GALILEO 11.1
Release Notes

Powering Business Worldwide

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Important:
Please contact our support (Automation@Eaton.com) if you find any errors, malfunctions, missing functions or other problems with the software. Your cooperation is greatly appreciated.

System Requirements

- Windows 10 / Windows 11
- 1GHz or faster processor
- 1GB of RAM
- Minimum available hard disk space: 600MB (application only)
  Recommended available hard disk space: 1GB (application, help system, sample projects, panel operating system images)
- 1024x768 or higher display resolution
- Browser (only needed for help system)
- .NET Desktop Runtime 9.0 (part of the installation of Galileo)

System Requirements Galileo Open Runtime

- Windows 10 / Windows 11
- 1GHz or faster processor
- 512MB of RAM
- Graphics card supporting OpenGL 1.5 for using graphics acceleration (otherwise, software rendering can be utilized)
- Minimum available hard disk space depends on project (at least 20MB needed for application only)

System Requirements XV-303

- Image version 1.1.0 or above

System Requirements XV-102

- Image version 1.1.0 or above

Table of content

1 Supported panels

Galileo 11 supports the following panel series:

- Linux-based panels XV-102-**Lx**-…
- Linux-based panels XV-303-….-**B2**
- Windows 32 based devices (like XP-503, XP-504 and any other Win32 PCs)

For the Windows CE 5.0 based XV-102 panel series and the Windows Embedded Compact 7 based XV-303 panel series please continue to use the latest Galileo 10.x version. It will not be possible to run Galileo 11 projects on these devices.

In case of a change to the Linux-based panels, please refer to the separate "Migration Guide" for more details and hints about the migration of the Galileo projects to these new panels.

2 New Features

2.1 Galileo 11.1.0

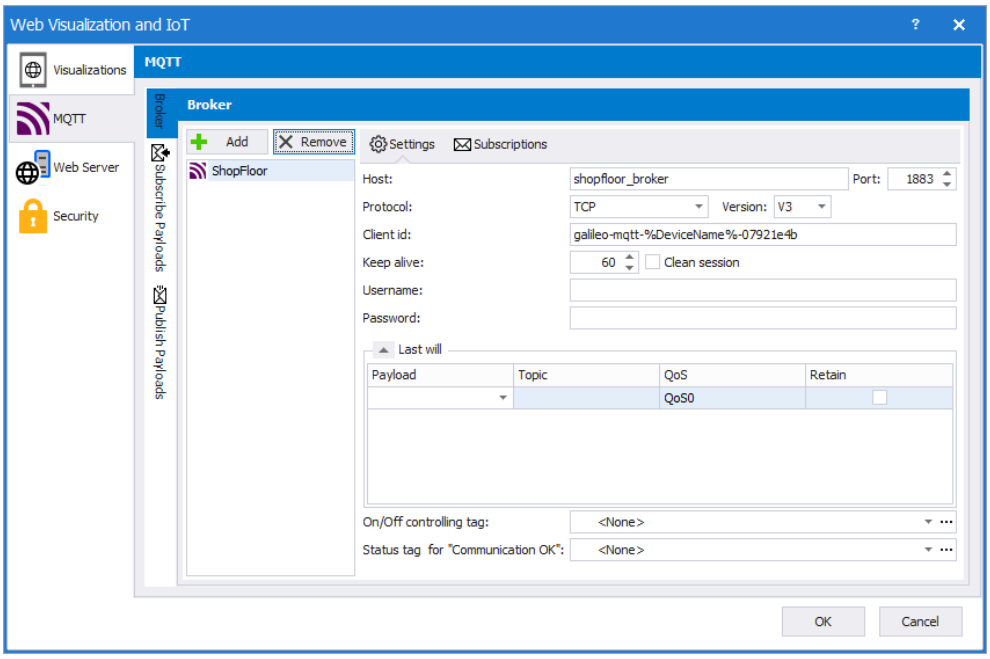
2.1.1 MQTT

Galileo now supports data exchange via the MQTT protocol.

