state prior to loading firmware. Also ensure that your process is **off control**, since loading firmware interrupts the component's normal operation.
- Ensure you have configured and loaded all C300 blocks, since Series 8 I/O Modules are only shown in CTool when the I/O Link is configured and loaded.
- Ensure you consult the *Software Change Notice* (SCN) for any special instructions or considerations before upgrading the firmware in any device.

Considerations

CAUTION	Ensure that the power is **not** removed from a module while its firmware is being upgraded. If power to a module is turned **Off** before the upgrade procedure completes, it is possible that the upgrade does **not** complete and the module may need to be replaced. If this occurs, the module will **not** start its power-on self test after its power is restored.

- Do not change system time while firmware is being loaded. If system time is changed, the firmware load may fail.
- You must run one instance of CTool on either the primary or backup Experion LX server.

Note: The first time you launch the CTool utility it may take up to 40 seconds before the Series 8 devices on the network appear in the module listing table.

- The CTool detects when modules are added or removed as well as when I/O Link cables are added or removed, which affect the presence of I/O Modules.
- A firmware download to a Series 8 device erases all its configuration information. You must reload the device's configuration information after a firmware update. Since CTool shows only I/O Modules on a loaded I/O Link, loading firmware to a C300 erases the I/O Link, which means the I/O Modules on the link are no longer visible.
- If you simultaneously select Series 8 I/O Modules and C300 Controller for firmware loading, CTool loads I/O Modules first before loading firmware to C300 Controller.
- The CTool utility does **not** allow loading firmware to a synchronized secondary device when the primary device is still on control.
- The loading of a new BOOT image automatically erases the application (APP) image in a module.
- You can check the status of firmware loads to single or multiple devices through the status message box on the CTool window.
- The CTool utility only shows updated status information for the modules while it is busy loading modules with new firmware and/or rebooting a module. It does continue to monitor for added/removed devices until all operations are complete.
- You cannot initiate a new firmware download or device reboot, while a firmware load or device reboot is in progress.
- If CTool is unable to load firmware to one of the selected modules, it skips loading firmware to that module and continues to load other selected modules.

The CTool display automatically includes the following color coding for application and boot firmware versions.

- **Red** - The module type is recognized, however, the device firmware version/revision is obsolete and no longer supported.
- **Green -** The module type is recognized and the device firmware version/revision is associated with the current release of Experion LX.
- **Blue -** The module type is recognized and the device firmware version/revision is interoperable with the current release of Experion LX, however, it is not the most recent version/revision of the firmware but it is still supported.

– **Black -** The loading of this module type is not supported by the CTool utility.

