

Firmware Release Notes

PLC500, PLC500ED, PLC500MC, PLC410



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1 INTRODUCTION

1.1 ABOUT THIS DOCUMENT

This document aims to present the updates, fixes, and improvements implemented in each firmware version of the WEG PLC models: PLC410, PLC500, PLC500ED and PLC500MC.

It describes the new features, performance enhancements, bug corrections, and security improvements applied to the embedded Linux operating system and the Codesys runtime environment.

The content of this document serves as a technical reference for engineering, maintenance, support, and system integration teams, ensuring traceability of changes between versions and promoting the use of firmware releases that comply with the company's reliability, compatibility, and security requirements.

1.2 IMPORTANCE OF FIRMWARE UPDATES

Regular firmware updates are essential to ensure operational stability, optimized performance, and, most importantly, cybersecurity of industrial automation devices.

Each new firmware release includes fixes for known vulnerabilities, enhancements to authentication, encryption, and integrity mechanisms, and updates to critical components of the embedded Linux system and the Codesys runtime.

Keeping devices up to date significantly reduces the risk of security breaches, unauthorized access, and external interference that could compromise plant operations or data integrity.

Therefore, it is strongly recommended that all devices always operate with the latest officially released firmware version, ensuring alignment with industrial cybersecurity best practices (ISA/IEC 62443) and extending the secure lifecycle of the equipment in production environments.



CYBERSECURITY NOTE!

Keeping the PLC firmware up to date is essential to protect the device against vulnerabilities.

Updates may include security patches, vulnerability fixes, and improvements that protect the device against cyber threats.

2 SUMMARY OF RELEASES

The information below describes the key features of each firmware version released. The term **PLCx** refers to the WEG PLC models: PLC410, PLC500, PLC500ED and PLC500MC.

FIRMWARE UPDATE PLCX		
Version	Date	Key releases
1.5.0	01/12/2025	CODESYS BACnet (IP) demo mode ¹ , Function blocks Immediate, Disable interfaces
1.4.4	01/06/2025	Enhanced the encoder signal handling
1.4.3	01/04/2025	Enhanced Linux CAN driver, Temporary default IP configuration via SmartMedia
1.4.2	01/01/2025	CODESYS OPC UA Server, Temporary IP configuration through the webpage
1.4.1	01/11/2024	Enhanced runtime robustness to prevent errors during successive TCP reconnections
1.4.0	01/08/2024	CODESYS WebVisu demo mode ¹ , Added Switch Mode, Counter and Capture functions
1.3.3	01/04/2024	CODESYS Profinet Controller, CODESYS Profinet Device
1.3.2	01/03/2024	CODESYS OPC UA Server demo mode ¹
1.3.1	01/01/2024	Optimized internal memory usage, Enhanced expansions communication
1.3.0	01/12/2023	CODESYS EtherNet/IP Scanner, CODESYS Soft Container and CODESYS Key (USB dongle)
1.2.1	01/09/2023	Disabled the internal overload watchdog (Overload Exception)
1.2.0	01/03/2023	CODESYS IIoT Libraries, CODESYS EtherCAT Master and FTP/FTP's server
1.1.0	01/09/2022	Function blocks to encoders
1.0.2	01/07/2022	Function blocks to control expansions
1.0.1	01/06/2022	First Edition



ATTENTION!

When updating the PLC from versions prior to 1.3.3, make sure the date and time are correctly set, otherwise the PLC may fail to update!

Versions prior to **1.3.3** require manual date adjustment, which can be done via the product's Webpage (available only for PLC410, PLC500, and PLC500MC) and/or using the CODESYS programming software.

To update the time through CODESYS, use the following command in the **PLC Shell**: `rtc-set YYYY-MM-DDThh:mm:ss` Example: **rtc-set 2024-08-01T12:00:00**

The PLC500ED automatically adjusts the date and time when connected to the internet.



ATTENTION!

Do not disconnect the product power supply during a firmware update!

Doing so may result in damage to the product's software. Once the update is complete, the PLC will restart automatically.

The information provided below outlines the key features of each released COREAPP firmware version. Please note that this applies exclusively to the PLC500ED.

