









S7-Panel-HMI Manual

-  S7-Panel-PLC
-  S7-Compact-PLC
-  **S7-Panel-HMI**
-  Periphery
-  Software
-  Energy Management

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Changes to older versions of the manual

Rev. 02 / 2012:

new: RemoteStage, BIOS added
changed: VisuStage updated to 2.0.1.4

Rev. 03 / 2012:

changed: RemoteStage with „Read-In-by-Ethernet“-functionality, VisuStage: improvements at receipt administration and objects placing (from VisuStage 2.0.1.5 referred to demo visu 2012_04_2)

Rev. 01 / 2013:

new: ServiceStage added

Rev. 02 / 2013:

new: VisuStage V2.0.2.2 and RemoteStage 1.0.3.3 new features (with OS 1.0.5), text buttons and watchdog added now referred to new demo visu 2013_02

Rev. 03 / 2013:

new: New description for VisuStage 2.0.2.3 / RemoteStage 1.0.3.4 (PLC-OS 2.0.39, HMI-OS 1.0.7) with colour change at Texts, confirmation messages at receipes, sorting at message archive, adjustable font sizes and scales in progress bars and trend archives, new download mechanism, I/O-fields with integer-input with comma, now referred to new demo visu 2013_04

Rev. 04 / 2013:

new: New description for VisuStage: Use of SFC201-5 from PLC with separated Panel-HMI (with PLS-OS 2.0.40 and HMI-OS 1.0.9)

Rev. 05 / 2013:

new: New remote-functions; recipe records read out/ store, DB-archives read out / store, (with PLC-OS 2.0.41 and HMI-OS 1.0.11)
Read in visualization binary over Ethernet directly from Panel-HMI (with RemoteStage V1.0.3.7)

Rev. 06 / 2013:

new: Service Stage 1.0.1.1: Know-how-protection available (HMI-firmware 1.1.0)

Rev. 07 / 2013:

new: VisuStage 2.0.3.1: library management, group/ungroup function, RemoteStage 1.0.4.0: PIN-code request at visualization-binary import valid from firmware 1.1.1

Rev. 08 / 2013:

new: VisuStage 2.0.3.4 / RemoteStage 1.0.4.2: Rotation of screens possible, Filtering of variables, Additional display of trigger-and acknowledgment variables at alarm/event ressources, from and HMI-firmware 1.1.3

Rev. 09 / 2013:

new: VisuStage 2.0.3.5: „Cross Reference“-function and display of list resources at image/text lists.

Rev. 01 / 2014:

new: VisuStage 2.0.3.6 and RemoteStage 1.0.4.3 : Grid/Snap, Screen template/Master foil, function „Screen change with PIN-input“, I/O-Fields: Input in calculator-style (with „comma“-key) inserted, from HMI-firmware 1.1.4

Rev. 02 / 2014:

new: VisuStage 2.0.3.9 and RemoteStage 1.0.4.5 : new: Function graph, added: button design @ virtual keyboards from HMI-firmware 1.1.5
changed: Structure in chapter VisuStage improved

Rev. 03 / 2014:

changed: S7-program lines as sample inserted for all SFCs and Ethernet.SFBs, Hints for VIDEOS added

Rev. 04 / 2014:

changed: VisuStage: new Find-, Overview- and CleanUp functions with version 2.0.4.0

Rev. 05/ 2014:

new: VisuStage 2.0.4.2: new function: User Lever Selection at PIN-Input (with firmware 2.1.9 and Remote Stage 1.0.4.7)
changed: better description of how to assign a connection between Panel-HMI ↔ PLC

Rev. 01 / 2015:

new: VisuStage 2.0.4.4: Lean-Version after 30 days, new function: TSAP-configuration, select color of IP-field by variable, insert hexadecimale values into I/O-field (with firmware 2.2.1)
changed: TSAP-configuration possible in BIOS too, description changed

Rev. 02 / 2015:

new: VisuStage 2.0.4.5: set colors / appearance to message texts / backgrounds of the message viewers (with firmware Panel-PLC 2.2.3, Panel-.HMI 1.1.9) , remote visible by RemoteStage 1.0.4.10

Changes to older versions of the manual

Rev. 03 / 2015:

new: CPU-T-inserted, adaptations (extensions) for CPU-T functionality inserted,
 changed: new VisuStage-functionality at images, rectangles, texts, progress bars, new ServiceStage functionality:
 Firmware update by ETH, description: how to make a WLD
 (with HMI-firmware 1.2.1, VisuStage 2.0.4.7, ServiceStage 1.0.1.5, RemoteStage 1.0.4.13)

Rev. 01 / 2016:

new: VisuStage V2.0.5.0: Import Variables from TIA-Portal Firmware HMI 1.2.5 (CPU -V/-P/-T)

Rev. 02 / 2016:

changed: VisuStage scaling of values in I/O-fields explained

Rev. 03 / 2016:

new: new up- and downloads in command line mode of RemoteStage 1.0.4.17, online-backup in Service Stage 1.0.1.7
 from PLC firmware 2.3.9 (all CPUs) or HMI firmware 1.2.7 CPU-V/-P and 1.2.6 CPU-T

Rev. 04 / 2016:

new: VNC-Server in CPU-T-Panels (and Panel-PLCs), change language and screen by variable
 Time synchronization with partner-device
 with VisuStage 2.0.5.2 and PLC-firmware 2.4.0 (CPU-T) or HMI-firmware 1.2.9 CPU-T
 changed: RemoteStage: Description at download recipes and data archives into remote-device improved
 ServiceStage: Description at Online Backup expanded

Rev. 05 / 2016:

new: VNC-Viewer in VisuStage described, from VS 2.0.5.2, firmware 1.2.9 (HMI) -CPU-T only
 changed: ServiceStage: Description at Online Backup expanded once more, new manual design line

Rev. 06 / 2016:

new: Multiplex-variables in VisuStage from VS 2.0.5.3, Firmware 1.3.1 (only HMI-T)
 IP-request at download in ServiceStage from V 1.0.2.0, Firmware 1.3.1 (HMI-all)
 changed: Description o I/O-fields and date/time-fields separated and improved

Rev. 01 / 2017:

new: VisuStage 2.1.0.0: gauges, sliders, key functions "Delete Archives", 1024 events for CPU-T-devices,
 vertical alignment for multiline texts, Access rights for recipe viewer, inserting objects by short cut and popup windows,
 also requires RemoteStage 1.0.4.23, with firmware 1.3.6 (Compact-/Panel- HMIs with CPU-V/-P)
 or with firmware (Compact-/Panel- PLCs with CPU-T) requires PLC-T-firmware 2.4.8

Rev. 02 / 2017:

new: VisuStage 2.1.0.4: rotate CPU-T-Panel-HMIs and Panel-PLCs, requires firmware HMI 1.4.1
 Ethernet; info for communication assignments for S7-1200/1500 – settings in TIA-Portal explained
 changed: BIOS better explained

Rev. 03 / 2017:

new: VisuStage 2.1.0.7: for CPU-T-devices: new trend (archive) functions added and described,
 HMI-firmware 1.4.4, Remote Stage 1.0.4.30 needed for remote functions

Rev. 01 / 2018:

new: VisuStage 2.1.0.13: to be simulated with S7-PLCSIM, new filter windows for resources, key function alternatively to navigation
 bars at trend,- recipe, message viewer, Remote Stage 1.0.4.33 needed for remote functions
 changed: more samples for batch file applications for RemoteStage, description of resource partner devices improved

Rev. 02 / 2018:

new: VisuStage 2.1.0.16: Assign of compilation-no's (manual / automatical, Notification when operator changes the I/O-field value
 changed: SFC206: new function No. 6 added (management of reciepe records on SD-card)
 (only for CPU-T-devices and from firmware PLC-T 2.5.7, RemoteStage version must be 1.0.4.36)

Rev. 03 / 2018:

new: VisuStage 2.1.0.19: Synchronization of S7-variables with S7-/TIA-projects, find & replace of resources with (partly) the same
 names, Button-function "variable driven multi menuue changing" (for CPU-T-devices only, inactive buttons visible now, when no
 access right, Firmware Panel-HMI-T: 1.5.0, Remote Stage 1.0.4.38 needed

Rev. 01 / 2019:

changed: new screenshots from 2019-Stage software inserted

Rev. 02 / 2019:

new: For T-CPU: indirectly variables for indirectly addressing, 50.000 alarm- and event archives
 from HMI-firmware: CPU-T 1.5.5, VisuStage from 2.1.0.24, RemoteStage from 1.0.4.42

Rev. 01 / 2020:

new: for CPU-T-devices: VisuStage: import of variables from TIA-V16, new object ellipse, new way to set up text-/ image and
 multiplexvariables lists, 2 new system variables for screen and user, copying between 2 VisuStage instances with linked
 objects, VisuStage: 2.1.0.27, Firmware for HMI-T; 1.6.0
 changed: VisuStage: description of first installation improved, RemoteStage: Description of DB-archiving improved

Changes to older versions of the manual

Rev. 02 / 2020:

changed: VisuStage: Description of TSAP at "PLC partner devices - for HMIs only" improved,
RemoteStage: Description of command lines improved, not supported functions in view mode described

Rev. 01 / 2021:

new: VisuStage: BIOS-PIN and NTP-server, selection of partner-PLCs instead inserting TSAP
changed: VNC now 4x, all from firmware 1.6.3 (T-CPU) and VisuStage 2.1.0.35

Rev. 02 / 2021:

new: VisuStage 2.1.0.36, Firmware for Panel-HMI-T; 1.6.6 with indirect variables (for scaling),
with integrated converter TIA-WinCC → VisuStage, needs RemoteStage 1.0.4.49

Rev. 01 / 2022:

changed: CPU Typ P and CON XX Connectors declared as discontinued, Product Images Panel HMI updated Corrections

Rev. 01 / 2023:

new: VisuStage 2.2.0.1 with Image Blocks, RemoteStage 1.0.4.51 required,

Rev. 02 / 2023:

new: VisuStage 2.2.1.0 New functions for image blocks (create, edit and duplicate from project), as well as plausibility check of the faceplates. New functions for lines and rectangles (round corners, other lines and arrow ends). General improvements and bug fixes.

Rev 01/2024:

new: ServiceStage 1.0.4.0: Observation table for variables added

Hint for better understanding by application videos

On our english **INSEVIS-En** Youtube channel we provide tutorial videos in various playlists sorted by topic, referring to single details and functions described in this manual

This will help you to get familiar with INSEVIS much faster – PLEASE use it beside this manual!



General instructions

Safety instructions

This manual contains instructions to avoid material damage and must be carefully attended for your own safety. These instructions are identified with a warning triangle with a note of exclamation inside and a signal word (*Signalwort*) below.



Danger Death, heavy bodily harm or material damage will appear, if appropriated precautions are not taken over.

Warning Death, heavy bodily harm or material damage will appear, if appropriated precautions are not taken over.

Caution Bodily harm or material damage will appear, if appropriated precautions are not taken over.

Attention means, that a unwished results or states can occur, if the appropriated instruction is not noticed.

Important means the commitment to a special behavior or operation for the safe treatment of the controller / machine.

Qualified personnel

All devices described in this manual may only be used, built up and operated together with this documentation. Installation, initiation and operation of these devices might only be done by instructed personnel with certified skills, who can prove their ability to install and initiate electrical and mechanical devices, systems and current circuits in a generally accepted and admitted standard.

Operation according to regulations

This device might be only used for this operation written in this manual and only in combination with other certified external devices. For a correct operation a proper transportation, storage, initiation and maintenance is necessary.

All valid safety instructions and regulations for the prevent of industrial accidents are to be attended carefully. The power supply must be connected to a central ground potential in a starlike wiring.



Maintenance

Modifications / repairs of an INSEVIS device might be done only by special educated and trained personnel of INSEVIS in an ESD-safe area. Every unauthorized opening might cause damages and will terminate all warranty claims.



Data security

Each customer is responsible by himself for protecting his IT-environment against illegal external attacks. INSEVIS shall not be held liable for any direct, indirect or consequential damages respect to any claims arising from the possible illegal external access to their PLCs or HMIs by Ethernet. If you are not sure, how to protect your environment ask for help at professional legal IT-companies.

Copyright

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- STEP®, SIMATIC® and other as reserved trade mark of Siemens AG.
- CANopen® and other as reserved trade mark of CAN in Automation eG
- WINDOWS® and other as reserved trade mark of MICROSOFT AG

and more reserved trade marks are property of the particular owners and are subjected to common protection of trade marks.

Disclaimer

All technical details in this documentation were created by INSEVIS with highest diligence. Anyhow mistakes could not be excluded, so no responsibility is taken by INSEVIS for the complete correctness of this information. This documentation will reviewed regularly and necessary corrections will be done in next version.

With publication of this manual all other versions are no longer valid.

Essential knowledge and experiences

To understand this documentation basic knowledge and experiences of the automation technology in general and the programming with STEP®7 are essential.

About INSEVIS

S7-system components for industrial automation technology

The range of INSEVIS- product families enables an integrated solution and easy to handle for small and medium automation application with latest technology, very high quality level and with additional interfaces like CANopen® and Modbus, to be configured easily.

The easy integration of INSEVIS-products into the S7-world meanwhile is famous and exemplary. Complex communication settings will be assigned easily and intuitively, so that these properties expand the common S7-world by far. A large and multilingual visualization in a modern design is done by a few clicks and the work flow is known by every WinCCflex user. It can be simulated on the visualization PC and is accessible remote.

The S7-CPU's -V and -P are the base of the successfully INSEVIS product families with Profibus DP Master/Slave. With the S7-CPU-T Panel-PLCs and Compact-PLCs Profinet IO Controller. Is available.

Step®7-Programability

INSEVIS-S7-CPU's are programmable by STEP 7® - AWL, KOP, FUP, S7-SCL, S7-Graph from Siemens and in general command-compatible to Siemens-CPU S7-315-2PN DP. Some special INSEVIS-blocks expand the functionality and allow outstanding solutions. The S7-programming will be done by good known tools SIMATIC®-Manager or by TIA-Portal® from Siemens always.

Independence

INSEVIS-products does not base on Windows or Linux, they have an own firmware. Thereby the hard- and software can be exactly designed for a perfect co-ordination with this firmware and a low power consumption. Booting times of less than 4 seconds and completely no software licenses and a current drain of <100mA @ 24V are the result of these facts.

Get your software rid of licenses

INSEVIS stands for a clear and honest license policy, what gives the customer sustainable cost benefits. Because of the ownership of BIOS, firmware and PC-software for visualization, configuration and remote access INSEVIS can offer its products completely without licenses.

Made in Germany

Development, PCB-design and -production, test and mounting of all INSEVIS-products - all this is made in Germany. So every product is a proof for the combination of German engineering and economy and is available with a certification of German origin.



INSEVIS operates a yearly certified quality management system ref. to DIN EN ISO 9001.

All suppliers of INSEVIS obligate to this quality management and contribute to the high quality level of INSEVIS-products.

Already during planning these families one goal was indicated as most important: to design highest quality and ergonomics into all products.

These products were put into comprehensive validation tests before they were produced in selected and certified production lines.

INSEVIS - Made in Germany

Product family Panel - HMI

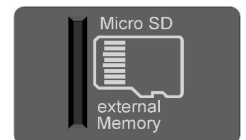
Communication HMI to PLC

INSEVIS-S7-Panel-HMIs will be connected to the PLC by its onboard Ethernet interface (RFC 1006, S7-communication). After assigning the partner-IP-address and TSAP each in panel and PLC the configuration is done already.



External memory card

Each panel has an own slot for an optional Micro-SD-card in the standard FAT32-format. Use this card only for archiving of message data, trend data as well as of data of the recipe management and for backup/restore. While updating the HMI-firmware by this card, the visualization will kept untouched - as it was before.



Most important properties at a glance

System boot time 4 seconds / CPU-V/P

No Windows-firmware means to boot up in less than 4 seconds and primarily: no licenses. And also no run-time limitations for tags. Therewith todays devices still may be updatable in more than 10 years...

Individualization

Keep your own logo as 3D-Doming on the front foil or as bitmap fix included in your OEM-firmware, or as inserting stripe with order-no at the rear side? Everything is possible. Turn the whole device for 90°, 180° or 270° ? No problem for INSEVIS-devices....

Data archiving

Save and archive process data to the Micro-SD-card and read it back to the PLC after updating S7-program. Completely without programming device - by using INSEVIS-SFCs and SFBs. To satisfy the customers for lots of years.

Backup & Restore

Save all data easily; user program, process data, visualization and archives - protected by password as a binary file for using in an equal equipped device, what will proceed with all data from the old PLC

Unlimited languages

INSEVIS supports all languages, what are installed on the PC, where the visualization is designed. No limitation of the number of used languages in the visualization-run-time. Always Unicode16-able. Always be at home in every language of the world.

Free remote account

Use your PC-screen as 2nd panel to display and control your application remote. Import and save archive and recipe data as txt- or csv- files. Do it in a multi-instanceable way in your PC, like in a master display of a control room.

Trend management

4 time based trends with 16 channels each can be started, stopped and continued manually or by variables. Display and archive it as you want it to do. Or display x;y-value couples from DBs in function graphs

Multistructured recipes

Create up to 64 recipes with up to 256 different variables (elements), what result up to 256 data records per recipe. Export and import recipes, records and elements via the Micro-SD-card.

Error messaging system

Display, indicate and archive up to 1024 alarms and 128 events in all your project languages, as blinking text line or symbol, as single- or multi-line message viewer and -archive. Export this data automatically as csv-file to any network drive.

User management system

Manage up to 9 user levers by run-time editable PINs. Define user based target screens and change screens depending on user level. Allow or deny access to „hot keys“ as you want to.

CPU's in the Panel-HMI

CPU-V and CPU-P

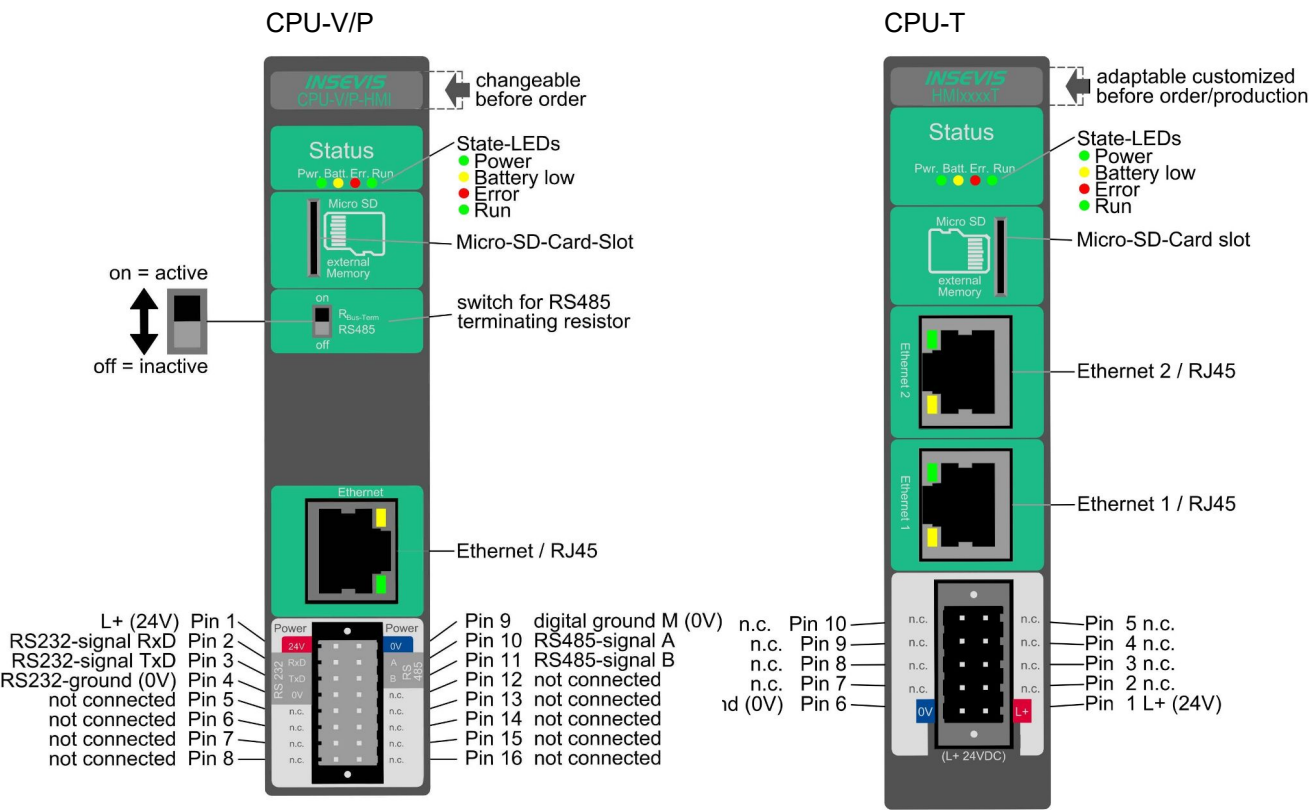
Devices with **CPU-V** and **CPU-P** fit properly to small and medium sized applications in the low cost-areas of Panel-HMIs of Generation I with high graded visualization. Type V best for 3,5 to 5,7. (Type P discontinued for 7 to 10,2"Panels)

CPU-T

Devices with **CPU-T** have more memory, a higher speed and can drive larger panels with more visualization objects. They fit perfectly for medium sized automation solutions. 2 separated Ethernet ports for separated networks or together as an Ethernet switch are onboard. All Generation II devices contain this CPU.

Memory	CPU-V	CPU-P	CPU-T
Memory for visualization	4MB flash memory	24MB flash memory	48MB flash memory
external memory	Micro SD, up to 8 GB	Micro SD, up to 8 GB	Micro SD, up to 8 GB

Wiring of the HMIs



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Touch panel units in the Panel-HMIs

General

By using TFT- displays a high brilliance of colour fastness and brightness and a wide viewing angle are possible. LED-backlight does assure typical half-live periods of 50.000 operating hours and increases the range of operating temperature from -20°C to +60°C (without condensation). All Panel-PLCs are multilingual and can be used in vertical and horizontal way. The complete front (including the touch area) is protected by a laminated IP65 foil.

Customized logos can be implemented on front- or rear side easily. Operating systems with custom logos are available as well. So INSEVIS products can be adapted to customers design easily and without initial costs. Inox-fronts are available too.

With CPU -V and -P

The S7-Panel-HMI-family with CPU-V/-P consist of 4 different display diagonals:

- 3,5" with QVGA-resolution (320x240pixel, 4:3-format)
→ for front panel use with a height of 96mm,
- 5,7" with QVGA- resolution (320x240pixel, 4:3-format) and
→ for front panel use (also from the side),
- 7" with WVGA- resolution (800x480pixel, 16:9-format)
→ for front panel use (cut out matches with 7" - CPU-T),
(Type P-Panels discontinueduse HMI710T instead)
- 10,2" with WVGA- resolution (800x480pixel, 16:9-format)
→ for front panel use (cut out matches with 10,1" - CPU-T),
(Type P-Panels discontinueduse HMI1010T instead)



With CPU -T

The S7-Panel-HMI family with the CPU-T consist of 4 different display diagonals:

- 4,3" with a resolution of 480x272pixel, 16:9-format
→ for front panel use with a height of 96mm,
- 7" with WVGA-resolution of 800x480pixel, 16:9-format
→ for front panel use (cut out matches with 7" - CPU-P),
- 10,1" with a resolution of 1024x600pixel, 16:9-format
for front panel use, (cut out matches with 10,2" - CPU-P),
- 15,6" with a resolution of 1366x768pixel, 16:9-format
→ for front panel use,



Software in the Panel-HMIs

The INSEVIS Software Tools are free, running on a Windows PC and can be executed in german or english language.

Visualization



„VisuStage“ imports symbolic variables from SimaticManager or TIA-projects, it exports texts to be translated easily. Exacts error messages help you to debug your project until it can be simulated and downloaded. For the use of the mulilinguistic version of “VisuStage” it's necessary to buy a company license. The software is providing among other things the following features:

- Alarm- and event messaging system and -archive up to 1024 alarms (50000 storeable) on each,
- Trend data sampling, and archiviing for 4 trends with 16 channels each (655000 storeable on each),
- Recipe management system with up to 64 recipes with 256 elements in 256 records,
- User management system with 9 layers and password protection,
- Screen saver, backlight switch-off function, clean screen and buzzer,
- Library with 2D- and 3D-symbols, integrated simulation,
- 4x VNC-server for CPU-T-Panel-PLCs.

Remote access



With software „RemoteStage“ there can be made a remote visualization from the binary of a VisuStage-visualization created before. This program comes as an directly executable file and can be also used for creating batch files. The Software communicates via S7-Communications (Put/Get) with the S7-CPU's and reads the process data which can be remotly visualized. Multiple RemoteStages can be operated in one PC to get a kind of master display with multiple remote screens.

- 1024 alarm archives and 128 Eventchives (Panel-PLC and Panel-HMI),
- 4 trends with up to 16 channels (Panel-PLC and Panel-HMI),
- 256 recipe records with up to 256 elements (Panel-PLC and Panel-HMI),
- Data (DB) -archives (Panel-PLC and Compact-PLC)

Service tool



The „ServiceStage“ is installed in a minute and made to have easy service access to the PLCs. Designed to make service and maintenance work easier. Without using complex programming tools for this kind of work it's a real time saver i






- Reading and editing device specific data,updating firmware version (CPU-T only),
- Changing of the operation mode RUN ↔ STOP,
- Set and synchronize date and time,
- Memory diagnostic and compression,
- Read out, show and store CPU-diagnostic buffer,
- Download of S7-program, visualization- and configurations binary,
- create backups of visualization and S7-program,
- Assign the know-how-protection levels.

Accessories for the S7-Panel-HMIs

There are available pin marked removable connectors with bolt flanges to connect INSEVIS-devices. This allows a explicit positioning of each pin to the signals and makes the wiring easier. The wire-contact is done by maintenance free cage-clamps for max. 1,5mm² cross sections without wire end sleeves.

The connectors E-CON XX with lift arms are discontinued and replaced by E-CONS XX connectors with bolt flanges.)

A mounting set with grounding terminal is part of every delivery. If periphery modules are ordered, they will be mounted for free at the INSEVIS production together with the referring rear foil, standard inserting and signal stripes.

Figure of accessories	accessories	Article-no.	MOQ (pcs)
Connectors   E-CONS16 (pin marked connectors for max. 1,5mm ² cross sections)	For CPU V: Connector 2x8pin, bolt flanges From 2023 the Pin-Numbers are printed on the sides. Adapter for Profibus SUB-D 9	E-CONS16-00 E-AD-DP12-00	1 1
  E-CONS10 (pin marked connectors for max. 1,5mm ² cross sections)	For CPU T: Connector 2x5pin, bolt flanges From 2023 the Pin-Numbers are printed on the sides.	E-CONS10-00	1
External memory  Hint: S7-program runs without these cards, these parts are used for archiving / recipes / updating only	Micro SD-card 1GB (external memory) Micro SD-card 2GB (external memory) Micro SD-card 4GB (external memory) Micro SD-card 8GB (external memory)	E-MSD1-00 E-MSD2-00 E-MSD4-00 E-MSD8-00	1 1 1 1
Customized labeling Hint: ¹⁾ Single fix costs only, no run-time costs per single PLC	3D-doming labels with customer logo (front) OEM-firmware with integrated customer logo Inserting stripes H with customer logo (rear) Inserting stripes V with customer logo (rear)	E-LAB3D-00 SW-BS-OEM ¹⁾ E-LABH-00 E-LABV-00	100 1 100 100
Software Hint: ²⁾ Company license, no run-time costs per single PC ³⁾ Maintenance license due yearly, if new versions are required, otherwise only old versions do run Software available for free download at INSEVIS web sites	VisuStage RemoteStage ServiceStage VisuStage full version company license VisuStage full version maintenance license	- - - SW-VS-2.0 ²⁾ SW-VSW-2.0 ^{2) 3)}	free download free download free download 1 1
Spare parts Hint: A mounting set with grounding terminal is part of every delivery	Additional mounting set with grounding terminal for 3,5" and 4,3"-devices Additional mounting set with grounding terminal for 5,7" and 7"-devices Additional mounting set with grounding terminal for 10,1" and 10,2"-devices Additional mounting set with grounding terminal for 15,6"-devices	E-MNT35-00 E-MNT57-00 E-MNT100-00 E-MNT156-00	10 10 10 10

Stainless steel front plates, attached parts and customized designs on request.

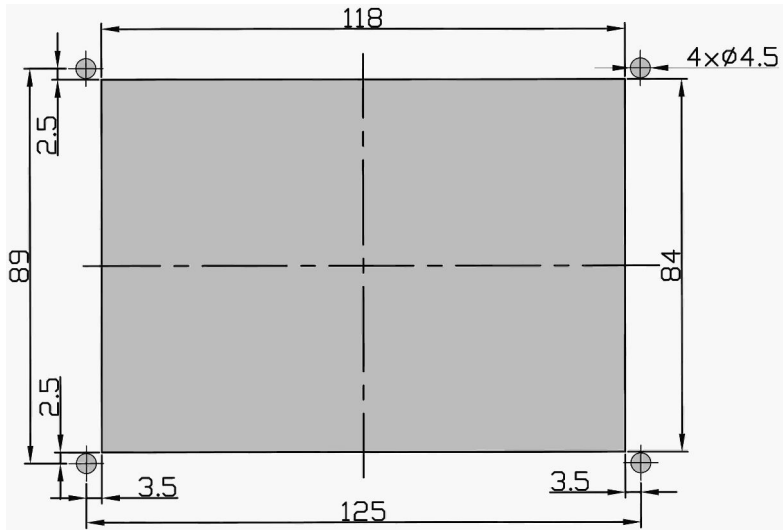
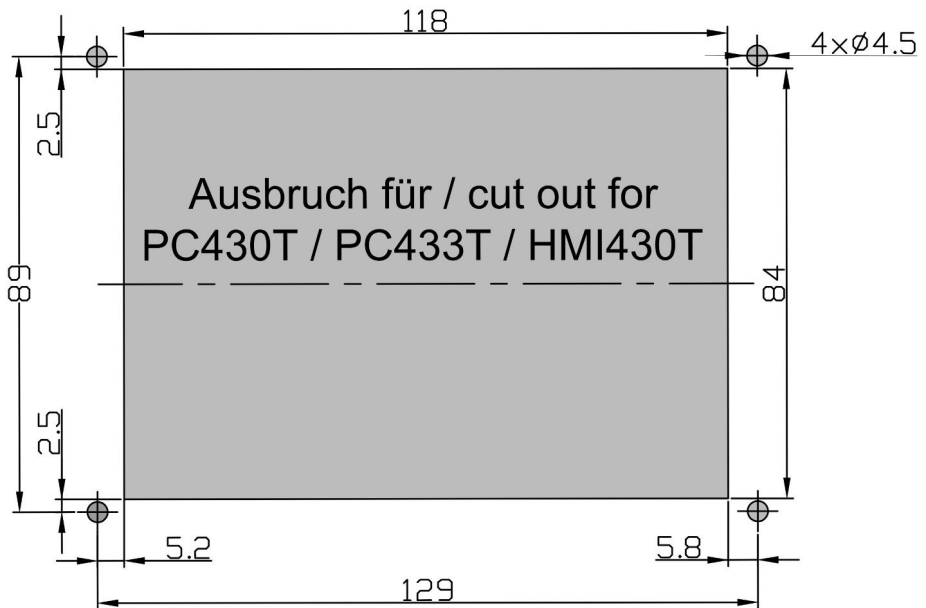
Product family Panel-HMI

Technical data	types of devices			
Types of models	HMI350V/P	HMI570V/P	HMI700P	HMI1000P
Dimensions W x H x D (mm)	132 x 96 x 49	182 x 140 x 49	222 x 147 x 49	286 x 188 x 49
Cut out W x H (mm)	118,5 x 84	163 x 118,5	203 x 126	262 x 165,5
Weight	ca. 450g	ca. 600g	ca. 800 g	ca. 1.000 g
Operating temperature range	-20°C ... +60°C (without condensation) -30°C ... +80°C			
Storage temperature range				
IP-protection class front panel / rear side	IP65 / IP41			
Connection technology	cage clamp connector with lift arms / crew flanges (cage clamp technology) for cross section up to max. 1,5mm ²			
Load voltage L+	24V DC (11 V ... 30V DC)			
Current consumption	20mA ... 450mA	50mA ... 650mA	100mA ... 750mA	150mA ... 800mA
Power dissipation	1,5W(typ.) 6W(max.)	2W(typ.) 10W(max.)	3W(typ.) 10W(max.)	4W(typ.) 10W(max.)
Start-up current	< 3A			
Diagonal of display (inch)	3,5" (89mm)	5,7" (145mm)	7" (178mm)	10,2" (259mm)
Display resolution (pixel)	320x240 Pixel (QVGA)	320x240 Pixel (QVGA)	800x480 Pixel (WVGA)	800x480 Pixel (WVGA)
Display unit	TFT display with 65.536 colours (16Bit) analog resistive touchscreen			
Operating unit				
Visualization unit to reference in VisuStage-tool	HMI350V/P	HMI570V	HMI700P	HMI1000P

Technical data	types of devices			
Types of models	HMI433T	HMI710T	HMI1010T	HMI1560T
Dimensions W x H x D (mm)	40 x 100 x 44	222 x 147 x 45	222 x 147 x 49	286 x 188 x 49
Cut out W x H (mm)	118 x 84	203 x 126	203 x 126	262 x 165
Weight	ca. 450g	ca. 700g	ca. 800 g	ca. 1.000 g
Operating temperature range	-20°C ... +60°C (without condensation) -30°C ... +80°C			
Storage temperature range				
IP-protection class front panel / rear side	IP65 / IP41			
Connection technology	cage clamp connector with lift arms / crew flanges (cage clamp technology) for cross section up to max. 1,5mm ²			
Load voltage L+	24V DC (11 V ... 30V DC)			
Current consumption	ca. 150mA	ca. 200mA	ca. 350mA	ca. 500mA
Power dissipation	ca. 3,6W	ca. 4,8W	ca. 8,4W	ca. 12W
Start-up current	< 3A			
Diagonal of display (inch)	4,3" (111mm)	7" (180mm)	10,1" (258mm)	15,6" (397mm)
Display resolution (pixel)	480x272 Pixel	800x480 Pixel (WVGA)	1024x600 Pixel	1366x768 Pixel
Display unit	TFT Display mit 65.536 Farben (16Bit) analog resistiver Touchscreen			
Operating unit				
Visualization unit to reference in VisuStage-tool	HMI433T	HMI710T	HMI1010T	HMI1560T

Technical data	CPUs		
CPU-type	Type V (HMI...V)	Type P (HMI...P)	Type T (HMI...T)
Flash internal - for visualization external memory	4 MByte Micro SD, up to max. 8 GByte	24 MByte Micro SD, up to max. 8 GByte	48 MByte Micro SD, up to max. 8 GByte
Real-time clock	yes (accumulator-backed hardware clock)		
Ethernet (protocols)	ETHERNET: 10/100 Mbit (RFC1006 / active S7-communication)		

