Release Notes

12/2024 MZ049013EN

easyE4 Firmware V2.30

Service

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Original Release Notes

is the German-language edition of this document.

Translation of the original Release Notes

All versions of this document that are not in German are translations of the original Release Notes.

10th edition, publication date 12/2024

Contents

1 easyE4 Firmware V2.30

1.1 Supported devices

These release notes refer to the firmware update V2.30 for the following base unit devices of the easyE4 product range:

- EASY-E4-UC-12RC1
- EASY-E4-UC-12RC1P
- EASY-E4-UC-12RCX1
- EASY-E4-UC-12RCX1P
- EASY-E4-DC-12TC1
- EASY-E4-DC-12TC1P
- EASY-E4-DC-12TCX1
- EASY-E4-DC-12TCX1P
- EASY-E4-AC-12RC1
- EASY-E4-AC-12RC1P
- EASY-E4-AC-12RCX1
- EASY-E4-AC-12RCX1P

→ This firmware update offers several bugfixes. We recommend to all users of easyE4 base units with firmware version V2.00 to V2.10 to migrate to the new version

→ Firmware versions V2.00 and higher are only applicable for devices with hardware revision 08 or higher.

→ In order to be able to update V2.25 or newer onto easyE4 base devices with firmware version V2.00, V2.01 or V2.02, the intermediate firmware version V2.10 has to be loaded first. Otherwise, the update will fail with a signature error.

→ Remanent data will get lost when performing a firmware update from V2.0x to any other version. Besides, the remanent data will get corrupted when performing a firmware downgrade from V2.10 to a V2.0x firmware version. In case of firmware updates from V2.10 to V2.25 or newer and in case of downgrades from V2.25 or newer, the remanent data will be retained.

1.2 Updating the firmware

The firmware update of base devices, expansions and communication modules can be triggered via device menu. Additionally, there is a second way utilizing a settings file on the microSD card for updating the base device automatically at device start, which can be used for serial machine builders.

To be able to update V2.25 or newer onto easyE4 base devices with firmware version V2.00, V2.01 or V2.02, the intermediate firmware version V2.10 has to be installed first. Otherwise, the update will fail with a signature error. For a downgrade from V2.25 or newer to older V2 firmware versions, the intermediate FW is not needed. Apart from this special case, upgrades and downgrades are possible if the hardware revision is supporting the update file.

Updates for the operating system are made available by Eaton Industries GmbH, Bonn in the Download Center - Software under Firmware Updates as *.zip files.

Download Center - Software

http://www.eaton.eu/software/Firmware Updates/easy

http://www.eaton.eu/software/OS Updates/easy

→ A base device will only perform an update if the actual base firmware version differs from the update version.

Observe the documents belonging to the update in the download center.

Check the integrity of the firmware update ZIP file

The integrity of the firmware update ZIP file can be checked using a separate hash file which can be found on the Download Center in the column *"txt":*

Firmware update files on the Eaton download server

For instance the respective hash file for V1.30 of the base unit firmware is named *„easyE4_V1_30_ZIP_sha256_hash.txt"*. This file contains the original hash for the ZIP-file. To calculate the hash value of the ZIP-file on your system you can utilize a standard tool to calculate SHA256 hashes. On a Windows 10 system the tool *„certutil.exe"* can be used:

```
certutil.exe -hashfile <ZIP-file> SHA256 > my_hash.txt
```

or for the V1.30 firmware update:

```
certutil.exe -hashfile easyE4_UPDATE_OS_V130.zip SHA256 > my_hash.txt
```

The file *my_hash.txt* now contains the hash value of the ZIP file on your system. This value can be compared to the hash file from the Eaton Download Center, e.g.

easyE4_V1_30_ZIP_sha256_hash.txt. The ZIP file on your system is identical to the ZIP file from the Eaton Download Center if the two hash values are identical.

1.2.1 Firmware update base device (hardware revision 08)

With hardware revision 08 the update process of the base device has been changed.

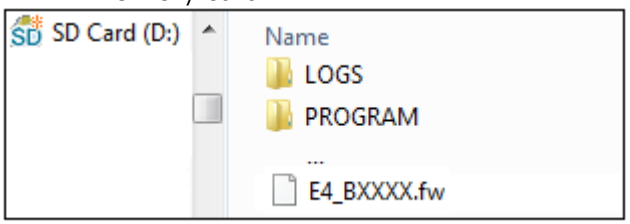
Only firmware versions V2.00 and newer can be loaded on devices with hardware revision 08.

Which generation your easyE4 device belongs to is printed on the device and displayed during online communication with the easyE4 base device in the *easySoft communication view/ HW Info tab*.

The firmware update can be triggered via device menu or via microSD card.

Just as with an update for expansion modules, this requires that the required unzipped operating system file "*.FW" is stored on the microSD memory card.

- ▶ Download the easyE4 operating system (V2.xx).
- ▶ Connect a microSD memory card (FAT format) to your computer.
- ▶ Unpack the downloaded operating system to the ROOT directory of the microSD memory card.



The unzipped file must be an operating system file that matches the easyE4 base device (*.FW).

→ V1.xx update files with the name easyE4.fw won't work.

Firmware update base device HW revision 08 - via device menu

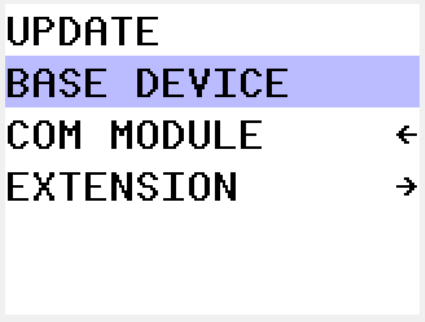
You can reach the device menu through one of the following options:

- a base device with display
- in the communication view of the easySoft under Display\Display + keys
- a remote display with the web server
- an easyE4 RTD

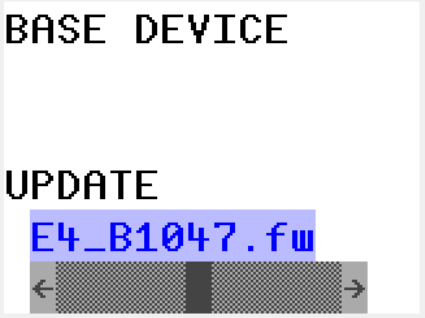
Take the following steps to update the base device with display:

- ▶ Go to the main menu.