Messages can be received ("Subscribe") and sent ("Publish").

The content of received messages can be mapped to tags, and Galileo can propagate tag values by publishing messages.

To configure the MQTT functionality, go to "Project Configuration" → "Web and IoT".



Following features are supported:

Broker configuration:

- Configuration of multiple brokers
- Per-Broker subscribing and publishing of messages
- Supported communication protocols: TCP, TCP Secure, WebSockets, WebSockets Secure
- Supported MQTT protocol versions: V3.1.1 and V5.0
- Authentication by username and password
- Client and server certificate authentication
- Configuration of "Last Will" message
- Usage of dynamic placeholders for unique identification of the client
- Galileo tag for enabling/disabling communication to the Broker
- Galileo tag for "connected/disconnected" status displaying

Subscribing of messages:

- Only messages with JSON payload are supported
- Assignment of JSON data to Galileo tag values by using JSON Pointer syntax. Example of JSON payload:

```
{
  "data":
  {
    "speed": 100,
    "parameters": [10, 20]
    "description": "Conveyor Belt A"
  }
}
```

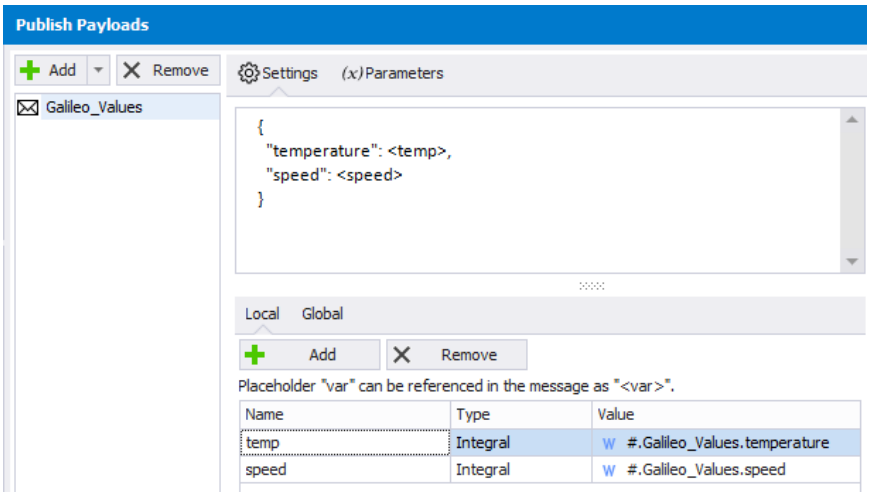
Configuration of data assignment to Galileo tags:

JSON Pointer	Type	Tag
/data/speed	Integral	dw #.dwSpeed
/data/parameters/0	Integral	by #.dwParam1
/data/parameters/1	Integral	by #.dwParam2
/data/description	String	ab #.szDescription

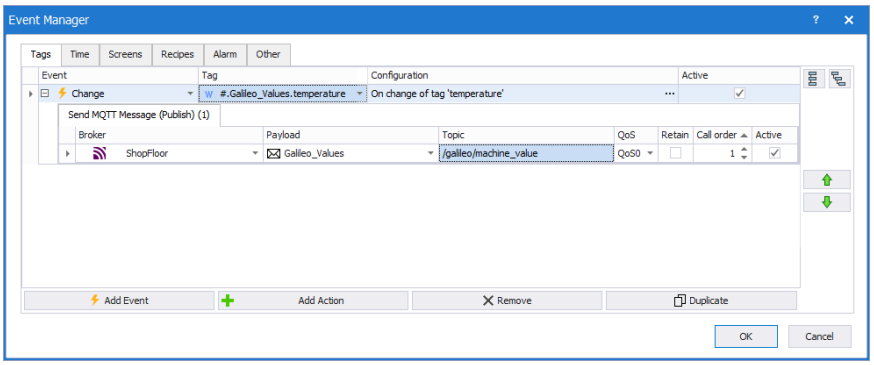
- Conditional checks before value assignment for plausibility check of data
- Usage of parameters (instead of fixed Galileo tags) to increase reusability of message definitions.