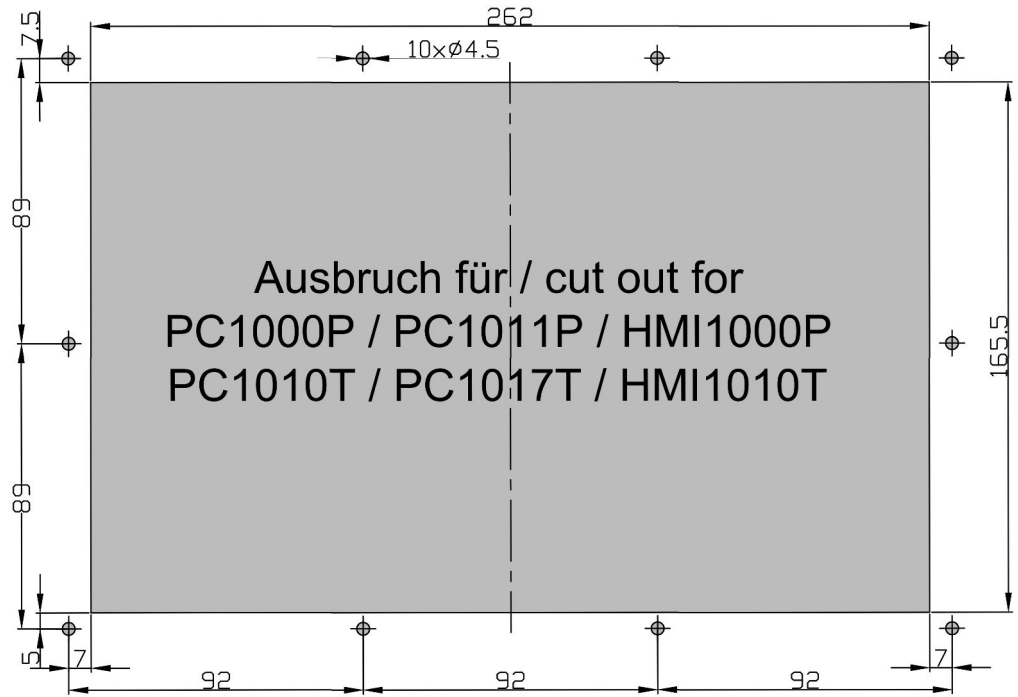
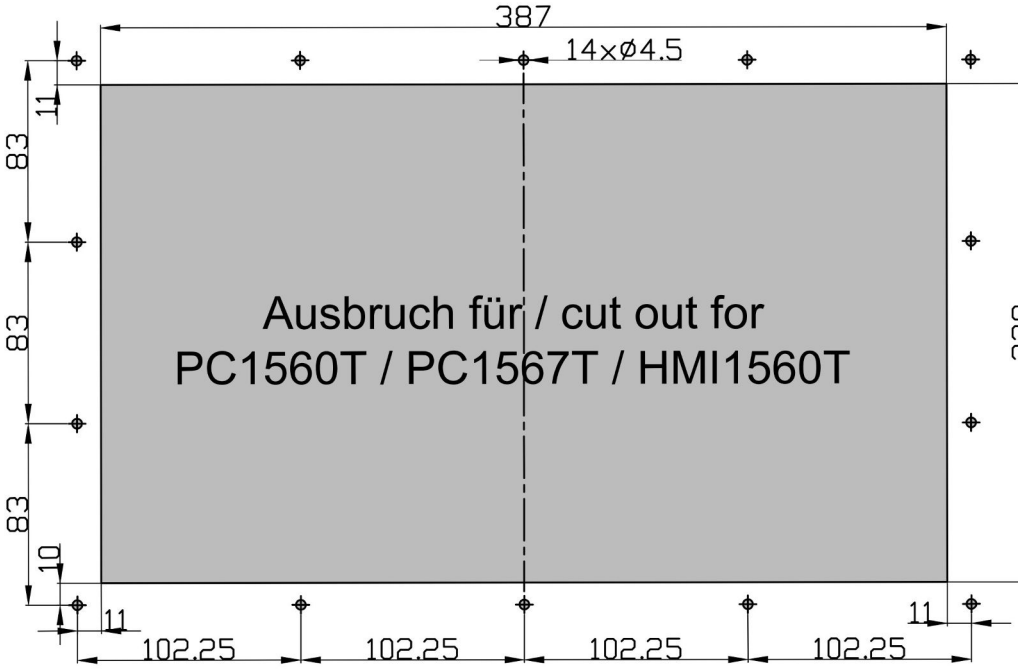
S7-Panel-HMI cut out for switching cabinets

Device	Cut out for devic(es)
Dimensions Cut out W x H (mm) / 118 x 84 4 holes with D 4,5mm Wiring outlet at rear view and horizontal mounting HMI 350V/P <u>Wiring outlet</u> - to the right <u>Mounting depth</u> ca. 49mm max.	 <p>Fig.: Cut out for all 3,5"-devices</p>
Dimensions Cut out W x H (mm) / 118 x 84 4 holes with D 4,5mm Wiring outlet at rear view and horizontal mounting HMI430T <u>Wiring outlet</u> - VCC / 2xETH to the left <u>Mounting depth</u> ca. 44mm max.	 <p>Fig.: Cut out for all 4,3"-devices</p>

S7-Panel-HMI cut out for switching cabinets

Device	Cut out for devic(es)
<p>Dimensions Cut out W x H (mm) / 163 x 118 6 holes with D 4,5mm</p> <p>Wiring outlet at rear view and horizontal mounting</p> <p>for HMI570V/P <u>Wiring outlet</u> - in the center to the right</p> <p><u>Mounting depth</u> ca. 49mm max.</p>	
Fig.: Cut out for all 5,7"-devices	
<p>Dimensions Cut out W x H (mm) / 203 x 126 6 holes with D 4,5mm</p> <p>Wiring outlet at rear view and horizontal mounting</p> <p>for HMI 700P, <u>Wiring outlet</u> - RJ45: centered to the right - VCC-connector to the bottom</p> <p><u>Mounting depth</u> ca. 49mm max</p> <p>for HMI710T <u>Wiring outlet</u> - VCC / 2xETH to the right</p> <p><u>Mounting depth</u> ca. 49mm max</p>	
Fig.: Cut out for all 7"-devices	

S7-Panel-HMI cut out for switching cabinets

Device	Cut out for devic(es)
<p>Dimensions Cut out (W x H / mm) 262 x 165,5 10 holes with D 4,5mm</p> <p>Wiring outlet at rear view and horizontal mounting</p> <p>for PC1000P, HMI 1000P, <u>Wiring outlet</u> - RJ45: centered to the right - VCC-connector to the bottom</p> <p><u>Mounting depth</u> ca. 49mm max</p> <p>for HMI 1010T, <u>Wiring outlet</u> - VCC / 2xETH to the right</p> <p><u>Mounting depth</u> ca. 47mm max</p>	 <p>Ausbruch für / cut out for PC1000P / PC1011P / HMI1000P PC1010T / PC1017T / HMI1010T</p>
Fig.: Cut out for all 10,1" and 10,2"-devices	
<p>Dimensions Cut out (W x H / mm) 203 x 126 10 holes with D 4,5mm</p> <p>Wiring outlet at rear view and horizontal mounting</p> <p>for HMI 1560T, <u>Wiring outlet</u> - VCC / 2xETH to the right</p> <p><u>Mounting depth</u> ca. 55mm max</p>	 <p>Ausbruch für / cut out for PC1560T / PC1567T / HMI1560T</p>
Fig.: Cut out for all 15,6"-devices	

Settings in BIOS / Backup + Restore

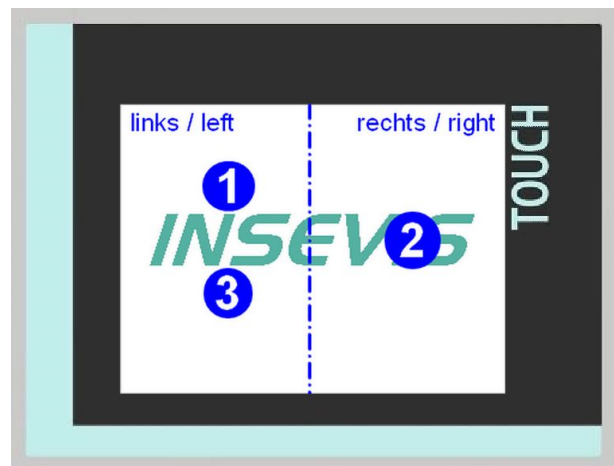
General settings

Because a panel HMI does not have S7 blocks and a run-stop-switch, the necessary settings are made in a BIOS, which appears when the HMI is searching for the partner PLC in the Ethernet network, either

- disconnect Ethernet cable, boot logo appears after ~30...60s
- or
- switch the HMI to STOP in ServiceStage

Access by touch operation as follows:
Split the screen mentally in the middle and while the bootlogo appears, touch as follows:

1. first in the left side
2. then in the right side
3. then again in the left side



With the HMIs of the -T-family the access can be protected by a PIN in the VisuStage. After entering the correct PIN, the BIOS menu appears with 5 topics, which are listed together or in individual tabs, depending on the space available. and here on the example of the HMI710T :

General device information

System information

i

Serial number: 0000000000000000

Firmware: 0000000000000000

MAC address: 0000000000000000

Exit BIOS

TCP/IP settings

TCP/IP

i

Local

Partner

IP address: 255.255.255.255 255.255.255.255

Netmask: 255.255.255.255

Gateway: 255.255.255.255

No gateway if gateway address is 0.0.0.0

Rack / Slot: 00 00 00 00

Connection resource (hex): 00 00

TSAP: 00000 00000

Date & Time settings

Date & Time

i

Date: 29.03.2021

Date format: DD.MM.YYYY

Time: 16:22:14

Time format: HH:MM:SS

Brightness settings

Display

i

Brightness: - +

Click on symbols to change the display brightness.

Update, Backup, Restore

System

i

Start firmware update:

Insert Micro-SD card. If the Micro-SD card has a firmware binary on its root, you can click on the update symbol to start the firmware update. (An other convenient way to update your device is using the ServiceStage freeware.)

Backup system: Restore system:

Insert Micro-SD card. Click on the backup/restore symbol to backup/restore your visualization data and system settings. (If activated, a PIN is requested at backup.)

General status messages

The panel HMI establishes an Ethernet connection to the Ethernet connection to the partner PLC, During the search the screen displays this message as long as this process lasts (approx. 1-2min). If the corresponding PLC is in the Stop-state, the following message appears on the panel display the following message on the right:



Settings in BIOS / Backup + Restore



Instructions for updating the firmware:

EITHER

→ via the BIOS ("Start firmware update")

OR

→ via the ServiceStage ("Update firmware")

OR

→ copy a new firmware as HMIxxx.bin to the root of the micro SD card, insert this card into the panel HMI and start the panel HMI (Power On).



Notes on the backup of the visualization:

Backup of the visualization factory settings

(unencrypted binary file, without IP changes in BIOS and new PINs by user).

→ Via the ServiceStage "Online Backup" to the PC in folder "backups", file name "visudata.vsbins".

Confirmation occurs on BIOS screen.

(If in VisuStage project upload in "access protection" tab was not allowed, backup is not possible).

OR

Visualization life backup

(encrypted binary file with IP changes in BIOS and new PINs by user).

→ Via BIOS (backup system) to the micro SD card, file name "backup.bin".

Confirmation takes place on the BIOS screen.



Notes on restoring the visualization:

Restore of the visualization factory setting

(unencrypted binary file without IP changes and new PINs by user).

→ Load file "visudata.vsbins" from PC to HMI via ServiceStage "Block Update".

Confirmation takes place on PC screen

OR (from firmware 1.7.2)

→ Copy file "visudata.vsbins" to micro SD card in folder "Backups", insert micro SD card and load into the HMI via the BIOS (Restore system),

Confirmation takes place on the BIOS screen

OR

Restore the visualization life backup

(encrypted binary file with IP changes in BIOS and new PINs by user).

→ Copy file "backup.bin" to the micro SD card in folder "Backups", insert micro SD card and load into the HMI via the BIOS (Restore system),

Confirmation takes place on the BIOS screen

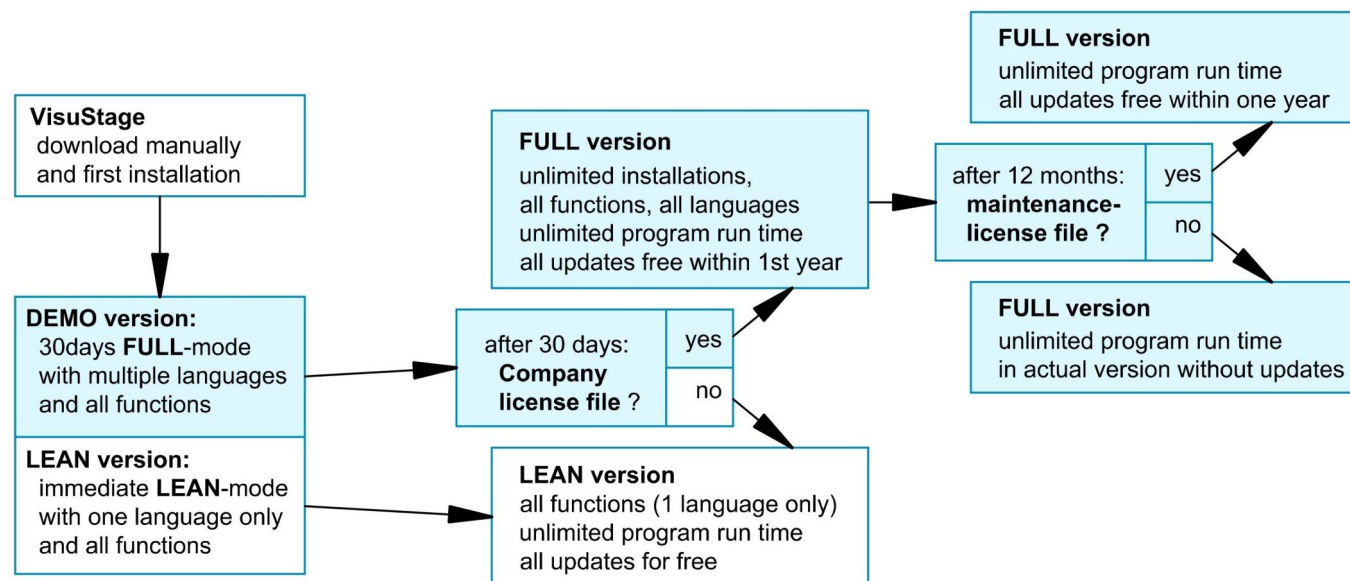
Visualization with the software „VisuStage“

Download and licensing

The actual version of VisuStage is free to download at INSEVIS websites in the download area. INSEVIS- programs do not check the internet for new versions, so please visit INSEVIS websites for new features by yourself. This software can be used with operating system Windows 10 only.

At the first installation VisuStage offers 3 modes: FULL-Mode with license, DEMO-mode with 30 days free FULL-mode without license and LEAN-mode without license. You can add a license later on at the folder “Help” → “Info” to upgrade a DEMO or LEAN version into a FULL version.

This company license can be multiple times used within one company for multiple installations. (Open visustage.exe once as administrator (by right mouse key) to not have to enter the license path every time).



System functions

The S7 Operating system provides the system functions (SFC) to control the visualization by your S7 program. These SFCs are described in the referring PLC-manual (Compact or Panel-PLC) at the chapter “System functions”. To use these SFCs you need the **S7-Library** from INSEVIS. It can be downloaded at download-area of INSEVIS websites for free.

Communication between PLC and external Panel-HMI

In a Panel-PLC these SFCs will be used from a common CPU for PLC- and HMI-functions as well. Only if you use PLCs with external HMI please note followig:

ATTENTION:

Only single SFC-jobs can be processed.

If the parameter "BUSY" of the corresponding SFC returns the value FALSE, the job is finished and a new SFC can be processed,

The configuration of connection parameters of INSEVIS-Panel to INSEVIS-PLC or external PLC is explained at the chapter “Resource Partner-PLC-device” in this manual

Use these data in the S7-program (e.g. LADDR := W#16#1 for the panel-connection with ID-No. 1)

Here the PLC can change the screens in an external panel (e.g. with the connection-ID-No. 1

```

CALL „SFC 201
LADDR      := W#16#1
SCREEN     := MW1006
RET VAL    := MW1008
BUSY       := #busy
  
```

More easy meanwhile: write/read your scree-ID into/from a variable (see more at the “Screen” resource)

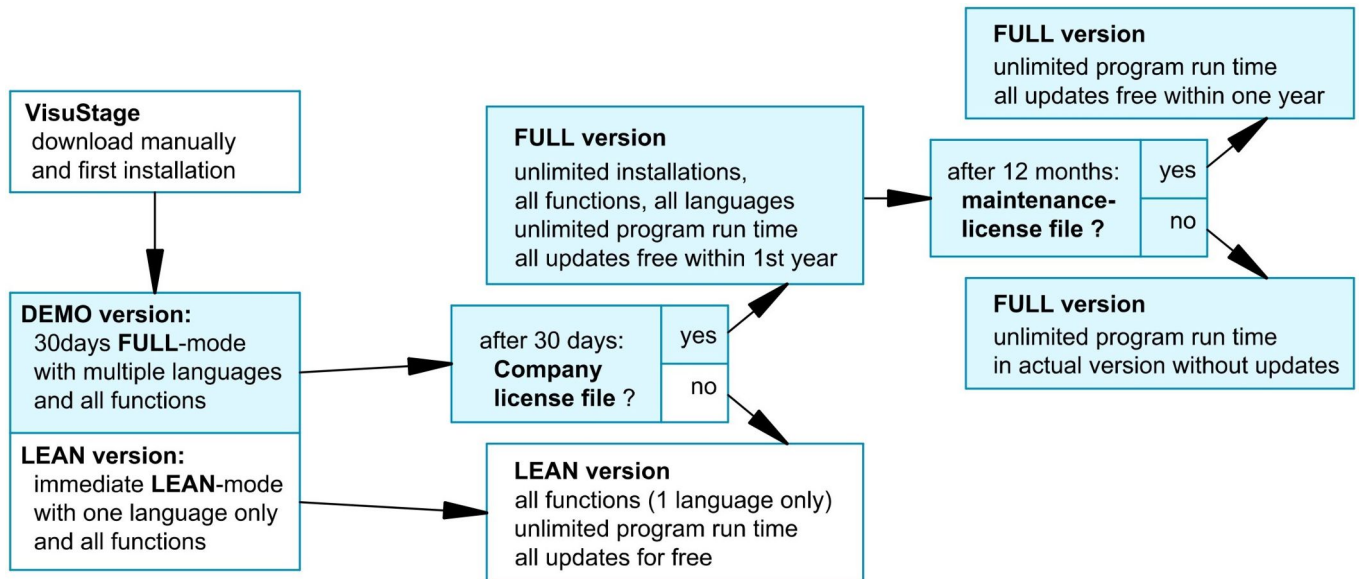
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```

More easy meanwhile: write/read your scree-ID into/from a variable (see more at the “Screen” resource)

Visualization with the software „VisuStage“

General settings of the program shell

Top: **Standard functions bar** (self explaining or explained by tool-tips)

Alignment functions (2 and more objects)

FIRST mark the Master-element,
THAN mark the others, what shall be aligned to the master
than choose the alignment property you want (left, horizontal centered, right, top, bottom centered, bottom)



Size functions

FIRST mark the Master-element,
THAN mark the others, what shall be aligned to the master
than choose the size item (width, height)
or assign multiple dimension properties to different selected objects (right)
with key-combination of CTRL+arrow-keys size of marked objects can be changed pixelwise



Alignment functions (1 or 3 and more objects)

FIRST mark the Master-element,
THAN mark the others, what shall be aligned to the master
FINALLY the element, what should mark the outer border of the grid
than choose the alignment property you want (same horizontal distance, center a single object, same vertical distance)



Grid-/ Snap functions (self explaining)

At Extra / Settings assign grid size
(de-) activate grid and snap by mouse click



General settings (without figure, self explaining)

It is recommended to hide the panels bezel to save window-space on your VisuStage-PC.
Grid and snap functions make it easier to design new screens

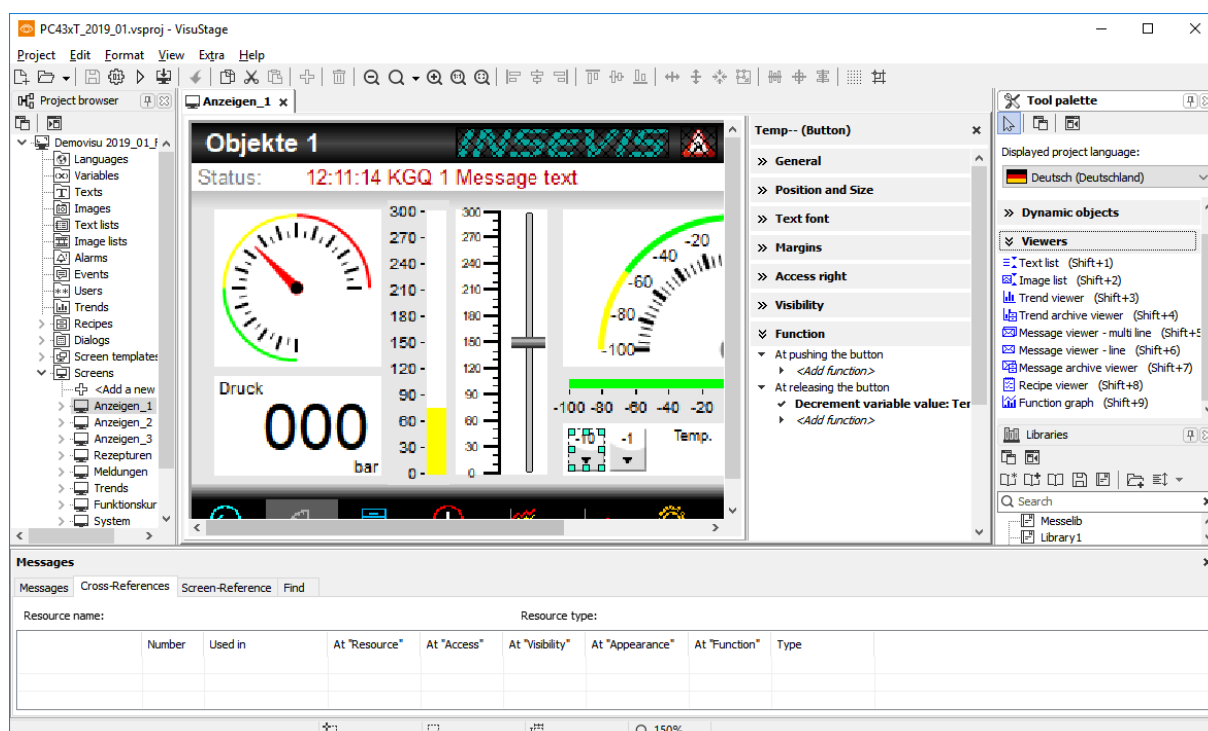
Top: General functions and drop down menus,

Left: Project browser with resource settings (here the resources will be set up and parametrized) and screens

Middle: Window of the projected screen, display of the objects parameters of the the selected object

Right: Tool bar with project language, function catalog with all objects what are available, Library catalog

Bottom: Message window (for messages, references, queries and filter results), to be switched on/off by F6-key



Visualization with the software „VisuStage“

General functionality

VisuStage imports S7-PLC-variables from Simatic®-Manager or TIA® Portal and uses it in different visualization objects in different screens. It can synchronize these S7-variables to the S7-project automatically.

The visualization source file will be compiled into a binary, what will be transferred to the Panel-HMI or Panel-PLC by Ethernet. The firmware in the Panel-HMI/-PLC creates the images and touch fields at the touch display there. No source data can be read back from the Panel-HMI/-PLC.

There is possible to get a free remote visualization of all S7-PLCs on a PC-screen by RemoteStage, what requires the visualization binary.

The following descriptions refer to the actual sample project what is available at the download area at INSEVIS websites. It requires the newest VisuStage-version and the newest operating systems at the devices. It is hardly recommended to use this project together with this documentation to understand it better.

Recommended procedures

A systematic working procedure reduces errors and decreases the programming efforts



- Import your S7-variables from the S7-symbol table or directly from your S7-DBs including symbols and synchronize it with your S7-project
- Assign objects for multiple screen use in different template screens, what you can use in every single screen.
- If you have finished entering all texts in your project language, you may export them into a *.csv-file and forward it to a translator into any other language you need. It is only necessary to keep the *.csv structure then you can re-import this file again - and you have your next language texts.
- Collect all special pictures for your visualization theme before you start. (We strongly recommend the file format "png", because it works with a good compression and it allows definition of transparency by an alpha-channel. This is very important, if you want to see your background color on rounded corners and not any image colors.)
- Use the grid- and snap-function.

Save your resources

It is very important to have an eye on the memory size, required by the visualization. In general it is better to tune your visualization with some easy hints, before you decrease the PLC performance with an unsuitable visualization.



- Multiple use of buttons
(if you use exactly the same buttons (resolution, image) you save lots of memory size because they will stored only one time as 1 object. It does not matter, if symbols or texts belonging to this items or not.)
- Do not overlap dynamic objects
(This function is not allowed by program cycle. You better navigate your images by dialog boxes with coords.)
- Better to have less screens with more common objects than to have lots of nearly empty screens.
(Every new screen is stored as image and requires memory space.)

Keep the overview

You need to know, what resources are „active“ and what are „blind passengers“.



- Filters reduce the number of displayed resources to get a better overview.
- With „cross reference“-function (right mouse button in the resource-menu) the use of variables, texts, images, text lists, image lists and trends can be displayed. Delete resources you do not use.
- Delete unused resources with the „CleanUp“-function at the rider „Edit“

Transfer your work to other projects

When you invested much time to create a very special head- or bottom line or navigation:



- Use the library function to export often used groups to your PC for a further use in other projects.
- Use the screen template function for Headlines or footers, etc.



VIDEO-Tutorials available You find detailed explanations in the VisuStage-Playlist at the INSEVIS YouTube®-channel „INSEVIS EN“. This manual refers to a referential visualization, what is available for free download at the download area at INSEVIS- web sites.

Visualization with the software „VisuStage“

General project formats and settings

File formats

VisuStage creates 3 file formats:

- ***.vsproj** contains the source code of the visualization
- ***.res** contains the resources of the visualization
- ***.bin** contains the compiled binaries to be downloaded into the panel



Hint:

The vsproj and res-files must be in the same directory in order to open the project (vsproj)...
When passing on the source data, send the vsproj and res files!
If no source data is to be passed on, then pass on the vsbin (sufficient for updating).

At the menu „Project“ basic settings will be made.

General data

- manual changeable

Version counter

- manual assignment of a 3 digits compile-no. or
- automatic counter (can be displayed by text field)

Screen rotations

- Only for CPU-P and -T versions

Data protection at upload

Secures the the vsbin file for upload (must be switched on, in each case with/without entering a PIN)

- into a remote PC (via RemoteStage)
- to a remote PC (via ServiceStage)
- to the micro SD card (for backup)

and (only for HMIs)

- Secures the the BIOS screen by entering a PIN (for access see chapter BIOS)

Demovisu HMI710 2019_01_Full x

General

Name:	Demovisu HMI710 2019_01_Full		
Author:	INSEVIS		
Created on:	30.07.2011 12:13:41		
Created version:	2.0.2.0		
Modified on:	20.11.2019 16:50:17		
Modified version:	2.1.0.26		
Project version:	Major: 0	Minor: 0	Compile: 0
	<input type="checkbox"/> Auto increment compile number		
Comment:	Nutzen mit dem aktuellsten Betriebssystem und mit der neuesten Version der VisuStage und RemoteStage Use with the latest operating system and with the latest version of VisuStage and RemoteStage		
Device description:	HMI710T 7.1" WVGA (800x480), 16bit Color, TFT, 48MByte load memory for visualization		

LCD screen rotation

☒ 0°
 ☐ 90°
 ☐ 180°
 ☐ 270°

Protection

☒ Enable for uploading the visualization binary via RemoteStage und ServiceStage
 PIN:

☒ Activate BIOS protection with PIN
 PIN:

Visualization with the software „VisuStage“

Conversion of third-party visualisations

TIA WinCC visualisations can to a large extent be automatically converted into VisuStage format. This saves the manual import of variables, the creation and linking of pages (menus) and the creation and linking of static and dynamic objects.

Only list objects such as recipe and trend management and the fault message system must then be added manually, as these cannot be converted.

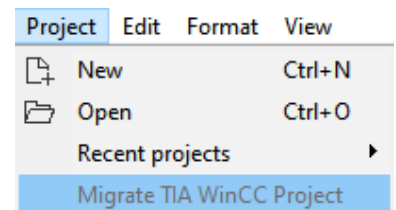
Requirements

This function is integrated from VisuStage version 2.1.0.36.

However, on the same computer as the VisuStage, the Siemens software tools

- TIA Portal 14-16.1 and from VisuStage version 2.1.0.37: TIA V17
- TIA Openness *

must be installed on the same computer as VisuStage in order for the conversion function to be activated (not greyed out).



Hint for the correct settings when using the Openness software:

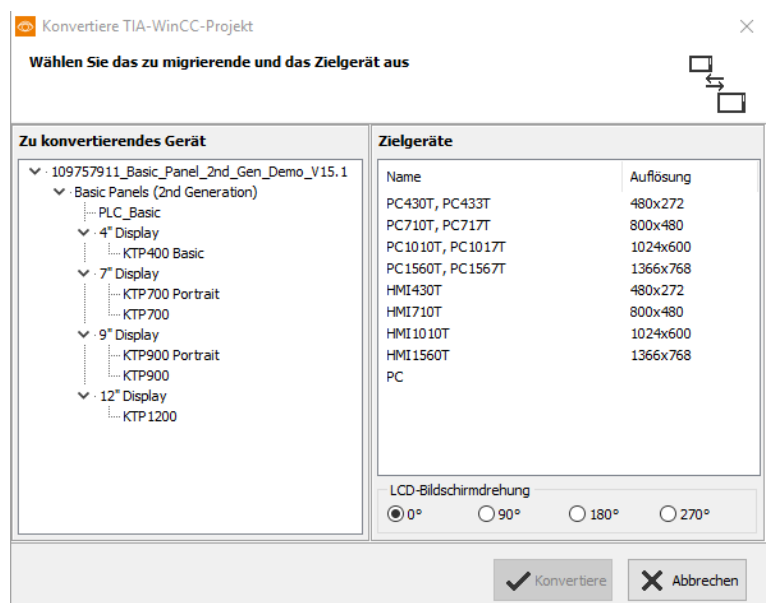
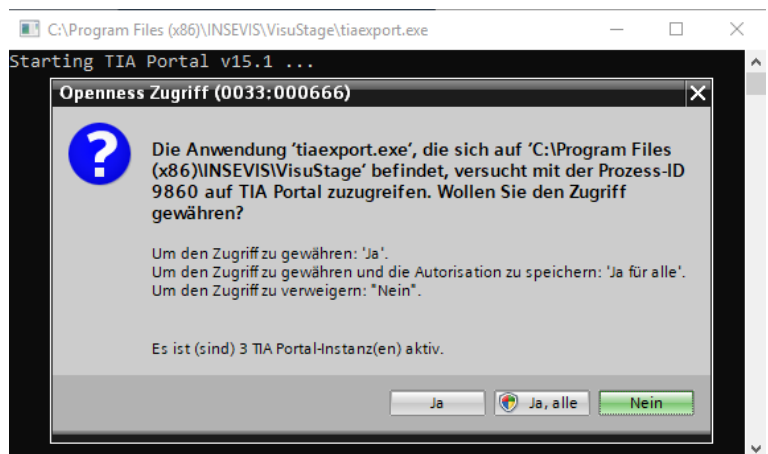
The Windows user must be a member of the "Siemens TIA Openness" group.

Depending on the Windows operating system, please set this assignment as administrator!

See here for more: <https://support.industry.siemens.com/cs/mdm/109773802?c=101778035467&lc=en-DE>

Procedure

- A project browser opens under Project → Convert TIA-WinCC Project.
- Open the TIA project with the visualisation to be converted.
- The file "tiaexport.exe" integrated in the VisuStage is opened and automatically started in a DOS window.
(The DOS window may be hidden, but can be seen in the task bar).
- This program starts the TIA Portal.
- The Openness Firewall recognises the access, which must be granted with "Yes, all"
- A new screen opens for selecting the source and target devices.
- (Make sure that the resolutions of both devices are identical so that the entire visualisation is visible).
- Start the conversion by pressing "Convert".
- The progress of the conversion is displayed in the DOS window.
- (Depending on the size of the visualisation, the conversion may take some time).



Visualization with the software „VisuStage“

Cross reference list: The following TIA WinCC objects are converted into VisuStage screen objects

TIA WinCC „Basic objects“	VisuStage „Static objects“
Line	Line
Rectangle	Rectangle
Ellipse	Ellipse
Circle	Ellipse
Text field	Text
Graphic view	Image

TIA WinCC „Elements“	VisuStage „Dynamic objects“ / „Viewers“
I/O field	I/O field
Button (Mode=„Text“ and Label=„Text“)	Button
Button (Mode=„Text“ and Label=„Text list“)	Text button
Button (Mode=„Graphic“ and Graphic=„Graphic“)	Button
Button (Mode=„Graphic“ and Graphic=„Graphic list“)	Dynamic button
Button (Mode=„Graphics and text“)	Button
Button (Mode=„Invisible“)	Touch area
Symbolic I/O field	Text list
Graphic I/O field (Mode=„Two states“)	State area
Graphic I/O field (except „Two states“ Mode)	Image list
Date/time field	Time/Date field
Bar	Progress bar
Switch (Mode=„Switch“)	Text list
Switch (Mode=„Switch with text“)	Text list
Switch (Mode=„Switch with graphic“)	State area
Slider	Slider
Gauge	Gauge

The following TIA WinCC objects are not supported during conversion.

Either they must be created manually in the VisuStage project or they are not available due to the system.

- „Polyline“ replace by multiple „Linies“
- „Polygon“ replace by „Images“
- „Symbol library“ replace by „Image list“ with single state images
- „Clock“ replace by a digital display at „Date/Time field“
- „Alarm view“ replace by „Message viewer“
- „Trend view“ replace by „Trend viewer“
- „User view“ replace by „Text list viewer“ with the user names
- „Watch table“ this function is currently not available
- „SmartClient view“ this function is currently not available
- „Recipe view“ replace by „Recipe viewer“
- „f(x) trend view“ replace by „Function graph“
- „System diagnostics view“ this function is currently not available
- „Media player“ this function is currently not available
- „GRAPH overview“ this function is currently not available
- „ProDiag overview“ this function is currently not available
- „Criteria analysis view“ this function is currently not available
- „Camera view“ this function is currently not available
- „PDF view“ this function is currently not available

Visualization with the software „VisuStage“

Following „Event-Press“ and „Event-Release“ functions are converted into VisuStage button functions:

TIA WinCC functions	VisuStage functions
ActivateScreen	Change screen
ActivatePreviousScreen	Change screen
SetLanguage	Select language
SetTag	Assign value to variable
IncreaseTag	Increment variable value
DecreaseTag	Decrement variable value
SetBrightness	Increment brightness
SetBit	Set a bit
SetBitInTag	Set a bit
SetBitWhileKeyPressed	Set a bit
ResetBit	Reset a bit
ResetBitInTag	Reset a bit
InvertBit	Invert a bit
InvertBitInTag	Invert a bit
ClearAlarmBuffer	Clear the alarm buffer
ClearAlarmBufferProTool (class number = 0)	Clear the alarm buffer
ClearAlarmBufferProTool (class number = 1)	Clear the event buffer
Logoff	Log-Out the user
ActivateCleanScreen	Activate Clean screen
ClearLog	Delete the alarm archive

Creation and management of resources

Resource Device Settings

Assign the target IP-address

- The connection between the PLC and the PC with visualization software „VisuStage“ is done by Ethernet S7-communication Put/Get. That's why it is necessary to enter the IP-address of the target Panel-PLC/HMI to identify the device where to the visualization should be send.
- AT HMIs** the IP address of the connected PLC (partner PLC device) is entered, both must be in the same IP address range!