FIRMWARE UPDATE COREAPP		
Version	Date	Key releases
2.4.5	01/12/2025	Date and time synchronization, Improved Wi-Fi dongle reconnection and DHCP behavior
2.4.1	01/08/2024	Support for switch mode
2.4.0	01/01/2024	Support for USB WiFi dongle

3 RELEASES PLCX

V 1.5.0

01/12/2025

CODESYS RELATED

New features:

- **CODESYS BACnet (IP)** demo mode¹ available.
- Application now starts in **STOP** if the expansion terminal is not connected.
- Added function blocks to read actual expansion modules configuration.
- Added function blocks read and write **IMMEDIATE** to perform real-time operations on embedded PLC I/Os.
- Added **IoDrvCmpShell** library to execute WEG commands from PLCshell during runtime.
- Added Cybersecurity PLC Shell WEG commands:
 - weg interface status
 - weg interface enable <interface>
 - weg interface disable <interface>

Improvements:

- Memory:
 - Persistent and retentive memory expanded from 64 kB to 256 kB.
- Enhanced the READM4ENCx function block to improve reading accuracy at low speeds.
- Enhanced the PWM function block to reduce execution time and avoid program stalls when changing frequency.

ADDITIONAL RELEASES

New features:

- SmartMedia:
 - The **Boot Application** flag now adds support for downloading **.ret** and WebVisu files².
- Added support for updating firmware and application via FTP³.
- Cybersecurity:
 - Non-essential services disabled by default.
 - Added the option to disable interfaces **eth1**, **eth2**, **usb1** and **usb2** via PLCshell.



CYBERSECURITY NOTE!

Disabling non-essential services and allowing unused interfaces to be turned off helps reduce the PLC's attack surface, prevent unauthorized access, and limit possible entry points for intrusion, following recommended hardening practices for industrial control systems.

Improvements:

- Updated switch mode behavior to avoid connection issues with newer CODESYS versions.
- Improved Linux I/O driver to prevent PLC non-responsiveness after download.
- Improved Linux Serial driver to prevent potential freezes when using multi-tasking with different priorities.
- Webpage updates:
 - Improved password requirements.
 - Added time zone configuration.
 - Added option to download application with optional **.ret** and WebVisu files (.zip).
 - Added functionality to update expansion module firmware.



CYBERSECURITY NOTE!

Stronger authentication makes it more difficult for attackers to compromise accounts through brute force, credential guessing, or weak-password exploitation, enhancing the overall security of the PLC.

V 1.4.4

01/06/2025

ADDITIONAL RELEASES

Improvements:

- Enhanced the encoder signal handling to ensure accurate pulse detection and prevent false readings caused by signal noise.

¹In demo mode, this feature will run for 2 hours and then will stop. To use it without time limitations, acquire the license from the Codesys website and install it on the PLC.

²To perform the action, it is necessary to connect the external media to the PLC containing the respective files for each action:

- **Boot Application:** Checks if the MAC address of ETH1 on the PLC is already listed in the **wegbootapp.txt** file. If it is not, the application (**.app** + **.crc**, and, if available, the **.ret** file and the **visu** folder) is updated, and the MAC address of ETH1 is added to the file. If it is already listed, no action is taken.

³At every startup, the PLC checks the **ftp** folder (this folder becomes accessible over the network when the PLC is enabled as an FTP server), searching for the files required for each action:

- **Firmware Update:** Checks if the MAC address of ETH1 on the PLC is already listed in the **wegupdate.txt** file. If it is not, the firmware (**.deb**) is updated, and the MAC address of ETH1 is added to the file. If it is already listed, no action is taken.
- **Boot Application:** Checks if the MAC address of ETH1 on the PLC is already listed in the **wegbootapp.txt** file. If it is not, the application (**.app** + **.crc**, and, if available, the **.ret** file and the **visu** folder) is updated, and the MAC address of ETH1 is added to the file. If it is already listed, no action is taken.

V 1.4.3

01/04/2025

ADDITIONAL RELEASES

New features:

- Temporary default IP configuration via SmartMedia: wegdefaultip.txt.

Improvements:

- Enhanced the Linux CAN driver to ensure all telegrams are properly processed by the interface, preventing potential Heartbeat and Node Guarding timeouts.

V 1.4.2

01/01/2025

CODESYS RELATED

New features:

- **CODESYS OPC UA Server** available.
- Added PLC Shell WEG commands:
 - weg port statusopcua
 - weg port changeopcua <port>
 - weg port statustcp
 - weg port changetcp <port>
 - weg port statuswebvisu
 - weg port changewebvisu <port>
 - weg port statuswebvisusecure
 - weg port changewebvisusecure <port>
 - weg supportlogs

Improvements:

- Fixed parameter changes, via FB, for MOD6.
- Webpage updates:
 - Added temporary IP configuration.

V 1.4.1

01/11/2024

CODESYS RELATED

Improvements:

- Enhanced runtime robustness to prevent errors during successive TCP reconnections (which could lead to Codesys crashes).

V 1.4.0

01/08/2024

CODESYS RELATED

New features:

- **CODESYS WebVisu** demo mode¹ available.
- Added Switch Mode for devices with 2 ETHs.
- Added Counter function to the DI7.
- Added Capture function for Encoders and Counter.