- Open the menu path *SYSTEM OPTIONS\UPDATE\BASE DEVICE.*



- Select the corresponding operating system file.



- Press the OK button to select. A confirmation prompt is displayed.
- You can return to the previous menu by selecting "No".
- The signature check and update process start immediately by selecting "Yes".

→ No "*.ini" file is required for the update via device menu.

→ All remote displays (easySoft, web client, easyRTD) will lose the connection during the update process.

Firmware update base device (hardware revision 08) - via SD card

Take the following steps to update the base device via SD card:

- Add the following two lines to the file "e4settings.ini" and replace the place holder after "updatefile:" with the actual name of the update file:
  - updatefw=1
  - updatefile:E4_BXXXX.fw
- Insert the microSD memory card and power up the base device. The firmware update should start automatically.

→ Make sure that "e4settings.ini" and the "*.fw" file are in ROOT directory of your microSD card.

1.2.2 Firmware update base device (hardware revision 09) – via web client

Devices with hardware revision 9 or higher can perform a remote firmware update via web client also. For storage of the firmware update file the internal memory is used and no SD card is required. The update file must be uploaded via web client menu "Settings/System Update". Hardware revisions below 09 are not able to use this feature. Besides firmware version V2.25 or newer is required.

1.2.3 Firmware update expansion and communication devices

Expansion and communication device updates must run via the device menu of an easyE4 base device.

Expansion devices of the first generation easyE4 (with firmware version 1.00) cannot be updated because there is no bootloader physically present in these devices. Which version of the firmware is on the device is displayed during online communication in the *easySoft communication view/register HW-Info*.

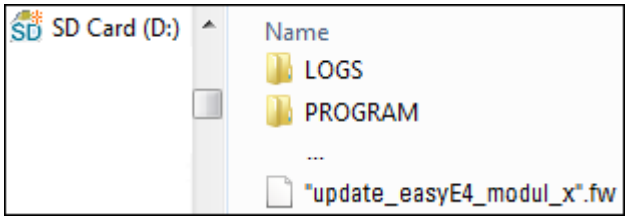
You can reach the device menu through one of the following options:

- a base device with display
- in the communication view of the easySoft under Display\Display + keys
- a remote display with the web server
- an easyE4 RTD

An update must be run separately for each expansion or communication device.

Just as with an update for base devices, this requires that the unzipped operating system file "*.FW" is stored on the microSD memory card.

▶ Download the operating system of the expansion or communication module.
▶ Connect a microSD memory card (FAT format) to your computer.
▶ Unpack the downloaded operating system to the ROOT directory of the microSD memory card.



The unzipped file must be an operating system file that matches the easyE4 expansion or communication device (*.FW).

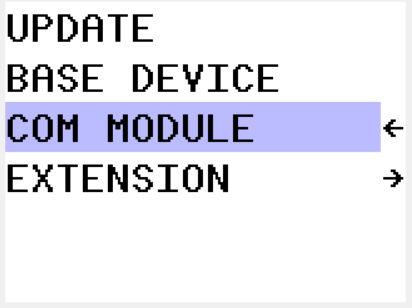
→ No entry is required in a configuration file for an update.

To update the firmware, the easyE4 expansion or communication device must be connected to the base device.

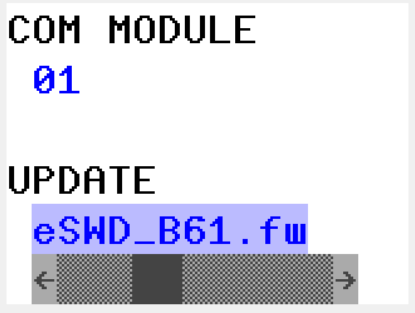
Take the following steps to update an expansion or communication device:

▶ Go to the main menu.

- Open the menu path *SYSTEM OPTIONS\UPDATE\EXPANSION or SYSTEM OPTIONS\UPDATE\COM MODULE*



- Select the number of the easyE4 expansion or communication module. The number is determined based on the position after the base device in the assembly block. The maximum expansion number is 11 and the number of communication modules is limited to 1 currently.
- Select the corresponding operating system file.



- Press the OK button to select. A confirmation prompt is displayed.
- You can return to the previous menu by selecting "No".
- The update starts immediately by selecting "Yes". "Update" flashes in the display.

Repeat the process for other easyE4 expansion or communication devices.

1.3 Legal disclaimer

All the information in this release notes has been prepared to the best of our knowledge and in accordance with the state of the art. However, this does not exclude the possibility of there being errors or inaccuracies. We assume no liability for the correctness and completeness of this information. In particular, this information does not guarantee any particular properties.

It is assumed that the user of this manual is thoroughly familiar with the information found in the manuals for incorporating the control relay into automation processes. Hazards posed by the control relay cannot be ruled out if the safety instructions are not observed – especially if the control relay is installed and commissioned by inadequately qualified personnel or if it is used improperly. Eaton assumes no liability for any damages resulting from cases such as these

1.4 New features in easyE4 Firmware V2.30

1.4.1 Increased Remanent Data Size

The maximum remanent data size has been increased from 512 to 1024 bytes.

1.4.2 New Diagnostic Bit ID21 - Incorrect Device Time

The diagnostic bit ID21 has been implemented to indicate an incorrect device date and time, such as when the device has lost its time due to being switched off for an extended period.

1.4.3 Firmware Update via AWS

Support for firmware updates via AWS has been added for hardware revision 09 or newer. The update will be triggered via an AWS Job document, similar to the project update via AWS. For more details, please refer to the manual.