VNC-Server (CPU-T devices only)

- Select to start the VNC-Server always or controlled by variable
- Static / dynamic port number (default port 5900 recommended!)
- Password settings (Needed in VNC-Client/Viewer)
- Content in VNC-Client/Viewer
 - passive (1:1 display only)
 - active (controls the HMI)
 - changeable by variable (e.g. key switch)

NTP-Server, time zones and daylight saving time (CPU-T devices only)

Activation of a time zone (for HMIs only, for PLCs the configuration is done in the ConfigStage)

- The respective changeover dates are entered here.
- The system then adjusts itself automatically. If the unit was switched off during the changeover and the battery had enough float voltage for the real-time clock, the unit adjusts the time itself to the current time during the boot process as of HMI firmware 1.6.3.
- If the unit was switched off for longer that the real-time clock became voltage-free, the time must be set manually.

Using NTP Servers

- NTP servers transmit the Coordinated Universal Time (UTC), which is the basis for calculating your own time. In the illustration, 3 TimeServers of the FAU University Erlangen-Nuremberg were addressed (131.188.3.220/1/2 correspond to the ntp0/1/2 of the fau.de).

Geräteeinstellungen x

General

IP address: 192.168.80.54 Partner PLC device ...

Remote control (VNC Server)

☒ Enable remote control (VNC Server)

Start behaviour

☒ Start automatically

☐ Controlled by variable

TCP Port number

☒ Port number (static) 5900

☐ From variable

Server name

☒ Name (static): INSEVIS-PC71x

☐ From variable

Authentication

☐ No authentication

☒ With password 12345

☐ Password from variable

Operation mode control

☐ Monitoring mode (view only)

☒ Controlling mode

☐ Controlled by variable

Concurrent connections: 1

Time of day

☒ Enable time zone (UTC+01:00) Amsterdam, Berlin, Bern, Rom, Stockholm, Wien

☒ Activate daylight saving time

Time offset (minutes): 60

Start of daylight saving time

Last Sunday March 02:00

Start of standard time

Last Sunday October 03:00

☒ Enable the time synchronization via NTP server

Synchronization interval (seconds): 3600

Server 1: 131.188.3.220 Server 3: 131.188.3.222

Server 2: 131.188.3.221 Server 4: 0.0.0.0



ATTENTION:

Using a VNC-Client/-Viewer as app makes possible a mobile application. The settings of operational and security functions depend on each app.

Every user is responsible for data security by itself! Do not use VNC-Server without authentication and care for access of identified and known devices by yourself

By connecting to the internet it is possible that unauthorized get access to the PLC and they could manipulate it and cause harms. The programmer and final user are responsible for installing and running suitable security actions to provide this unauthorized access.

INSEVIS is not responsible and does not take over responsibility for damages caused by unauthorized access.

Visualization with the software „VisuStage“

Configure a VNC-Viewer/-Client

When select a VNC-Viewer/-Client care for following issues:

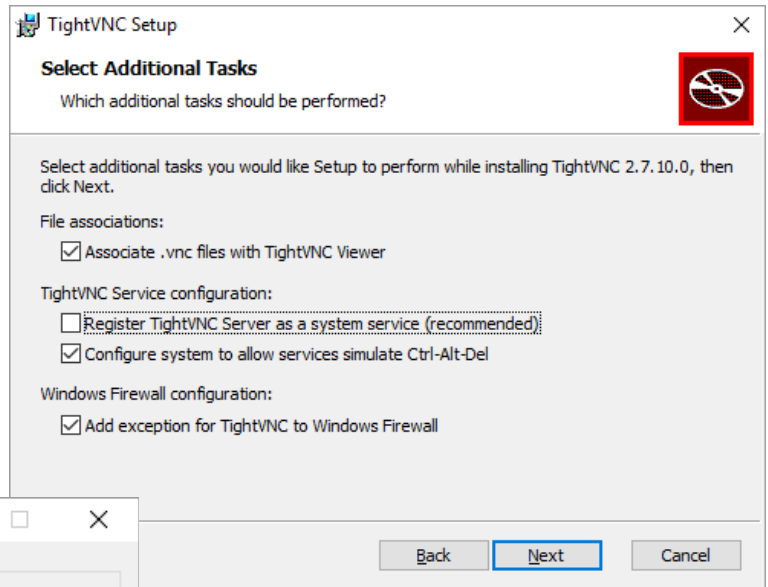
- Supporting RFB V 3.8 with encryption ZRLE, RAW-protocol
- Deselecting of „Clipboard transfer“ (copy & paste for texts)

See a setup and configuration sample for the free **Tight VNC-Viewer** to get the most important settings from installation to remote visualization

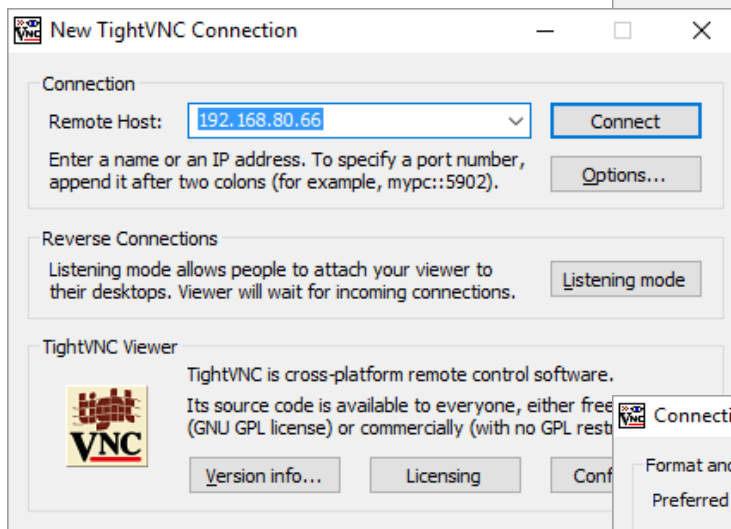
Deselect server function during program setup



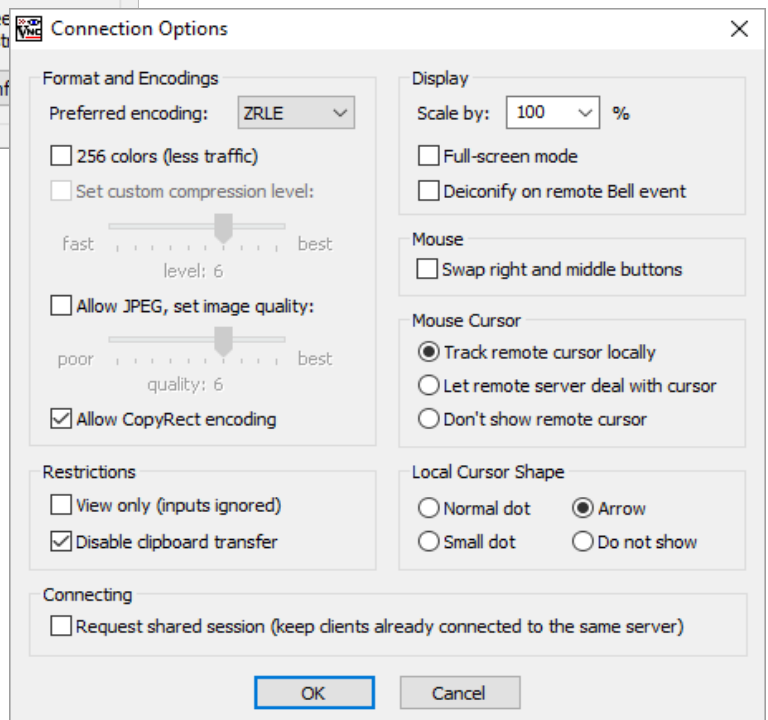
Hint: Images are made at installation of Tight VNC-Viewer. This is a free software easy to install and configure, so that we can recommend it.



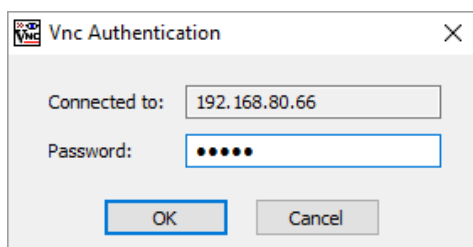
Assign IP-address of the remote device and go to „Options“



assign „ZLRE-Encoding“
deselect „256 colors“
deselect „Clipboard Transfer“
deselect „Shared Session“



Insert password what was assigned in VisuStage



Visualization with the software „VisuStage“

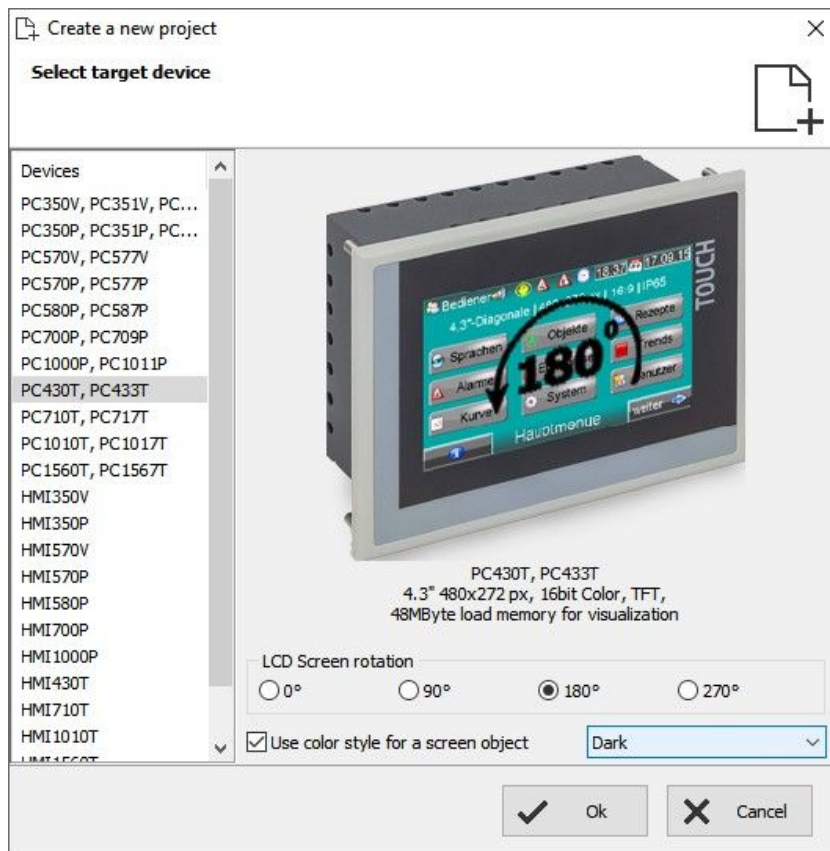
Change screen orientation or resolution

At the menu „Project/change target device“ it is possible to adapt the project to another target system.

This could be:

- other Panel-PLCs or Panel-HMIs from INSEVIS)
- a free resolution for using PC-monitors as remote panel
- other orientations of the same device (in 90-degree-steps for CPU-P-versions only)

This procedure is only made arithmetical and needs manual reconditioning to get an attractive visualization and to reduce the binaries memory size (e.g. font sizes, bottom sizes, etc.).

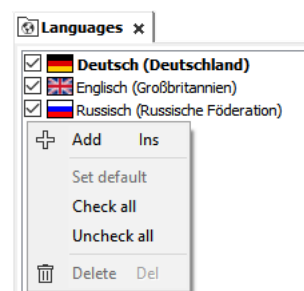


Create and administrate resources

Resource languages

All languages installed on your PC are available for VisuStage-projects. These will be stored as bmp. If an other PC without these installed languages will be used to compile and download to the Panel-PLC/HMI, the missing languages can not not be displayed correctly.

- Add / delete a language: → by right mouse key
- Select the project language: → by right mouse key opens up a pull down menu
- Select a reference: language (marked bright) → by right mouse key „Set default“



Hint:

Text- and image resources are connected to the language, where they were assigned/imported. If this language is deleted, all (text- and image) resources will be deleted after confirming it in a confirmation window.

Visualization with the software „VisuStage“

Resource variables

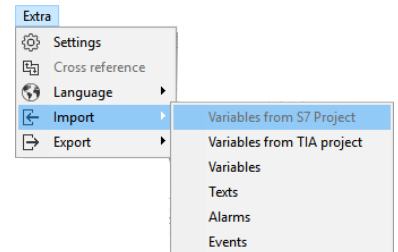
Beside the manually input of variables there are 2 better opportunities to import S7-variables from the S7-program

1) Import the variables by the system data file (*.sdf) of Simatic®-Manager (without symbols)

- Create a S7- symbol table by the Simatic®-Manager
- Import it as a variables list (**importable in sdf-file format**) by:
 - Extra
 - Import
 - Variables

2.) Import the variables directly from the DBs of the S7-project (including symbols)

- Start it by
 - Extra
 - Import
 - Variables from S7-Project
- (Simatic®-Manager must be installed on this PC)**



- Mark and open the corresponding project

Name	Path	Author	Created	Modified
Beispiel	C:\Users\Messe\Documents\Siemens\Step7\S7...		28.07.2011 13:37:29	15.10.2012 16:40:15
Handbuch Demo v3	C:\Users\Messe\Documents\Insevis\Messe201...	INSEVIS GmbH	04.03.2014 16:14:22	06.04.2016 11:05:46
Messe2018-TB20	C:\Users\Messe\Documents\Insevis\Messe201...		20.11.2015 12:07:12	20.11.2018 18:17:29
PC710T	C:\Users\Messe\Documents\Siemens\Step7\s7...		21.12.2018 14:05:07	21.12.2018 15:03:12
PROJECT-ETHERNE...	C:\Program Files (x86)\Siemens\Step7\Exempl...		26.10.1998 09:33:06	14.06.2005 12:58:26
PROJECT-PROFIBU...	C:\Program Files (x86)\Siemens\Step7\Exempl...		27.10.1998 09:44:37	14.06.2005 13:14:01
Test Function Graph	C:\Users\Messe\Documents\Siemens\Step7\S7...		24.01.2014 10:34:48	27.01.2014 17:37:01
VariableImport	C:\Users\Messe\Documents\Siemens\Step7\s7...		27.11.2018 09:45:46	27.11.2018 09:47:07
ZDt01_01_STEP7_...	C:\Program Files (x86)\Siemens\Step7\Exempl...	Siemens AG	04.08.1998 13:02:37	01.02.1999 09:35:36

Open Cancel

- Choose the required data blocks from the S7-program list (**no instance data blocks**).

Project Info				
Name:	VariableImport			
Path:	C:\Users\Messe\Documents\Siemens\Step7\s7proj\Variable			
Author:				
Created on:	27.11.2018 09:45:46			
Modified on:	27.11.2018 09:47:07			
SIMATIC 300(1) <ul style="list-style-type: none"> CPU 315-2 PN/DP <ul style="list-style-type: none"> S7-Programm(1) 	Block name	Symbolic name	Created	Mo...
	DB10	MyVariables	27.11.2018 09:51:48	27...
	DB131		29.11.2018 11:12:13	29...
	Symbol		27.11.2018 09:46:50	27...

Open block Close

- Mark the required variables (also multiple) and import it.



VIDEO-Tutorials available Therefore is a **VIDEO** available in the VisuStage-Playlist at the INSEVIS YouTube®-channel „INSEVIS EN“.

Visualization with the software „VisuStage“

3.) Import the variables directly from the TIA®-project (including symbols)

3.1) Import the variables directly from S7-3xx-CPU from TIA®-project

With VisuStage version 2.1.0.27 projects from TIA®-Portal versions 13...16 can be imported.

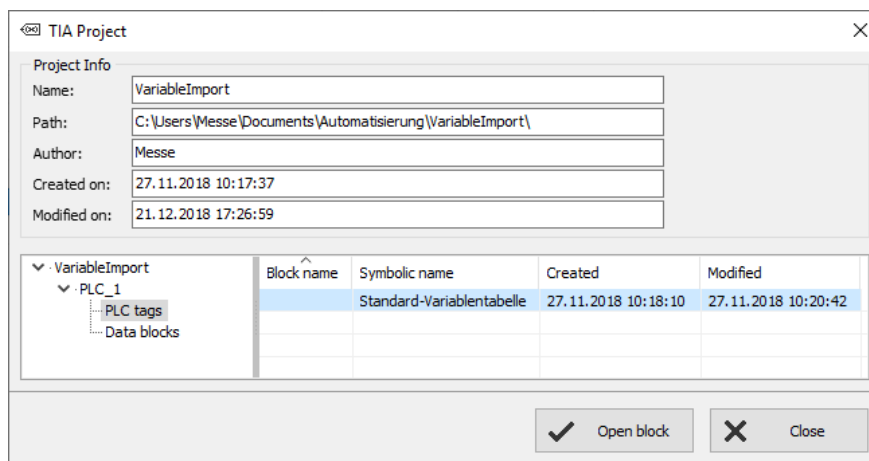
TIA®-Portal does not need to be installed on this PC, just only TIA®-project must be closed while importing.

- Start it by
 - Extra
 - Import from TIA®-project

Then a window opens to select the TIA®-project.

SELECTION

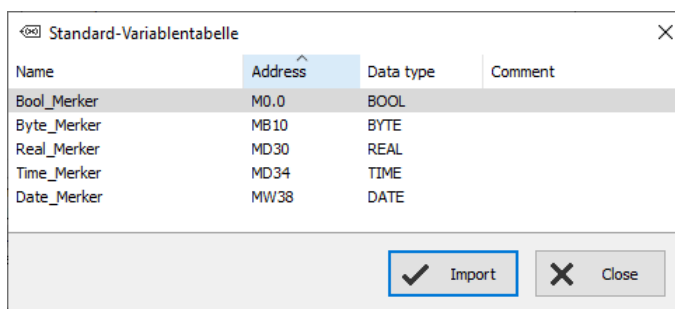
→ of the **Station** (here INSEVIS SPS)
 → and then of the **CPU** (here PLC_1)
 and then



EITHER

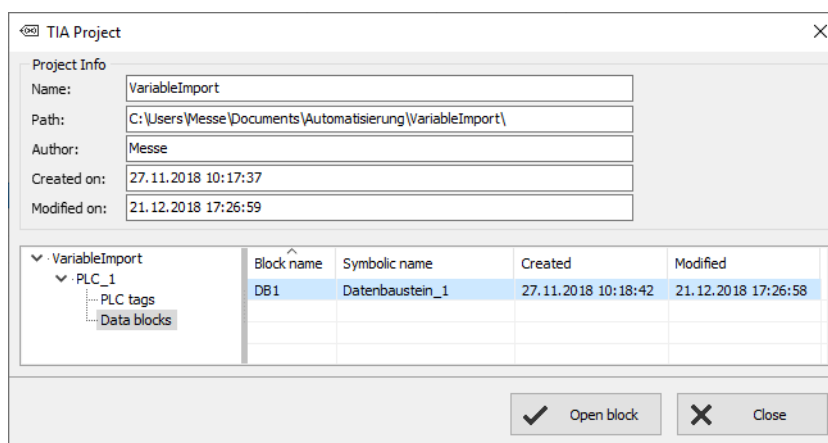
of the **symbol table** (here SPS-Tags)

- In the right window all variable tables will be displayed
- Open up a variable table and see all existing variable lists.
- Selection of the variable lists by marking (multiple marking by Shift or Ctrl)
- Import the selected variable lists

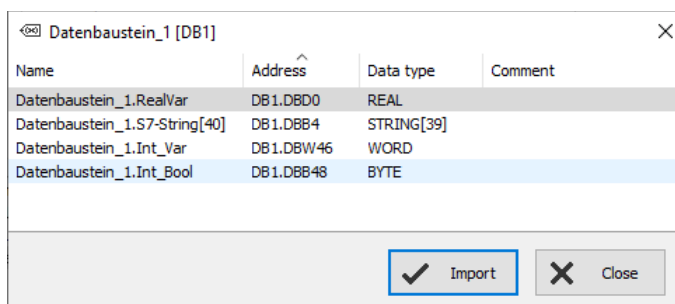


OR

of the **data blocks** (here Data Blocks)



- In the right window all data blocks will be displayed
- Selection of the data block by marking (only single blocks)
- Open a data block
- Selection of variable from a data block by marking (multiple marking by Shift or Ctrl)
- Import the selected variables from the data blocks



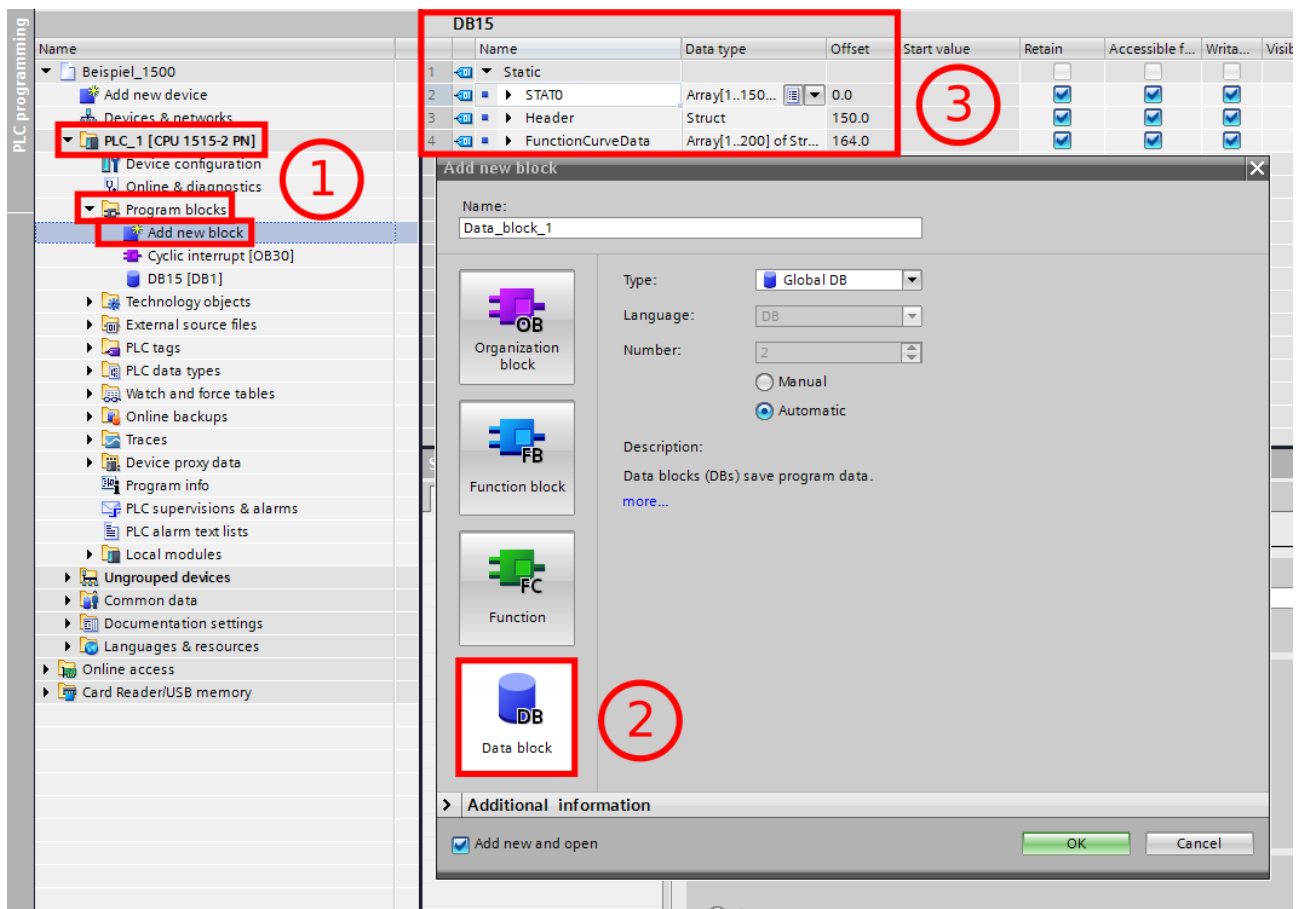
Visualization with the software „VisuStage“

3.2) Import the variables directly from S7-12xx and 15xx CPUs from TIA®-project

To import variables from projects which are based on CPUs from the 1200 and 1500 series they have to be stored inside a data block.

To achieve this execute the following steps in your TIA project:

1. Select your CPU -> Program blocks -> Add new block
2. Select in the opened menu the type "Data block" and enter a name. Press OK to create the data block
3. In this new data block you can now create variables with name, data type and offset which can later be imported into the VisuStage.

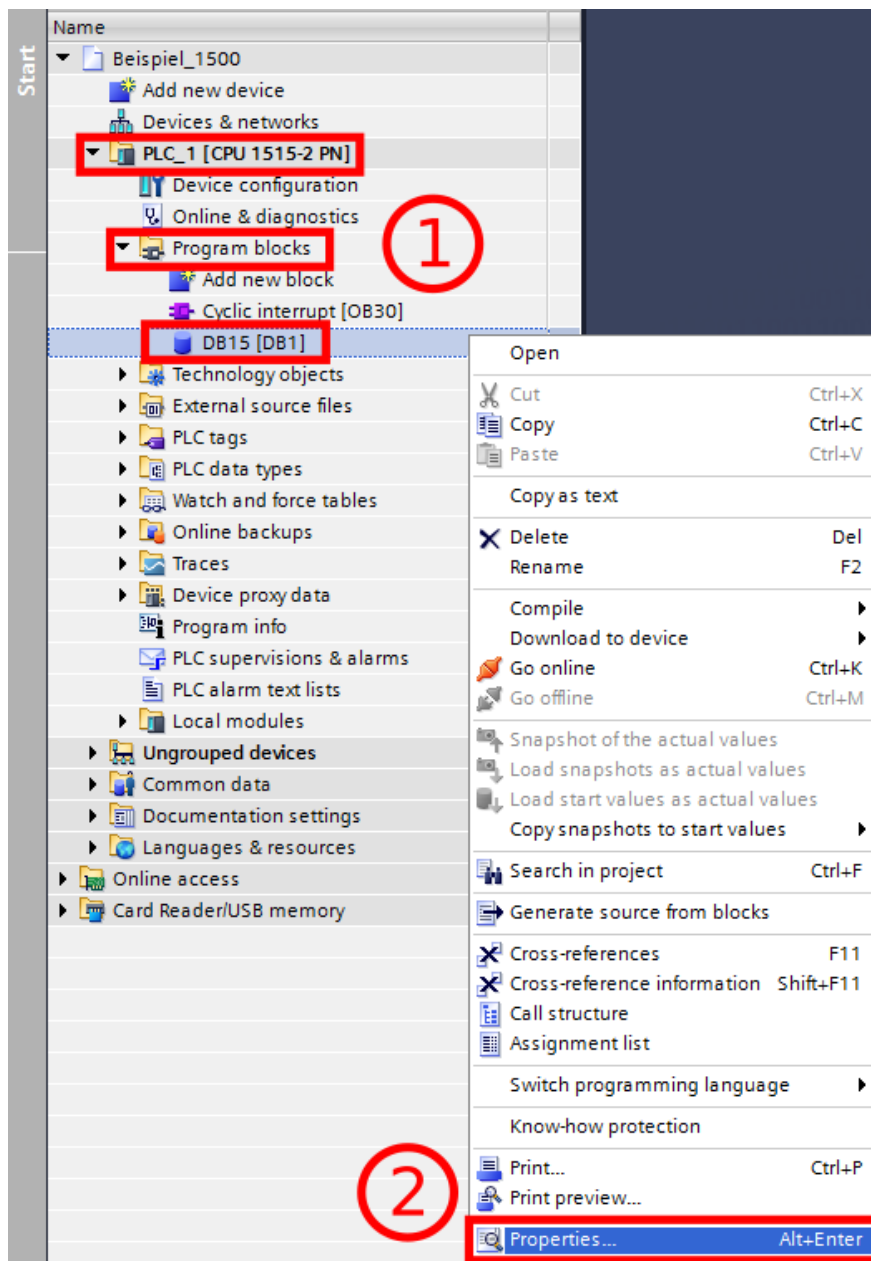


Visualization with the software „VisuStage“

To ensure a flawless communication between RemoteStage and S7-CPU 12xx / 15xx, the block access must not be optimized. (only for S7-12xx and 15xx)

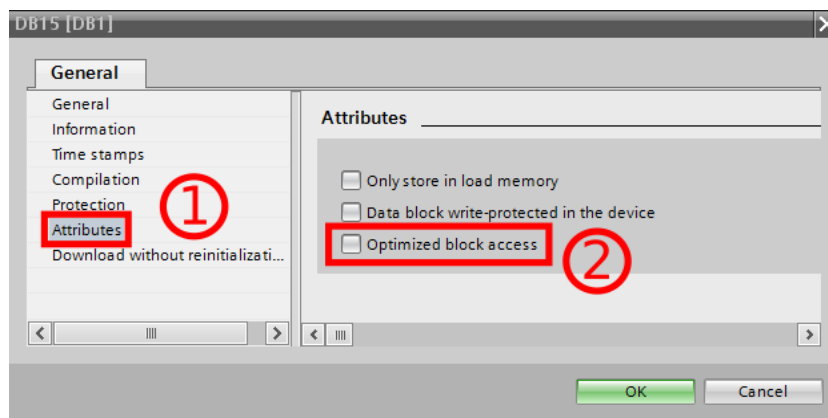
To achieve this execute the following steps in your TIA project:

1. Select your CPU -> Program blocks
2. Do a right click on the concerning block and select "Properties..."



Execute the following steps in the opened window:

1. Select "Attributes"
2. Deactivate the option "Optimized block access"



Visualization with the software „VisuStage“

In following cases VisuStage wants a confirmation before it starts a variable import:

- A variable with the same name exists already, but with another address or data type
- A variable with the same address exists already, but with another name or data type
- A variable with the same name and address exists already, but with another data type



ATTENTION:

When VisuStage overwrites the variables, the connections between variables and its objects will be kept. When deleting the variables manually these connections will be deleted as well.

The **Export** of the variables is done in the same formats as well:

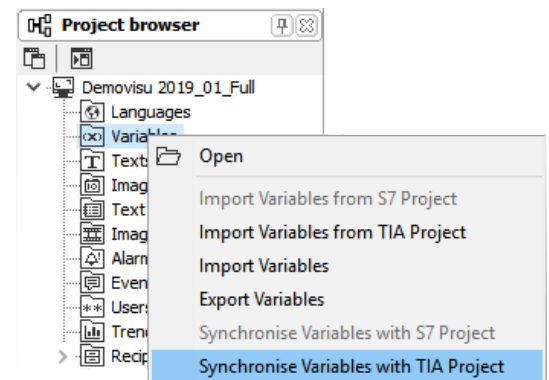
- sdf- file format (System data format, variables only), or in
- sym- file format (Symbol table format with variables and data blocks)

Synchronization of variables with TIA®-Portal/ Simatic®-Manager

By inserting, deleting and other manipulating of S7-variables in programming systems TIA®-Portal and SimaticManager the absolute addresses in referring S7-programs change. To synchronize these changes easily with the variables in the VisuStage-project as function „Synchronize with S7 /TIA® Project “ is available.

Go to resource „Variables“ or directly into table of variables

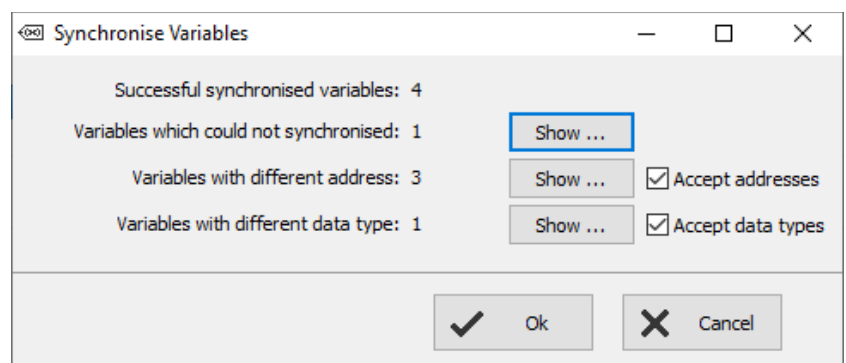
- right mouse key opens Pull-Down menu
- if Simatic-®Manager is installed on this PC, synchronization with S7-Projects is possible
- to synchronize with TIA® projects insert the path to this project (It must be compiled and closed before)
- all variables of the VisuStage project will be detected and synchronized with S7/TIA now



As result a synchronization table will be displayed, where

In the 1st line

- Successfully synchronized variables (without differences – where nothing was changed) are mentioned/displayed only.
- There is nothing to do for that variables, just for your information.



Visualization with the software „VisuStage“

In the 2nd line:

- Not synchronized variables (where the symbolic variables name was not available in the S7-/TIA®-project) are mentioned/displayed only.
- These must be **deleted manually**, to keep the overview (First delete the connection in the visualization, otherwise you will earn compile errors)

Variables which could not synchronised		
Name	Address	Data type
Datenbaustein_1.Bool_Var	DB1.DBX0.0	BOOL

In the 3rd line:

- variables where at least the absolute address (or also the data type) was changed in the S7-/TIA®-project will be displayed.
- This is a proposal for modification only and **must be accepted** by checking a hook in the check box, than all these variables will be synchronized with referring variables in VisuStage-project automatically.

Variables with different address		
Name	Address in VisuStage project	Address in S7 project
Datenbaustein_1.RealVar	DB1.DBD2	DB1.DBD0
Datenbaustein_1.S7-String[40]	DB1.DBB6	DB1.DBB4
Datenbaustein_1.Int_Var	DB1.DBW48	DB1.DBW46

In the 4th line:

- variables where only the data type was changed in the S7-/TIA®-project will be displayed.
- This is a proposal for modification only and **must be accepted** by checking a hook in the check box, than all these variables will be synchronized with referring variables in VisuStage-project automatically.

Variables with different data type			
Name	Address	Data type in VisuStage project	Data type in S7 project
Datenbaustein_1.Int_Bool	DB1.DBX48.0	BOOL	BYTE

If there was created new variables in S7-/TIA®-project, import them or add it manually new.

Internal variables

These variables are available internally to the visualisation and are listed in a separate tab.

Using the key function "Copy variable value", the values of these variables can be transferred to PLC variables and vice versa.

With indirect variables, e.g. linear scaling is possible through this function (see picture on the right).