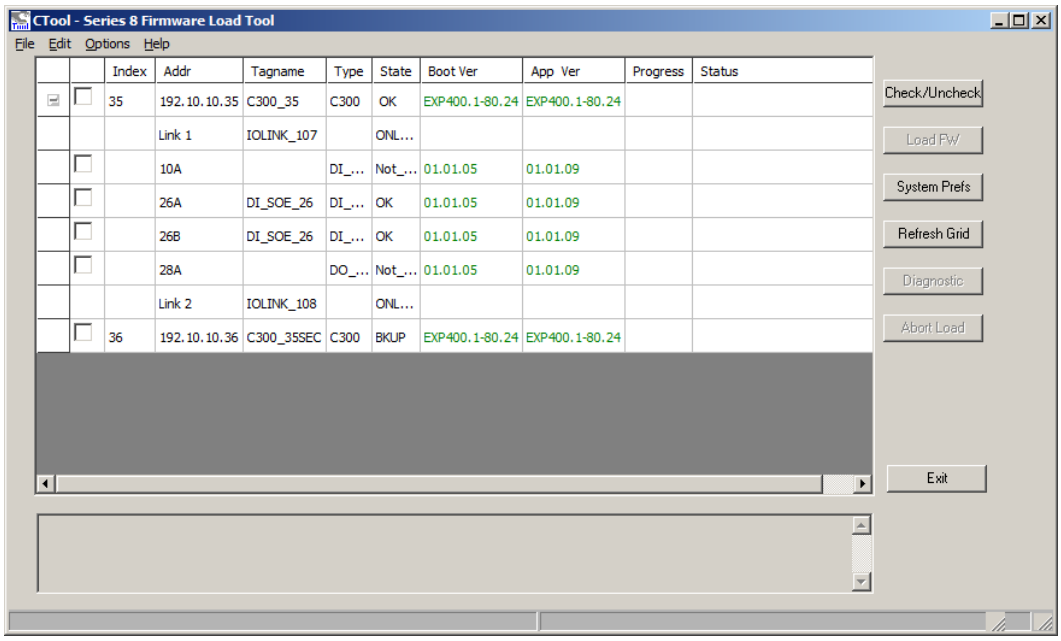


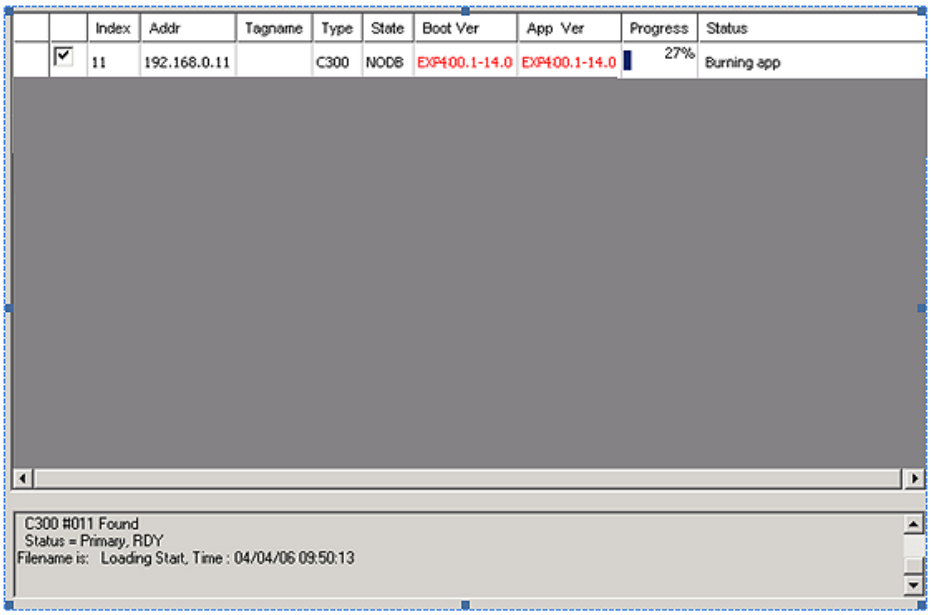
Figure 1 Typical CTool display with color coded boot and application firmware versions.

To load firmware in multiple Series 8 devices, perform the following steps.

Step	Action
1	• Choose **Start** > **Run** The **Run** dialog box appears. • Click **Browse**. The **Browse** dialog box appears. • Browse to: *C:\Program Files\Honeywell\Experion PKS\Engineering Tools\system\Firmware\CTools*. • Select the **CTools.exe** file and then click **Open**. • Click **OK** to launch the CTool application and close the **Run** dialog box.
2	• Wait for the module listing table to appear in the **CTool** window. • For C300 devices, click the plus sign in the first table column to expand the table listing to show the C300's configured I/O Links and associated Series 8 I/O Modules, as shown in the following example illustration excerpt of the module listing table.

		Index	Addr	Tagname	Type	State	Boot Ver	App Ver
⊟	☐	35	192.10.10.35	C300_35	C300	OK	EXP400.1-80.24	EXP400.1-80.24
			Link 1	IOLINK_107		ONL...		
	☐		10A		DI_...	Not_...	01.01.05	01.01.09
	☐		26A	DI_SOE_26	DI_...	OK	01.01.05	01.01.09
	☐		26B	DI_SOE_26	DI_...	OK	01.01.05	01.01.09
	☐		28A		DO_...	Not_...	01.01.05	01.01.09
			Link 2	IOLINK_108		ONL...		
	☐	36	192.10.10.36	C300_35SEC	C300	BKUP	EXP400.1-80.24	EXP400.1-80.24

Step	Action
3	• Click **Check/Uncheck** to have the utility select all the modules that require a firmware update by selecting the check box for the applicable module in the module listing table. • If applicable, use the horizontal and vertical scroll bars to scroll information in the table for viewing. Check for modules that have interoperable firmware for the current Experion LX release but it is not the most current version/revision (color code Blue). You must select these modules individually for updating, since the check/uncheck function does not automatically select them for updating.
4	Click **Load FW** to initiate the firmware update of the selected modules. The CTool utility takes care of all the steps required to update the selected modules.
5	You can monitor the firmware update activity through the status message box and the Status column in the module listing table, as shown in the following example illustration.