1.4.4 Cyclic Data Enable Operand

An enable operand has been added to the AWS cyclic data configuration table. When configured, the table entry data will only be sent cyclically from device to AWS when this operand is set.

1.4.5 FB DL - Maximum Number of Instances

The maximum number of possible instances of the function block DL has been increased from 1 to 8.

1.4.6 FB DL - New Logging Settings

Two new optional settings have been added to the function block data logger. The first setting can be used to limit the number of logs by adding a blocking time, during which logging is not performed. The blocking time starts with a successfully performed log event.

The second setting can be used to force a logging event after a configured waiting time. The logging is forced when there has been no log event for the configured maximum waiting time.

1.4.7 FB AR - New Operating Mode MOD (Modulo)

The operating mode Modulo has been added to the function block arithmetic to calculate the remainder of a division.

1.4.8 FB AR - New Operating Mode POW (Potentiator)

The operating mode Potentiator has been added to the function block arithmetic to calculate the power of a number.

1.4.9 Modbus TCP Client - Performance Enhancement

The performance of the Modbus client has been increased. For more details, please refer to the manual.

1.4.10 Modbus TCP Client - Expanded Server Configuration

The number of configurable external Modbus TCP servers has been expanded from 4 to 16.

1.4.11 Modbus TCP Server - Configurable Listening Port

The listening port for the easyE4 Modbus TCP server can now be configured through easySoft.

1.4.12 Modbus TCP Server - Read-Only Mode Option

Write requests to the easyE4 Modbus TCP server can be disabled via easySoft, enabling a read-only mode.

1.4.13 Program Name in Device Menu

The program name has been added to the device menu INFORMATION/ACTUAL CONFIG and will be shown also on main screen when pressing ALT.

1.5 Important changes in easyE4 Firmware V2.30

1.5.1 Structured Text - Result of MOD 0

The result of MOD 0 has been changed to comply with IEC 61131-3. The new result is 0 in the case of MOD 0. Previously, the result was the dividend.

1.5.2 AWS Device Registration - Special Characters Support for Policy and Thing Names

Support for some special characters has been added for policy and thing names, which were not supported before.

1.5.3 AWS Device Registration - MQTT Connection Closing Time after AWS Deregistration

An issue has been resolved where the MQTT connection was only closed 60 seconds after the device had been deregistered from AWS.

1.5.4 Communication Module Driver - Device Clock Reset

In rare situations, the date and time of the base device were constantly reset when using EASY-COM-RTU. This issue has been resolved.

1.5.5 Web Client - Missing Texts and Translations

Some missing texts and translations have been added.

1.5.6 Web Client - Data Log Export

Several issues with the data log export via the web client have been resolved. In one case, the data logs were not exported correctly when using the time filters. In other cases, the comments of the function block inputs were not shown in the exported logs, or the log date and time were in the wrong format.

The easyE4 firmware V2.30 includes all changes and improvements of V2.25 and older firmware releases. Additionally, the new version includes several minor improvements.

2 Release notes of previous firmware versions

2.1 New features in easyE4 Firmware V2.25

2.1.1 Remote firmware update via web client

The firmware version V2.25 supports a remote firmware update via web client for base devices with hardware revision 09 or newer (see chapter 1.2.2). In the web client check the new menu entry "Settings → System Update" for instructions.

2.1.2 Web client - Clock Settings in RUN

Date and time can be modified also in RUN state now via web client and web visualization.

2.1.3 Amazon Web Services

AWS – Device Shadow

Starting with firmware version step V2.20, easyE4 supports the device shadow concept of the AWS IoT Core service. A list of operands can be specified in easySoft, which represents the cyclic AWS data. The shadow of these operands will be sent to AWS on a regular basis via MQTT. Besides some operands can be defined as "writable", which allows user to modify easyE4 operands via AWS.

AWS – Remote Project Update

The firmware V2.25 supports a project update based on AWS Jobs. A remote action can be triggered to update user program of an easyE4 with a program on AWS S3. To access the project file a pre-signed URL must be used. The pre-signed URL can either be created manually in S3, or a placeholder is used, which leads to an automatic creation of the pre-signed URL when the job is executed by the device. With a special setting in the job document, the old device password can be retained. If not set, the old password will be overwritten according to the settings in the new project file.

A more detailed description of the AWS features can be found in the latest revision of the easyE4 user manual.

2.1.4 Web Visualization (WebVisu)

A web editor has been added to easySoft 8.25, which allows the creation of an user specific web visualization on easyE4. The WebVisu supports several widgets like push buttons, sliders, pictures, gauges and many more.

A detailed description of the widgets and the web editor can be found in the online help of easySoft and in the latest revision of the easyE4 user manual.

2.1.5 New Function Block FF – Flip-Flop

easyE4 V2.25 supports the new bistable flip-flop function block FF with the modes SR (set dominant) and RS (reset dominant).

2.1.6 New Function Block ED – Edge Detector

easyE4 V2.25 supports the new function block ED (Edge Detector). The function block allows the detection of either a rising (R_TRIG mode) or a falling edge (F_TRIG mode) at the block input.

2.1.7 System event logging – new log entries

Some new system event log entries related to project update via cloud were added. The system log feature needs to be activated in the user program in easySoft. The resulting log file will be stored on the SD card. The log files contain event codes and a time stamp. The following table lists the new event codes of the easyE4.

system event code	description
16	Project update via cloud started
17	Project update via cloud failed
18	Project update via cloud successful

2.2 Important changes in easyE4 Firmware V2.25

2.2.1 Retain data loss after loading a defective project from SD card

An issue was solved where the retain data could get lost after trying to update a defective project from SD card. The retain data was not properly recovered after the update had failed.

2.2.2 Rare project loss after FW update via e4settings.ini

A problem has been solved where in very rare cases the user program might get corrupted/lost after performing a firmware update via e4settings.ini in combination with a boot project on SD card.