Function: Copy variable value to other variable

Copy variable value to variable

Select your desired variable from the list or add a new

Source variable:

Anzeige Katalyse (MW334, INT)

Destination variable:

scaled variable (INT)

☒ Linear scaling

Source variable's

End value:

0

Start value:

128

Destination variable's

End value:

30

Start value:

158

Ok

Cancel

Visualization with the software „VisuStage“

Multiplex variables (variables list)

With multiplex variables it is possible to use one I/O-field multiple times. Depending on the value of the index variable only the pre-assigned and referring the multiplex variables will be showed at run time.

At the resource “Variable”, at the rider “Multiplex variables” can be created (see sample right beside). It work similar to text- and image lists, but only with variables.

Only whole-number variables will be accepted as index variable, the variables in the variable list are free (STRNG-types are not to mix with other types). It also can be DBs, Merkers, inputs or outputs.

Index	Variable
0	Variable (DB1.DBW0, INT)
1	Variable 1 (DB4.DBW10, INT)
2	Variable2 (DB10.DBW0, INT)

Indirect variables

Alternatively to the Multiplex variables (quasi the list of variables) the number of variables can be reduced by far, if the address range can be manipulated individually at run time by one or more variables.

The indirect variables allow by help of one or more variables a multitude of memory cells in the address range of the PLC. These variable memory areas can be written or read out, without defining a fixed variable for each before.

Sample with data type BOOL

Fix addressed
(512 variables)

DB 0 DBX 0 0
DB 0 DBX 0 1

DB 0 DBX 0 ...
DB 0 DBX 0 7

DB 0 DBX 1 0...7
DB 0 DBX 2 0...7

DB 0 DBX 6 0...7
DB 0 DBX 7 0...7

DB 0 DBX 0...7 0...7
DB 1 DBX 0...7 0...7

DB 6 DBX 0...7 0...7
DB 7 DBX 0...7 0...7

indirectly addressed
(4 variables)

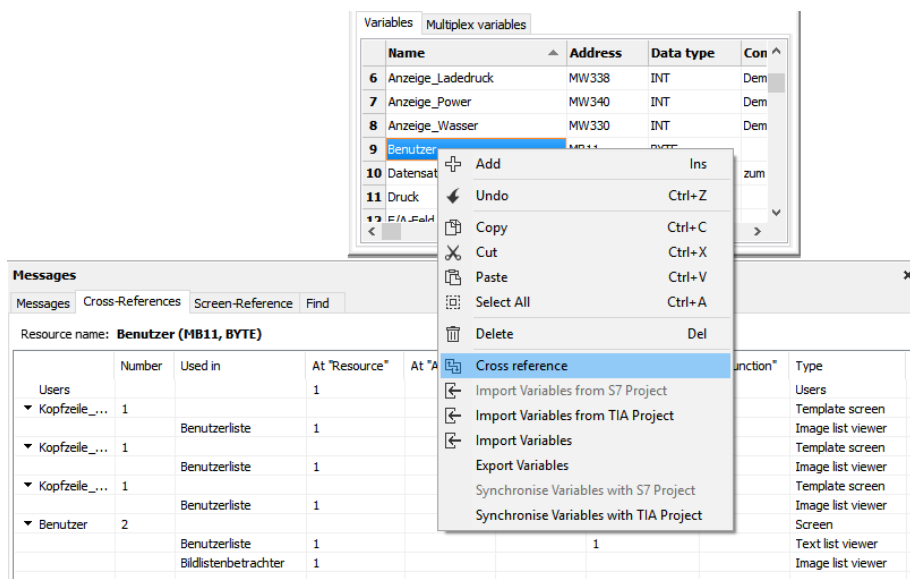
DB X1 DBX X2 . X3
X1 = 0...7
X2 = 0...7
X3 = 0...7

Visualization with the software „VisuStage“

Cross references for variables

To keep the overview about the variables used in the project, there is a function „Cross reference“ (mark a variable and use right mouse button). All variables will be displayed referring to their usage in resources or in menu objects.

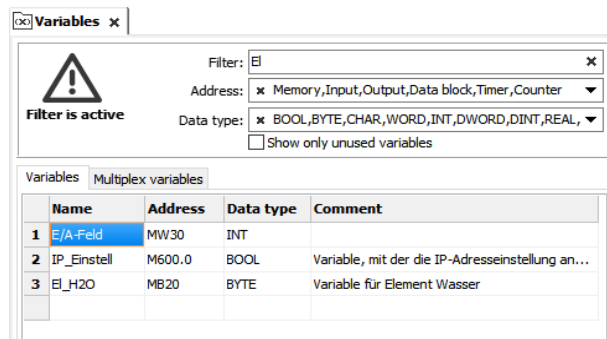
By a double click on an item you get automatically into the menu, where it is used. For sample the “Benutzer” variable was used. Close/open the message window by key „F6“.



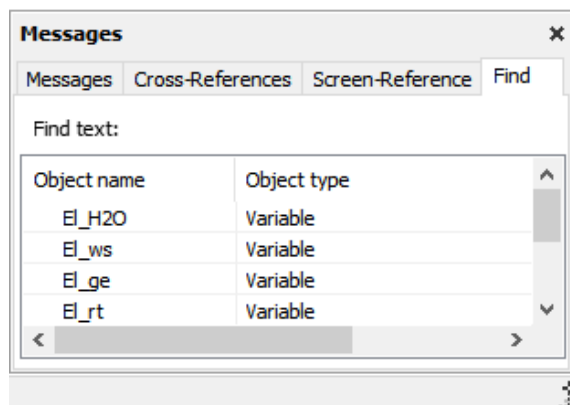
Set filter or find variables

Variables can be filtered for:

- Name
- Address- and
- Data type

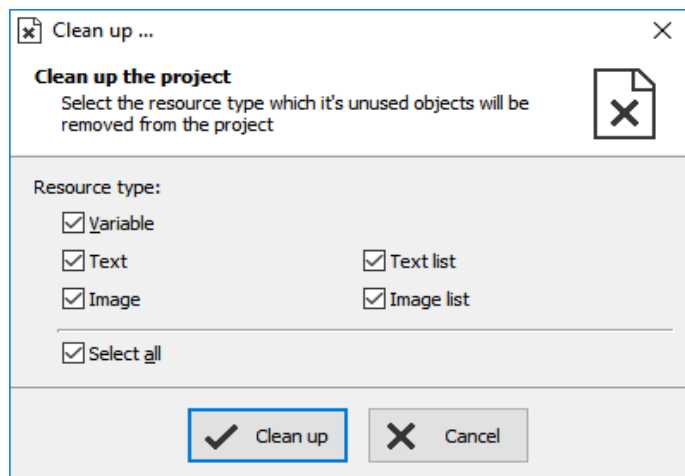


The result is shown in the message window (show/hide with key „F6“)



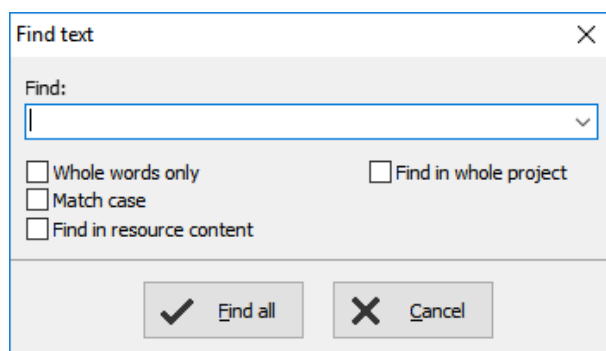
Clean up unused variables

Delete unused resources with the „CleanUp“-function at the rider „Edit“ and keep your project small and simple.



Find variables by text phrases

Find resources with the „Find“-function <CTRL+F> at the rider „Edit“ to keep an overview.



Visualization with the software „VisuStage“

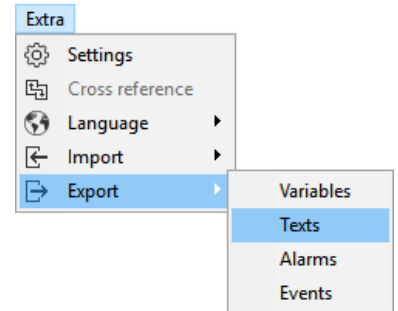
Resources Texts and Text lists

Texts

Will be created in the project language and can be imported or exported as a csv-file

(This helps for external translation.)

- Export by:→ Extra → Export → Texts
- Choose the languages to be exported
- select your csv-format and save the csv-file.
- Open/import it with a table calculation program (csv-settings must be the same!)
- Edit the text while keep the structure as it is (no cells may be removed or added!)
- Import by → Extra → Import → Texts

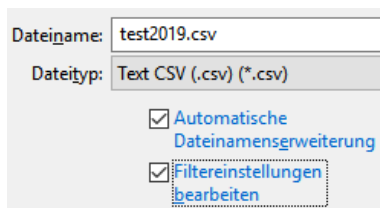


In the first lines there are system texts. Is a text created in the project language only and not in another language, it will be displayed in all other language as it was created in the project language (see line 5).



Hint:

If import is failed, your table calculating program removed the field delimiters or text separators. To prevent this, do „Save as“ and activate the „Assign filter settings“ function.



Hint: at some Windows7 installations it is necessary to check "Quote / Set All text cells"



Text lists

(when different texts should be displayed depending on a variable, e.g. in the user administration - operator, master etc.)

Will be created manually

- first define the list,
- than add existing text resources or create new ones
- than add limiting values (**Min/Max**) for each element of the text list

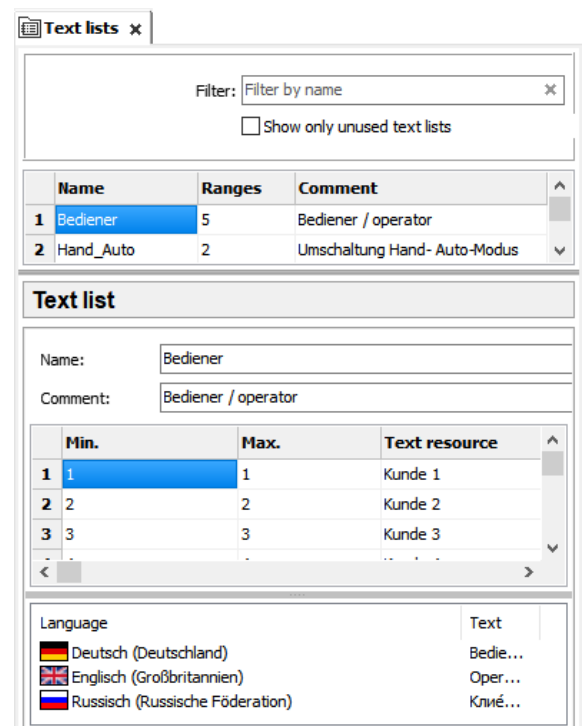
or

- mark multiple texts in resource "texts"
- press right mouse button and select "create text list"
- than add limiting values (**Min/Max**)
- and add a **name**



ATTENTION:

If there is active another value as these what are assigned in line 1...n, than ALWAYS this text resource will be displayed, what is assigned FIRST (in first line / line 1).



Visualization with the software „VisuStage“

Cross references for texts / text lists

To keep the overview about the texts/ text lists used in the project, there is a function „Cross reference“ in the resource pool. (Go to resources Text/ text list, mark a text/ text list and use right mouse button). All texts / text lists will be displayed referring to their usage in resources or in menu objects.

By a double click on an item you get automatically into the menu, where it is used. Close/open the message window by „F6“.

Messages

MessagesCross-ReferencesScreen-ReferenceFind

Resource name: Auto_HandResource type: Text list

	Number	Used in	At "Resource"	At "Access"	At "Visibility"	At "Appearance"	At "Function"	Type
▼ Anzeigen_3	1							Screen
		Dynamische Taste 1	1					Dynamic but...

Find texts / text lists by text phrases

Find resources with the „Find“-function <CTRL+F> at the rider „Edit“ to keep an overview.

Find text

Find:

☐ Whole words only
 ☐ Find in whole project

☐ Match case

☐ Find in resource content

☒ Find all
 ☐ Cancel

Clean up unused texts / text lists

Delete unused resources with the „CleanUp“-function at the rider „Edit“ and keep your project small and simple.

Clean up ...

Clean up the project
 Select the resource type which it's unused objects will be removed from the project

Resource type:

☒ Variable
 ☒ Text list

☒ Text
 ☒ Image list

☒ Image

☒ Select all

☒ Clean up
 ☐ Cancel

Delete single text contents in text resource list

It is possible to delete single text contents in the text resource list. Mark the desired cells by mouse and click right mouse key. With „Delete content“ the content of these cells will be deleted.

Alternatively:

If you press the „delete“-button of your keyboard the marked text resources will be deleted completely.

Deutsch ...

English ...

PIN eingeben

insert PIN

Ungültige PIN

PIN not valid

+

 Add

↶

 Undo

✂

 Copy

✂

 Cut

📄

 Paste

📄

 Select All

🗑

 Delete

🗑

 Delete content

📄

 Create a text list

📄

 Cross reference

📄

 Import texts

📄

 Export texts

Visualization with the software „VisuStage“

Resources Images and Image lists

Images

INSEVIS delivers some sample images with the VisuStage.
Creating own images is a child's play by any free software.

- Recommended file format: PNG because of the transparent alpha-channel.
Substitute a color by transparency and save the image as PNG (Interlaced / Automatic recommended).
- Images of the project-language will be used for all other languages as well
→ shown half transparency
- It is possible to use other images in other languages instead the image of the project language
→ by right mouse key assign a new one and it will be shown with full color

Image lists

These lists are the best tool for color changes of an object or toggling images caused by changing variable values.

Will be created manually

- right mouse key in the field **Name**,
(add the new name of the image list)
- Add limiting values for each element of the image list
- Assign an existing image resource,
(or add a new one in this field directly)

or

- mark multiple images in resource “images”
- press right mouse button and select “create imagelist”
- than add limiting values (**Min/Max**)
- and add a **name**

Image lists x

Filter: Filter by name x

☐ Show only unused image lists


	Name	Ranges	Comment
1	Pipe_hori	5	horizontaler Rohrabschnitt
2	Pipe_vert	5	vertikaler Rohrabschnitt
3	Angle_1	5	Eckverbinder
4	Hand_Auto	2	Umschaltung Hand- und Auto...
5	Auto_Hand	2	Umschaltung Auto- und Hand...

Image list

Name: Angle_1

Comment: Eckverbinder

	Min.	Max.	Image resource
1	0	0	wink_re_gr
2	1	1	wink_re_gn
3	2	2	wink_re_ge
4	3	3	wink_re_re



Deutsch (Deuts...



ATTENTION:

If there is active another value as these what are assigned in line 1...n, than ALWAYS this text resource will be displayed, what is assigned FIRST (in first line / line 1).

Visualization with the software „VisuStage“

Cross references for images / image lists

To keep the overview about the images / image lists used in the project, there is a function „Cross reference“ (mark a image / image list and use right mouse button). All images / image lists will be displayed referring to their usage in resources or in menu objects.

By a double click on an item you get automatically into the menu, where it is used.
Close/open the message window by key „F6“.

Messages

MessagesCross-ReferencesScreen-ReferenceFind

Resource name: Angle_1Resource type: Image list

	Number	Used in	At "Resource"	At "Access"	At "Visibility"	At "Appearance"	At "Function"	Type
▼ Anzeigen_3	1							Screen
		Seg_re_wink	1					Image list viewer

Find images/image lists by text phrases

Find resources with the „Find“-function <CTRL+F> at the rider „Edit“ to keep an overview.

Find text

Find:

☐ Whole words only☐ Find in whole project

☐ Match case

☐ Find in resource content

☒ Find all☐ Cancel

Clean up unused images/image lists

Delete unused resources with the „CleanUp“-function at the rider „Edit“ and keep your project small and simple.

Clean up ...

Clean up the project

Select the resource type which it's unused objects will be removed from the project

Resource type:

☒ Variable☒ Text list

☒ Text☒ Image list

☒ Image

☒ Select all

☒ Clean up☐ Cancel

Visualization with the software „VisuStage“

Multiple replacement of resources

If you organize your symbolic stringently you can swap multiple resources

- Variables,
- Texts,
- Text lists,
- Images,
- Image lists.

If they have similar symbolic phrases in their name.

In the sample on the right a „Dynamische Taste re“ is described with different properties by different resources „*** rechts“.

After copying an object like this it is necessary to swap all resources at the new copied object step by step. This needs time while multiple copying.

The function „Find & Replace“ allows a fast swapping.

Click with the right mouse key directly on the screen background (not on an object!), then select “Show references” and the message window opens up (close with F6, refresh by closing and re-opening)

There all resources such as with „rechts“ in their name will be replaced into others like such as with „links“ in their name. (... but only, if you organized you symbolic stringently ...)

The screenshot shows the 'Messages' window with the 'Screen-Reference' tab selected. The screen name is 'Menue'. The table lists resources for two dynamic buttons. A dialog box 'Find & Replace in Screen-Reference' is open, showing 'rechts' in the 'Find in reference' field and 'links' in the 'Replace with' field. The dialog has buttons for 'Find', 'Replace', 'Replace all', and 'Close'.

Object name	Object type	Property	Resource name	Resource type
▼ Dynamische Taste re	Dynamic button	Variable	Sichtbarkeit rechts	Variable
		Text label	Unsichtbar rechts	Text list
		Appearance	Farbe_Strang_rechts	Variable
		Function (Invert a bit)	Sichtbarkeit rechts	Variable
▼ Dynamische Taste li	Dynamic button	Variable	Sichtbarkeit links	Variable
		Text label	Unsichtbar links	Text list
		Appearance	Farbe_Strang_links	Variable
		Function (Invert a bit)	Sichtbarkeit links	Variable

Visualization with the software „VisuStage“

Resource Messages (Alarms and Events)

Alarms / Events

It can be processed

- with CPU-V 128 alarms and 128 events
- with CPU-P/T 1024 alarms and 1024 events

It can be archived messages (each: alarms and events). in total:
500 for (CPU-V/-P-devices)
or 50.000 (for CPU-T-devices)

(These archives can be deleted from Micro-SD-card

by a VisuStage button function)

Alarms x

General

Sign for Coming: Date format:

Sign for Going: Time format:

Sign for Acknowledge:

Alarm bit area:

Acknowledge area:

☒ Enable message archiving messages

☐ Set bit in acknowledge area by acknowledgement from operator

☒ Acoustic signal on Coming message

☒ Alarm siren by unacknowledged alarms in seconds interval

- Can be imported or exported as a csv-file (This helps for external translation)
- Import by → Extra → Import → Alarms / Events
- A new creation proceeds in project languages set default before.
- To archive it enable message archiving by a check mark and insert a micro-SD-card (Archiving is done in a binary fil format. RemoteStage converts this binaries into csv, alt automated in batch files)
- Acoustic signal means a single sound by an internal buzzer
- Alarm siren means an one-second-sound of the internal buzzer, what is played once between 10 and 600 seconds.

Alarm-(Event-) Bit area (Trigger bit address area)

is 128 bit at CPU-type V and 1024 bit at CPU-type P

and must be in a row without gaps!

Each bit belongs to a message (alarm/ event) (bit 0 to Alarm/Event 1, bit 1 to Alarm/ Event 2, etc...)

The message state can be controlled by the S7-Program by a bit from this area.

With bit=1 this message appears as „coming“.

With bit=0 this message will be interpreted as „going“.

Acknowledge bit area (only for alarms)

is 128 bit at CPU-type V and 1024 bit at CPU-type P. too

and must be in a row without gaps!.

Each bit belongs to an alarm (bit 0 to alarm 1, bit 1 to alarm 2, etc...)

The alarm state can be controlled by the S7-Program by a bit from this area.

With bit=1 this alarm appears as „acknowledged“.

With bit=0 this message will be interpreted as „not acknowledged“.

Both areas may not overlap each other (error message appears at compiling)



ATTENTION:

The block for Trigger- and Acknowledge areas **MUSST EXIST** in the PLC and must have at least that size 128/1024Bit, otherwise messages will not be displayed!

If the acknowledge bit is **activated**, it must be **reset** in the PLC after a while, otherwise the next of these alarms appears as „acknowledged“.

If it is **not activated** and you create and use a visualization with the RemoteStage there will be set no bit in the PLC when you acknowledge the alarm on the RemoteStage-visualization and on any other panels/HMI this alarm stays **not acknowledged** there.

Visualization with the software „VisuStage“

Alarm/ Event-Message box

Alarm messages							
	Deutsch...	Englisch...	Russisch ...	Group	Trigger bit address	Acknowledge bit address	Variable
1	Alarm 1 hat a...	Alarm 1 trigg...	тревога 1 нора...	1	M1.0	M17.0	
2	Alarm 2 hat a...	Alarm 2 trigg...	тревога 2 нора...	2	M1.1	M17.1	
3					M1.2	M17.2	

- Alarms of the same **Group** are acknowledged together / Alarms of Group 0 are acknowledged **automatically**.
- Trigger bit / Acknowledge bit areas** are displayed for better information only and are not changeable in this view!
- An additional **variable** (only for Panel-PLCs not for Panel-HMIs) offers to display a dynamic optional error code as decimal number.
(e.g. an calculated value of an special factor for customers needs as decimal number)
→ This is not a trigger variable for the message!
- Events can be displayed ascending or descending in the archive viewer
- By "Variable" a variables value (INT or REAL with (fix) 2 decimal places) can be displayed at the end of the message line.
- Like at the text resources it is possible to delete single text contents in the alarm / event message box.
→ Mark the desired cells by mouse and click right mouse key.
→ With "Delete content" the content of these cells will be deleted.
Alternatively:
→ If you press the "delete"-button of your keyboard
→ the marked text resources will be deleted completely.

Visualization with the software „VisuStage“

Resource User administration

There can administrated be up to 9 users with passwords by 8 digit - PIN-codes. Users with level 9 have all access rights, those with level 1 have least access rights.

In the upper mask can be assigned

- the target screens, whereto the project should change after login/ logout or if there shall be called the PIN-input dialog directly after touching a button with access rights.and
- an automatic logout time (in minutes). (With logout time 0 is assigned no automatic logout.) and
- a variable, what informs the PLC, what user level is active yet and
- an additional query to identify the user level before PIN input

Users

By operating the access protected objects ...

☐ Change to screen: Benutzer

☒ Invoke PIN input dialog

Log out screen: INSEVIS

Logout time: 0 minutes

Variable: x Benutzer (MB11, BYTE)

☐ Query user level by PIN input

Level	Name	PIN code	View name
1	Operator	111	Anzeigename_Operator
2	Master	222	Anzeigename_Master
3	Chief	333	Anzeigename_Chef
4	Service	444	Anzeigename_Service
5	Superuser	555	Anzeigename_Superuser

In the lower mask can be assigned

- the user names and PIN-codes of each levels (1...9).
- A new user will be added by entering its name and PIN-code
- The "view name" (multilingual resources, what displays the present user name by using system variable \$(CurrentUserViewName) in text fields (only CPU-T-devices) see sample visualization

"Query user level by PIN input

Just before entering PIN code it is possible to activate a identification mask, where the user enters his level.

Select user level

☒ Operator

☐ Master

☐ Chief

☐ Service

☐ Superuser

☒ Cancel

All lines can be displayed single-lingual or -by selecting different text resources- multi lingual in every project language. To be assigned at the resource "Dialogs / user level select"



Hint:

- The target menu screen after successfully log in will be assigned at the dynamic object „**PIN-input field**“
- With the **PIN-Change dialog- function** a PIN can be changed by the operator (his level stays the same). If this PIN is forgotten, a new upload of the visualization binary can set it back to delivery state.
- For a **user-level-referring screen** change use the function „Change screen with PIN input“ on a button.

Visualization with the software „VisuStage“

Change user level by SFC215 "LOGIN"

The SFC215 "LOGIN" enables the user level change by S7-User program at Runtime.

Parameter	Declaration	Data type	Description
LADDR	INPUT	WORD	Logical base address = 0 (for all Panel-PLC) Logical base address = 1..16 (Connection ID number to Panel-HMI)
LEVEL	INPUT	BYTE	User level (1..9) 0 = Logout current user level
RET_VAL	OUTPUT	WORD	Error code W#16#0000 – No error W#16#8002 – VisuStage is not running W#16#8005 – Level is invalid or not configured W#16#8xyy – General error codes (compatible to STEP 7) only for Panel-HMI: W#16#7000 – Job is in process W#16#7001 – Invalid connection state e.g not connected W#16#7002 – Job is not accepted, because another job is proceeded actually W#16#7003 – Connection resource occupied (temporarily locked) W#16#8001 – Invalid connection ID number or connection is not configured
BUSY	OUTPUT	BOOL	TRUE: Job is in processing

S7-User program example to change user level 7

Target: Change to user level 7

```

UN    M    1502.4          // if change request is not set, then
BEB                                     // end the function

CALL  SFC   215
LADDR :=MW2000              // VisuStage connection ID number.
                                // In Panel-PLC (e.g PC710T) must be W#16#0.
LEVEL :=B#16#7              // User level, could be 0..9
                                // 0= Logout current user level
RET_VAL:=MW1000             // Return / result code
BUSY   :=M1702.3            // TRUE = Reading is in process

U      M    1702.3          // Job is in process
BEB
R      M    1502.4          // reset request signal

L      MW   1000            // return / result code
L      0                    // no error
==I    BEB                  // If no error, then
                                // end the function

L      MW   1000            // error occurred
                                // error evaluation
                                // ...

BEA                                     // end of function

```

Visualization with the software „VisuStage“

Resource Partner-PLC (for HMI only)

INSEVIS HMIs run with data types of S7-300-family only. They use Ethernet S7-communication (Put/Get) to communicate. The HMI communicates with its partner device as active partner by via Ethernet S7-communication (put/get). In that communication INSEVIS-HMIs are the ACTIVE part. The referring partner-device will be identified by IP-address and TSAP (made of rack-no. / slot-no. of CPU / and hex no. of this connection resource). One HMI can only communicate with ONE partner-device (CPU).

Connection setting in the HMI

- Either assign it in the BIOS of the Panel-HMIs (put out the Ethernet-cable, wait for the logo in the screen and than press left/right/left side of the screen) or
- in VisuStage-project at the resource partner device

Connection settings in the Partner-device

- If general no connections must be configured in the partner device (PLC) for the HMI because the HMI is the active part of S7-communication (put/get) and uses the connection resource no.* 02 (reserved for OP-communication). (Screen- and language can be changed from PLC by using variables with screen- or language-ID-no.)
- If the **PLC uses SFCs for changing screens or handle trends** in the Panel-HMI shall change screens and languages at the INSEVIS-HMI, an Ethernet connection with connection resource no.* > 03 (hex), best FF must be assigned (e.g. in ConfigStage or in Siemens-programming tool)

below: assignment of connection parameter at HMI's view in the VisuStage
(TSAP can be entered by selecting a partner-PLC automatically by rules below)

below: assignment of connection parameter at PLC's view in the ConfigStage

HMI device settings

IP address: 192.168.80.54

TSAP: 02.00

Partner PLC settings

PLC type: INSEVIS PLC (selected from dropdown: INSEVIS PLC, Siemens S7-300/400, Siemens S7-1200/1500, Other)

IP address: 192.168.80.50

TSAP: 02.02

☒ Synchronize the HMI time with partner time (Accept the time of only INSEVIS or S7-300/400 PLC).

☒ Enable to change partner time in Runtime

Property: Ethernet

IP Protocol

IP Address: 192.168.80.60

Netmask: 255.255.255.0

Router:

Protection

Permit access with S7 Communication from remote partner (PG, PLC, HMI, OPC, ...) via ☒ Ethernet 1 ☒ Ethernet 2

Connections

ID	Type	Active	Local	Partner
1	INSEVIS Panel-HMI		FF.02	

For INSEVIS-Panels and Siemens-CPU's

1. Assign the IP-address of the partner-PLC into the field „Partner-PLC“ in VisuStage-project or in HMI-BIOS
2. Configure the TSAP by assigning **CPU rack-no. and -slot-no. and connection resource no.* (hex)**
for Siemens-CPU's 300/ 400 it is **0, 2, 02**,
for Siemens-CPU's 1200/1500 it is **0, 1, 02** → allow "Put/Get" communication
→ do not use optimized DBs

* Please do not confuse the connection resource no. 04...FF (hex) with the connection-ID-no. (01...16 (dec))!

Partner-PLC Synchronization (for HMI only)

When assigning partner device a time synchronization between panel and PLC is highly recommended.

- 1st check box:** The HMI will be synchronized to the PLC-time
- 2nd check box:** The PLC-time can be changed by the panel at runtime



Attention:

If you do not synchronize panel and PLC the difference between both devices may lead to unexpected program behavior.

Visualization with the software „VisuStage“

Resource Dialogs

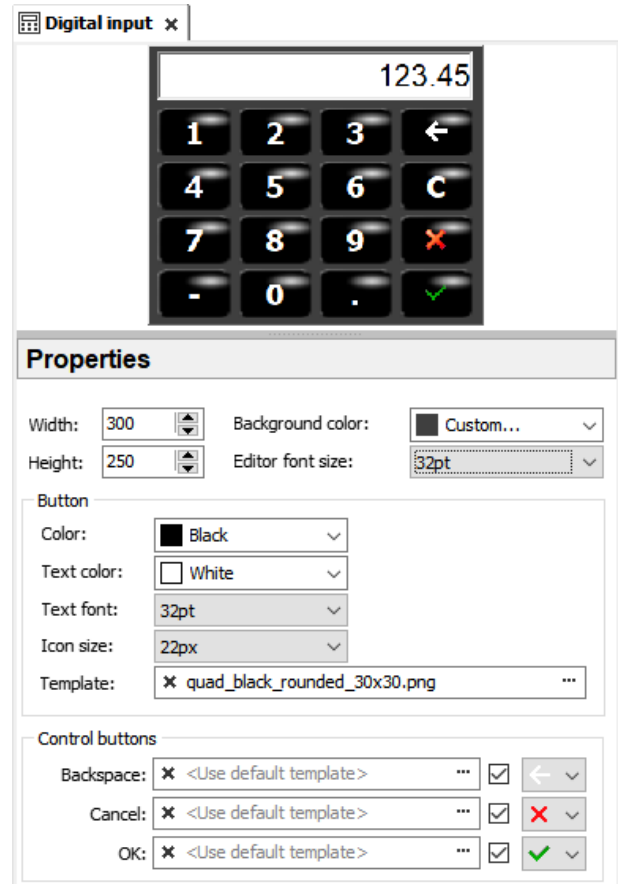
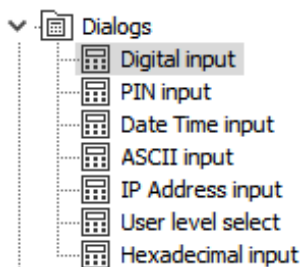
The dimension and the design of the virtual keyboards appearing at

- I/O-field,
- Login field,
- Date-/Time field
- Stringinput field
- IP-address field
- User level select

can be adapted to ones needs in the resource „Dialogs“.

The size of the single keys is generated by the size of the whole object (Do not assign a size larger than the LCD-resolution!)

All other settings are self explaining.

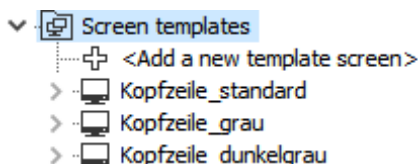


Hints:

At small panel diagonals it is very important benefit for the operator to easy enter his values that there is available a fitting virtual keyboard. This is not available at most other HMIs and a strong benefit for your solution.

At the resource "user level select " all lines (Header, single user levels and the cancel-button) can be displayed single-lingual or -by selecting different text resources- multi lingual in every project language.

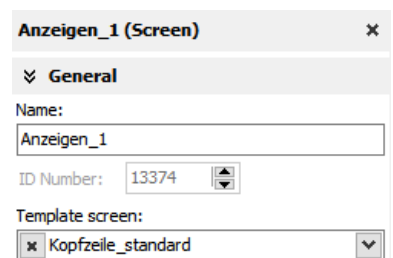
Resource Screen templates



Screen templates (no image) can be created as a special resource and can be uses once in every screen.

Therefore you activate this template screen in the settings of a screen you selected. Than choose one of the screen templates you made before.

Every modification in the screen templates will be taken over automatically into every screen this template will be used. Use this e.g. for top or bottom menus, headlines and so on.



Visualization with the software „VisuStage“

Resources Trends

There can be processed 4 trends with 16 channels each. This represent values by time, smallest time base is 1 sec. All 16 channels of one trend need to have the same data format.

Trends will get a name - here "Druck" (pressure), what will be used for displaying and storing at RemoteStage as file name.

Samples: here you enter the number of samples in the circular buffer in runtime (100...200)

Start behavior: Beside S7-SFCs there are 3 additional ways to start a trending

- manually / by demand by assigning a function "Trend Start" to a button
→ Configuration at the function (limited archiving functionality to stay compatible to old versions)
- with each system start
→ Configuration at the trend resource settings
- depending on a variable
→ Configuration at the trend resource settings

If **Archive** was activated, you can

- enter the number of samples you want to archive in the **Circular archive** (max. 65635 samples per each trend channel) or
- combine up to 10 circular archives on the Micro-SD-card to an **Segmented circular archive** to 656.350 samples per each trend channel to display it in the trend archive viewer.

Trends

Name	Data type	Channels	Comment
1 Druck	WORD	2	
2 Luft	BYTE	0	
3 Temp.	BYTE	0	

Trend

Name: Druck
 ID number: 6163
 Data type: WORD
 Comment:
 Samples: 200

Start behaviour

☐ By demand (e.g Trend start function)
☒ By system startup
☐ By boolean variable change (not assigned)

Sampling interval: 1

By start

☒ Append to existing samples
☐ Clear the existing sample

Archive

☒ Enable 10000 samples in archive
☒ Circular archive
☐ Segmented circular archive 10 segments

Channels:

Name	Variable	Min.	Max.	Decimal point	Color	Style	Point
1 Kanal 1	Trend (MW12, WORD)	0	255	0		Interpolated	Cross
2 Kanal 2	Trend1 (MW7, WORD)	0	510	0		Bar	Triangle

When number of samples exceed these limits, they will be overwritten in the FIFO system.

To configure the trend channel values, assign min/max values, decimal point, color, style (interpolated – shortest connection between 2 sample values, bars (vertically), stepped) and design of the sample point markers (diverse).

Archives will be archived to the external Micro-SD-card only. Each trend will be saved as own file. This binary will be converted by the software „RemoteStage“ on the PC into a csv- format either manually or in "Planned Tasks" of your Windows-PC. These archives can be deleted from Micro-SD-card by an special SFC, assigned as function to a button.

Cross references for trends

To keep the overview about the trends started, stopped, continued or displayed) in the project, there is a function „Cross reference“ (mark a trend and use right mouse button). All trend handling will be displayed referring to their usage in resources or in menu objects. By a double click on an item you get automatically into the menu, where it is used. Close/open the message window by key „F6“.

Messages

Messages Cross-References Screen-Reference Find

Resource name: Druck Resource type: Trend

	Number	Used in	At "Resource"	At "Access"	At "Visibility"	At "Appearance"	At "Function"	Type
▼ Trends	7							Screen
		Trend-Viewer	1					Trend viewer
		Kanal_2					1	Check box
		Trend archive viewer	1					Trend archive viewer

Visualization with the software „VisuStage“

Starting the trend sampling with SFC 202 "TRENDSRT"

To start the configured Trend use SFC202 "TRENDSRT". The sampling interval and number of samples are assigned to the trend.