6	Wait for the load operation to complete and all Boot Ver and App Ver entries shown in the module listing table to become current.

Step	Action
7	Choose **File** > **Exit** to close the CTool window.

2.2 Upgrading Firmware in Single Series 8 Device

Use the following instructions to upgrade the firmware in any one of these Series 8 devices:

- C300 Controller (C300)
- Series 8 I/O Modules

Prerequisites

- Ensure you have installed the Experion LX R110 software, configured the base IP address as well as addresses for time servers through the **System Preferences** selection in the Control Builder's **Tools** menu, and set the Device Index number for each C300 through the Binary Coded Decimal switches on its input/output termination assembly (IOTA).
- Ensure all Series 8 devices are set to their corresponding **IDLE** state prior to loading firmware. Also ensure your process is **off control**, since loading firmware interrupts the component's normal operation.
- Ensure you have configured and loaded all C300 blocks, since Series 8 I/O Modules are only shown in CTool when the I/O Link is configured and loaded.
- Identify the required firmware update file names and locations. These are documented in the *Software Change Notice* (SCN). You can compare these with the Release firmware versions listed in the **ver_rev.txt** file that is usually stored in this directory location: *C:\Program Files\Honeywell\Experion PKS\Engineering Tools\system\bin*, and/or the Control File firmware version listed for a given device stored in this default directory location: *C:\Program Files\ Honeywell\Experion PKS\Engieering Tools\sytem\Firmware*.
- Ensure you consult the *Software Change Notice* (SCN) for any special instructions or considerations before upgrading the firmware in any device.

Considerations

CAUTION	Ensure power is **not** removed from a module while its firmware is being upgraded. If power to a module is turned **Off** before the upgrade procedure completes, it is possible that the upgrade did **not** complete and the module may need to be replaced. If this occurs, the module will **not** start its power-on self test after its power is restored.

- Do not change system time while firmware is being loaded. If system time is changed, the firmware load may fail.
- You must run one instance of CTool on either the primary or backup Experion LX server.

  Note: The first time you launch the CTool utility it may take up to 40 seconds before the Series 8 devices on the network appear in the module listing table.
- The CTool detects when modules are added or removed as well as when I/O Link cables are added or removed, which affect the presence of I/O Modules.
- Since CTool does not detect duplicate Device Index settings during its scan, devices with duplicate Device Indexes are prevented from joining the FTE network and are invisible to the CTool application.
- A firmware download to a Series 8 device erases all its configuration information. You must reload the device's configuration information after a firmware upgrade.
- The CTool utility does **not** allow loading firmware to a synchronized secondary device when the primary device is still on control.
- The loading of a new BOOT image automatically erases the application (APP) image in a module.
- You can check the status of firmware loads to single or multiple devices through the status message box on the CTool window.
- If device's application (APP) firmware is not the current version, CTool will only load application firmware when module is selected and **Load FW** is clicked.
- The CTool utility only shows updated status information for the modules while it is busy loading modules with new firmware and/or rebooting a module. It does continue to monitor for added/removed devices until all operations are complete.
- You cannot initiate a new firmware download or device reboot, while a firmware load or device reboot is in progress.