2.2.3 Web client – Missing translations and comments added

Missing operand comments for IDs and translations were added.

2.2.4 FB D - Text Display

Fixed a display issue where an unexpected FB D instance was shown on the screen after updating the user program.

2.2.5 FB DL - Data Logger

Fixed a display issue where after a ring buffer overrun a wrong number of log records were shown in easySoft and web client.

The easyE4 firmware V2.25 includes all changes and improvements of V2.10 and older firmware releases. Additionally, the new version includes several minor improvements.

2.3 New features in easyE4 Firmware V2.10

2.3.1 Product QR Code

A new product QR code has been added to the device for accessing product specific information and documentation by scanning the code with the Eaton Asset Manager App or another QR code scanner. With devices produced starting from 04/2024 it is also possible to register your easyE4 inside the Eaton Asset Manager App, which helps managing your Eaton devices.

The product QR code is displayed in the easySoft communication view, the WebClient and on the device menu. See the manual for further details.

2.3.2 Support for easyE Remote Touch Display Advanced

The easyE4 firmware version 2.10 includes the visualization feature support for the easyE Remote Touch Display Advanced (easyE RTD Advanced; EASY-RTD-DC-43-03-B2) device.

Remarks

Connection notification

When the connection between an easyE4 and a RTD is not established, a notification is seen after approximately 20 seconds.

Time synchronization

The easyE RTD's system time, which is used for the visualization features “Date and time display” and “Date and time entry” is synchronized with the easyE4, that is selected as time source in the easySoft project.

P-Key access

The P-Keys of the easyE4 connected in the mirror mode of the RTD can be operated when logged in as “Watcher”.

2.4 Important changes in easyE4 Firmware V2.10

2.4.1 Device Name in easySoft

Fixed an issue where the device name was not shown properly in easySoft HW info tab.

2.4.2 Program Loss

Fixed two rare issues where the user program could get lost.

In rare cases the user program could get corrupted when electrically powering down the device during boot-up phase directly after switching on the device.

The second cause for this problem could be rare cases where constant inputs to function blocks are edited simultaneously in the device menu and the web client parameter list.

2.4.3 Remanent Data Loss

Fixed two issues where the remanent data could get lost.

In rare cases the remanent data could get lost when electrically powering down the device during boot-up phase directly after switching on the device.

Besides the remanent data would get lost after updating the base device firmware.

2.4.4 Unnecessary Diagnostic Entry 230 in Diagnostic Buffer

After disconnecting the easySoft communication a diagnostic buffer entry “230” sometimes was added to the diagnostic buffer. This has been removed.

2.4.5 FB AC - Astronomic clock

When daylight saving time is set to CEST (The Central European summer time) and device date is set via the JSON API, the function block calculated an incorrect sunrise time. This issue has been fixed.

2.4.6 Device Name contains character ‘-‘

Fixed an issue where an incorrect device name is displayed on easy display for a device name that contains the character ‘-‘.

2.4.7 easySoft Connection loss

easySoft while using easyProtocol V2 lost the connection to the device during the redownload of a program after it has been deleted before. This issue has been fixed.

2.4.8 FB D - Text Display

Fixed an issue where value entry element is not allowed to edit in a specific condition where both value entry and value display elements are utilized.

2.4.9 FB AL - Alarm function block

Operand values are not getting embedded inside the email body and instead the operand names are sent in a specific condition. This condition occurs when the maximum operand limit in the email body is exceeded and again reduced back to below limit. This issue has been fixed.

In the subject of the email German "Umlauts" or other international characters are not shown correctly for GMX or WEB.de emails.

2.4.10 Web Client

Missing translations added

Added some missing translation for some languages.

Special characters - Parameter List, Operand Comments

The handling of special characters in Parameter List and Operand Comments has been improved.

In addition to this list the new version includes several minor improvements.

2.5 Important changes in easyE4 Firmware V2.02

2.5.1 SD card project – Device restart when loading big projects

Fixed an issue with loading big projects from SD card to device where in some cases the device might restart during program download. As a result, the loaded project could get corrupted.

2.5.2 SD card project – Automatic program start

Fixed an issue where the project from SD card was not started automatically. In case both project options "card start" and "allow overwriting via card" were set the device never switched to RUN automatically after reboot.

2.5.3 SD card project – Error code 33154

Fixed an issue where projects initially created on the device and not in easySoft could cause the error code 33154 after transferring them first to SD card and afterwards back to the device.

2.5.4 SD card project – improved password protection

For project files exported to SD card the mechanism to protect the device password has been improved. In order to use this improvement, it is mandatory to use the latest easySoft version V8.01 and to set the firmware version in the project settings to V2.02.

2.5.5 Web Client: Datalog export depends on selected language

A problem with exporting datalogger files via web client has been solved where the export failed when language was set to Italian or French.

In addition to this list the new version includes several minor improvements.

2.6 Important changes in easyE4 Firmware V2.01

2.6.1 FB DL - Data logger

Fixed an issue with FB DL where the currently used log file could not be read from web client in RUN state.

Fixed an issue with FB DL where no new log session has been started after reading out a full log file in program state RUN.

2.6.2 FB T - Timing relay

Fixed a problem with FB T where retentive FB inputs were not handled correctly by the function block after device restart.

2.6.3 FB AV - Average Calculation

Fixed an issue with the EDP editor in the device menu where the contact AVxxT_ was interchanged with AVxxRE.

2.6.4 FB RC - Real-time Clock

Fixed an issue with FB RC inside UFBs (User Function Blocks) where a time shift of several minutes could be seen when FB RC was used inside multiple instances of UFB.

2.6.5 Missing diagnostic message when using DCF77

Up till now the DCF77 diagnostic messages only were updated once after power on. Now every system time update through DCF leads to a corresponding diagnostic buffer entry.

2.6.6 Web Client

Stability of web client connections when using Apple Safari

Improvements in the stability of web client connections. Adjustment of web client to current Apple Safari (Safari version - 16) for better connectivity stability.