ADDITIONAL RELEASES

New features:

- Added system reboot through the webpage.
- Introduced FTP configuration within the PLC Shell.
- External devices can be shared to the FTP directory.
- Specific files inside external devices can trigger actions²:
 - Firmware update: `wegupdate.txt` + `.deb`.
 - Boot application: `wegbootapp.txt` + `.app` + `.crc`.
 - Factory reset: `wegfactoryreset.txt`.
 - Retrieve logs: `wegsupportlogs.txt`.

Improvements:

- Improved connection delay in HMI for CODESYS V3 Protocol.
- Prevented oscillation in the Encoders' counters.
- Fixed parameter changes, via FB, for slot 8 of expansions.
- Improved I/Os performance.
- Updated expansions library documentation.
- Updated I/Os library documentation.

¹In demo mode, this feature will run for 2 hours and then will stop. To use it without time limitations, acquire the license from the Codesys website and install it on the PLC.

²To perform the actions, it is necessary to connect the external media to the PLC containing the respective files for each action:

- **Firmware Update:** Checks if the MAC address of ETH1 on the PLC is already listed in the **wegupdate.txt** file. If it is not, the firmware (**.deb**) is updated, and the MAC address of ETH1 is added to the file. If it is already listed, no action is taken.
- **Boot Application:** Checks if the MAC address of ETH1 on the PLC is already listed in the **wegbootapp.txt** file. If it is not, the application (**.app** + **.crc**) is updated, and the MAC address of ETH1 is added to the file. If it is already listed, no action is taken.
- **Factory Reset:** Checks if the **wegfactoryreset.txt** flag exists. If it does, a factory reset is performed, and the flag is deleted.
- **Retrieve Logs:** Checks if the **wegsupportlogs.txt** flag exists. If it does, the log files are saved directly to the external media.

V 1.3.3

01/04/2024

CODESYS RELATED

New features:

- **CODESYS Profinet Controller** available.
- **CODESYS Profinet Device** available.

V 1.3.2

01/03/2024

CODESYS RELATED

New features:

- **CODESYS OPC UA Server** demo mode¹ available.

V 1.3.1

01/01/2024

CODESYS RELATED

Improvements:

- Optimized internal memory usage.
- Enhanced expansions communication.
- Factory reset removes additional log files.
- Factory reset can also be executed by the PLC Shell in Codesys.

¹In demo mode, this feature will run for 2 hours and then will stop. To use it without time limitations, acquire the license from the Codesys website and install it on the PLC.

V 1.3.0

01/12/2023

CODESYS RELATED

New features:

- **CODESYS EtherNet/IP Scanner** available.
- **CODESYS Soft Container** for software licensing.
- **CODESYS Key (USB dongle)** for secure storage of software licenses.
- Implemented automatic scanning and connection of expansions.
- Support for identifying devices with Wink.
- Introduced PLC Shell WEG:
 - weg webpage enable
 - weg webpage disable
 - weg webpage status
 - weg webpage reset (reset credentials)
 - weg hash (technical support)
 - weg reboot (reboot the PLC)

Improvements:

- Memory:
 - Persistent memory expanded from 16 kB to 64 kB.
 - Input size (%I) expanded from 4 kB to 16 kB.
 - Output size (%Q) expanded from 4 kB to 16 kB.
 - Memory size (%M) expanded from 4 kB to 16 kB.
- LEDs:
 - Added orange pattern to show active processes before startup.
 - Enhanced LED's function blocks.
 - Status LED powers off whenever the application is deleted.
 - Status LED blinks in red when an application is invalid.
- New function blocks:
 - Read internal memory.
 - Read network status.
 - Read internet connection.
- Improved expansions communication.
- Fixed error in RS485 device when no devices are plugged in.
- Enhanced CAN capabilities via function blocks.
- Maximum number of open files in an application set to 300 files.

ADDITIONAL RELEASES

- Support for exFAT format (SD cards and USB devices).
- Webpage updates¹:
 - Added Codesys version information.
 - Added internet connection status.
 - Added memory usage information.
 - Added descriptions for several elements.

V 1.2.1

01/09/2023

CODESYS RELATED

Improvements:

- Increased the number of Codesys channels from 4 to 16.
- Disabled the internal overload watchdog (Overload Exception).

ADDITIONAL RELEASES

- CODESYS Profinet's demo mode available.

V 1.2.0

01/03/2023

CODESYS RELATED

New features:

- **CODESYS IIoT Library** available (MQTT Client, Web Client, etc).
- **CODESYS EtherCAT Master** available.
- Support to **MOD8.00-SCW** (Control up to four SCW).