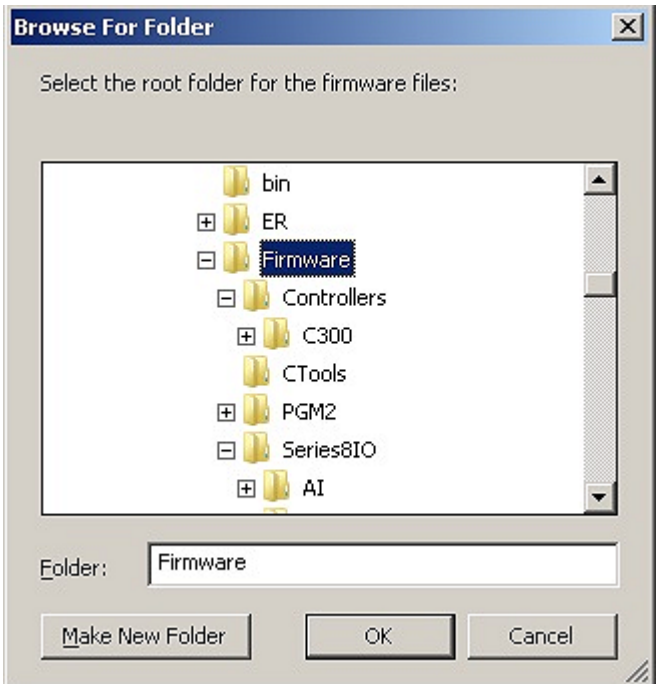
- If required, you can change the default path to the Control File (.lcf) firmware through the **System Prefs** button on the CTool window. Refer to the section, *To change default path to Control File firmware-optional*, for details.
- The CTool display automatically includes the following color coding for application and boot firmware versions.
  - **Red** - The module type is recognized, however, the device firmware version/revision is obsolete and no longer supported.
  - **Green** - The module type is recognized and the device firmware version/revision is associated with the current release of Experion LX.
  - **Blue** - The module type is recognized and the device firmware version/revision is interoperable with the current release of Experion LX, however, it is not the most recent version/revision of the firmware but it is still supported.
  - **Black** - The loading of this module type is not supported by the CTool utility.

To change default path to Control File firmware – optional, perform the following steps.

If you change the previously noted default directory location for the Control File firmware, use the following procedure to change the default path used by the CTool utility.

Step	Action
1	• Choose **Start** > **Run** The Run dialog box appears. • Click **Browse** to open the **Browse** dialog box. • Browse to: *C:\Program Files\Honeywell\Experion PKS\Engineering Tools\system\Firmware\CTools*. • Select the CTools.exe file and click **Open**. • Click **OK** to launch the CTool application and close the **Run** dialog box.
2	Wait for the module listing table to appear in the **CTool** window.
3	Click **System Prefs** to open the **Browse For Folder** dialog box.

Step	Action



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- Navigate the directory tree in the list box to find and select the new default folder for firmware files, so the file name appears in the **Folder** field.
- Click **OK** to save the default path change and close the **Browse For Folder** dialog box.

5 Click **Exit** to close the **CTool** window or go to the next section.

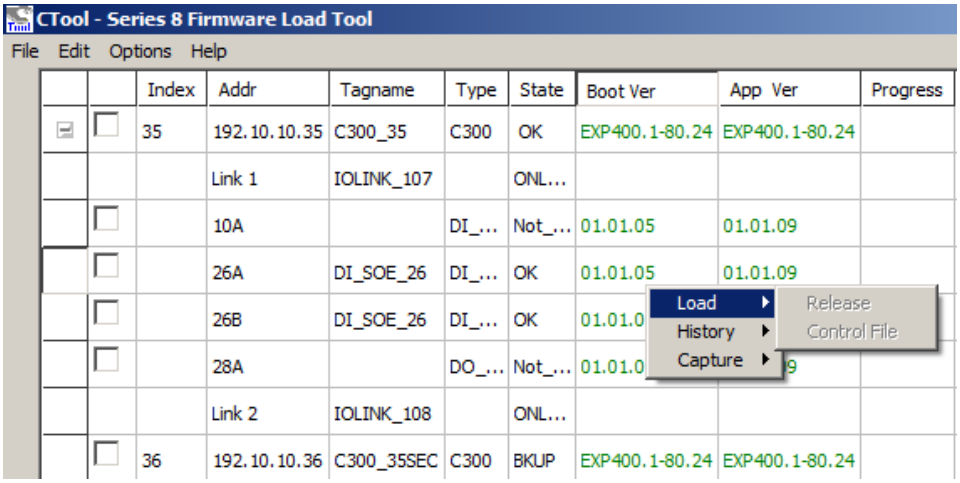
To load firmware in single Series 8 device, perform the following steps.