Special characters - Email groups, device name, domain name and Email username

The handling of special characters in domain name has been improved.

Parameter list confirmation box

Fixed an issue where changing operand value from parameter list page was not showing the new value in the confirmation box.

Diagnostic ID18 description

Diagnostic ID 18 displays whether SD card is present or not present inside device on diagnostic page in web client.

Missing translations added

Some texts which were not translated in email recipient group are now available in all 16 languages.

Entering values in parameter list

Fixed an issue with the parameter list where sometimes entering a value was not working correctly.

In addition to this list the new version includes several minor improvements.

2.7 New features in easyE4 firmware V2.00

This new major version of the easyE4 firmware is the first version for the new hardware revision 08. It offers plenty of new features which are shortly described here. For a detailed description of these features kindly refer to the easyE4 manual or the easySoft 8 online help.

→ Firmware versions V2.00 and higher are only applicable for devices with hardware revision 08 or higher.

2.7.1 Support for new hardware revision 08

Figure 1: Position of the hardware revision number as part of the nameplate on the side of the easyE4 housing

This firmware version supports the new hardware revision 08 of the easyE4 base unit, which features a new main controller with higher performance and more available memory. The main benefits for the user are:

- 128kB memory size for the user program (increased from 40kB),
- 512 bytes memory size for the retention data (increased from 400 bytes),
- 72kB memory size for comments and configurations (increased from 16kB),
- an improved performance of all Ethernet based protocols and
- an improved performance for user programs.

New Hardware and its implications

The hardware of the easyE4 base devices was upgraded to device revision 08 in March 2023. The hardware version is indicated on the left-hand side of the easyE4 housing directly below the "Moeller Series" label. The hardware change required a change to the easySoft and the device firmware.

Please note the following important information:

- New device version (generation 08)
  - The housing and the connections of the hardware are unchanged.
  - The new hardware requires a new firmware from V2.00 and easySoft 8.

- New firmware version V2.00
    - The firmware is pre-installed on all base devices with hardware revision 08 or higher.
    - This firmware version is intended exclusively for devices with hardware revision 08 or higher.
    - Further improvements for V2.00 will be provided via download in the future.
- New easySoft V8.00
    - With easySoft 8, devices prior to hardware revision 08 can still be programmed. Functional extensions will be provided from firmware V2.00 only.
    - Existing easyE4 projects or programs that were created for base devices with firmware older than V2.00 can still be used with easySoft 8 without modifications and within devices from firmware V2.00 and higher.
    - The existing easySoft 7 license can be reused for easySoft 8, too.
    - Parallel installation and use of easySoft 7 and easySoft 8 is possible.

2.7.2 Important changes in easySoft 8

This firmware version supports the new easySoft version 8 which offers:

- support for numerous new features of firmware version V2.00 listed in this document,
- the new easyProtocol V2 for encrypted communication between easySoft and easyE4,
- installation of the new easyE4 root certificate and
- backward compatibility for user programs created in easySoft 7.

Hints on backward compatibility

If users want to use existing user programs developed for easyE4 V1.* they can directly use these programs without any change due to the backward compatibility of V2.00. In this case most of the new features of V2.00 are not available except the following:

- all enhancements to the web client,
- easyProtocol V2 for encrypted connection to the easySoft
- use of the new TLS certificates based on the easyE4 root certificate

If the user wants to upgrade an existing program to V2.00 this can be done in the user program's system settings in easySoft.

If the user wants to optimize the cycle time of the existing user program on the new hardware, then the function block ST can be used.

Support for easyProtocol V2

We recommend using easyProtocol V2 as the standard for connection to easyE4 since it features an encrypted connection based on TLS for a higher level of cybersecurity. Furthermore, easyProtocol V2 is checking if the easyE4 TLS certificate is derived from the easyE4 root certificate to validate if the connected device is an easyE4.

2.7.3 TLS certificate

The easyE4 features a TLS device certificate which created every time the IP address or device name of the easyE4 is changed. This device certificate is based on a certificate chain with the 'easyE4 root certificate' as the trust anchor.

The installation process of the root certificate on iPad, iPhone, Android tablets/smartphones and Windows 11 is described in different documents which can be found on eaton.com: eaton.com/easyE4RootCertificate

When a client (e.g. a web browser) establishes a TLS connection to an easyE4 (easyE4 in the role as a server), the authenticity of the easyE4 is verified by using a certificate chain. To validate the integrity of the chain the 'easyE4 root certificate' must be installed in the client's certificate store.

2.7.4 Support for CORS in webserver

The easyE4 base unit offers a Web API called JSON API (since V1.20) to integrate the easyE4 into 3rd party software. For details kindly refer to https://www.eaton.com/flash/eaton/json-api/Default.htm .

With this new firmware version the webserver of the easyE4 can be configured to allow *Cross-Origin Resource Sharing* (CORS) requests which is useful for web applications running in web browers which need to connect to more than one web server, i.e. not only to the easyE4 webserver.

http OPTIONS method

To facilitate CORS requests the easyE4 webserver supports the OPTIONS method of the http protocol. The CORS setting can be activated in the user project in easySoft as part of the webserver settings.