Improvements:

- Added expansions function blocks.

ADDITIONAL RELEASES

- Optimized coprocessor communication.
- Webpage updates³:
 - Implemented **Login Page** with username and password.
 - Added a **FTP/FTPS server** to easily transfer files.
 - Possibility to download Codesys logs.
 - Included button "Set clock from browser".

³Applicable for PLC410, PLC500 and PLC500MC. PLC500ED uses a different Webpage software (Coreapp).

V 1.1.0

01/09/2022

CODESYS RELATED

New features:

- User can access PLC's logs in "Device → Files".
- New function blocks to set/reset encoders' counter.
- New examples of how to use WEG libraries function blocks.

Improvements:

- SD card will be mounted as \$SDcard\$ instead of \$SD card\$.

ADDITIONAL RELEASES

- Removing power for more than 2 seconds will trigger the PLC reboot after next power on.
- Added Boot Application update via Webpage¹.

V 1.0.2

01/07/2022

CODESYS RELATED

New features:

- CAN and SERIAL LEDs functionalities can be chosen.
- New function blocks to control expansions' parameters during runtime.
- New function block to disable expansions on the Codesys device tree.
- New function block to identify all connected expansions.
- WEGpackage installs several .eds files of WEG products.

Improvements:

- More efficient writing on digital outputs.
- PWM outputs follow "PLC Settings → Behavior for outputs in stop".
- Enhancements in identifying disabled expansions.

ADDITIONAL RELEASES

- Increased performance when reading CPU and networks status.

V 1.0.1

01/06/2022

CODESYS RELATED

Improvements:

- Recognition of expansions.
- Readout of MOD6 parameters.
- Impossibility of configuring ethernet on the same network.
- Enhancements in the PWM channels.
- Encoder mode settings, functionalities and function blocks.

ADDITIONAL RELEASES

- Scripts for network settings.
- Webpage updates¹:
 - **Factory reset** erases the application and restores networks.
 - **Date and time settings**.
 - Summary of firmware update versions.

¹Applicable for PLC410, PLC500 and PLC500MC. PLC500ED uses a different Webpage software (Coreapp).

4 RELEASES COREAPP - PLC500ED

V 2.4.5

01/12/2025

**NOTE!**

Starting from version **1.5.0**, the **COREAPP** firmware has been integrated into the **PLCx** update. As a result, updating the **PLCx** firmware will automatically update the **COREAPP** as well.

Improvements:

- Optimized DHCP timeout handling for wired interfaces.
- Improved overall DHCP behavior across network interfaces.
- Enhanced Wi-Fi dongle reconnection mechanism.
- Webpage updates:
 - Added access to CODESYS logs and support logs.
 - Removed the requirement for a hash to download logs.
 - Displayed the installed PLC firmware version on the login screen.
 - Introduced a system reboot button.
 - Added one-click date and time synchronization.
 - Enhanced progress bars for clearer operational feedback.
 - Improved network information display when interfaces are disabled.

V 2.4.1

01/08/2024

To ensure optimal performance, it is crucial to install this firmware in conjunction with **PLCx** version $\geq 1.4.0$.

Improvements:

- Added support for switch mode.
- Fixed unnecessary reload issue during firmware update.
- Updated WEGnology MQTT topics.

V 2.4.0

01/01/2024

To ensure optimal performance, it is crucial to install this firmware in conjunction with **PLCx** version $\geq 1.3.1$.

Improvements:

- Added support for USB Wifi Dongles. Refer to Section 5 for detailed information.
- Monitor internet status using a specific thread.
- Improved internal MQTT Buffer.

5 USB WIFI DONGLES

To ensure seamless connectivity, it is crucial to use USB WiFi dongles that are compatible with the linux RTL88x2BU driver. Refer to the following table for recommendations on supported USB WiFi dongles.

Table 5.1: List of recommended USB WiFi Dongles

VENDOR	MODEL	COMPATIBILITY
TP-Link	Archer T3U Nano	PLC500ED
TP-Link	Archer T3U	PLC500ED
TP-Link	Archer T4U	PLC500ED
TP-Link	Archer T4U Plus	PLC500ED

Important Notes

- Ensure that the selected USB WiFi dongle model is compatible with linux RTL88x2BU driver.
- Use the latest firmware version for both the PLCx and Coreapp to guarantee optimal performance.

Installation Procedure

- Insert the USB WiFi dongle into the USB1 port on the PLC500ED.
- Please wait until the webpage automatically reloads. Once completed, you should see the WiFi information displayed on the login page.
- Follow the PLC webpage to set up the WiFi connection. Access the WiFi setup within the Configuration tab.



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