Publishing of messages:

- Publishing of messages in any plaintext payload format
- Use placeholders for adding tag values to the messages. Example:



- Publishing of messages on events, configurable in the Event Manager. Example:



- Usage of parameters (instead of fixed Galileo tags) to increase reusability of message definitions.

2.1.2 PDF generating

Galileo supports the generation of PDF documents on runtime. This makes it possible, for example, to save predefined print reports as PDF. It's also possible to save dynamic content, like alarm list or parameter list, as PDF.

This offers an ideal alternative to the printing of data for archiving purposes.

Following Galileo functionalities are offered:

- Save History as PDF
- Save History as PDF Var
- Save Parameter List as PDF
- Save Parameter List as PDF Var
- Save Parameter List (no Header) as PDF
- Save Parameter List (no Header) as PDF Var
- Save Report as PDF
- Save Report as PDF Var

- Save Screen as PDF
- Save Screen as PDF Var

It is also possible to define different page/pager formats.

2.1.3 QR-Code generating

It is now possible to generate QR codes on runtime and display them on the screen as controls.

As content of the QR code, following can be used:

- Language dependent text: This, for examples, enables the representation of an URL with a language dependent URL part ("…/de/index.html", "…/en/index.html", …)
- Galileo tag value: Displaying of content of a string tag
- Dynamically put together texts (text definition with placeholders, which are replaced on runtime with Galileo tag values).

2.1.4 Printer support for XV-102 and XV-303

The former Windows CE 5.0 and Windows Embedded Compact 7 based XV-102 and XV-303 panels supported printing of specific Galileo content on PCL (Printer Command Language) compatible printers. The Galileo version 11.0 was not offering any printer support for the new, Linux-based XV-102 and XV-303 panels.

With Galileo 11.1.x, printing from XV-102 and XV-303 is now possible again. It is required that min. OS version 1.1.0 is running on the panel.

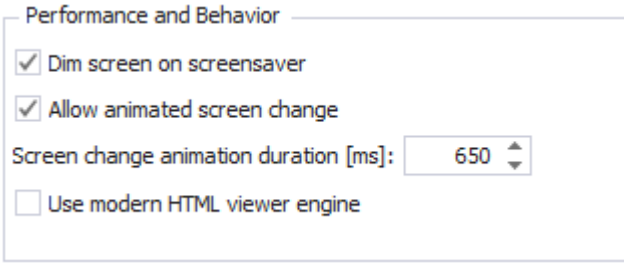
The printing is no longer performed via the PCL protocol but is using instead the standard IPP (Internet Printing Protocol). The printer therefore needs to support this protocol and needs to have the functionality enabled.

2.1.5 New HTML Viewer engine

For Galileo Open there is now the possibility to use Microsoft's Edge WebView2 as HTML Viewer engine. This enables, for example, the displaying of modern, HTML5-based pages.

Because of compatibility reasons, the earlier HTML Viewer engine will still be offered and remains the default one when opening existing projects.

To enable the new engine, navigate to the "Project Settings" under "Runtime" and enable the option "Use modern HTML viewer engine":



To make Galileo running correctly on the target system, it is mandatory that the Microsoft Edge WebView2 Runtime is installed. This can be downloaded from here (state July 2025):

https://developer.microsoft.com/en-us/Microsoft-edge/webview2

2.1.6 easyE4: Functional replacement support for XV-102-…-1E4 WinCE 5.0 panels

The Galileo versions 10.x offered limited, free support for the special, Windows CE 5.0 based device types:

- XV-102-A0-35TQRB-1E4
- XV-102-A3-57TVRB-1E4

Galileo 11 supports the same limited, free functionality now as well on the Linux-based device types of series XV-102-Lx-…

It is therefore now possible to migrate existing Galileo 10.x projects, which are targeting these devices, to Galileo 11.1.x and use them under the same conditions and limitations as on Galileo 10.x.