After starting, operating system samples the configured operand values in given interval and stores to Micro-SD card if „ARCHIVE“ parameter set to „TRUE“. If „CYCLIC“ parameter is „FALSE“, the „COUNT“ samples are one time sampled and trend automatically changes to „STOP“ state.

Trends are written to „trend_xxx.bin“ whereas xxx is Trend ID number. This archive file is based on „Ring-Buffer“ mechanism with „COUNT“ samples.

(Trend data can be get out of the PLC by SD-card only. In future versions a download by Ethernet will be possible.)

Parameter	Declaration	Data type	Description
LADDR	INPUT	WORD	Logical base address = 0 (for all Panel-PLCs) Logical base address = 1...16 (connection-ID-No. to the Panel-HMI)
TREND	INPUT	INT	Trend ID number, (from VisuStage configured @ resources)
INTERVAL	INPUT	WORD	Sampling interval in seconds. 1..65535 second are allowed.
COUNT	INPUT	WORD	Number of samples to sample / to archive. 1..65535 are valid.
CYCLIC	INPUT	BOOL	TRUE: It cyclically samples the COUNT samples. FALSE: One time samples the COUNT samples, then stops the sampling
ARCHIVE	INPUT	BOOL	TRUE: Sampled values are stored in microSD card FALSE: No archive
RET_VAL	OUTPUT	WORD	Error code W#16#0000 – No error W#16#8002 – VisuStage is not running/configured W#16#8003 – Invalid „TREND“ ID number W#16#8004 – Invalid state / Already started. W#16#8005 – Invalid „INTERVAL“ value W#16#8006 – Invalid „COUNT“ value W#16#8xyy – General error codes (compatible to STEP®7) only for Panel-HMI: W#16#7000 – Job is in process W#16#7001 – Invalid connection state, e.g not connected W#16#7002 – Job not accepted, because another job is proceeded actually W#16#7003 – Connection resource occupied (temporarily locked) W#16#8001 – Invalid connection ID number or connection is not configured
BUSY	OUTPUT	BOOL	Busy flag, TRUE Job is in processing

If a trend is started once and the PLC has got a power OFF, the trend starts after power ON by itself automatically.

→ Here you will find more for parameterizing of the objects Trend viewer and trend archive viewer

Visualization with the software „VisuStage“

S7-program sample for using the SFC202

Purpose: Start trend (ID number =6163) with configuration:

- 1s interval,
- cyclically,
- with archiving,
- ring buffer size 65535 samples (set of values)

```

UN    M    1500.2    // if request is not set, then
BEB                                     // end the function

CALL  SFC  202
LADDR :=W#16#0      // VisuStage connection ID number.
                        // In Panel-PLC (e.g PC700P) must be W#16#0.
TREND :=6163        // ID number of trend, which is configured in VisuStage
INTERVAL:=W#16#1    // every 1s samples the values
COUNT :=W#16#FFFF // max. no. of samples (set of values) 65535 (dez) => FFFF (hex)
CYCLIC :=TRUE       // cyclically samples as ring buffer.
                        // Buffer size is given in COUNT parameter
ARCHIVE :=TRUE      // enables the archiving in micro SD card
RET_VAL :=MW1000    // Result / return code
BUSY    :=M1700.2   // TRUE = Request is in process

U      M    1700.2    // If Start the trend is in process, then
BEB                                     // end this function
R      M    1500.2    // reset request signal

L      MW   1000      // return / result code
L      0              // no error
==I                                         // If no error, then
BEB                                     // end the function

L      MW   1000      // error occurred
                        // error evaluation
                        // ...

BEA                                     // end of function

```

Visualization with the software „VisuStage“

Stopping the trend sampling with SFC 203 "TRENDSTP"

The trend sampling can be stopped by SFC 204 "TRENDSTP" function call.

Parameter	Declaration	Data type	Description
LADDR	INPUT	WORD	Logical base address = 0 (for all Panel-PLCs) Logical base address = 1...16 (connection-ID-No. to the Panel-HMI)
TREND	INPUT	INT	Trend ID number, (from VisuStage configured @ resources)
RET_VAL	OUTPUT	WORD	Error code W#16#0000 – No error W#16#8002 – VisuStage is not running/configured W#16#8003 – Invalid „TREND“ ID number W#16#8xyy – General error codes (compatible to STEP®7) only for Panel-HMI: W#16#7000 – Job is in process W#16#7001 – Invalid connection state, e.g not connected W#16#7002 – Job not accepted, because another job is proceeded actually W#16#7003 – Connection resource occupied (temporarily locked) W#16#8001 – Invalid connection ID number or connection is not configured
BUSY	OUTPUT	BOOL	Busy flag, TRUE Job is in processing

S7-program sample for using the SFC202

Purpose: Stop the trend with ID number 6163

```

UN    M    1500.3    // if request is not set, then
BEB                                     // end the function

CALL  SFC  203
LADDR :=W#16#0          // VisuStage connection ID number.
                        // In Panel-PLC (e.g PC700P) must be W#16#0.
TREND :=6163           // ID number of trend, which is configured in VisuStage
RET_VAL:=MW1000        // Result / return code
BUSY  :=M1700.3        // TRUE = Request is in process

U      M    1700.3    // If top the trend is in process, then
BEB                                     // end this function
R      M    1500.3    // reset request signal

L      MW  1000        // return / result code
L      0              // no error
==I    BEB            // If no error, then
                        // end the function

L      MW  1000        // error occurred
                        // error evaluation
                        // ...

BEA                                     // end of function

```

Visualization with the software „VisuStage“

Continue the trend sampling with SFC 204 "TRENDCNT"

The previously stopped trend sampling could be continued by calling SFC 204 "TRENDCNT".

The sampling interval must be new assigned. The number of samples and sampling mode (cyclical overwriting, archiving) are kept as last assigned.

Parameter	Declaration	Data type	Description
LADDR	INPUT	WORD	Logical base address = 0 (for all Panel-PLCs) Logical base address = 1...16 (connection-ID-No. to the Panel-HMI)
TREND	INPUT	INT	Trend ID number, (from VisuStage configured @ resources)
INTERVAL	INPUT	WORD	Sampling interval in seconds. 1..65535 second are allowed.
RET_VAL	OUTPUT	WORD	Error code W#16#0000 – No error W#16#8002 – VisuStage is not running/configured W#16#8003 – Invalid „TREND“ ID number W#16#8004 – Trend was not started or Sampling count reached to zero. W#16#8xyy – General error codes (compatible to STEP®7) only for Panel-HMI: W#16#7000 – Job is in process W#16#7001 – Invalid connection state, e.g not connected W#16#7002 – Job not accepted, because another job is proceeded actually W#16#7003 – Connection resource occupied (temporarily locked) W#16#8001 – Invalid connection ID number or connection is not configured
BUSY	OUTPUT	BOOL	Busy flag, TRUE Job is in processing

→ Here you will find more for parameterizing of the objects Trend viewer and trend archive viewer

S7-program sample for using the SFC204

Purpose: Continue / resume the trend with ID number 6163

```

UN    M    1500.4    // if request is not set, then
BEB                                     // end the function

CALL  SFC   204
LADDR :=W#16#0    // VisuStage connection ID number.
                                     // In Panel-PLC (e.g PC700P) must be W#16#0.
TREND :=6163      // ID number of trend, which is configured in VisuStage
INTERVAL:=W#16#1  // every 1s samples the values
RET_VAL :=MW1000  // Result / return code
BUSY    :=M1700.4 // TRUE = Request is in process

U      M    1700.4    // If Resume the trend is in process, then
BEB                                     // end this function
R      M    1500.4    // reset request signal

L      MW    1000     // return / result code
L      0             // no error
==I    // If no error, then
BEB                                     // end the function

L      MW    1000     // error occurred
                                     // error evaluation
                                     // ...

BEA                                     // end of function

```

Visualization with the software „VisuStage“

Query the trend status with SFC 205 "TRENDSTA"

To query the trend status use SFC205 "TRENDSTA" function. It reports about trend sampling and/or trend archiving status.

Parameter	Declaration	Data type	Description
LADDR	INPUT	WORD	Logical base address = 0 (for all Panel-PLCs) Logical base address = 1...16 (connection-ID-No. to the Panel-HMI)
TREND	INPUT	INT	Trend ID number, (from VisuStage configured @ resources)
RET_VAL	OUTPUT	WORD	Error code W#16#0000 – No error W#16#8002 – VisuStage is not running/configured W#16#8003 – Invalid „TREND“ ID number W#16#8xyy – General error codes (compatible to STEP®7) only for Panel-HMI: W#16#7000 – Job is in process W#16#7001 – Invalid connection state, e.g not connected W#16#7002 – Job not accepted, because another job is proceeded actually W#16#7003 – Connection resource occupied (temporarily locked) W#16#8001 – Invalid connection ID number or connection is not configured
BUSY	OUTPUT	BOOL	Busy flag, TRUE Job is in processing
TREND_STATUS	OUTPUT	BYTE	Trend status code B#16#00 – Trend sampling is not initiated B#16#01 – Trend sampling is initiated and running B#16#02 – Trend sampling has finished/stopped
ARCHIVE_STATUS	OUTPUT	BYTE	Archiving status code B#16#00 – Trend archiving is not initiated B#16#01 – Trend archiving is initiated and running B#16#02 – Trend archiving has finished successfully B#16#03 – SD card is not inserted or not recognized B#16#04 – Trend archiving stopped: Could not create file B#16#05 – Trend archiving stopped: Could not read file B#16#06 – Trend archiving stopped: Could not set file size B#16#07 – Trend archiving stopped: Could not write header to file B#16#08 – Trend archiving stopped: Error on file seek B#16#09 – Trend archiving stopped: Could not write samples to file

→ Here you will find more for parameterizing of the objects Trend viewer and trend archive viewer

Visualization with the software „VisuStage“

S7-program sample for using the SFC205

Purpose: Check the status of trend with ID number 6163

```

UN    M    1500.5      // if request is not set, then
BEB                                     // end the function

CALL  SFC  205
  LADDR      :=W#16#0  // VisuStage connection ID number.
                                // In Panel-PLC (e.g PC700P) must be W#16#0.
  TREND      :=6163    // ID number of DRUCK trend, which is configured in VisuStage
  RET_VAL    :=MW1000  // Result / return code
  BUSY       :=M1700.5 // TRUE = Request is in process
  TREND_STATUS :=MB2008 // Trend status code
  ARCHIVE_STATUS:=MB2009 // Trend archiving status code

U      M    1700.5      // If Start the trend is in process, then
BEB                                     // end this function
R      M    1500.5      // reset request signal

L      MW    1000       // return / result code
L      0               // no error
==I                                     // If no error, then
BEB                                     // end the function

L      MW    1000       // error occurred
                                // error evaluation
                                // ...

BEA                                     // end of function

```

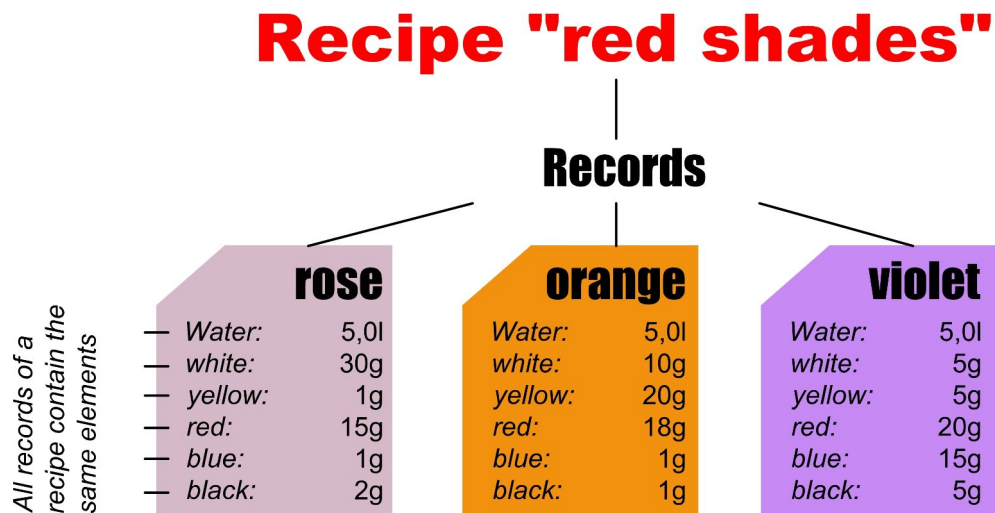
Visualization with the software „VisuStage“

Resource recipe administration and recipe viewer

INSEVIS-Panels/HMIs and Panel-PLCs may administrate

- with CPU type V up to 64 recipes with each up to 128 records with each up to 128 elements and
- with CPU type P up to 64 recipes with each up to 256 records with each up to 256 elements.

Structure of a randomized sample for color mixing



The different kinds of color shades (**red shade, blue shade, green shade**) are recipes.

Each recipe contains of always the same elements (e.g. **red shades** contains of *water, white, yellow, red, blue, black*).

Depending on the relation of the elements several records of the recipe **red shades** are generated (e.g. the colors **rose, orange, violet**).

The user selects a recipe from the recipe list first.

(in this sample the recipe **red shade**)

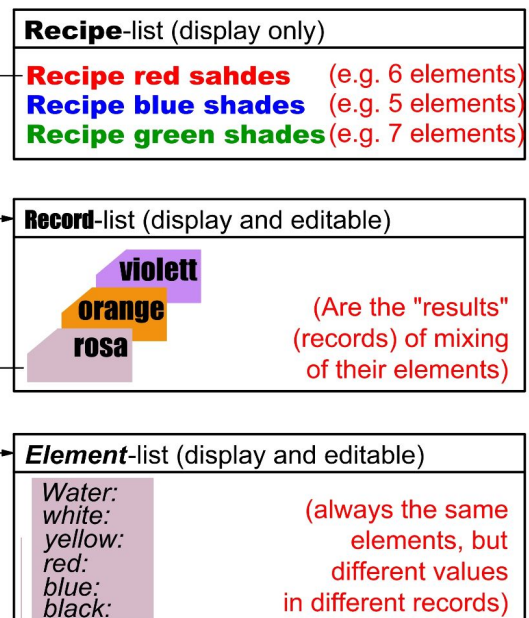
There can not be created new recipes at runtime, because new elements are needed for that. But for those elements some new machine parts must be integrated and wired (e.g. hatches, scales and so on...) first.

The record list shows existing records. A record can be added, selected for further operation, saved as or deleted here.

(in the sample te records (colors) **rose, orange, violet**)

If you create a recipe in the VisuStage, you assign a value for each element and so the first record is created automatically, buit not named and stored. Save it with a new name and so create your records.

Select a record to change its elements in the element list. The values of all elements (assigned to this recipe in the VisuStage) can be changed and stored here
(in the sample the elements *water, white, yellow, red, blue, black*)



INSEVIS-specific hints for recipe administration

1. INSEVIS- Panel-PLCs store the records in the Micro-SD-Card.
2. There is only one recipe viewer allowed and useful in a screen window.
3. If the visualization is changed and download again, the recipe structure wil overwritten by itself. But the record data on the Micro-SD-Card will be kept. So all stored records of the recipes can be kept while you update your visualization.
4. Because of the data storage on the Micro-SD-card (external memory) there no simulation of the recipe administration with SimuStage is possible.
5. The access administration is made by a button with own access rights, who changes the screen into the menu of the recipe viewer.
6. With SFC206 you can combine e.g. a bar code reader input with a special recipe record. The reference table (what bar code uses what recipe record) is to program in S7.
7. Export of recipe records is available with RemoteStage 1.0.3.7

Visualization with the software „VisuStage“

Development of recipes in a randomized sample for color mixing

Choose „Add a new recipe“, parameterize it in a new window as written below:

General settings

- Recipe name: internal name of the recipe (independ of project language)
- View name: displayed name of the recipe (depends of project language)
- Comment: Insert your additional comments here
- (Number) automatic increased internal number of the recipe (not changeable)

Recipe structure

- Element internal name of the element (independ of project language)
- View name: displayed name of the element (depends of project language),
Here the physical user unit can be displayed too (e.g. kg, sec., cm, etc.)
- Variable Assigning of a variable to this element (if you show user units, than scale this variable to fit with the displayed unit. So the operator can work very comfortable)
- Min. Input of the minimal value of the element (If the operator inserts a lower value, it will replaced by the the minimum value automatically)
- Value Input of the element value (thereby the elements of the first record will be pre-assigned and kept in the memory until the record is first time saved as...)
- Max. Input of the maximal value of the element (If the operator inserts a higher value, it will replaced by the the maximum value automatically)
- Decimal point: Insert the number of decimal places of the value

Rezeptur_Rot x

General

Recipe name:

Rezeptur_Rot

Number:

1

View name:

Rot_t

Comment:

Demo-Rezeptur für Farben mit roter Tönung.
Die Elemente werden hier konfiguriert und in ihrer jeweiligen
Menge als Datensatz/Record gespeichert durch den
Bediener.
Demo-Receipe for colours with red shape
The elements will be configured here and stored as a record
by the operator himself

Recipe structure

	Element	View name	Variable	Min.	Val...	Max.	Deci...	
1	Wasser (Liter)	Wasser	El_H2O (MB20, BY...	0	5	10	1	
2	Pulver weiss (g)	Pulver ws	El_ws (MB21, BYTE)	0	30	100	0	
3	Pulver gelb (g)	Pulver ge	El_ge (MB22, BYTE)	0	1	100	0	
4	Pulver rot (g)	Pulver rt	El_rt (MB23, BYTE)	0	15	100	0	
5	Pulver schwa...	Pulver sw	El_sw (MB25, BYTE)	0	2	100	0	



Hint:
The FAT16/32 file system of the Micro-SD-card does not accept some characters in the file- or folder names

These are: \ / : * ? " < > | This characters will be ignored.

Visualization with the software „VisuStage“

Recipe handling with SFC 206 "RECIPE"

With the SFC206 "RECIPE" recipe records can be

- read in from Micro-SD-card and written to the PLC and
- written from the PLC to the Micro-SD-card.

It means, you can combine e.g. a bar code reader input with a special recipe record. The reference table (what bar code uses what recipe record) is to program in S7.

Parameter	Declaration	Data type	Description
REQ	INPUT	BOOL	TRUE assign and start job
LADDR	INPUT	WORD	Logical address 0 Panel-SPS (intern VisuStage RT) 1..16 HMI- Connection ID number
RECIPE	INPUT	INT	Recipe ID number (from VisuStage configured @ resources)
REC_NAME	INPUT	STRING	Recipe record name
FUNCTION	INPUT	BYTE	Function number 1 Read record from SD and write to PLC (SD → PLC) 2 Read record from PLC and write to SD (PLC → SD) 3 Read record from PLC and overwrite to SD (PLC → SD) 4 Delete record from SD 5 Check record existence in SD 6 Get number of records in SD (Output parameter „RETVAL“ returns number of available records)
RETVAL	OUTPUT	WORD	Status code of job
BUSY	OUTPUT	BOOL	TRUE= Job is in process
DONE	OUTPUT	BOOL	TRUE= Job is done successful
ERROR	OUTPUT	BOOL	TRUE= Job is failed, error code in RETVAL

Status code meaning

RETVAL	BUSY	DONE	ERROR	Description
W#16#0000	0	1	0	Job is successfully done
W#16#7000	1	0	0	Job is process
W#16#7001	0	0	1	Connection is in invalid state (e.g. not connected)
W#16#7002	0	0	1	Job is not accepted, due to previous job is still in process
W#16#7003	0	0	1	Connection resource is temporary locked
W#16#7004	0	0	0	REQ Parameter is FALSE
W#16#8001	0	0	1	Invalid connection ID number
W#16#8002	0	0	1	Visualization is not running (on Panel-HMI) or recipe not configured
W#16#8003	0	0	1	Invalid RECIPE ID number
W#16#8004	0	0	1	File system is not ready (eg. SD card is not inserted)
W#16#8005	0	0	1	Could not access to record file in SD card
W#16#8006	0	0	1	Invalid file content
W#16#8007	0	0	1	Record file exists in SD card
W#16#8008	0	0	1	Recipe path not found in SD card
W#16#842A	0	0	1	Invalid format in REC_NAME parameter
W#16#852B	0	0	1	Invalid function ID number in FUNCTION parameter
W#16#8xyy	0	0	1	General error code (S7 compatible)

Visualization with the software „VisuStage“

S7-program sample for using the SFC206

Purpose: Create (overwrite if record file exists) a new recipe record file in micro SD card.

```
CALL SFC 206
REQ      :=M1500.6          // TRUE = Request to create a new recipe record
LADDR    :=W#16#0           // VisuStage connection ID number.
                                // In Panel-PLC (e.g PC700P) must be W#16#0.

RECIPE    :=1               // Recipe number, in VisuStage configured
REC_NAME  :=DB205.RECORD_NAME // Recipe record name
FUNCT     :=B#16#3          // Write Record to SD card,
                                // if record exists, overwrite it
                                // Result / return code
RET_VAL   :=MW1000          // TRUE = Request is in process
BUSY      :=M1700.6         // TRUE = Successful created
DONE      :=M1002.0         // TRUE = Error occurred
ERROR     :=M1002.1         // TRUE = Error occurred

U      M      1700.6        // If Recipe record is in process, then
BEB
R      M      1500.6        // end this function
                                // reset request signal

U      M      1002.0        // If successful done, then
BEB
                                // end the function

UN      M      1002.1       // if no error occurred, then
BEB
                                // end the function

L      MW      1000         // error occurred
                                // error evaluation
                                // ...

BEA
                                // end of function
```



Hint:

The FAT16/32 file system of the Micro-SD-card does not accept some characters in the file- or folder names

These are: \ / : * ? " < > | This characters will be ignored.



Hint to function 6

The input parameter „REC_NAME“ can carry wildcards as:

*	any ASCII character(s)
?	only one ASCII character
<ASCII character>	specific ASCII character

For sample:

- REC_NAME = "ab*" returns the number of all records, what start with **ab** (no matter what and how much character follow)
- REC_NAME = "a?b" returns the number of all records with 3 characters (what start with **a** and end with **b** and contain on character in the middle (no matter what))
- REC_NAME = "*" or an empty S7-String return the number of all records

Visualization with the software „VisuStage“

Ressource Menues

The "Menus" resource shows the overview of the created menus (screens) and general settings about them as follows:

- **Display backlight** - Autonomous switch off / - Alarm message after switch on
- **Screen saver**
 - Autonomous switch on
 - To be switched off by a programmed screen change by S7-program
 - Blinking, when alarm message is active
 - Design of a display of date/time, image or text, what should be displayed during the screen saver timer period
- **Acoustic signals** by an integrated buzzer
- **Displaying inactive buttons** when no access rights exist
- **Using of color schemes** to get a modern design (or to switch it off)
- **Watchdog**
 - to control the connections to the PLC with a toggeling (live-) bit (for Panels-HMI only)
- **Control of**
 - screens and languages by variables (writing actual screen/language ID to variable or change screen/language by its ID from variable)
- **Activation** of a log of the last 16 screens visited before (for button function "Change Screen" → <Previous screen>)



Hint:

Make the dimension of the screen saver **much smaller** that the whole resolution is to let the screen saver „walk“.

Visualization with the software „VisuStage“

Basic functions

There can be selected any objects by left mouse click and be copied/ cut out/ grouped/ ungrouped by right mouse key. Copied objects will be pasted in the same screen, they will get an X-Y-offset of 5 pixels to keep orientation. When having marked multiple different object, common properties can be edited at once.

Background image

Hit an empty space (with no objects) in your screen to get to the general settings.

The name is the name of the screen (to be seen in the screen-tree on the left side)
The ID-number of the screen will be used by the PLC, when a screen change is to be ordered by the PLC (of course not available in the HMIs). This ID is not to be changed manually.

By the view name a a multi-linguaged text resource will be used from a text field from the screen template with the system variable \$(CurrentScreenViewName) to display the present screen name in multiple languages .

A template screen can be selected and assigned.

A background color or a background image can be selected. (Image needs more memory than a simple color.)

In this configuration no wallpaper but a gray background color is defined.

General

Name: Anzeigen_3

ID Number: 179

View name: Anzeigenname_Objekte_3

Template screen: Kopfzeile_dunkelgrau

Wallpaper: (not assigned)

Comment:

Display of used resources in a screen

The function „Screen-reference“ displays all resources used in the marked screen.

- Mark a screen in the left screen tree by left mouse key
- Right mouse key opens up a pull-down menu, select „Screen-reference“
- In the message window all resources of this screen will appear

Messages

Messages Cross-References Screen-Reference Find

Screen name: Anzeigen_3

Object name	Object type	Property	Resource name	Resource type
▶ Hand_Auto1	State area			
▶ Tank	Image			
▶ Fortschrittsbalken_ver	Progress bar			
▶ Fortschrittsbalken_hor	Progress bar			
▼ E-/A-Feld	I/O field			
		Variable	E-/A-Feld	Variable
		Appearance	E-/A-Feld	Variable
▼ Info EA Feld	Text			

Clean Screen

The Clean screen will be started with a function (to be chosen by the rider „Function“) and there also the time period will be assigned.

Placing an object

Select the required objects at the catalog tree (right) and add them to the screen in a window by left mouse key.

Make the fine placement by the box „Position and Size“ in pixels or by key-combination SHIFT+arrow-keys (8 pixels each click)

Note that the zero-point (X;Y = 0;0) is the **TOP LEFT CORNER**

Position and Size

X: 405 365

Y: 103 175

Text font

Here you can assign the font and size as well as the color and the style (Italian, Bride) of text

Font

48pt

Border

Assign here the outline and mostly the rear color of your object

- flat = assign frame and background color without 3D-effect
- lowered = assign frame and background color with 3D-effect "low"
- raised = assign frame and background color with 3D-effect "high"
- none = transparent

Border

Lowered

Flat 1Px

Lowered

Raised

Flat 2Px

Flat 0Px

Visualization with the software „VisuStage“

Margins

Assign the distance between texts/labels or symbols on a button to the frame of this object (in pixels).

Visibility

The visibility of objects can be controlled by a variable and is to be assigned easily

In this sample an object is hidden, when the 4th bit (counting from right) will have the binary value 1, in all other cases it is visible

In this sample an object is hidden, when the variables value is between 4 and 6, in all other cases it is visible

Hint: Depending on type of variables, some inputs can stay empty (e.g. the masking, if a boolean variable was selected).

Access rights

These rights are to be assigned by user level and by a variable.

In this sample an object is accessible, for every user below the level 2 (Master)

In this sample an object is accessible, when the variables value is 1

Group / Ungroup objects

Group objects is necessary to fix multiple objects in an preassigned position by the right mouse key. It makes sense e.g. to create library elements. The group can be split by right mouse key again.

Visualization with the software „VisuStage“

Appearance

The appearance of most of the objects can be controlled based by value of a variable.

Appearance

Variable:

Type: ☒ Range ☐ Bitwise masked value

	From	To		
1	251	255		
2	0	125		
3	126	250		

In the area (0...125) the object will displayed in green and in the area (126...250) in red. The frame will be displayed in black.

Appearance

Variable:

Type: ☐ Range ☒ Bitwise masked value

	Bit mask	Value		
1	127	0		
2	127	63		
3	127	64		

Here the object becomes green only if in the lowest 7Bit (refers to bit mask 127) the value of 63 is reached and red if the value of 64 is reached. The frame is shown in black.

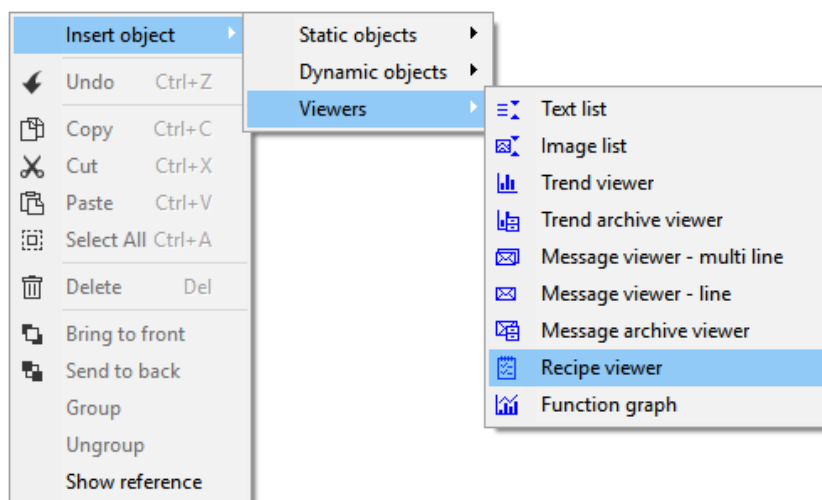
Out of the selected area or values the color of the first line is displayed always. In above samples it is with black frame. Here it is recommended to create an additional line for that purpose.

ATTENTION:
 You need to define another color valid for values out of desired area or values in the 1st line.
 If you do not add this line, the color of the first line will be displayed for values out of desired area or values.
 This can cause wrong color information, what can cause an incorrect operation by operator!

Insert objects

Objects can be inserted by

- selecting in the right catalog window and clicking with left mouse key in the menu window
- a key combination without mouse in the menu window (to see right beside the object in the catalog-window)
- by right mouse key in the menu window by a popup window (see image right)



Copy objects

Instead of systematic saving groups of objects into libraries (recommended!) there is a "cheap'n dirty" version too by simple copying of selected object from one VisuStage into another open VisuStage.

- Mark the requested objects
- Move it by drag'n drop into the other VisuStage

Variables will be copied too and

- if identical to existing ones the original variables will be used
- if symbols (name) and or absolut address differ to original ones, a ne variable will be crated

If there are variables, what are linked to any objects (like screen changes) a message box appears and informs about every single variable and wants a decision how to act.

Object import

The connected object/resource is not found

Object: 'Touchfläche_Rezepturen' (Touch area)
Connected to: 'Rezepturen' (Screen)

The connected object is not found.
 Possible objects which can be connected:

Menue

Do you want to ... ?

☒ Make connection
☐ Remove connecton
☐ Keep connection

Visualization with the software „VisuStage“

The PLC can request what screen menu is active and can force the VisuStage to change into another screen.

Query the current the screen ID number with SFC 200 "SCR_GET"

The currently shown screen ID number can be retrieved by using SFC 200 "SCR_GET"

Parameter	Declaration	Data type	Description
LADDR	INPUT	WORD	Logical base address = 0 (for all Panel-PLCs) Logical base address = 1...16 (connection-ID-No. to the Panel-HMI)
RET_VAL	OUTPUT	WORD	Error code W#16#0000 – No error W#16#8002 – VisuStage is not running/configured W#16#8xyy – General error codes (compatible to STEP®7) only for Panel-HMI: W#16#7000 – Job is in process W#16#7001 – Invalid connection state, e.g. not connected W#16#7002 – Job not accepted, because another job is proceeded actually W#16#7003 – Connection resource occupied (temporarily locked) W#16#8001 – Invalid connection ID number or connection is not configured
BUSY	OUTPUT	BOOL	Busy flag, TRUE Job is in processing
SCREEN	OUTPUT	INT	Currently shown screen ID number, (from VisuStage configured @ resources)
LANG	OUTPUT	INT	Currently selected language ID number (referring to int'l. codes - you can find it in the csv-file, when using the text export)

S7-program sample for using the SFC200

Purpose: Query the actual screen

```

UN      M      1500.0          // if read request is not set, then
BEB                                           // end the function

CALL   SFC   200
      LADDR  :=W#16#0          // VisuStage connection ID number.
                                   // In Panel-PLC (e.g. PC700P) must be W#16#0.
      RET_VAL:=MW1000          // Result / return code
      BUSY   :=M1700.0         // TRUE = Reading is in process
      SCREEN :=MW2002          // Current screen ID number
      LANG   :=MW2004          // Current language ID number

U       M      1700.0          // Reading is in process
BEB
R       M      1500.0          // reset request signal

L       MW     1000            // return / result code
L       0                    // no error
==I                                           // If no error, then
BEB                                           // end the function

L       MW     1000            // error occurred
                                           // error evaluation
                                           // ...

BEA                                           // end of function

```

Visualization with the software „VisuStage“

Changing the screen with SFC 201 "SCR_SET"

Screen can be changed by using SFC 201 "SCR_SET".

Parameter	Declaration	Data type	Description
LADDR	INPUT	WORD	Logical base address = 0 (for all Panel-PLCs) Logical base address = 1...16 (connection-ID-No. to the Panel-HMI)
SCREEN	INPUT	INT	Screen ID number, (from VisuStage configured @ resources)
RET_VAL	OUTPUT	WORD	Error code W#16#0000 – No error W#16#8002 – VisuStage is not running/configured W#16#8003 – Invalid Screen ID number W#16#8xyy – General error codes (compatible to STEP®7) only for Panel-HMI: W#16#7000 – Job is in process W#16#7001 – Invalid connection state, e.g not connected W#16#7002 – Job not accepted, because another job is proceeded actually W#16#7003 – Connection resource occupied (temporarily locked) W#16#8001 – Invalid connection ID number or connection is not configured
BUSY	OUTPUT	BOOL	Busy flag, TRUE Job is in processing

S7-program sample for using the SFC201

Purpose: Change to screen with ID number 16917

```

UN    M    1500.1      // if request is not set, then
BEB                                     // end the function

CALL  SFC  201
LADDR :=W#16#0          // VisuStage connection ID number.
                        // In Panel-PLC (e.g PC700P) must be W#16#0.

SCREEN :=16917          // Screen ID number to change
RET_VAL:=MW1000         // Return / result code
BUSY   :=M1700.1        // TRUE = Request is in process

U      M    1700.1      // request is in process
BEB

R      M    1500.1      // reset request signal

L      MW   1000        // return / result code
L      0               // no error
==I    // if no error, then
BEB    // end the function

L      MW   1000        // error occurred
                        // error evaluation
                        // ...

BEA                                     // end of function

```

Visualization with the software „VisuStage“

Creating a visualization screen

Static objects

Lines, rectangles, texts, images

Lines

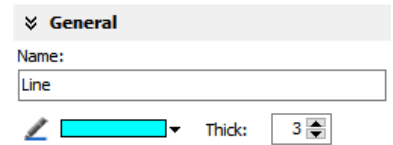
Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign appeareance: [\(see basic funtions\)](#)

Parameterize the object: (register "General")

- this sample shows a 3px wide line.
- When changing target screens a miss calculation of width can happen what causes overlapping failure (reported in message window)
- As of version 2.2.10, new line types and arrows can be used.



Rectangles

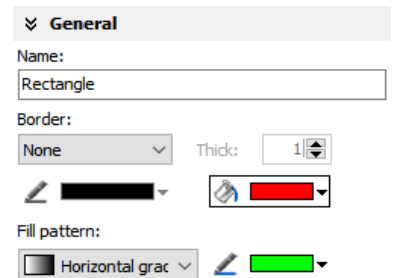
Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign appeareance: [\(see basic funtions\)](#)

Parameterize the object: (register "General")

- this sample shows a rectangle without border, with a horizontal color gradient from red to green, all other properties are self explaining



From VisuStage version 2.2.1.0 it is possible to round the corners with a radius.
In the settings, under the item Corners, a radius can be configured for all four corners.