Step	Action
1	• Choose **Start** > **Run** The Run dialog box appears. • Click **Browse** to open the **Browse** dialog box. • Browse to: *C:\Program Files\Honeywell\Experion PKS\Engineering Tools\system\Firmware\CTools*. Select the CTools.exe file and click **Open** Click **OK** to launch the CTool application and close the **Run** dialog box.
2	• Wait for the module listing table to appear in the **CTool** window. • For C300 devices, click the plus sign in the first table column to expand the table listing to show the C300's configured I/O Links and associated Series 8 I/O Modules, as shown in the following example illustration excerpt of the module listing table.

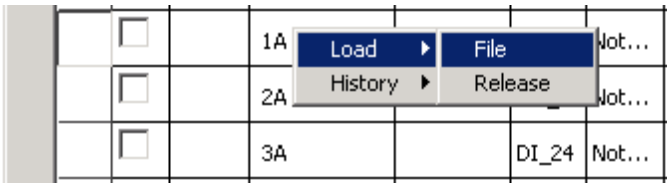
		Index	Addr	Tagname	Type	State	Boot Ver	App Ver
⊟	☐	35	192.10.10.35	C300_35	C300	OK	EXP400.1-80.24	EXP400.1-80.24
			Link 1	IOLINK_107		ONL...		
	☐		10A		DI_...	Not_...	01.01.05	01.01.09
	☐		26A	DI_SOE_26	DI_...	OK	01.01.05	01.01.09
	☐		26B	DI_SOE_26	DI_...	OK	01.01.05	01.01.09
	☐		28A		DO_...	Not_...	01.01.05	01.01.09
			Link 2	IOLINK_108		ONL...		
	☐	36	192.10.10.36	C300_35SEC	C300	BKUP	EXP400.1-80.24	EXP400.1-80.24

3	Right-click in the row for the module to be upgraded to open the shortcut menu.

Step	Action



Note: The shortcut menu for Series 8 I/O modules differs from the one above as shown below.



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- To use the **Release** version source for the upgrade, select **Load > Release** from the shortcut menu list to initiate the upgrade.
- To use the **Control File** or **File** source for the upgrade, select **Load > ControlFile (**or **File)** from the shortcut menu list to call up the **Open** dialog box. Navigate to the correct firmware folder for the selected module, double-click folders until the folder containing the **Control File** (.lcf) appears in the **Look in** field and the file appears in the list box. Select the file and click **Open** to initiate the upgrade.

6 Monitor progress of the upgrade in the Status Message Box and the **Status** column.

Step	Action
7	When firmware load is completed, click **Exit** to close the CTool window or repeat Steps 3 to 6 to upgrade firmware in another module.

3. Common Experion LX Process Controller tasks

3.1 Verifying dangling control connections

This section describes how to verify dangling control connections.

Prerequisites

- You have launched Configuration Studio with Security level of at least Engineer.
- You are running Control Builder on Experion LX server.

Considerations

Be sure the **Monitoring** tab in Control Builder is set for the Assignment view rather than the Containment View. To change the view, right-click the **Monitoring** tab and then click **Assignment** View from the menu.

To verify dangling connections, perform the following steps.

Step	Action
1	On the **Monitoring** tab, click C300 icon.
2	On the **Controller** menu, click **Checkpoint**>**Rebuild selected object(s) and contents checkpoint from monitoring tab**.
3	Resolve any **Block at other end of connection missing** errors before starting the on-process migration.
4	This completes the procedure.

3.2 Verifying switch port settings

This section describes how to verify the switch port settings before starting a controller upgrade.

Prerequisites

- The name of Yellow and Green switches. Yellow and Green are the standard naming conventions for FTE switches. Your switches may have different names.
- The IP addresses of the Yellow and Green switches.
- The login name and password.

To verify port settings, perform the following steps.

Step	Action
1	Choose **Start** > **Run**. The Run dialog box appears.
2	Type `cmd` in the **Run** dialog box and click **OK** to open the DOS command window.
3	At the DOS prompt, type `telnet` *`ip_address`* where *`ip_address`* is the IP address of the switch. Press the **ENTER** key.
4	At the password prompt, type the password and then press the **ENTER** key.
5	Type `enable` and press the **ENTER** key.
6	Type `password` and press the **ENTER** key.
7	Type `sho run` and press the **ENTER** key.
8	If the settings in your switch are not the same, contact your local Honeywell Technical Assistance Center (TAC).

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