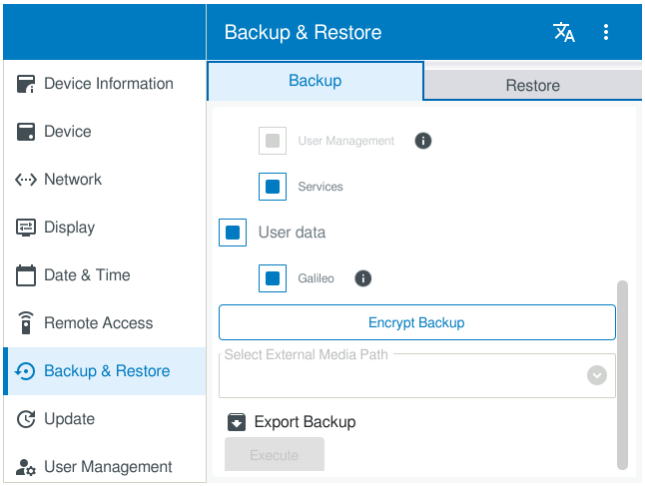
Limitations:

- Only communications of type "Modbus TCP easyE4" and "Persistent Tag Storage" are supported.
- No support for Web Visualization.
- No support for MQTT.

2.1.7 Others

2.1.7.1 Support for "Backup & Restore"

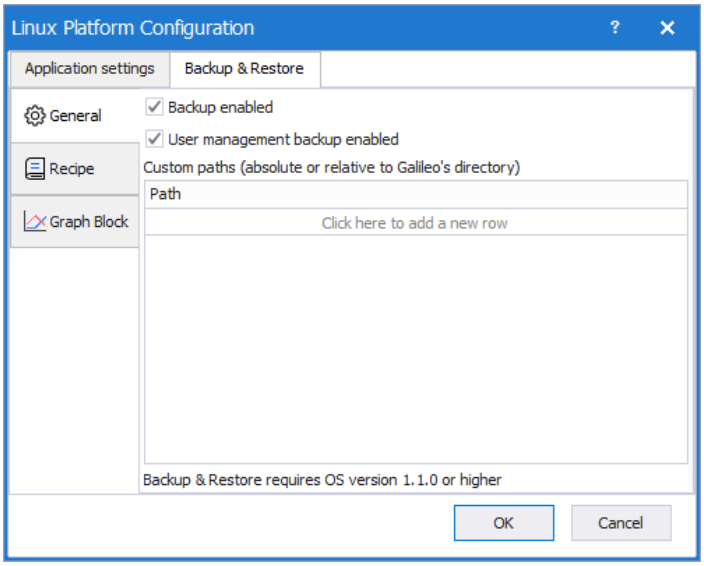
On the Linux-based panels XV-102 and XV-303, starting with OS version 1.1.0, a "Backup & Restore" functionality is available:



With this functionality it is possible to create a backup of the current device configuration. The generated backup file then can be applied on a second device via "Restore" or during the first setup of the device to restore the current state.

In addition to the device configuration, it is also possible to back up the Galileo application and selected data of it.

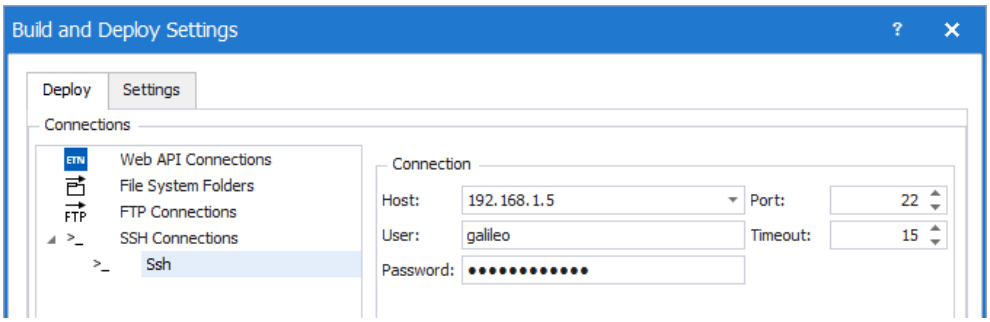
The configuration of what will be part of the backup can be configured in the "Linux Platform Configuration" dialog on the "Backup & Restore" tab:



Configure here whether the backup functionality should be enabled/disabled at all, whether the user management, which recipes and which recorded graph data should be part of the backup.