Ellipses

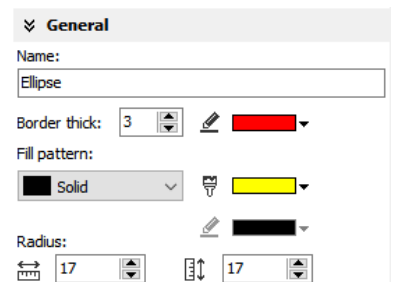
Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign appeareance: [\(see basic funtions\)](#)

Parameterize the object: (register "General")

- this sample shows 17px diameter yellow circle with a 3px red outline
- all other properties are self explaining



Texts

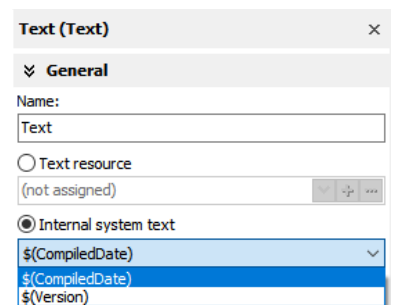
Place an object: [\(see basic funtions\)](#)

Assign visibility, fonts: [\(see basic funtions\)](#)

Assign appeareance: [\(see basic funtions\)](#)

Parameterize the object: (register "General")

- Use an existing **text resource** or create a new one directly here **OR** use the **Internal system text** to display compile-no and -date
- Assign font, bride and italic style
- Assign horizontal/vertical alignment
- Check "Wrap words" if this is a multiline text



Images

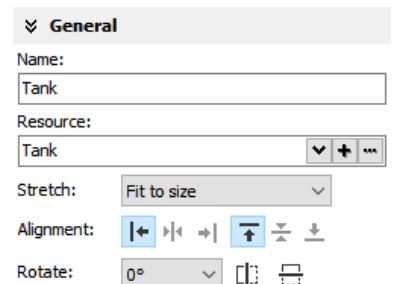
Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign appeareance: [\(see basic funtions\)](#)

Parameterize the object: (register "General")

- use an existing **resource** or create a new one directly here
- in the „Stretch“-box choose „Fit to size“ to see your image in the objects rectangle you did draw
- assign horizontal/vertical **orientation** if object is not stretched
- **rotate** and **mirror** object as you want to



Visualization with the software „VisuStage“

Dynamic objects

Date/Time fields

Date/Time fields are used to **display** (and, when „Editable“ is checked) to **edit** time and date by an automatic displayed virtual keyboard to type in the values.

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign margins: [\(see basic funtions\)](#)

Assign border: [\(see basic funtions\)](#)

Assign font: [\(see basic funtions\)](#)

Assign access rights: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- Assign the **format of Date/Time field**:
 - Time format
 - Date format
- Assign horizontal and vertical alignment
- By checking „**Editable**“ the object’s value is changeable by the operator on the touch panel



Hint:

- If a DateTime field is too narrow, then characters, what can not be displayed completely will not be displayed at all
- At **TOD** (TimeOfDay) the time will be displayed in hh:mm:ss format.
Use TOD for longer times.
- At **TIME**, **S5TIME** and **TIMER** time is displayed in ms Milliseconds).
- At **DATE** the date will be displayed in days (since 01.01.1990).



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

I/O fields

I/O fields are used to **display** (and, when „Editable“ is checked) to **edit** values with an automatic displayed virtual keyboard to type in the values.

Place an object: (see basic funtions)

Assign visibility: (see basic funtions)

Assign margins: (see basic funtions)

Assign border: (see basic funtions)

Assign font: (see basic funtions)

Assign access rights: (see basic funtions)

Assign appearance: (see basic funtions)

Parameterize the object: (register “General”)

- Assign the vertical and horizontal **alignment**
- Assign a (or create a new one) **variable** to be displayed in this field
- Assign the **format of I/O-field**
 - leading zero, „+“-sign, digits, decimal point
 - display format (if comma-key shall be used in keyboard dialog)
 - or use the format of the assigned variable (shown here)
- By checking „**Editable**“ the object’s value is changeable by the operator on the touch panel
- **Limit** the max/min values
(always depending on the variables type)

Notification of modification

Assign a bit to get informed, when the operator changes the value of the I/O-field at runtime.

General

Name:

Variable: ...

Alignment:
 ☒ Left
 ☒ Center
 ☐ Right
 ☐ Justified
 ☒ Fixed width
 ☐ Automatic

Display format:

Format of Variable type ▾


Digits: ▴ ▾

Decimal point: ▴ ▾

☐ Show plus sign on positive value
☐ Leading zero
☒ Editable
☒ Limit the edited value


Maximum limit:

Const ▾

Const Constant value
 Value from variable

Minimum limit:

Const ▾

Const Constant value
 Value from variable

Notification of edited value by operator:

☒ Message bit I/O (M0.0, BOOL) ▾ + ... ►

>> Position and Size



Hint:

- At **STRNG** notice the S7-definitions (length-values in the first 2 bytes)!
At INSEVIS the maximal length of the STRNG is 60 bytes
BUT the referring DB MUST BE at least 60+2 bytes large!
- **Scaling:** by S7-program with the Siemens-FC105 SCALE
(Result: REAL-value, what is not allowed in VisuStage to color the appearance of this fields),
- If this coloring/ appearance is needed, than us S7-commands Rounding (RND) or Cutting (TRUNC)
to reach a valid value for this function
- If a DateTime field is to narrow, than characters, what can not be displayed completely will not displayed at all



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

PIN input fields

In the user administration can be assigned up to 9 levels with an up to 8-digit PIN- number to administrate the access rights.

A login-keyboard appears automatically after touching the PIN input field by the operator.

„**INPUT**“ is to enter your PIN to get into your access rights.

„**CHANGE**“ means, that PIN can be changed by authorized personally. After changing the new PIN is valid.

There are 3 ways to call this dialog:

1.) PIN-INPUT / CHANGE field (object)

The benefit of this way is, that the target screens, whereto it will be changed after successfully login/ logout are defined in the resource „User“

And here can be assigned a special screen change too.

2) Invoke PIN-INPUT / CHANGE dialog (function)

The benefit of this way is, that the login dialog can be assigned to any button or touch field as well. (See first 2 functions right)

The disadvantage is, that the screen is not automatically changeable with this function.

2) Change screen with PIN-input (function)

This is the right way to assign a different screen to change for every single user level.

(See 3rd function right)

With assigning this function you need to design the target screens for every user level.

General

Name:

Mode: ☒ PIN input
☐ PIN change

☒ Change screen by valid PIN input

Function

- Stop the trend
- Clear the alarm buffer
- Clear the event buffer
- Soft-Key
- Invoke PIN-Input dialog
- Invoke PIN-Change dialog
- Log-Out the user
- Backlight Off
- Activate Clean screen
- Change system setting
- Change screen with PIN input
- Delete the alarm archive
- Delete the event archive
- Delete the trend archive

Function: Change screen with PIN input

Assign screen to user level
Select your user level and assign the desired screen

PIN input
☒ Change to the screen which is assigned to current user level (without asking PIN)
☐ Always ask for PIN input

Level	Name	Screen
1	Operator	Anzeigen_1
2	Master	Anzeigen_2
3	Chief	Rezepturen
4	Service	Meldungen
5	Superuser	System
6		
7		
8		
9		

✓ Ok X Cancel



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

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Visualization with the software „VisuStage“

Assign a function (register “Function”)

It is possible to assign multiple functions to one action (press or release).

- Decide, WHEN the function will be proceeded:
 - at PUSHING or
 - at RELEASING the button
- After choosing a function (by double click) opens up another window to enter the required data for the selected function (like shown in sample below at “start Trend” function:)

Function: Start the trend

Start the trend
Select your desired trend from the list or add a new
Enter the settings of trend

Trend:

Sampling mode
☐ Sample once
☒ Sample cyclical

Archive the samples ☒

Number of samples:

Interval in seconds
☒ Const
☐ From variable (not assigned)

Ok Cancel

- There can be assigned multiple functions to one object as well
- There can be assigned functions for pushing and releasing the button as well

Function

- At pushing the button
 - <Add function>
 - Assign value to variable
 - Increment variable value
 - Decrement variable value
 - Set a bit
 - Reset a bit
 - Invert a bit
- At releasing the button
 - <Add function>
 - Change screen
 - Select language
 - Assign value to variable
 - Increment variable value
 - Decrement variable value
 - Increment brightness
 - Decrement brightness
 - Set a bit
 - Reset a bit
 - Invert a bit
 - Start the trend
 - Continue the trend
 - Stop the trend
 - Clear the alarm buffer
 - Clear the event buffer
 - Soft-Key
 - Invoke PIN-Input dialog
 - Invoke PIN-Change dialog
 - Log-Out the user
 - Backlight Off
 - Activate Clean screen
 - Change system setting
 - Change screen with PIN input
 - Change screen via variable value
 - Delete the alarm archive
 - Delete the event archive
 - Delete the trend archive
 - Recipe viewer function
 - Trend viewer function
 - Filter trend channel

Use of Soft-Key function

- It is used to create own navigation buttons for viewer object and works in the same screen as the viewer object is.
- If there are more than one object with soft-key opportunities you have to select it first in the upper line.

Function: Soft-Key

Soft-Key
Select the target object from the list
Select the key code from the list

Object:

Key code:

Up arrow
Left arrow
Down arrow
Right arrow
Home
End
Esc
Enter

Visualization with the software „VisuStage“

Dynamic buttons

This buttons were used mostly for a mixture as state area, text- and image lists with a function to execute. (e.g. is in run / switch to stop, etc.). For this kind of button it is not possible to create own ones, because they were calculated at runtime.

- Place an object:** [\(see basic funtions\)](#)
- Assign visibility:** [\(see basic funtions\)](#)
- Assign margins:** [\(see basic funtions\)](#)
- Assign font:** [\(see basic funtions\)](#)
- Assign access rights:** [\(see basic funtions\)](#)
- Assign appeareance:** [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- **Assign a variable**, to control symbol- and text changes
- **Text changes:** (in the sample description / state of the buttons)
choose (or create a new) a **text list**, what shall be shown on the dynamic button
- **Symbol changes:** (in the sample manually/automatic mode sign)
choose (or create a new) an **image list**, what shall be shown on the dynamic button

The screenshot shows the 'General' configuration panel for a dynamic button. It includes fields for 'Name' (Dynamische Taste), a color selection dropdown, checkboxes for 'Flat button' and 'Execute functions too, when leave the button', a 'Variable for lists (Text label / Symbol)' dropdown (Modus (M0.1, BOOL)), 'Text label' and 'Symbol' dropdowns (both set to 'Hand_Auto'), a 'Wrap words' checkbox, and a 'Layout' dropdown (Left of text label). At the bottom, there are two size input fields, both set to 48.



Attention

If there is active another value as these what are assigned in line 1...n, than ALWAYS this appearance will be displayed, what is assigned FIRST (in first line / line 1).

Use of self-made buttons

- Dynamic buttons are to be created in the VisuStage software.
- There is not possible to add additional (own) button designs.

Text buttons

These objects are used like a dynamic button without symbol change, but can be used to proceed very large text lists. For this kind of button it is not possible to create own ones, because they were calculated at runtime.

Touch areas – invisible buttons

These objects will be placed above an other object (mostly an image) to add a special function by pressing it (like an invisible button over a special part of a machine).

- Place an object:** [\(see basic funtions\)](#)
- Assign access right:** [\(see basic funtions\)](#)
- Assign appeareance:** [\(see basic funtions\)](#)
- Assign a function:** (register “Function”)
like at the standard simple buttons.



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

State areas

Place an object: [\(see basic funtions\)](#)
 Assign access rights: [\(see basic funtions\)](#)
 Assign visibility: [\(see basic funtions\)](#)

Parameterize the object: (register "General")

- If you depend the state area on variables
→ use an existing resource or create a new one directly here
- If you use a system setting
→ select one of the system settings of the drop down menu
- In the „Stretch“-box choose
 - „Fit to size“ to see your image in the objects rectangle you did draw
 - „Proportional“ to keep the images proportion (rest of the object stays empty)
- Assign an image resource or create a new one to be shown in ON-state and in OFF-state

Hand_Auto1 (State area)
✕

General

Name:

State of:

Variable:
▼ + ... ▶

☒ Bit index

Value of ON:

Value of OFF:

☐ Changeable

Stretch:

Alignment: ◀ ▶ ⬅ ➡ ⬆ ⬇ ⬆ ⬇

Image of ON:
▼ + ... ▶

Rotate:
⏏

Image of OFF:
▼ + ... ▶

Rotate:
⏏



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- use PNG graphic format with a transparent Alpha-channel to let the background shine through the transparent areas of the image (e.g. on rounded corners).
- Simulation with F9 or „▶“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Radio boxes and Check boxes

Radio boxes are used to visualize an **either-or-selection** (e.g. at alarms coming and leaving)

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign margins: [\(see basic funtions\)](#)

Assign font: [\(see basic funtions\)](#)

Assign access rights: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- Assign (or create a new one) a text („Label“) to describe the check item in the box
- Assign the alignment of the text
- Assign the dimension of the box size to click into
- Assign the group information (to what other radio boxes it should belong)
- Assign a variable value for UNCHECKED and one for CHECKED state

Check boxes can be checked and unchecked individually and **multiple** of it (e.g. to filter trend channel or to change a state area).

Also these boxes are used to assign buzzer system functions.

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign margins: [\(see basic funtions\)](#)

Assign font: [\(see basic funtions\)](#)

Assign access rights: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- Check, if the text shall be left of the check box
- Assign (or create a new one) a text („Label“) to describe the check item in the box
- Assign the alignment of the text to the objects border
- Assign the dimension of the box size to click into
- Assign a variable, where the value is set by activating CHECKED / UNCHECKED (e.g. a bit with 0 / 1)
- Assign (or create a new one) a filter for a trend channel to show or
- Assign the state of a system property like e.g. the internal buzzer



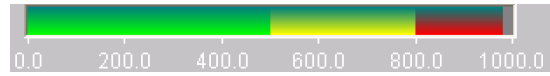
Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- transparent areas of the image (e.g. on rounded corners).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Progress bars

This item is used to display analog values like dimensions, time, etc., where different colors depend on different limits assigned before.
The progress bar right was designed with these settings below:



- Place an object:** [\(see basic functions\)](#)
- Assign visibility:** [\(see basic functions\)](#)
- Assign margins:** [\(see basic functions\)](#)
- Assign font:** [\(see basic functions\)](#)
- Assign access rights:** [\(see basic functions\)](#)

Parameterize the object: (register "General")

- Assign a **variable** (or create a new one)
- Assign the **format** (minimal value, maximal value, decimal point)
At INTEGER values type in the value w/o decimal point (here: 10000 = 1000.0)
- Assign a variable or a fixed value for Maxlimit and for Minlimit of the progress bar.
- If you want to color 3 parts of the progress bar, enable limit areas
 - by a fixed value or
 - By a variable

General

Name: Fortschrittsbalken_hor

Variable: E/A-Feld (MW30, INT)

Decimal point: 1

Max value: Const 10000

Min value: Const 0

☒ Enable limit area

Max limit: Const 7999
 Const Constant value
 Value from variable

Min limit: Const 4999
 Const Constant value
 Value from variable

Color the object: (register „Appearance“)

- Choose a **bar style** (horizontal, vertical, 2D, 3D, color of background and fill color)
- Decide, if the bar is always having ONE actual color ("Solid") or 3 segments with a single color each ("Area")
- If "Area" was selected: Assign direction of the colors in the bar
- Assign colors and of the 3 segments defined by the limits in "General"
- Design the **ruler** (position, color, divisions, capture height)
→ at unfavourable divisions rounding errors are possible!

Appearance

☒ Horizontal bar ☐ Vertical bar

☐ 3D Bar style

Direction: Right

Coloring: ☐ Entire bar ☒ Area

Filling: ☐ Solid ☒ Gradient

Colors:

Border:

Background:

Gradient:

Normal area:

Low area:

High area:

Ruler: Bottom

Divisions: 10

Caption height: 16



Hint:

During first time dropping a progress bar into the screen the progress direction will be assigned referring to height / width as shown below:

- Is height > width = vertical direction
- Is height < width = horizontal direction



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Sliders

This object is a good solution to display a variables value along a straight line or (if editable is activated) to set up a value roughly by hand.

Place an object: [\(see basic funtions\)](#)

- Is height > width = vertical direction
- Is height < width= horizontal direction

Assign visibility: [\(see basic funtions\)](#)

Assign access rights: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- Assign a **Variable** vor the value you want to display/edit
- If “**Changeable**” is activated the slider point is movable and changes the variables value
- It is possible to assign the sliding rail by VisuStage or to import an existing image as **Background image**
- It is possible to assign the sliding point by VisuStage or to import an existing image as **Slider point image**

General

Name:

Variable:

☒ Changeable

Background image:

Rotate:

☒ Show rail Size:

Slider point:

Slider point image:

Parameterize the scale: (register “Ruler”)

- Insert fixed values for the **Minimum / Maximum** of the rulers range
- Activate the display of the **Ruler**
- Select the rulers position referring the slider
- Assign the increments (values between the visible values on the ruler)
- **Position** = The rulers distance between the ruler and the sliding rail.
- **Size** = Width (at vertical) e.g. height (at horizontal) of the ruler
- Activate **Scale sub marks** (between the main marks = rulers increments) (it is better if these sub marks are a devisor of the main mark, e.g. 5 or 10, when the rulers increment is 20)
- Activate **Scale label** (self explaining)

Ruler

Scale value:
Maximum:
Minimum:

☒ Show ruler

Increment:

Position: Size:

☒ Show scale sub mark

Increment:

Size:

☒ Show scale label

16pt

A B I



Hint:

- By the dimension of the objects when putting into the menu by mouse it will be set automatically, if it is a
- vertical (height > width) or an
 - horizontal (height > width) slider.



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

System data (IP-address field, languages, etc.)

While languages, brightness or screen savers are functions what can be assigned to buttons or touch areas, the IP-address-field is an own object.

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign margins: [\(see basic funtions\)](#)

Assign font: [\(see basic funtions\)](#)

Assign access rights: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- Assign a (or create a new one) **variable** to control the system property
- By checking „**Editable**“ the object’s value is changeable by the operator on the touch panel
- Assign the alignment of the box
- Assign access rights

General

Name:

IP Adresse

Variable:

IP-Adresse (MD200, DWORD) ▼ + ...

Alignment:

☒ Editable

Access right

Level:

2 : Master ▼

Variable:

Benutzer (MB11, BYTE) ▼ + ... ▶

Variable value:

☐ Range
 ☒ Bit

number

0 ▼▲

value

1 ▼▲



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „▶“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Gauges

With this object a value can displayed in a gauge form with a pointer like in older meters.

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Parameterize the object: (register "General")

- Assign a variable to display their value
- Activate a background image
(If you do not want do create your gauge by VisuStage)

General

Name: Rundanzeige_Druck

Variable: Druck (MW342, INT)

Background image: (not assigned)

Parameterize the dial: (register "Dial")

When round dial is activated, a circle is created by the smaller value ox X and Y

- When "Show dial" is activated this can be colored
 - Assign the background color of the dial
 - Assign the border color and thickness of the dial
- When "Round dial" is deactivated, you can set:
 - **Radius** of the circle segment (angle below „Scale“)
 - **X-Position** of the pointer rotation points (from the left object border)
 - **Y-Position** of the pointer rotation points (from the upper object border)

Dial

☐ Round dial

Center: X: 108 Y: 105

Radius: 100

☒ Show dial

Color: [Black]

Thick: 0,05

Scale configuration: (register "Scale")

- Insert **Minimum / Maximum** of the scale value to be displayed
- Insert the **Angle** of the circle segment for the scale area
 - Start at **Min**, end at **Max**,
 - **Pointer always runs clockwise**
 - Information angle position: $-270^\circ = „6 \text{ o'clock}“ / -180^\circ = „9 \text{ o'clock}“$
 $-90^\circ = „12 \text{ o'clock}“ / 0^\circ = „3 \text{ o'clock}“ / 90^\circ = „6 \text{ o'clock}“$
 $180^\circ = „9 \text{ o'clock}“ / 270^\circ = „12 \text{ o'clock}“$
- Activate **Scale marks** (marks and sub marks)
 - Increments between main marks
 - Color, thickness, position (~Radius form pointer rotation point), size (~length)
- Activate **Scal sub marks**
 - Increments between sub marks
 - Color, thickness, position (~Radius of the pointer rotation point), size (~length)
- Activate **Scale label**
 - Font, size, color, style (bride/italian)
 - Position (~ assign radius of the pointer rotation point

Scale

Value:

Maximum: 300

Minimum: 0

Angle:

Max: 0 Min: -270

☒ Show scale mark

Increment: 20

Color: [Black] Thick: 3

Position: 0,60 Size: 0,10

☒ Show scale sub mark

Increment: 10

Position: 0,60 Size: 0,05

☒ Show scale label

Arial 10pt

Label position: 0,82

Pointer configuration: (register "Pointer")

- Assign a **color** for the pointer
- Assign the **length** of the pointer (distance between pointer root to top))
- Assign the **width** of the pointer
- Design the shape of the **pointers tip** (0,01~ flat, >0,01 more and more narrow)
- Assign the distance between pointer root to the rotation point (**tail**)
- Color the **circle at the pointers rotation point**
(The rotation circle always does have a 1 pixel-frame outside in the pointers color))
- Adjust the **size (diameter)** of the rotations points circle

Pointer

Color: [Red]

Length: 0,57 Tip: 0,17

Width: 0,16 Tail: 0,00

Rotation point: [Black]

Size: 0,11

Visualization with the software „VisuStage“

Configure the color ring: (register „Range“)

Limits and areas can be colored by a ring inside/outside the scale.



- Activate **Scale range**
 - Assign the **position** (~ radius of this circle segment)
 - Assign the **thickness** of this ring
- **Coloring**
 - The color area do not have an upper limit.
 - The next color are starts at the lower limit of the next color.
 - the last color limit is the maximum limit of the scale

Range

☒ Show scale range

Position: 0,98

Thick: 6

	From	
1	0	
2	100	
3	200	



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Viewers

Image and text lists

Image list

Look at the color change of the pipes in visualization sample, screen “objects” 3. The pipes will be separated into segments. For these segments all colors are available as single images with the requested colors. In the resource „image list” values will be assigned to these single images. In the object image list these values will be controlled by a variable (what itself is controlled by arrow buttons, what increase/decrease its value by „1”. This value is also shown in a I/O-field).

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign appeareance: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- In the „Stretch“-box choose „Fit to size“ to see your image in the objects rectangle you did draw
- Assign horizontal/vertical **orientation** if object is not stretched
- **Rotate** and **mirror** object as you want to assign an **image list** resource (must be existing - created at the image lists item)
- Assign a **variable**, what controls the image lists value

The screenshot shows the 'General' tab of a configuration window. It includes fields for 'Name' (User-Liste), 'Variable' (Benutzer (MB11, BYTE)), and 'Resource' (Benutzer). There are also controls for 'Stretch' (set to 'Fit to size'), 'Alignment' (with icons for left, center, right, top, bottom, and fill), and 'Rotate' (set to 0°).

Text lists

Look at the text change of the users in visualization sample, screen “users”).with displaying the actual logged-in user. There were assigned 3 user (user 1, .._2, .._3).

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Assign appeareance: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- In the „Stretch“-box choose „Fit to size“ to see your image in the objects rectangle you did draw
- Assign horizontal/vertical **orientation** if object is not stretched
- **Rotate** and **mirror** object as you want to assign an **image list** resource (must be existing - created at the image lists item)
- Assign a **variable**, what controls the image lists value

Color the object: (register „Appearance“):

Additional functions at text lists

- If there is a multiline text list, it is possible to assign **navigation buttons** for scrolling up-/down

The screenshot shows the 'General' tab of a configuration window for a text list. It includes fields for 'Name' (Benutzerliste), 'Variable' (Benutzer (MB11, BYTE)), and 'Resource' (Bediener). There are also controls for 'Alignment' (with icons for left, center, right, top, bottom, and fill), checkboxes for 'Wrap words' and 'Navigation', and a 'Button width' field set to 40.



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Trend viewer and trend archive viewer

This object shows the samples of up to 16 values (= 1 trend) by time in a graphic way.

At CPU-T-devices there are available grid lines for better orientation, a higher scaled X-axis (more time values) and a movable measurement ruler to show archived values at different times.

Per trend there is shown only ONE vertical scale with the referring trend name above. To see the other scales click on the name and the scale and name of the next trend appears, and so on until the first trend comes again.

Place an object: (see basic funtions)

Assign border settings: (see basic funtions)

Parameterize the object: (register "General")

- Assign a **trend resource**
(use existing rersources)
- **Format the text** of the displayed channel name
- Check, if the **channel name** should be displayed
- Activate and color **grid lines**
- Activate and color the **measurement ruler**

Parameterize the object: (register „X/Y-axis“)

- **Activate and color the Y-axis**
- Assign **scale divisions**
(Rounding errors can appear!)
- Activate the rulers caption
- Assign caption height

Activate and color the X(time)-axis

- **Assign time format**
 - Time + Date or
 - Time only or
 - Date only or
 - nothing
- Enter the **number of samples** to be displayed
max. 200 in viewer, max. 65535 (expect longer displaying time)
in archive viewer (values for CPU-T)
- Assign font, size and color of the X-axis

Navigation bar (for trend archive viewer only)

For CPU-V/-P-devices or for CPU-T-devices, when there shall not be an manual generated navigation, zoom bar

- Activate **navigation bar** for scrolling forward or backward
- Assign buttons and dimension it
- Assign background color for the bar
- 4 buttons with scroll functionality
 - 1st: back to first (oldest) sample
 - 2nd: one window back
 - 3rd: one window forward
 - 4th: forward to last (newest) sample

Information for time axis (X-axis) of CPU-V/-P-devices

Because the displayed time will be calculated in run-time, only 2 time stamps will be displayed:

- the time of the first shown sample (very left) and
- the time of the last shown sample (very right)

and nothing between it because it would overwrite each other.

100 samples will be displayed in the trend window. After the graph reaches the right border, the graph is moved 10 samples (10%) to the left (and the displayed times are changing).

Trend-Viewer (Trend viewer)

General

Name:

Trend-Viewer

Trend:

Druck



16pt

☒ Show channel name

☒ Show grid lines

☐ Show measurement ruler

Vertical (Value) axis

Show:

Left



Division: 5

☒ Show ruler caption

Caption height: 14

Horizontal (Time) axis

Show:

Time

Date format:

yy.mm.dd

Time format:

hh:mm

Samples:

175



16pt



Navigation bar

☒ Show

Template:

quad_white_rounded_30x30.png



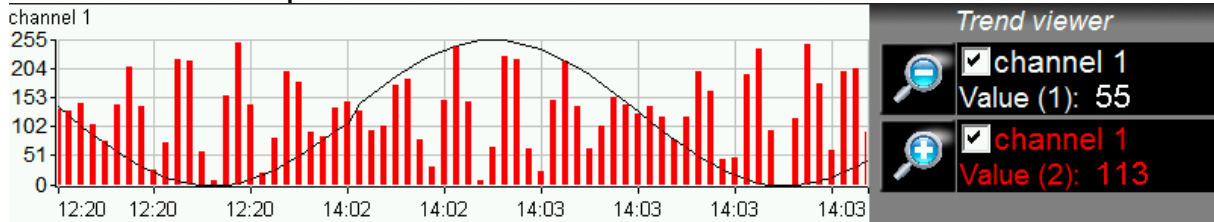
30



20

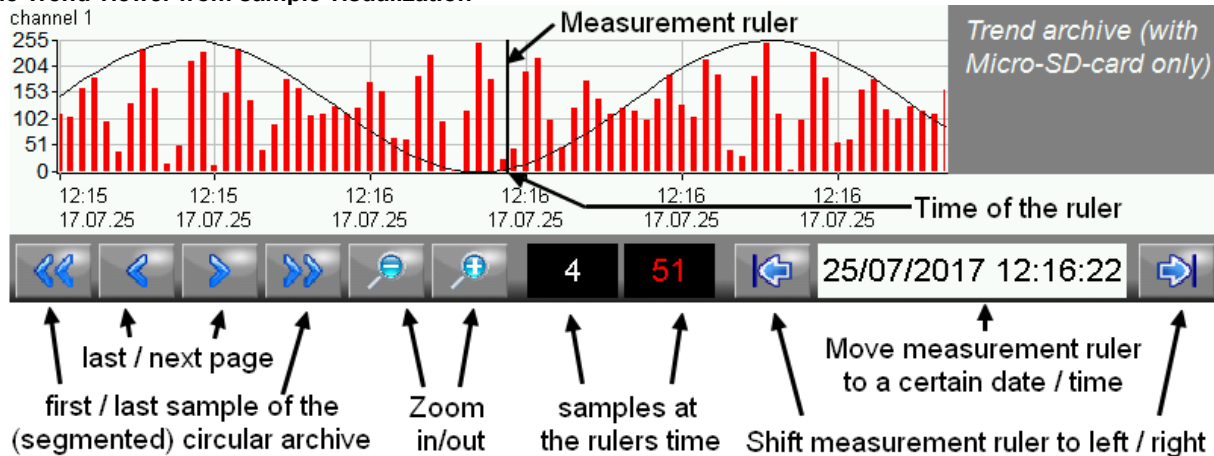
Visualization with the software „VisuStage“

Sample Trend viewer from sample visualization



Activating trend channel:by check box (function: Filter trend channel)
 Display the actual sample value:by I/O-field (variables value)
 Zoom in/out functions:as button function (Trend viewer function, zoom in/out)

Sample Trend viewer from sample visualization



Activating trend channel:by check box (function: filter trend channel)
 Zoom in/out functions:as button function (trend archive viewer function, zoom in/out)

Manually designed navigation

First / last (actual) samplesas button function (trend viewer function, zoom in/out)
 Next sample page / sample page beforeas button function (trend viewer function, zoom in/out)
 Values at the measurement ruler timeas I/O-field (with values from trend archive viewer)
 Move the m-ruler to a certain timeas date/time-field (with source trend archive viewer)
 (The measurement ruler can be moved by touching the touch display in the viewer)



Attention / objects in general:

- trends can be archived only, if there is a micro-SD-card inserted
- for CPU-V/-P-devices:
 - trend viewer max. 100 samples will be displayed. When the samples reach the right border, they were shifted 10% to the left
 - trend archive viewer: max. 800 samples can be displayed
- for the CPU-T-devices
 - trend viewer: max 1000 samples can be displayed. When the last sample reaches the right border, the where shifted to left pixel by pixel.
 - Trend archive viewer: max. 655.350 samples can be archived (=10 circular archives)
- there is shown only ONE vertical scale with the referring trend name above. To see the other scales click on the name and the scale and name of the next trend appears... until the first trend comes again.
- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Message viewing and archiving

There are different objects to display messages:

- blinking symbols (Message indicator)
- blinking text lines (Message indicator - text)
- oldest/youngest message only (Message viewer - line)
- viewer box for all actual messages (Message viewer - multi line)
- viewer for all archived messages (Message archive viewer)

For all standard parameters:

Place an object: [\(see basic funtions\)](#)

Assign frames: [\(see basic funtions\)](#)

Assign margins: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Message indicator symbol and text

This dynamic objects are used to inform the operator about an actual existing message (alarms/events) either with a blinking symbol or a blinking text line.

Indicator at alarms:

Blinking if alarm has come and is not acknowledged
 Display (without blinking) if alarm is acknowledge but still there
 Disappears if alarm is acknowledged and no more there

Indicator at events:

Blinking if event is there
 Disappears if event is no more there

Placing as like at all other objects too, **Parameterization** is self explaining only **Assign** an event type - alarm or message.

General

Name:

Message:

☐ Oldest message first
☐ Wrap words

Message viewer - line

This message line is made to **show only** the most actual message to be implemented as an information line only, with no opportunity to acknowledge or scroll.

Parameterize the object: (register "General")

- Select "events" or "alarms" to display
- Adjust, if oldest or newest message will be displayed
- Activate word wrapping

Formatting the object (register "Message format")

- date
- time
- state
- ID-no. (Group)
- message text

General

Name:

Message:

☐ Oldest message first
☐ Wrap words

Message format

☐ Date ☒ ID number
☒ Time ☒ Text
☒ Status

Color the object (register „Appearance“)

All messages in the message viewers all single messages can be changed in color referring to their stat (Coming, Going, Acknowledged).

Appearance

Message state		A	
1	Coming	<div></div>	<div></div>
2	Going	<div></div>	<div></div>
3	Acknowledged	<div></div>	<div></div>

Visualization with the software „VisuStage“

Message viewer multiline / Message archive viewer

This message viewer is made to show all **active messages**. It contains navigation functions (line **scroll**) and (for alarms) an **acknowledgment** function.

This message viewer is made to show all **archived messages** saved on the Micro-SD-card. It contains navigation functions (line and page scroll). To archive samples activate it by a hook as archivable.

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Formatting the object: (register "Message format" at the single line message viewer)

Color the object: (register „Appearance“ at the single line message viewer)

Parameterize the object: (register "General")

- Select "events" or "alarms" to display
- Adjust, if oldest or newest message will be displayed
- Activate word wrapping

Formatting navigation bar: (register "Navigation bar")

- **Activate** the bar
- **Color** the background
- Design the **placement** of the buttons
- Configure the **size of the icons** in the buttons
- Select a **button template**
- Design the **button size** width by height
- Adjust the **distance** between the buttons

Designing navigation buttons: (register "Navigation buttons")

- Select a **button template**
- Activate to insert a icon (Up/Down/Acknowledge)
- Select one of the icons from the list
- Scroll navigation (up & down):
 - Message viewer: line by line
 - Message archive viewer: line by line & page by page

Color lines and texts by status: (register "Appearance")

- Depending on message status (such as Coming, Going, Acknowledged) different colors are possible for
 - Foreground (Text)
 - Background (field area)

General

Name:

Alarmanzeige_mehrzeilig

Message:

Alarm

32pt

☐ Oldest message first

Navigation bar

☒ Show

Position:

Bottom

Alignment:

Left/Right

Bar color:

Icon size:

32px

Button template:

button_gray.png

36

30

Space:

6

Navigation buttons

Up button:

TRIANGLE_UP_black_Q1.png

Down button:

TRIANGLE_DOWN_black_Q1...

Acknowledge button:

ack.png

Appearance

	Message state		
1	Coming		
2	Going		
3	Acknowledged		



Attention / objects in general:

- Dynamic objects shall **not overlap each other** (Exception: touch area may).
- Simulation with F9 or „►“ creates an error report, click on error and come directly to the failed object.