In case CORS is activated the OPTIONS http response of the easyE4 web server for all URLs starting with "/api" will look like:

```
$ curl -X options http://192.168.178.32/api -i

HTTP/1.1 204 No Content
Server: easyE4
Access-Control-Allow-Methods: GET, POST
Access-Control-Allow-Headers: Content-Type, Authorization, Content-Length
Access-Control-Allow-Origin: *
Access-Control-Allow-Private-Network: true
```

In case the CORS setting is **not** activated the OPTIONS http response on the "/api" url will look like:

```
$ curl -X options http://192.168.178.32/api -i

HTTP/1.1 403 Forbidden
Server: easyE4
```

For all other URLs not starting with "/api" the standard responses will be returned by the standard rules for the http methods GET and POST, e.g.:

```
$ curl -X options http://192.168.178.32/int/index.html -i
```

```
HTTP/1.1 200 OK
Content-Type: text/html; charset=utf-8
Server: easyE4
```

2.7.5 Optional expansion modules

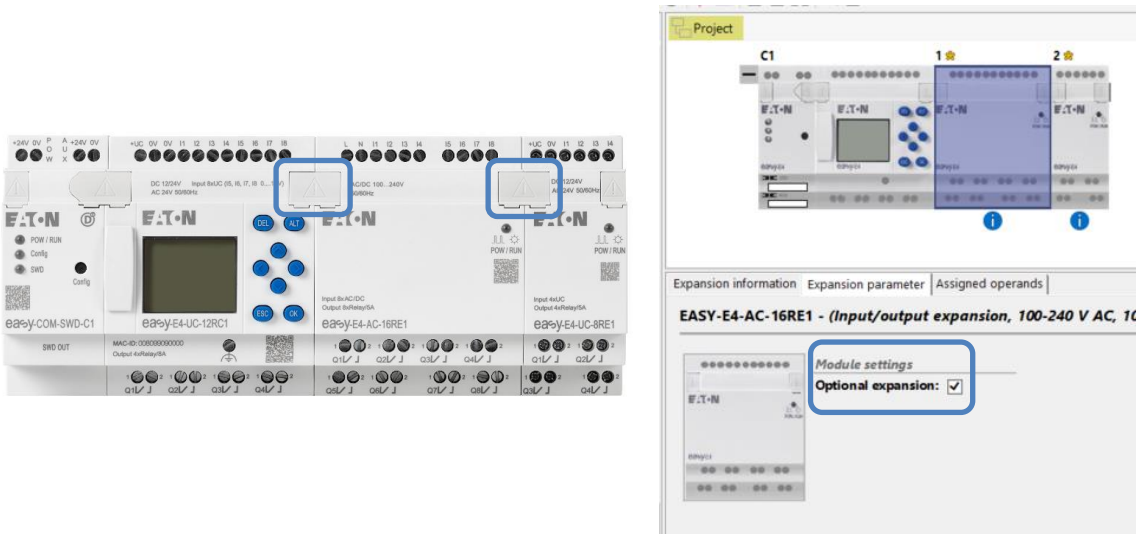
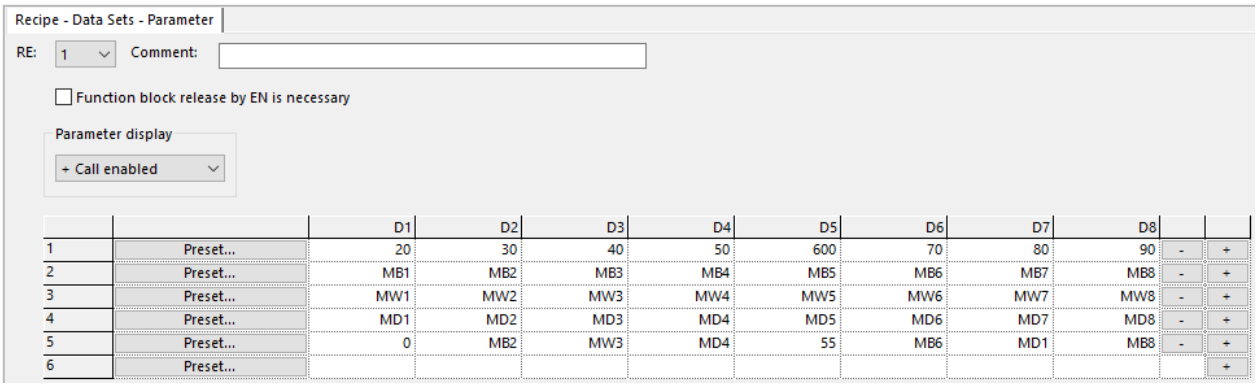


Figure 2: example for optional expansion modules

The local IO expansions can be set to optional in the easySoft project configuration, which allows the base device to start the user program even without all optional IO expansions available in the hardware setup. The optional expansions can be left out at the end of the configuration, but not in between. If there's a missing optional expansion in front of a present optional expansion, the configuration is seen as invalid, and the device won't switch to RUN.

2.7.6 FB RE: support for linked markers in recipes

In addition to constant values the recipes can now also link to marker operands (MB, MW, MD).



		D1	D2	D3	D4	D5	D6	D7	D8		
1	Preset...	20	30	40	50	600	70	80	90	-	+
2	Preset...	MB1	MB2	MB3	MB4	MB5	MB6	MB7	MB8	-	+
3	Preset...	MW1	MW2	MW3	MW4	MW5	MW6	MW7	MW8	-	+
4	Preset...	MD1	MD2	MD3	MD4	MD5	MD6	MD7	MD8	-	+
5	Preset...	0	MB2	MW3	MD4	55	MB6	MD1	MB8	-	+
6	Preset...										+

Figure 3: example of a FB RE using links to markers

2.7.7 FB D: support double size digits to display values

The FB D offers the possibility to display values with digit in double the normal size. This can be used for better readability of important values in a screen of FB D.

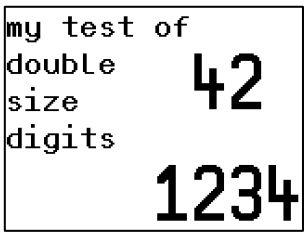


Figure 4: example for a FB D output using double size digits

2.7.8 FB AL: Support for operands in e-mail message

The function block AL (alarm) now offers the opportunity to embed current values from the user application, e.g. measured temperatures or other sensor values, into the email body text. To facilitate this the FB AL text message supports operand values by embedding operand name in special character $ (e.g., $MW3$). The values of the following operands are supported:

Operand	Operand type	Example in message text
I	Digital input	$I1$
Q	Digital output	$Q1$
IA	Analog input	$IA1$
QA	Analog output	$QA1$
M	Marker	$M1$
MB	Marker byte	$MB1$
MW	Marker word	$MW1$
MD	Marker double word	$MD1$
N	NET marker	$N1$
NB	NET marker byte	$NB1$

Operand	Operand type	Example in message text
NW	NET marker word	$NW1$

Leading zeros in the operand index are allowed if the index has three digits or less:

Example	Allowed
$Q1$	yes
$Q01$	yes
$Q001$	yes
$M512$	yes
$Q0001$	no
$M0512$	no

The maximum number of operands allowed across all FB instances is 128.