2.1.7.2 SSH/SFTP support for deploying of Galileo Open projects

In addition to the data transfer via FTP there is now the more secure alternative SSH/SFTP available:



(Requires an SFTP server to be installed on the target system.)

2.1.7.3 New "What's new" overview

The major new features, changes and bug fixes are now shown in a "What's new" popup dialog on first startup of a new installed Galileo version. This gives you a brief overview without having to read this full release notes document.

2.2 Galileo 11.1.1

2.2.1 Detection of external storage media

There are now comfortable ways to detect, whether an external storage media (USB or storage card) is attached to the device or not.

Following new system tags are available:

- UsbMounted
- StorageCardMounted

The tags will be set by Galileo to 1 if a USB storage media resp. storage card is attached to the device. If there are no USB storage media resp. storage cards attached (or, of course, got detached), the appropriate tag is set to 0.

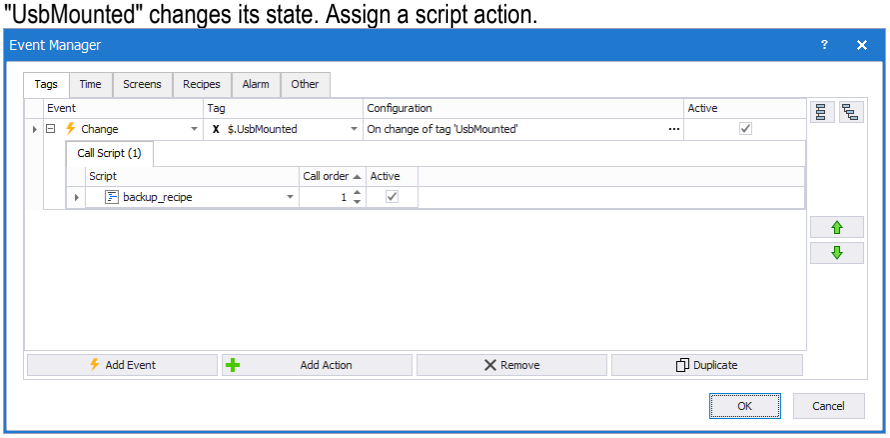
In addition, there are the two new script functions:

- System.DirectoryExists(…)
- System.DirectoryExistsVar(…)

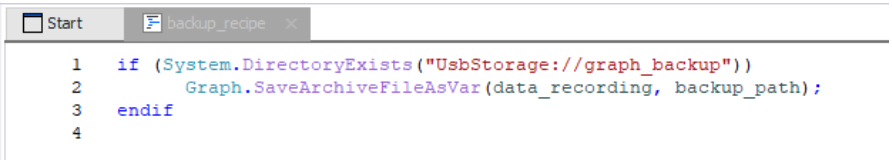
Use one of these functions to check whether a given directory (or drive) exists.

These functionalities combined enable some automated use-cases. For example, you could execute a graph archive backup as soon as a specific USB storage media is attached by setting up following:

- In the Event Manager, create an event which gets executed as soon as the system tag "UsbMounted" changes its state. Assign a script action.