Visualization with the software „VisuStage“

Recipe viewer

The resource “recipes” will displayed by this object in 3 different windows:

- Recipe viewer window
- Records viewer window (of each recipe)
- Element configuration window

Place an object: [\(see basic funtions\)](#)

Assign border settings: [\(see basic funtions\)](#)

Assign access right: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

Name:

- internal name of the recipe viewer (independent of project language)

Show only one recipe:

- reduces the list to only one (selected) recipe (e.g. if this machine is designed for only one recipe but the project contains more recipes for more machines)

Recipe variable: *(to display the actual used receipt name)*

- Assign it, if the internal number of the recipe shall be stored in a S7-variable, what will be linked with the receipt name
- (resource „View Name“ in a text list and can be displayed as active receipt name)

Record variable: *(to display the actual used receipt name)*

- Assign it, if the internal number of the record shall be stored in a S7-variable to be shown in a I/O-field to display the actual record name
- (At first simulation assign any value to this variable in the SimuStage, than you see the active record after press the button „Save to PLC“)

Enable to edit the recipe:

- Allows manipulation by the operator (changing the element values, storing as a new record, deleting records and so on)

Parameterization of the title bar

(general for recipe lists, record lists, element lists)

- It is recommended to use a title bar and to assign a title to the recipe list.
- The titles of the other lists bellow (record list and element list) will be assigned automatically by the inserted data.
- (Title of the record list in the sample „red shades“, element list in the sample Rose“)
- All other settings are self explaining settings to design the title bar

Parameterization of the navigation bar

(general for recipe lists, record lists, element lists)

- This activation is recommended, when more recipes, records or elements are more than fit into the screen window and scrolling is necessary.
- All settings are self explaining settings to design the scroll bar

General

Name:

Rezepturanzeige

32pt

A

Show only one recipe:

(not assigned)

Recipe variable:

×

Rezepturnummer (MW2000, IN

+

...

Record variable:

×

Datensatzname (DB10.DBB0, S

+

...

☒ Enable to edit the recipe

Show viewer mode

☒ Recipe list (view names of recipes)
☐ Record list (of a selected recipe)
☐ Element list (of a selected record list)

Title bar

☒ Show title bar

Title:

×

Farb_t

+

...

26

32pt

A

Alignment:

Navigation bar

☒ Show vertical scroll bar

36

Button template:

quad_white_rounded_30x30.png

...

36

36

Icon size:

32px

Function: Recipe viewer function

Recipe viewer function

Select the target recipe viewer from the list

Select the function from the list

Viewer:

Rezepturanzeige

Function:

Open the selected recipe record

Close the opened recipe record

Delete the selected record

Copy the selected record

Rename the selected record

Save the record

Download the selected record to PLC

Create a new record by reading data from PLC

Create a new record with default data

Hint:

Instead of a navigation bar you can assign own buttons by using “Recipe Viewer Function” at releasing the button.

Visualization with the software „VisuStage“

Parameterization of the operators control elements

(general for recipe lists, record lists, element lists)

By the register „Navigation buttons“ can be selected all function keys you need.
Their button design can be substituted by a customized button.

Recipe list:

Select: activates a recipe from the recipe list (will be highlighted),
by touching directly too, this list can be hided, when you have
1 receipe only

Record list:

Select: activates a record from the record list (will be highlighted),
by touching directly too

New: creates a new record with existing element structure

Save as: saves the record with a new name in the Micro-SD-card
(an string input field opens automatically)

Delete: deletes an existing record

Copy: copies an existing record

Back: returns to recipe list

Element list:

Edit opens up a virtual keyboard to edit the elements value

Save: overwrites (in the Micro-SD-card)
an existing value with actual element values

To PLC: transfers the stored values and records into the PLC

From PLC: reads variable for element values from the PLC

Back: returns to record list

Assign a width of the recipe viewers window to the displayed elements name to have a
efficient window design.

Different confirmation messages (register “Messages”)

In the 3 different viewing windows (recipe, record- and element-) it is useful to ask the
usere “Do you really want to...” BEFORE he is manipulating something wrong.
These message texts are system messages and can be activated here

At the text resources you will find these text phrases as system texts always on top of the
texts and in the csv-file with the prefix “__SYSTEXT”.

These messages will be displayed BEFORE storing, deleting, data transfer to/from PLC

(These register is shown just for the record-list only, the others work similar to it.)

Navigation buttons

Recipe list:

Select

ack.png

Record list:

Select

New

Save as

Delete

Copy

Back

Element list:

Edit

Save

To PLC

From PLC

Back

Name width [%]: 80

Messages

Record list:

Function: "Save as"

Request confirmation in case of existing recip

(not assigned)

Function: "Delete"

Request confirmation

__SYSTEXT_RECIPVIEW_DELETE_

Show notification on successful delete

(not assigned)

Show notification on delete failure

(not assigned)

Visualization with the software „VisuStage“

Views of recipe lists, record lists, element lists at runtime

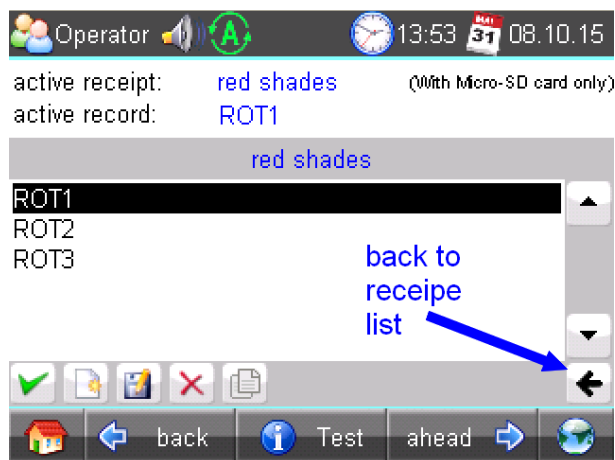
Recipe list

The recipe list contains all recipes, what are pre-assigned in the VisuStage before. It has an clear and an uniform element structure, what was pre-assigned in the software VisuStage before.

The assigned name for all recipes is displayed on the title list.

The choice of the a recipe is done by a touch on the name and a touch on the bottom left symbol to open it. Than the display changes into the next screen with the record list.

To exit the recipe administration, add a common button and assign the function „change screen“ whereto ever you want.



Record list

The record list contains all user-created records of a certain recipe (in this sample of the recipe „red colors“).

The regarding recipe name is displayed on the title list. Select it by touch on the name and press „Edit“ or create a new one. Than it switches directly into the element table to edit values and to store it in an automatically displayed string input field.

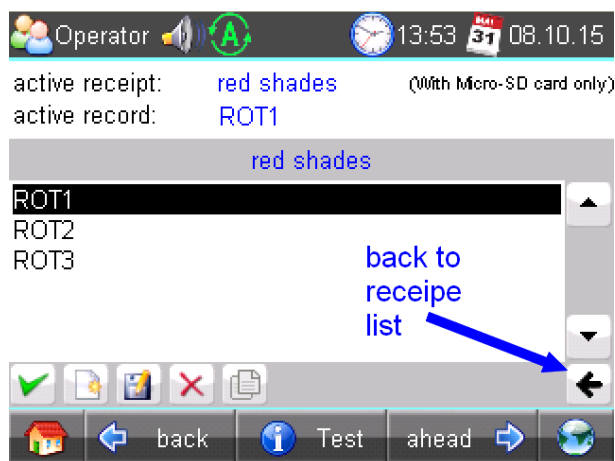
New from VS 2.0.1.5: The actual record will be displayed in the color of the recipes name in the title bar

The function buttons are displayed in the lower left bar:

Edit | New | Save | Delete

With the lower right „←“ this screen changes back to the recipe list.

Note: Because recipe data are kept in the Micro-SD-card there is possible no simulation with these values (your PC has not such a memory extension).



Element list

The element list contains all user-created values of a certain record (in this sample of the record „ROSE_1“)

The regarding record name is displayed on the title list.

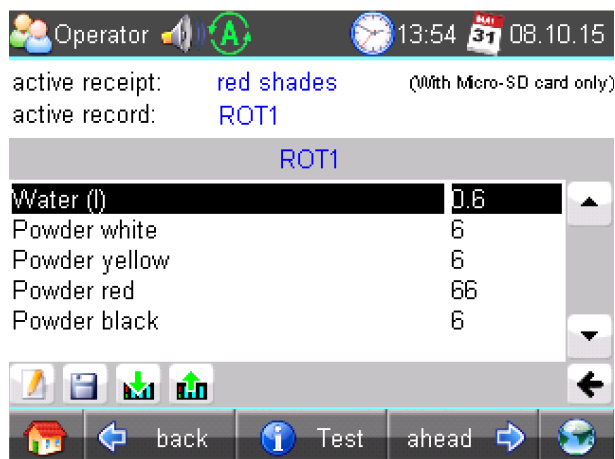
By touching an elements value a numeric keyboard opens up automatically to type in the new value of the selected element.

The function buttons are displayed in the lower left bar:

Edit | Save | Read from PLC | Write to PLC

With the lower right „←“ this screen changes back to the record list.

Note: Because recipe data are kept in the Micro-SD-card there is possible no simulation with these values (your PC has not such a memory extension).



Visualization with the software „VisuStage“

Function graph

This viewer is able to display a number of x;y-values from a data block. There could displayed up to 2000 couples of x;y-values each as one pixel.

Place an object: [\(see basic funtions\)](#)

Assign visibility: [\(see basic funtions\)](#)

Parameterize the object: (register “General”)

- **Assign a data block and offset**

This data block contains the values to be displayed

Adapt the navigation bar: (register “Navigation bar”)

- **Activate** the bar
- **Color** the background
- Design the **placement/alignment** of the buttons
- Configure the **size of the icons** in the buttons
- Select a **button template**
- Design the **button size** width by height
- Adjust the **distance** between the buttons

Designing navigation buttons: (register “Navigation buttons” / see right)

- Select a **button template**
- Activate to insert a icon into your buttom
- Select one of the icons from the list

Parameterize the object: (register „X/Y-axis“ / see below)

Horizontal (X) axis

☒ Show axis

☒ Show label

A

Range

Begin:

-100

End:

100

Decimal point:

1

Vertical (Y) axis

☒ Show axis

Left

☒ Show label

A

Range

Begin:

-1000

End:

1000

Decimal point:

1

Help line

☒ Show help line

At:

500

Activate and color X-axis

Activate and color the label of the X-axis

Assign scale values

- Start value
- End value
- Decimal point

Activate and color Y-axis

Activate and color the label of the Y-axis

Assign scale values

- Start value
- End value
- Decimal point

Activate and assign help line

- Y-Value
- Color (one help line possible for an Y-value)

General

Name:

Funktionskurve

Data block:

15

Offset:

150

Navigation bar

☒ Show

Position:

Bottom

Alignment:

Distributed

Bar color:

Icon size:

32px

Button template:

button_gray.png

Space:

20

Size:

48

Navigation buttons

☒ To beginning

quad_white_rounded_30

☒ Backward

quad_white_rounded_30

☒ Forward

quad_white_rounded_30

☒ To end

quad_white_rounded_30

☒ Zoom in

quad_white_rounded_30

☒ Zoom out

quad_white_rounded_30

☒ Update

quad_white_rounded_30

Visualization with the software „VisuStage“

The data block with the x;y-values to display must be divided into two parts:

- Header Information about trend coordinate structure.
- Data Array of [X,Y] pairs. Data type must be defined in Header

Header structure

Offset	Name	Data type	Value	Notes
0	DataID	DWORD	DW#16#46475250	Constant value
4	HeadID	INT	1	Constant value
6	Points	INT		Number of [X,Y] pairs [0 .. 2000]
8	RefreshCount	INT		Refresh request counter. S7-User program should increment the value, in order to request refreshment in VisuStage.
10	DataTypeX	BYTE		Data type of X coordinate value 2 = BYTE 3 = CHAR 4 = WORD 5 = INT 6 = DWORD 7 = DINT 8 = REAL
11	DataTypeY	BYTE		Data type of Y coordinate value (see DataTypeX notes)
12	Color	WORD		RGB color value, format 565 Bit0..Bit4 Blue component Bit5..Bit10: Green component Bit11..Bit15: Read component

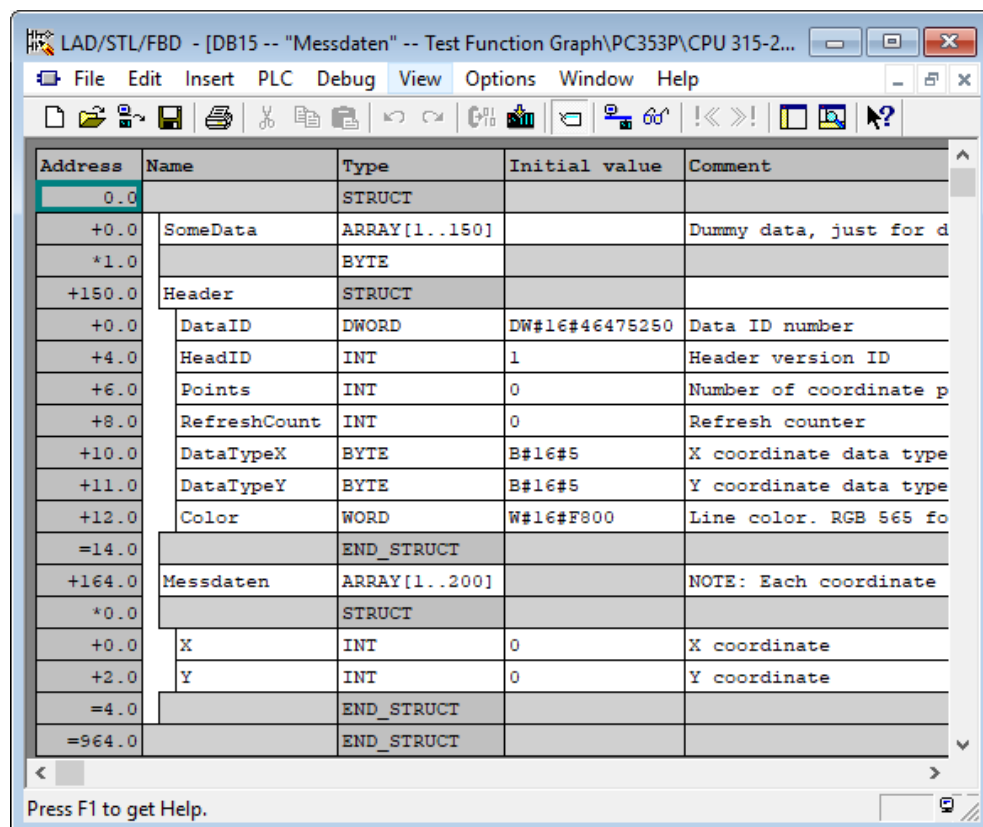
Data structure

Array of [X,Y] pairs (structure).
It's structure completely depending on user demands and must be correctly defined in Header structure.

For example:

The following data block contains trend coordinates with following property

- each coordinate value (16 bit integer, value range - 32768 .. 32767)
- 200 coordinate pairs (sample, max. 2000)
- Line color is blue



Visualization with the software „VisuStage“

Working with library elements

Library elements were used to have available pre assigned elements for different projects. This is very useful as base for multiple visualizations and show a corporate design e.g. at navigation bars, state bars and login pages. For all, who want to copy (quick'n dirty) only, find more about copying more in [basic funtions](#).

Creating libraries and ~ elements

Single or multiple (grouped or ungrouped) objects can be added to a library, consisting of at least one element.

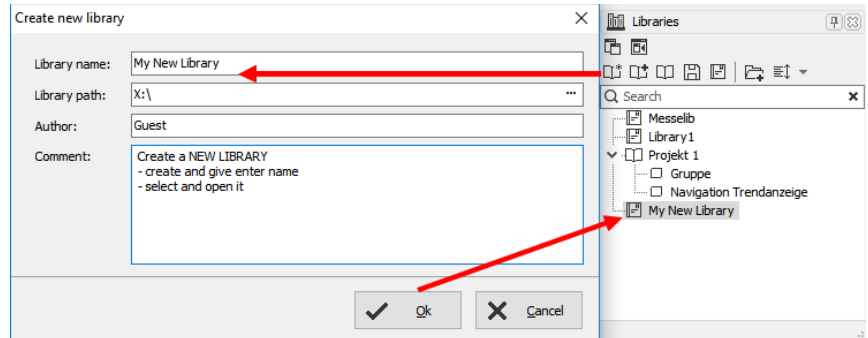
If a library element consists of multiple objects, it is better to group these objects before. So the positions between these objects are fixed.

To create a new library

- 1. select the "new library" button
- 2. assign name, path and comments
- 3. select the new created library and
- 4. open this new library

To add new library elements

- 1. open your library
- 2. move objects or groups directly on the library sign



Using library elements

The Library function is self explaining:

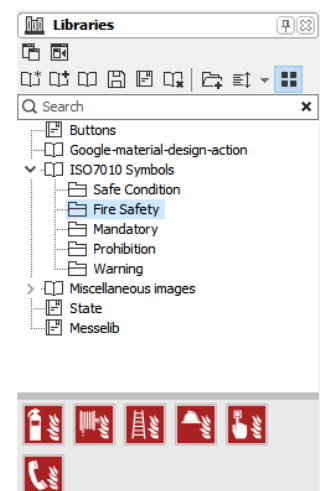
- either **CREATE** a new one,
- or **ADD** another library from any PC-directory (*.vsl) into this library list
- or **OPEN** a library from this list
- Group some objects and name the group.
Copy this group by drag'n drop into your open library
or
- Click at a group in your open library and copy it by drag'n drop into your screen.

Variables, texts and images will be taken over 1:1 from the library element into the new screen/project. All other resources must be assigned new.

Library elements will be integrated in the visualization project (*.vsproj).

To send your libraries to others, always zip and send complete libraries (folders on the VisuStage-PC) including your library elements (*.vsl) .

The library offers images, button shapes and state areas in a SVG-format, who will be stored at the image-resource of the project. To get a preview right in the library window, select the icon as shown in the figure to the right.



Hints:

The library objects in SVG-format allow a very simple color-change (at the rider „Appearance“), much easier then with image lists, what will simplify your visualization project by far.

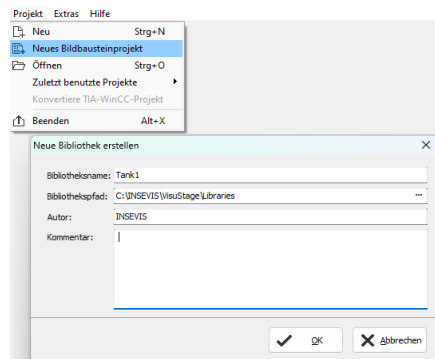
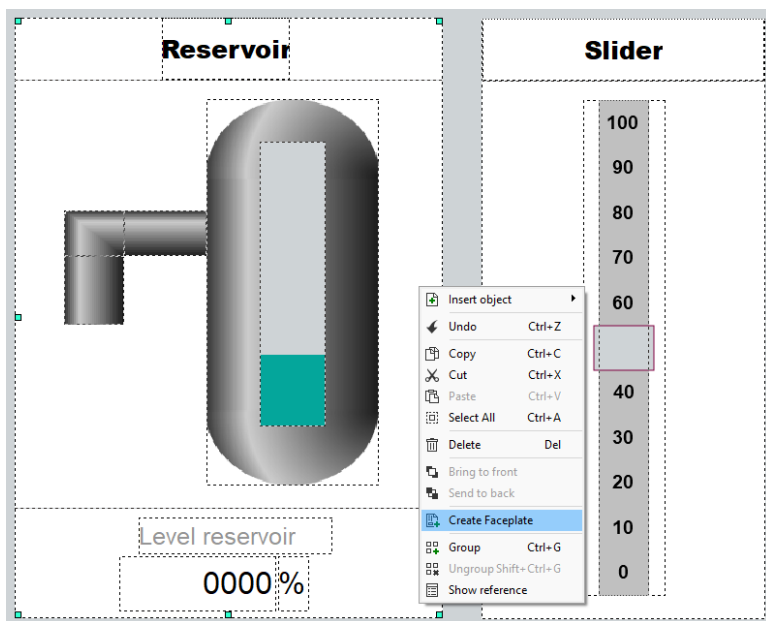
Also when scaling the size of the objects the quality loss is less than at bmp-, jpg- oder png-files.

Visualization with the software „VisuStage“

Working with image blocks

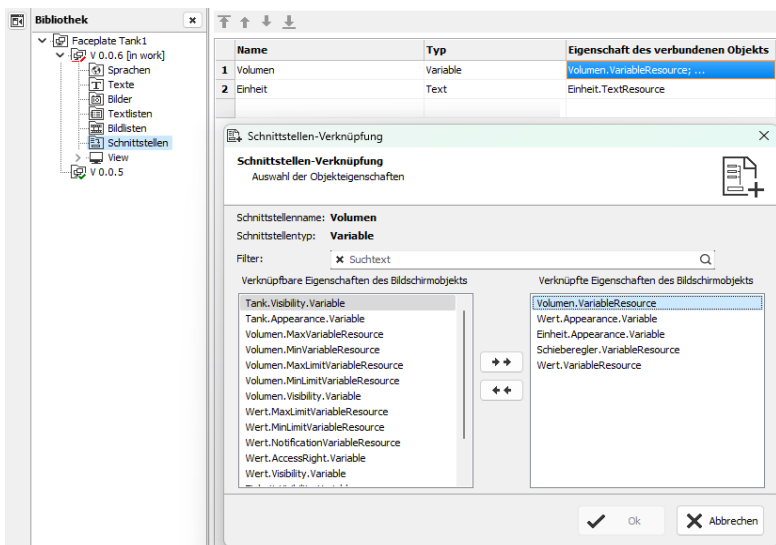
As of version 2.2.0.0, image blocks can be created.

For this purpose, a new image block project is started in an empty VisuStage or an existing image block (attention: file format *.vsl) is opened in a library and a new release is created with the right mouse button (display as [in work]).



Another possibility to create image modules, which is especially useful for existing projects, is to select the desired objects in an existing view and then create an image module by right-clicking. This can then be stored under the desired name at the desired location. Afterwards, the image module that has just been created appears in the library.

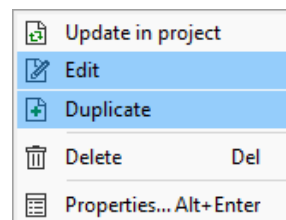
In the "View" resource, the image module is created with the familiar VisuStage objects (not all of them are useful for use in an image module and are therefore grayed out). The configuration takes place in the usual property windows as with the previous VisuStage also. However, no variables can be assigned (this is done in the resource Interfaces).



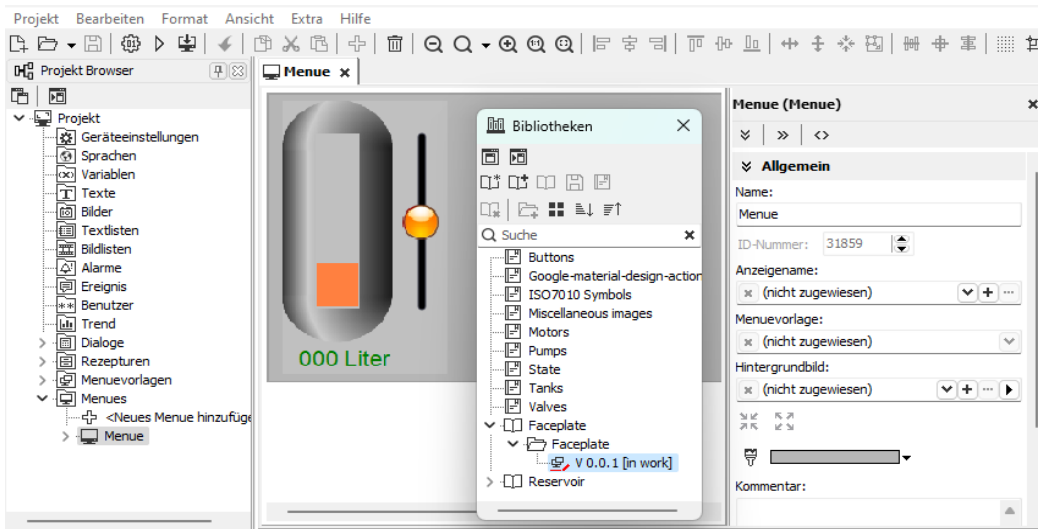
In the "Interfaces" resource, after adding an interface with the right mouse button, selected properties of the used individual image block objects are assigned as a property for the entire image block.

This is done in the "Property of connected object" column. These can be selected variables, texts or other properties. The image module is then integrated in the VisuStage project via these properties, which are now linked to the image module.

The image module can now also be opened, edited and duplicated directly from the library. This is done by right-clicking on the object, then selecting the desired option. (Changes made in one picture component affect all used picture components of this type. If picture components are to be excluded from this, a duplicate of the picture component must be created).



Visualization with the software „VisuStage“

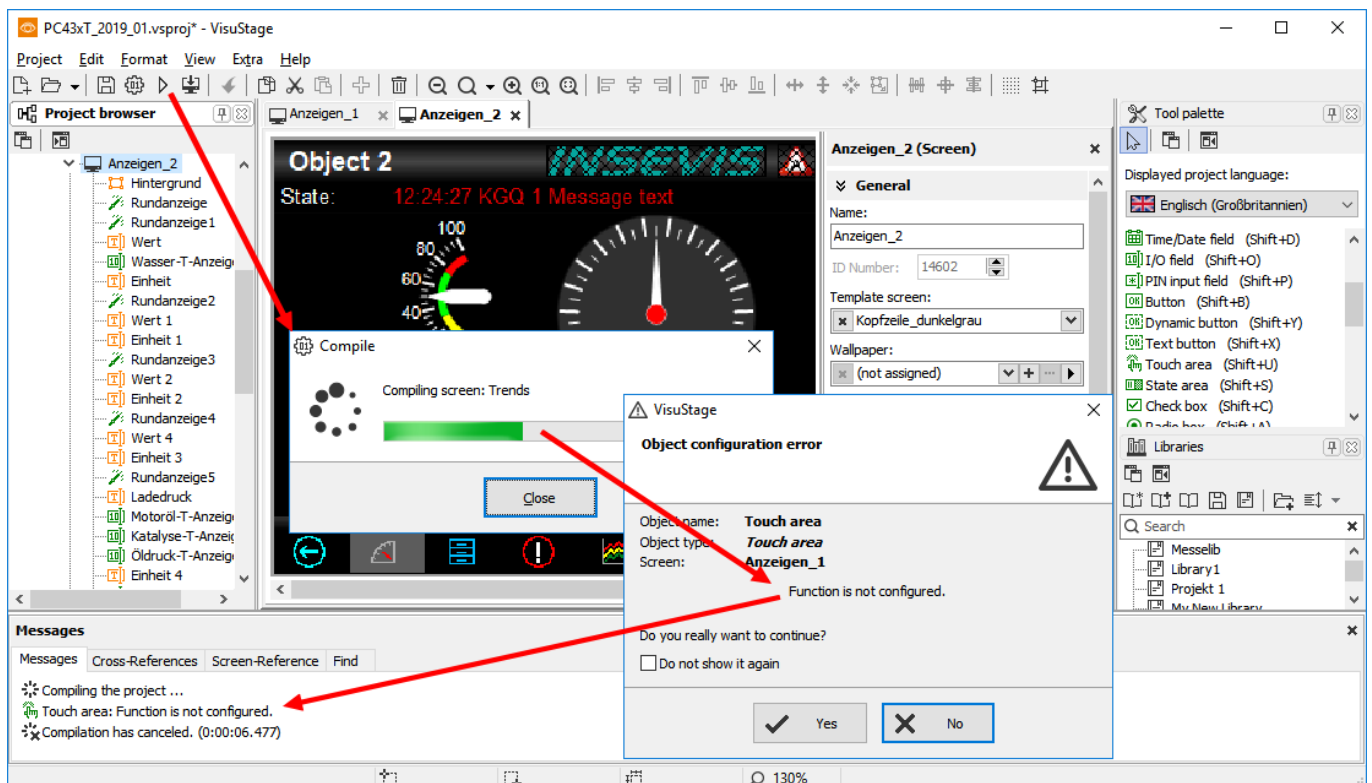


After creating the image module, this release is released (right mouse button) and the image module is saved (do not forget, otherwise the module remains locked in the [in work] state). Before release and saving, the function block is subjected to an automatic plausibility check. If errors occur, they are displayed and the module is not saved. Only after these errors have been corrected is the function module released and can be used. Now the project

can be closed in VisuStage. The next time a VisuStage project is opened, the image module appears with its releases in the library at the bottom and the released versions can be dragged into a menu after opening the library. There, the linked properties of the image module must then be assigned to the resources of the visualisation project.

Simulation and download

Error treatment



- After finishing the visualization start the simulation by F9 or „►“
- If there are errors, the compiler stops and creates a error message (object and error type).
- Double click this message and you will see the failed object.
- Correct the error and restart the simulation by „F9“ or „►“

If all errors are cleared, the compiler creates a *.bin-file and the simulation tool „SimuStage“ starts automatically.

Visualization with the software „VisuStage“

Simulation and download

There are 2 ways to simulate your visualization:

Manual simulation

Starts the integrated simulation tool SimuStage in a new window.

The operation by the user is by mouse pointer simulated like at the real touch panel.

Automatical simulation

Starts the SimuStage together with the Siemens-software S7-PLCSIM (what must be installed at the same PC).

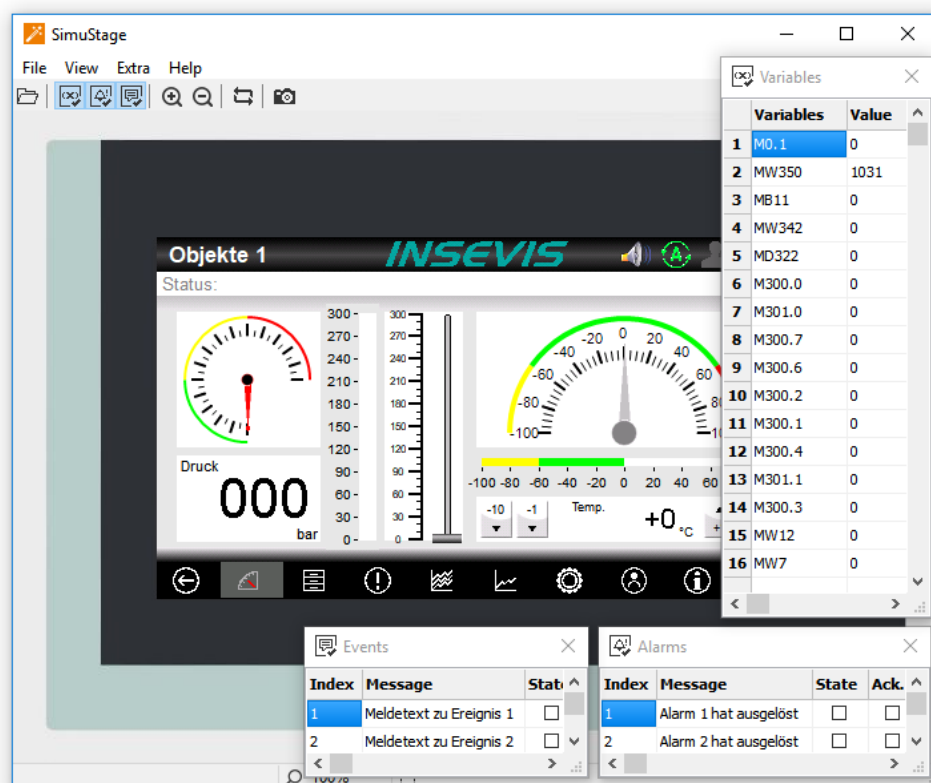
The process data come from S7-PLCSIM (not from PLCSIM Advanced – this is for 1200/1500CPUs). Of course, S7-PLCSIM does not simulate INSEVIS-SFCs/SFBs.

Manual simulation

By manipulating variable values in the variable table you can cause changes manually.

Events can be simulated (Coming - Leaving - Acknowledge) by checking/unchecking boxes in the SimuStage.

It is also possible to generate screen shots of the simulated screen for creating any kind of documentation.



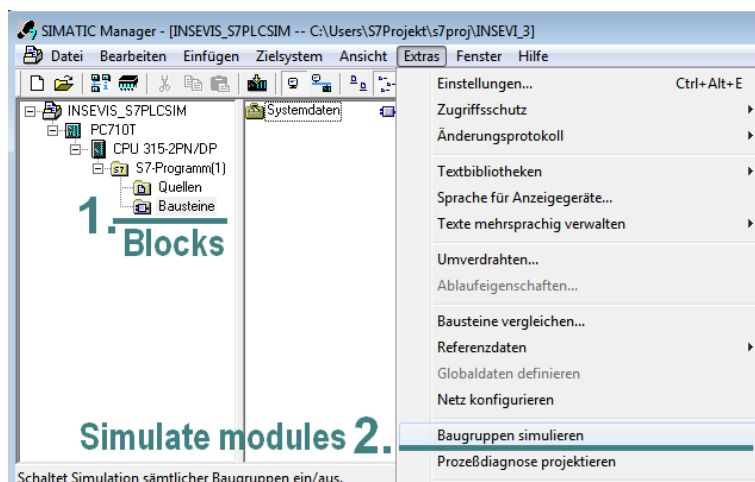
Automatical simulation

Start in the VisuStage by "Project" → "Simulate with S7-PLCSIM"

The (already installed) S7-PLCSIM must be opened from the S7-programming tool.