The following example includes MW10 and MB50 operand values into the email message:

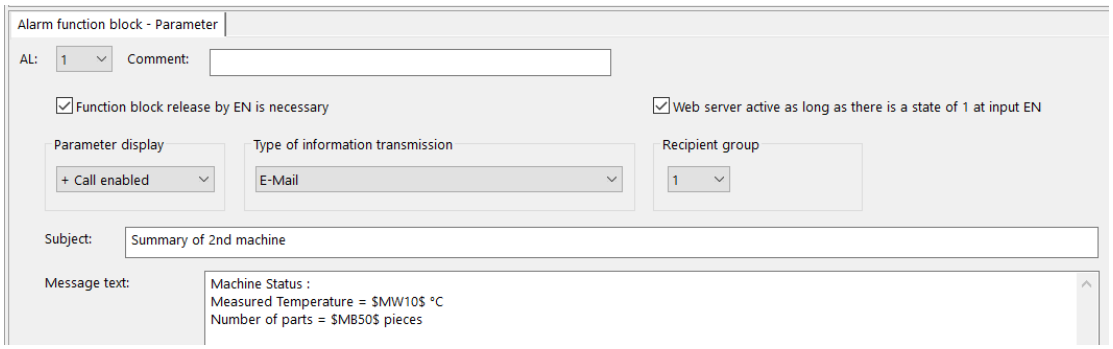


Figure 5: example of a FB AL instance including operand values in the message text

After triggering email, received email shows operand MW10 and MB50 values in email body:

Figure 6: email sent by the above example of FB AL

2.7.9 FB DL: Logs can be downloaded in RUN

The log files from FB DL can be read out in easySoft and web client irrespective of the device state. It's not required to switch to STOP, and user can read the log files in RUN state also.

2.7.10 New firmware update procedure

The firmware update procedure has been changed. Like updating communication modules and local IO expansions, the update can now be triggered from device menu.

For serial machine builders and other customers, who cannot or don't want to use the device menu for firmware update, a second way is given to update the device by utilizing a setting file on microSD card.

For details see chapter 1.2.1.

2.7.11 System event logging - new log entries

Some new system event log entries related to firmware update were added. The system log feature needs to be activated in the user program in easySoft. The resulting log file will be stored on the SD card. The log files contain event codes and a time stamp. The following table lists all event codes of the easyE4.

system event code	description
0	Program download from easySoft
1	Program download from microSD card

system event code	description
2	User program deleted
3	Web API key created
4	Wrong web API key entered
5	New device password created
6	Device password deleted
7	Wrong device password entered
8	SWD config. button pressed
9	Firmware update of IO expansion module
10	Firmware update of communication module
11	Firmware update of base device
12	Web user: Invalid user or password
13	FW update base device started
14	FW update base device signature invalid
15	FW update base device failed (e.g. update for wrong device)
120	Modbus/TCP Client activated
121	Modbus/TCP Client deactivated
122	Modbus/TCP Client: configuration changed
123	Modbus/TCP Client: invalid data received

2.7.12 System parametrization via SD card

System parameters can be set via SD card by utilizing the file "e4settings.ini", which must be placed into the root folder of the SD card. The following parameters can be set through the file:

- Display language

- Display brightness 1 and 2
- Timeout for brightness switch
- Start graphic screen time
- Color setting
- Firmware update through SD card

The file contains the settings in ASCII text format. Refer to the below example for the proper syntax to set the values:

```
Display Language=0
Brightness1=80
Brightness2=70
Timeout Brightness=30
Timeout start graphics=1
updatefw=1
updatefile:E4_V200.fw
Color=3
```

Display language

language code	language	language code	language
0	ENG / English	8	POR / Portuguese
1	GER / German	9	RUS / Russian
2	FRA / French	10	TRK / Turkish
3	ESP / Spanish	11	RO / Romanian
4	ITA / Italian	12	HUN / Hungarian
5	NLD / Dutch	13	SRB / Serbian
6	POL / Polish	14	HRV / Croatian
7	CZ / Czech	15	SVN / Slovenian

Display brightness 1 and 2

Specify the two brightness levels x1 and x2 as a multiple of 10 (0<=x1,x2<=100). If entered value is not a multiple of 10, then it will be rounded up to the next multiple of 10.

Timeout for brightness switch

Need to specify value in seconds as per below table. If any intermediate value is specified, then it will be rounded up to the next possible value as per table.

Example, if 2 seconds are specified in the *.ini file then the value will be rounded up to 10 seconds.

Values in seconds	timeout
0	0 seconds
10	10 Seconds
30	30 seconds
60	1 minute
120	2 minutes
300	5 minutes
600	10 minutes
900	15 minutes

Start graphics timeout

How long shall the start graphics be visible on the screen? Specify a value x in seconds (0<=x<=10).

Firmware update

Alternative method to install a new firmware on the base device (described in chapter 1.2.1.). This method can be used to install an update on devices without a display. Two parameters are needed here:

```
updatefw=1
updatefile:<file name>
```

The device with the respective file name needs to be available in the root directory of the SD card.

Color scheme setting

The color index refers to a full color scheme for the easyE4 display which consists of 14 different colors for different purposes:

- standard device menu entries: text color + background color
- warning messages: text color + background color
- error messages: text color + background color
- input fields: text color + background color
- headings: text color + background color
- cursor color: text color + background color

The following table list the two most important colors with respect to the color scheme index.