- Have a script to check, whether the expected directory on the USB storage media exists and execute the operation then. Something like this, assuming the tag "backup_path" contains a file path like "UsbStorage://graph_backup/mybackup.gdb":



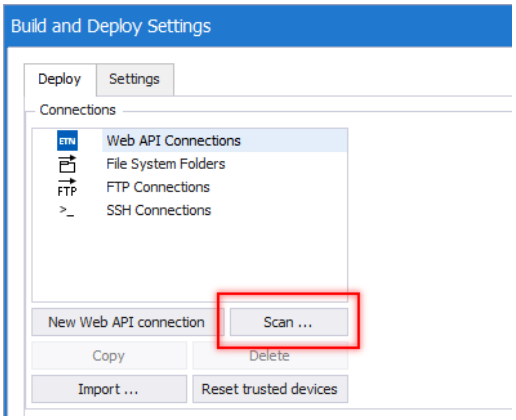

```
if (System.DirectoryExists("UsbStorage://graph_backup"))
    Graph.SaveArchiveFileAsVar(data_recording, backup_path);
endif
```

Refer to the Galileo help to get more information about the system tags, the script functions and possible limitations.

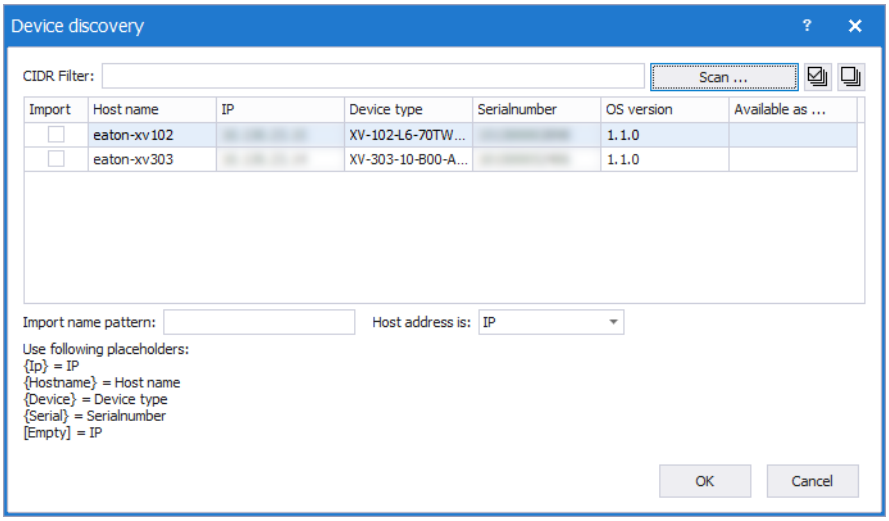
2.2.2 Device Discovery

The Galileo Design Tool now offers a "Device Discovery" functionality to scan the network for available XV-102 and XV-303 devices.

Within the dialog "Build and Deploy Settings", select the "Web API Connections" entry and click on "Scan …"



A new dialog opens, which let you execute the scan:



The discovered panels can be selected for import and by using the import name pattern, the naming can be defined very flexible.

The network scan uses the "zeroconf" technology. A communication via the UDP port 5353 therefore is required and must be allowed for the local network.

Refer to the Galileo help to get more information about the different settings and options.

2.2.3 System tag EPAS_Code

The system tag "EPAS_Code" is available to be used on panels of the series XV-102. The content is a URL linking to the website with product information. It represents the same information as, for example, printing as QR code on the label on the back of the panel.

Use, for example, the QR Code control of Galileo to make this information available as well on the front on the screen (e.g. on a dedicated "Service Screen").

3 Major Changes

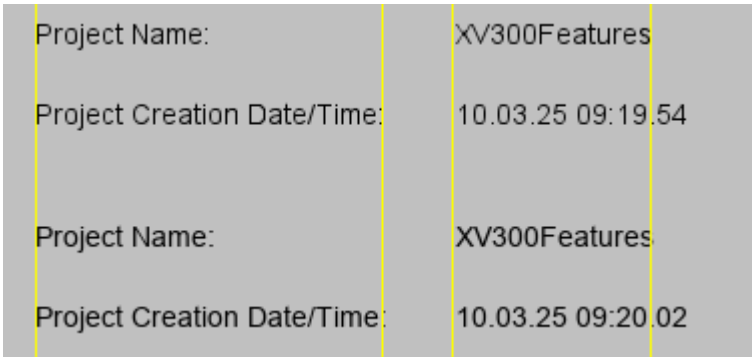
3.1 Galileo 11

The font rendering on runtime slightly changed compared to Galileo 10.

Galileo 10:

Galileo 11:

The difference is minor, but it can happen, that certain texts need some few pixels more space as compared here (upper part = Galileo 10, lower part = Galileo 11, yellow lines as virtual marking):



3.2 Galileo 11.1.1

Until Galileo 11.1.1 it was mistakenly allowed on Linux-based panels to store continuous graph recordings (.TDB files) on the same storage media as the boot media. This is strongly not recommended. If such a configuration was used, you will see now an error appearing on runtime as soon as the appropriate graph gets started.

If you still want to use this functionality, please contact the support team.

4 Known issues

The following issues are known and will be addressed in a future release:

General

- Only the remote connection related system tags "RemoteClientEnable" (to control the running/stopping of the VNC service) and "RemoteClientEnabled" (to retrieve the state if the VNC service is running) are supported. The system tags "RemoteClientActive", "RemoteClientInputEnable" and "RemoteClientInputEnabled" are not yet supported.
- It is not recommended to operate the panel at the same time locally on the touch panel and remotely via a VNC connection. Having, for example, some touch actions ongoing locally and a click action is happening in between from VNC connection can break the local touch operation sustainable. It is strongly recommended to enable remote access only in controlled environments/situations (e.g. a service situation). This can be done either by setting the Galileo system tag "RemoteClientEnable" temporarily to "1" (e.g. on a service screen) or by enabling VNC via the Web Config Tool (which is always accessible).

Design Tool

- Upload: Uploading of recipe files and the user management file from Linux-based XV-102 is not yet working if the file is stored on an external storage device like SD card or USB drives.

Communication

- CODESYS-2: When changing the CODESYS-2 symbol file on the PLC while Galileo is connected to it, too many error messages with partly misleading messages could occur.
- CODESYS-3: It can be that the CODESYS-3 application requires a bigger amount of time until it is capable of handling connections to Galileo and starting to communicate. It is therefore, until further notice, recommended to configure a sufficiently large "Startup Delay" time (e.g., 20s).
- CODESYS-3: The syntax "`ARRAY [a..b] OF ARRAY [x..y] OF <TYPE>`" for multi-dimensional arrays is not supported. Please use the possible alternative syntax: "`ARRAY [a..b, x..y] OF <TYPE>`"

4.1 "Permission denied" error after update of OS

After an update of the OS on the panels XV-102/303 from version 1.0.x to 1.1.x it can happen, that after a following up installation of Galileo on startup a "Permission denied" error appears. By rebooting the panel once the error will be solved permanently.

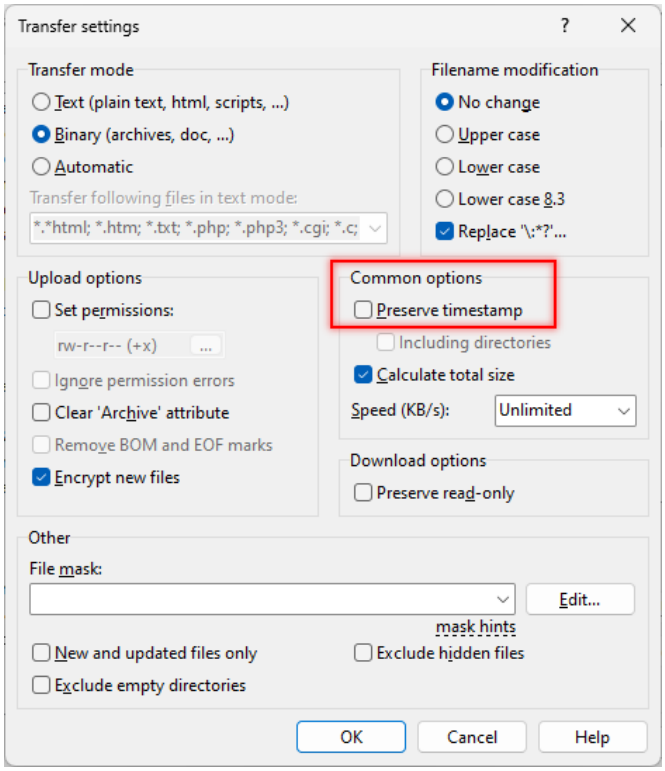
4.2 Modifying of recipes and download via SCP

It is possible to modify recipes (without the Galileo Design Tool) on a PC and download them with an SCP client to the panel (XV-102/XV-303) again.