Color scheme index	Text / Background color	Color scheme index	Text / Background color
0	black / white (default)	8	dark brown / light brown
1	white / black	9	light brown / dark brown
2	black / white (alternative 1)	10	dark green / light green
3	white / black (alternative 1)	11	light green / dark green
4	black / white (alternative 2)	12	dark red / light red
5	white / black (alternative 2)	13	light red / dark red
6	grey-blue / light blue	14	dark purple / light purple
7	white / dark blue	15	black / white (alternative 3)

2.7.13 Web Client Features

Compatibility of web client with recent versions of web browsers

The web client of version 2.00 is now compatible with current web browsers (Google Chrome version - 109.0.5414.75, Microsoft Edge version - 109.0.1518.55) to provide a stable connection when using https.

Remark: When connecting from Apple Safari (tested with Safari version 16.2) to easyE4 for the first time, the full functionality will be available after some seconds.

FB DL log files accessible through the web client

Users can now download log files from the device directly through the web client without the need to use easySoft or remove the SD card from the device. For this the web client has a new menu entry named 'Data Logger':

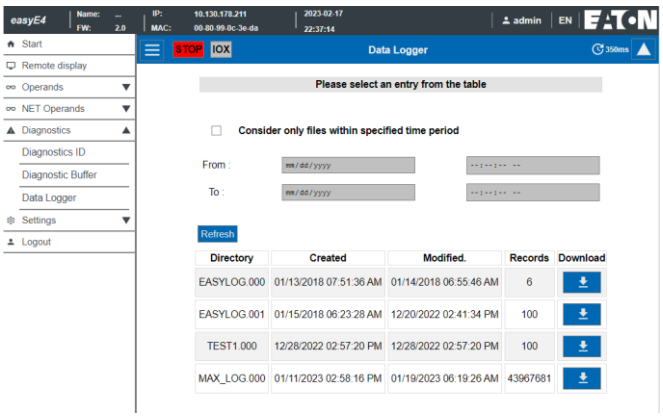


Figure 7: New Data Logger view in web client

Users can download all logs from a particular directory:

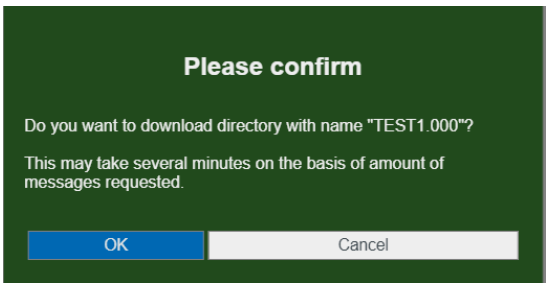


Figure 8: Popup to confirm the download

Users can also download files within a specified time period:

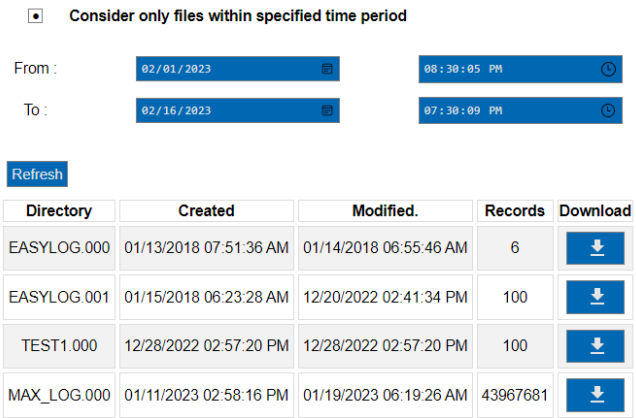


Figure 9: Choose a time period of the log files to download

The resulting files can be found in the download folder of the web browser as comma-separated values (CSV) files.

Miscellaneous features

- Eye icon to display and hide the password in the login window: The user can reveal the password by clicking on the eye icon provided in the password field in web client.

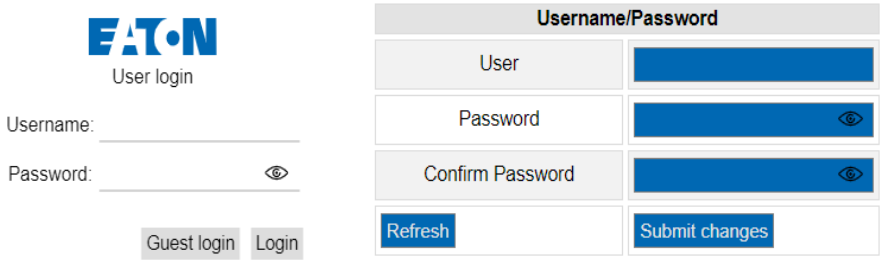


Figure 10: Eye icon in password fields

- Visual Improvement of Remote Display page in web client.

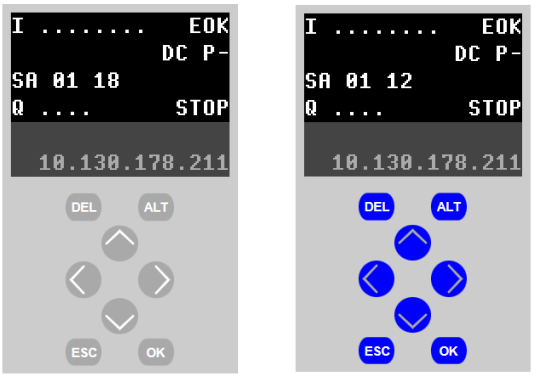


Figure 11: Remote display if user has no access to the display keys or if the user has access

- Improved handling of special characters in email groups, device name, domain name and email username.
- Improved handling of email server IP address change.
- Some missing language translations were added.

2.8 Important changes in easyE4 Firmware V2.00

This version of the easyE4 firmware includes all bugfixes of the firmware versions V1.42 and before. Refer to the release notes of these firmware versions for details.

Eaton is dedicated to ensuring that reliable, efficient and safe power supply is available when it is needed most. With vast of energy management across different industries, experts at Eaton deliver customized, integrated solutions to solve our customer' most critical challenges.

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