Because of different user and user permissions on the Linux system it is mandatory, that the used SCP client doesn't try to update the timestamps when downloading the file to the panel.

Some clients handle this as required by default (e.g., application "FileZilla", checked with version 3.68.1).

For the client "WinSCP" the setting must be configured as follows (checked with version 6.5): Menu "Options" → Menu entry "Preferences" → Category "Transfer" → Selection "Default" → Button "Edit …" to edit the "Transfer settings" → Disable "Preserve timestamp"



If a different SCP client is used, the documentation of the client application should be consulted to find information about this topic.

4.3 MQTT: Assigning of negative values to unsigned QWord tags

When receiving a negative value and trying to assign it to an unsigned QWord Galileo tag, the value wraps around the maximum possible value. This means, if the value -1 gets retrieved, the tag value will become 2^{64}-1, for -2 the tag value will be 2^{64}-2 and so on.

This only applies to QWord Galileo tags. For any other numeric Galileo tag type the result in such a case, where a negative value is retrieved and gets assigned to an unsigned Galileo tag, will be 0.

5 Improvements and bug fixes in 11.1

Galileo 11.1.0 includes all the improvements and bug fixes of Galileo 11.0.x up to the release date (state Galileo 11.0.3).

5.1 Galileo 11.1.1

New

- Refer to the chapter "2.2 Galileo 11.1.1" for having a detailed overview and explanation of the new features.
- Added support for new device types "XV-102-L0-35TQRB-1E4" and "XV-102-L0-57TVRB-1E4", intended to be used ONLY and exclusively in combination with easyE4 control relays.

Design Tool

- **New**: Support tag import for CODESYS-3 symbol files with "CODESYS-2" compatibility set.
- Dialog: fixed a bug in resolving of parameters in dialogs.
- User Control: fixed a bug regarding displaying of arguments.
- Fixed crash when converting a Win32 based project to XV-102/303 and there are faulty scripts.
- Minor UI adjustments in "Build and Deploy Settings" dialog.
- Changed compiler handling of missing placeholders in texts from "warning" to "error".

Runtime

- Graph: A graph control displaying data from an array could be scrolled too far to the left beyond the first element of the array.
- Touch operations: Fixed issue with long-lasting touch interactions which caused a faulty release of the touch after some seconds, even though the touch was continuously pressed. This especially affected Buttons in "Streaming" mode but also scrolling/moving actions like scrolling lists or moving a slider.

Communication

- Persistent Tag Storage: Fixed retrieving stored values at startup.

5.2 Galileo 11.1.0

Design Tool

- Fixed flickering when starting up the Design Tool
- Copy/Paste: Fixed script parameter handling on copy/paste of function keys calling parameterized scripts.
- Cross-Project Copy/Paste: Scripts are getting copied now as well when copying User Controls which have the script used as static content.
- Cross-Project Copy/Paste: Added option to retain resp. apply the folder hierarchy on pasting.
- Print Report: Fixed drawing and placing of controls on pages different from the first one.
- Project organization: Allow incremental search in trees by typing when tree is focused. It is also possible to move between the search results with key combination CTRL + "arrow up" and CTRL + "arrow down".

- Tags: Fixed several crashes happening when deleting tags.

Runtime

- Visual improvements for the system error windows shown due to failures on startup.
- Numeric keypad support for "ENTER" and arrow keys

Communication

- Communication Test application: Layout improvements, especially to fit better on small screens.