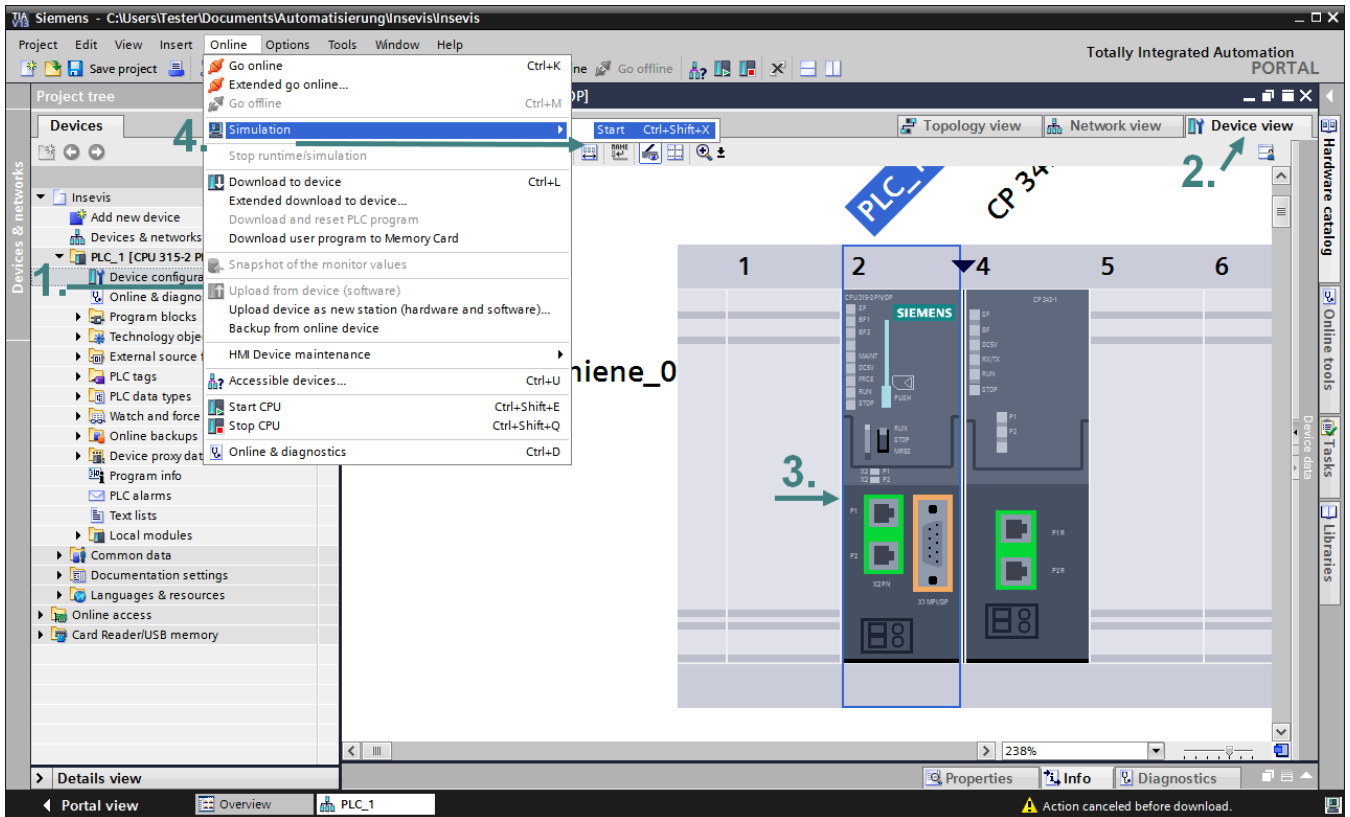
Here you find the call from Simatic®-Manager

1. select "Blocks"
2. click on "Simulate modules"



Visualization with the software „VisuStage“

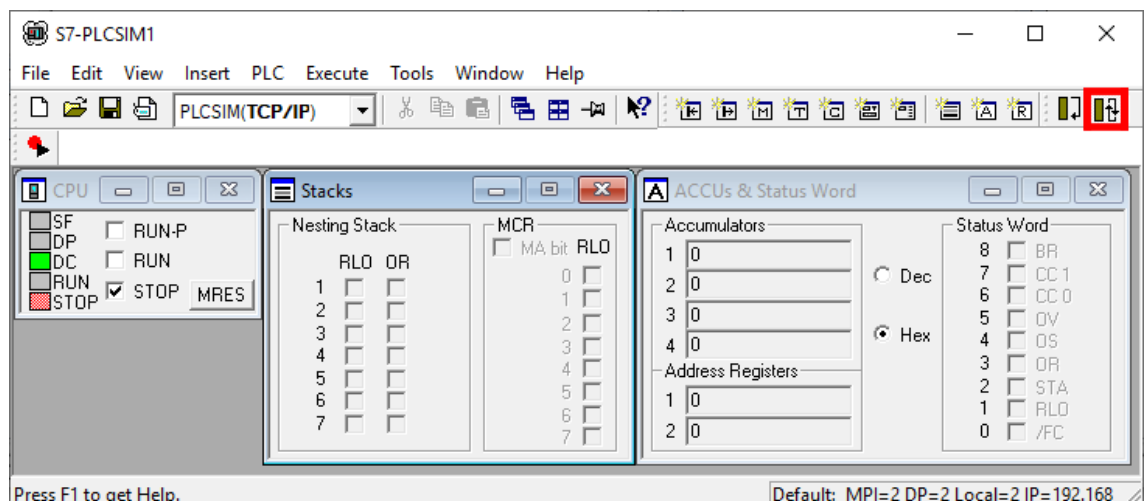
Here you find the call from Simatic®-Manager



1. Goto "Device configuration"
2. Select "Device view"
3. Select the CPU
4. select "Simulation" and "Start"

If the S7-PLCSIM was called, the S7 program is simulated **ONCE** only.

For a **CYCLIC** simulation use the right button (green frame)



Visualization with the software „VisuStage“

Download

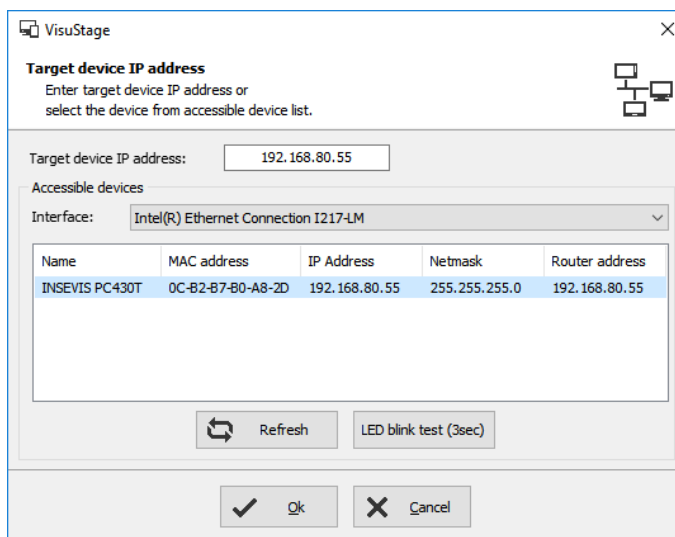
Transfer the visualization binary file to the target device

To transfer the project (start by key F12 or icon) use

- the IP-target-address from the project data or
- the IP-addresses in the network area you are connected to by using the magnifier icon (identification in networks with switches only, not with routers, because they filter the Ethernet-Layer 2, what is necessary for identification)

Alternatively download the compiled project as vsbin-file

- via ServiceStage or
- by a Micro-SD-card (with hard reset and clear all)



Attention

If some devices with **the same IP-address** should be connected, this will be stopped from Windows-OS. To switch off this function, please insert in the **cmd** this command: **arp -d** (this deletes in your PC the old MAC-address from the foregoing device, what was stored in your PC).

Remote access with the software „RemoteStage“

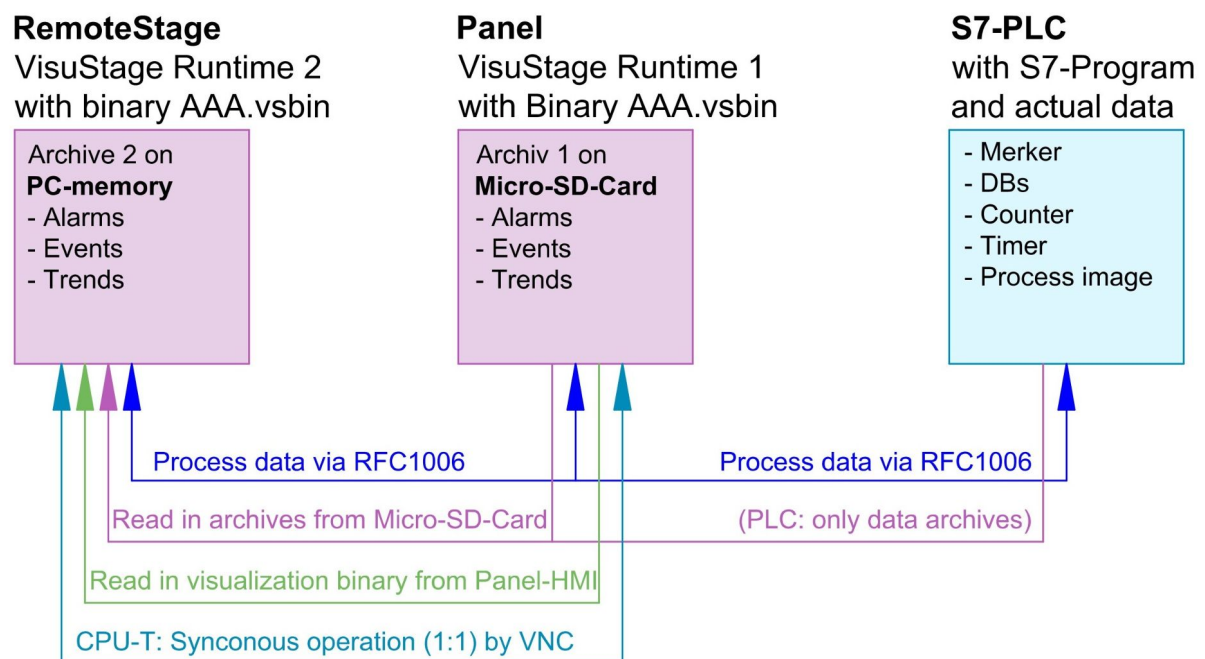
General

The RemoteStage is a multiple instanciable command line software tool, what is not to install. It can be kept in a folder on the remote-PC or on a mobile data carrier as **remotestage.exe** (and if you use German program language with the file **remotestage.deu** as well). As command line tool it can proceed diverse functions in a batch file.

The software RemoteStage uses the binary files (binaries / *.vsbin) of visualization projects, made with „VisuStage“. These binaries are not backreadable, what offers an effective protection of the users know-how and allows to forward these files towards the final user or operator. It is possible to download the visualization binary directly by Ethernet from the Panel-PLC / Panel-HMI to reduce the organization efforts. A PIN-code protects the visualization against unauthorized uploads.

The RemoteStage works **like an additional Panel-HMI** on the remote-PC, what gets the process (actual) data by a TCP/IP-connection straight from the PLC. System data like time and buzzer are related to even this PC of course. This allows a free remote visualization and account to external S7-PLCs by S7-Ethernet (Put/Get).

In a 2nd program instance (Archive mode) the RemoteStage reads in (direct form Micro-SD-card or by Ethernet) from the Micro-SD-card, displays the values, converts into csv-format and saves it to the remote PC.



If the RemoteStage should be installed as an batch call on the end user's PC this is all you need to write:

```
[path of RemoteStage]\remotestage.exe /r=[IP-address of the remote-PLC in the same sub net]
/V=[path of visualization binary]\complete file name]
/start
```

Selection of the remote-device

With opening of the visualization binary („visualization“.vsbin) the IP-address of the remote PLC will be required (Fig.). (By using the function „accessible devices“ - loupe- you can select one of these directly or type in the IP-address manually.)

This address will be linked with this binary.
So it is not necessary to re-type it again.

The screenshot shows a dialog box titled "Remote address" with the following fields and options:

- A text input field labeled "Please enter the remote PLC address" with a search icon.
- A section for "Remote TCP port" containing:
 - A checkbox labeled "Use different TCP port number as default" (which is unchecked).
 - A "TCP port number:" field with a value of "102" and a spin button.
 - A note: "Note: Default TCP port number is 102."
- At the bottom, there are three buttons: a checkmark icon, "Ok", and "Cancel".

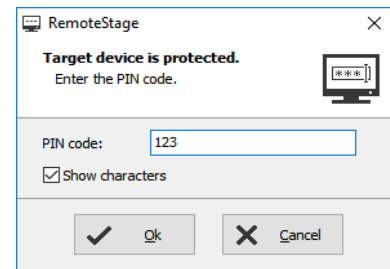
Remote access with the software „RemoteStage“

Insert PIN code

In the VisuStage-project it is possible to allow an upload of the compiled binary to the remote PC. This upload can be protected by a PIN code, what is to be inserted in a new window (right)

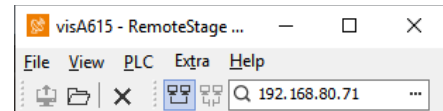
This PIN must be inserted at every new upload (also when you use this upload for backup function in ServiceStage). At INSEVIS sample projects this PIN is 123.

After successful upload a black window appears, what changes to the first menu in the VisuStage project after clicking the “connect” button. (Not 1:1 of the original panel, this will be done by VNC)



Using and setting up the remote screen

The PopUp-menus are self explaining. It starts with a black screen and displays the remote visualization after pressing “connect” key. The actual remote state is shown on the bottom of the screen. The switching between online/offline can be done by the green button beside the IP-address line or by the menu „PLC“.



Hint: Referring the system data (like buzzer, archives and time) always the PC-system data will be used, not these of the remote device.

Hints: Following properties / functions / setting **will not be supported** by RemoteStage (viewing mode)

- "display backlight control" and "Screen- and language control" - from "Screens - Settings"
- "Synchronize the HMI time with partner time" – from resource „PLC-device settings“
- "Enable to change partner time in runtime" – from resource „PLC-device settings“
- "Change system time" by Screen-object "Time/Date field"
- Button-functions: „increment / decrement brightness“, „backlight off“, „activate clean screen“
- VNC Server

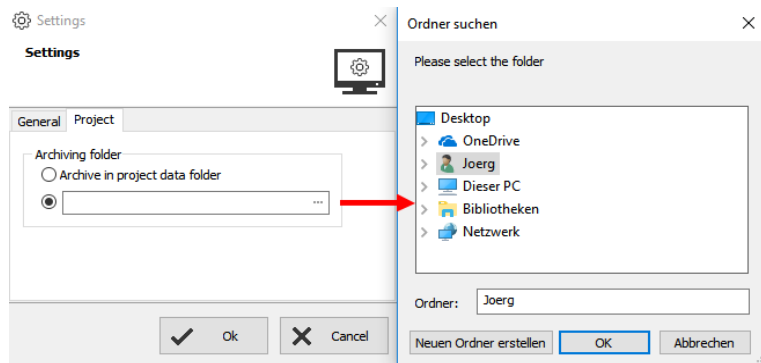
Storing the remote (on the PC) archived data

The archive data, logged during the remote session on the PC, will be stored on the working place in the remote-PC **only**. (not depending from the archive in the PLC in the Micro-SD-card during the same time).

Note: there are 2 archives of each item. If you want to archive a remote-trend, you need to start this trend in the remote visualization.

At the menu „Settings“ will be set up, if these date will be stored

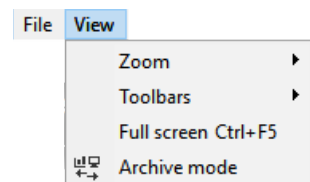
- in the project folder (where the visu binary is kept) or
- at another path.



Hint: If you upload the visualization binary from the remote device (this function will be activated in the VisuStage-project), this file will be kept in the local TEMP-directory of your PC as long you are remote online. There will be stored the archive files as binary too as long the remote session is active. To save and convert these archives into CSV-format please go to archive mode and select “File Open” and select the TEMP-directory.

Most of the archive data are kept on the Micro-SD-card as binaries and can be converted to csv-format by RemoteStage “Archive mode” (a 2nd instance of RemoteStage) only.

Open this 2nd instance in the “View”.menu (see right).



ATTENTION:

Use only the binary file what fits to the archives (where these archives were projected)

Remote access with the software „RemoteStage“

Uploading, converting and storing archive data as csv-files

These data can be archived by these products on the Micro-SD-card:

Messages (alarms, events)	by all Panel-PLCs and Panel-HMIs → by activating the archive funtion „archiving“ in the VisuStage-project
Trends (with all channels)	by all Panel-PLCs and Panel-HMIs → by activating the archive funtion „archiving“ in the VisuStage-project
Recipes (with all records and elements)	by all Panel-PLCs and Panel-HMIs → will always be stored / archived on the Micro-SD-card
Archiv -(data blocks) (as bin or csv)	by all Panel-PLCs and Panel-HMIs → will be configured by SFCs in the S7-program

In the newly appeared PC-window you may find different groups of icons with different functions:



Reads archive by inserting Micro-SD-card in PC slot from left → right:

- Data(DB-)archive*
- Alarm archive*
- Event archive*
- Trend archive*

Read in archives by Ether-net directly into PC from left → right:

- All archives
- Alarm archive
- Event archive
- Recipe archive
- Trend archive
- Data(DB-)archive

Exports archive data to PC into the PC-network from left → right:

- Alarm archive
- Event archive
- Recipe archive
- Trend archive
- Data(DB-)archive

Editing and downloading of modified archives from left → right:

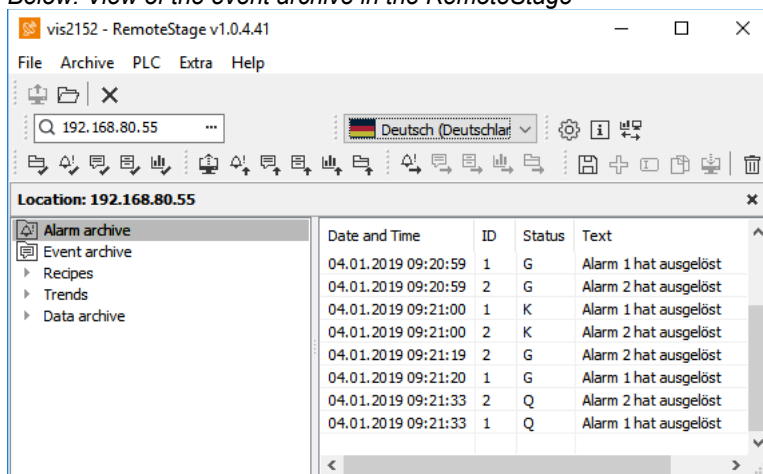
- Save archive
- Add new archive
- Rename archive
- Copy archive
- Download archive

* To open these files insert a nearly valid IP-address and open the binary of the visualization what fits to your project. Than the binaries can be converted into csv-files

Display and export event and alarm archives

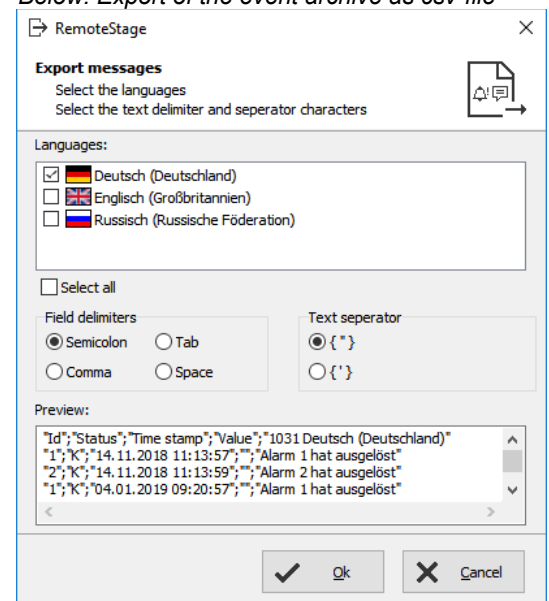
Archive data will be read in from Micro-SD-card, can be displayed and e.g manually saved as csv-file.

Below: View of the event archive in the RemoteStage



(Displays all archived alarm messages of the Panel-PLC with the IP-address 192.168.80.55)

Below: Export of the event archive as csv-file



ATTENTION:

Do not confuse the uploaded (from Micro-SD-card) archive file with the other archive file created during the remote-session in the remote-PC itself. Pay attention to format the csv-file according to your own needs.

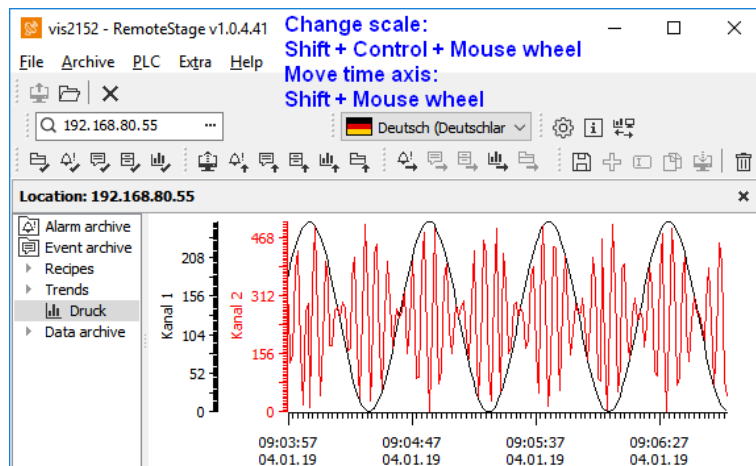
Remote access with the software „RemoteStage“

Display and export trend archives

Archive data will be read in from Micro-SD-card, can be displayed and e.g manually saved as csv-file.

Figure right displays all archived trend with name „Druck“ of the Panel-PLC with the IP-address 192.168.80.55.

The time will be displayed in the language format you assigned on your PC (here in German = DE)



ATTENTION:

Do not confuse the uploaded (from Micro-SD-card) archive file with the other archive file created during the remote-session in the remote-PC itself. Pay attention to format the csv-file according to your own needs.

Remote access with the software „RemoteStage“

Recipe handling

Recipe archive data from Micro-SD-card can be

- read in / uploaded (→ You have to select the whole root-folder “recipes” of the Micro-SD-card !),
- displayed and maybe edited in RemoteStage directly what is self explaining and

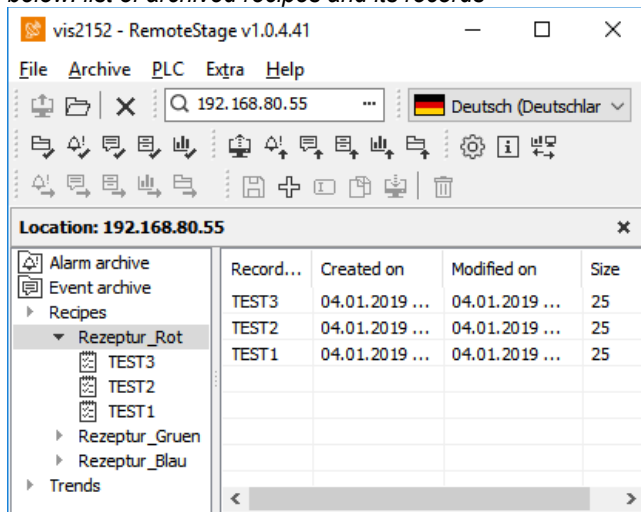
for FURTHER EDITING stored as csv-file at the PC

- converted into csv and stored, edited and written back / downloaded into the remote PLC or

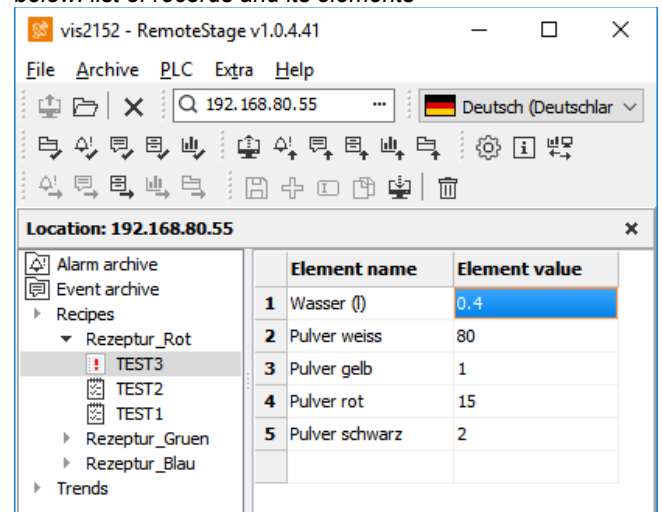
for COPYING THE WHOLE RECIPE SYSTEM saved as binary at the PC

- stores the whole recipe tree uneditable as binary, to be opened again and downloaded to another remote device (You have to select the whole root-folder “recipes” in the PC!)

below: list of archived recipes and its records



below: list of records and its elements



The record „TEST3“ was modified in the RemoteStage and this is shown by an „!“ .
After downloading into the remote device this sign disappears.

The storing of all records (as binary files in an own folder into the network drive for modifying) is done, when “recipes” are marked in the tree view (left).

When recipes are edited in a network drive you can see their path in the address line.
When recipes will be uploaded from the remote device you see its IP-address.

The creating of a record can be done when in the tree view (left) a single recipe is marked.



ATTENTION:

The structure of the recipes **MUST** be kept the same.
Records of a recipe can be added or deleted within this recipe.

Remote access with the software „RemoteStage“

Data (DB) archive upload, display, storing and download

Any data can be archived with the **SFC 207 ARCHIVE** onto the Micro-SD-card (binary or csv-data) and read back with the **SFC 209 READFILE** from the Micro-SD-card in the folder UserData (see system functions).

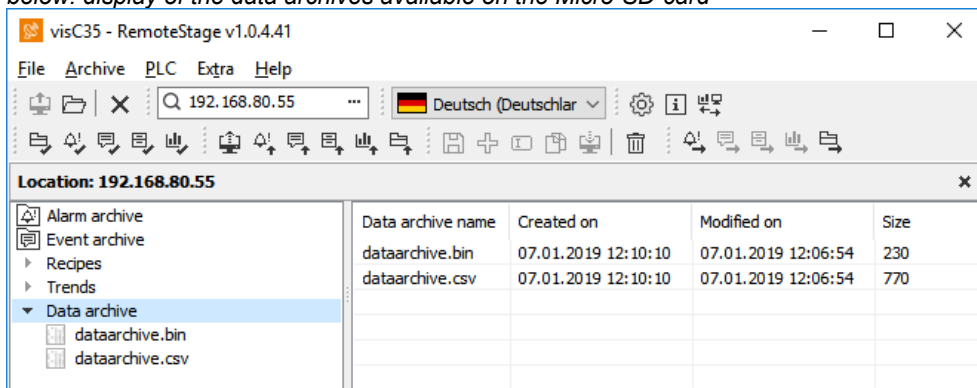
In the RemoteStage-shell no DB-archives can be written from PC to the Micro-SD-card of the PLC manually. This will be done by command lines in batch files (see samples in next pages).

Data archive display and storing

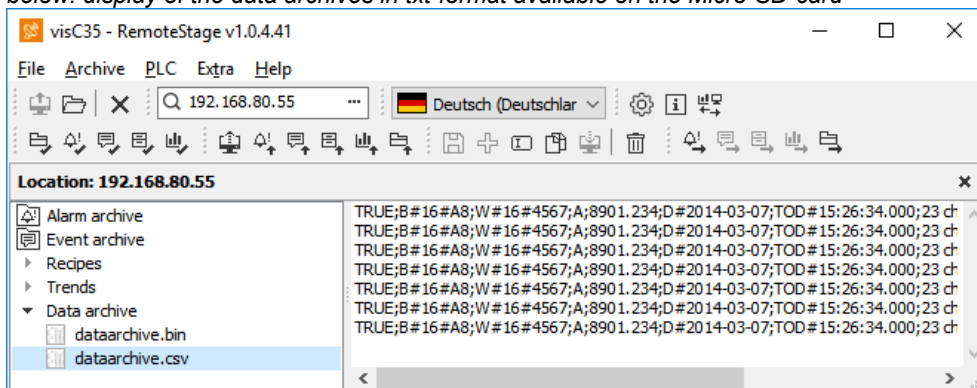
These data (DB) archived over S7-program to Micro-SD-card, can be read in and displayed and stored to the PC in the assigned format.

The format of the csv-file will be assigned by the S7-program (SFC207) and is not configurable by the RemoteStage. This can be done later on with any table calculation program by customer (because only he knows the format).

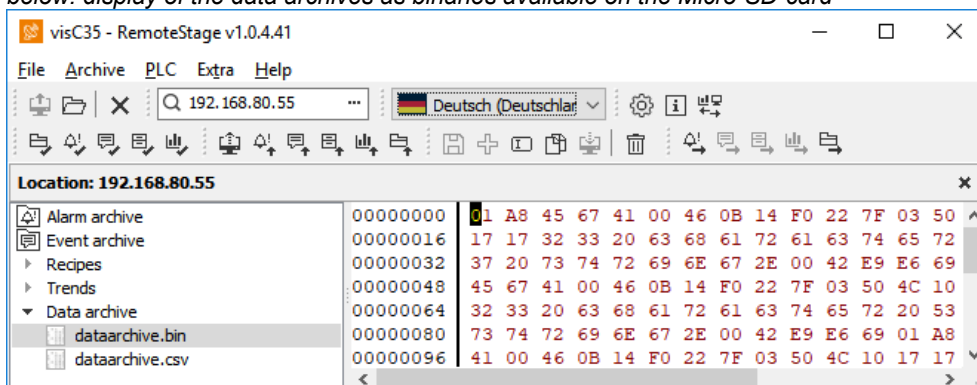
below: display of the data archives available on the Micro-SD-card



below: display of the data archives in txt-format available on the Micro-SD-card



below: display of the data archives as binaries available on the Micro-SD-card



Remote access with the software „RemoteStage“

Command line of RemoteStage (Viewing mode)

RemoteStage can be inserted in „planned tasks“ of the remote PC. A combination of multiple parameters is possible.

Here are available these special functions.

Automatic connecting to remote device after starting PC

With his function a binary of the visualization is called and linked with the predefined IP-address of the remote panel (if this is available online only)

Command line

<path>\remotestage.exe /start /r=<remote> /v=<project binary>

Hint: If the binary name contains space-signs it is necessary to write it in “ like „C:\Test 1 2 3.vsbin“)

Automatic reconnect to remote device after disconnect

With his function the lost connection to the partner device will be reconnected after a configurable time in seconds.

Command line

<path>\remotestage.exe /restart=[seconds] /r=<remote> /v=<project binary>

Hint: If the binary name contains space-signs it is necessary to write it in “ like „C:\Test 1 2 3.vsbin“)

If the parameter is „restart=0 (default), the connection will be restarted only once. For all others the value is the time in seconds from loss of connection abort to the planned start of the new reconnection.

Automatic full screen after starting PC

With his function a binary of the visualization is called and the RemoteStage changes into full screen at the remote PC after automatic starting (Screen stays dark, because no IP-address was assigned here...)

Command line

<path>\remotestage.exe /start /full /r=<remote> /v=<project binary>

Hint: Use STRG+F5 to switch between full-/ part screen

Set up TCP port number for S7-communication

If there are multiple PLCs to connect by a web enabled router/ gateway with port forwarding service

In this case the RemoteStage starts a communication with a remote device with the IP address 192.168.80.50 via the TCP port with the number 4500.

Command line

<path>\remotestage.exe /v=d:\visu\process.vsbin /r=192.168.80.50 /p=4500

Hint:

The default port number for TCP is port 102 at the PLCs.

Remote access with the software „RemoteStage“

Command line of RemoteStage (Archive mode)

RemoteStage can be used in batch process from command line with command line parameters, to save archives somewhere with a self defined name.

In the PC-OS Windows® batch files can be done **time controlled** in the task manager

Start menu → All Programs → Accessories → System programs → Planned tasks → add a task

In the wizard dialog can be assigned date and time for that job.

Read in (upload) message- and trend archives from remote device

The binaries of the messages and trends (assigned in the VisuStage before and created at runtime) will be read in, converted and stored in a path on the PC.

Command line (no line feed please, write all in one line!)

```
<path>\remotestage.exe /mode=<mode> /r=<remote>
/o=<output file> /v=<project binary> /t=<trend number>
```

Parameters

- mode:** Archive file read in
alarm_archive - read in alarm archive from remote device (alarm.bin)
event_archive - read in event archive from remote device (event.bin)
trend_archive - read in trend archive from remote device (trend_<trend number>.bin)
 (trend ID is assigned automatically by VisuStage at resources / grayed out you can not change it)
- remote:** Remote device IP address
- output file:** File name of archive file to be stored in PC.
 This is optional parameter. If this parameter is not assigned, default archive name is used (e.g alarm.bin) and stored in same folder where remotestage.exe located.
 If file name includes space character, it should be quoted with " (quotation mark).
 Archive converted to CSV format if file name has .csv or .txt extension, otherwise it writes as binary format.
- project binary:** Visualization project binary file name
- trend number:** Trend ID-number which is automatically assigned in VisuStage.
 It is only used at "trend_archive" mode.

Samples

For example to read in alarm archive from INSEVIS PLC with IP address 192.168.80.50 and write to „d:\archive\alarm.csv“ file with CSV format you need this command (supposed remotestage.exe is at C:\):

Command line (no line feed please, write all in one line!)

```
C:\remotestage.exe /mode=alarm_archvie /r=192.168.80.50
/o=d:\archive\alarm.csv /v=d:\visu\myvisu.vsbin
```

For example to read in the sample-trend with ID6163 (from sample visualization of PC1560T) from Panel-PLC with IP-address 192.168.80.50 and to save it as csv-file to D:\archive\trend6163.csv you need this command (supposed remotestage.exe is at C:\):

Command line (no line feed please, write all in one line!)

```
C:\remotestage.exe /mode=trend_archive /r=192.168.80.50
/o=D:\archive\trend6163.csv /t=6163 /v=D:\PC156xT_2017_03.vsbin
```

Remote access with the software „RemoteStage“

Read in (upload) recipe archive from remote device

The binaries of the (in VisuStage predefined) recipes and the of the records (created in runtime by the operator or by SFC206 from the S7-program) will be read in, converted and stored in a path on the PC.

Command line (no line feed please, write all in one line!)

```
<path>/remotestage.exe /mode=recipe /r=<remote> /v=<project binary> /recipe=<recipe name>
/record=<record name> /o=<output file> /format=csv
```

Parameters

mode	Recipe = read in the recipe data from remote-device
remote	Remote device IP address
project binary	Visualization binary name
recipe name	Recipe name assigned in visualization project (NOT: View name)
record name	<p>Name of the record for saving of SPECIAL (single) records.</p> <p>If this parameter is not assigned, RemoteStage reads in ALL records, what belong to the recipe <i><recipe name></i> and stores it in a folder assigned by the parameter <i>"/o="</i> before.</p> <p>→ To configure the format of the output file as csv, the parameter <i>"/format=csv"</i> must be set, otherwise all data will be stored a a binary.</p> <p>In the csv-files this format is predefined: ; (Semicolon) as field limiter and " (quotation mark) as text separator.</p> <p>If this parameter is assigned, the format of the output file MUST BE predefined by the extension of the record name.</p> <p>→ If the file has an extension .csv or .txt, than it is a csv-format, otherwise the output file format is binary.</p>
output file:	<p>Path and file name of the recipe record for the storing in the PC (optional parameter)</p> <p>If the parameter <i>"/o="</i> is not assigned, a folder <i>"Recipes\<recipe name>"</i> will be created in the project folder (where the visualization binary is kept) automatically and the recipe record stored as <i><record name>.rec</i>.</p> <p>If file name includes space character, it should be quoted with " (quotation mark).</p>

Samples

To read in e.g. a single recipe record „Orange“ from the recipe „Rezeptur_Rot“ from the INSEVIS Panel-PLC with the IP-address 192.168.80.50 and to store it as csv-file to „D:\archive“ this command line is required (supposed remotestage.exe is at C:\):

Command line (no line feed please, write all in one line!)

```
C:\remotestage.exe /mode=recipe /r=192.168.80.50 /v=d:\visu\myvisu.vsbini
/recipe=Rezeptur_Rot /record=Orange /o=D:\archive\Orange.csv
```

To read in e.g. ALL recipe records from the recipe „Rezeptur_Rot“ from the INSEVIS Panel-PLC with the IP-address 192.168.80.50 and to store it as csv-file to „D:\archive“ this command line is required (supposed remotestage.exe is at C:\):

Command line(no line feed please, write all in one line!)

```
C:\remotestage.exe /mode=recipe /r=192.168.80.50 /v=d:\visu\myvisu.vsbini
/recipe=Rezeptur_Rot /o=D:\archive /format=csv
```


Remote access with the software „RemoteStage“

Write back (download) recipe archive into remote device

With this function the uploaded (and maybe modified) recipe data will be written back (downloaded) into the remote device. (from rev. 1.0.4.17 and PLC firmware 2.3.9 (all CPUs) or HMI firmware 1.2.7 CPU-V/-P and 1.2.6 CPU-T)

Attention: The structure of the receipes in the remote device may not be modified between upload and download. (No adding, deleting elements or changing the row of order)

Command line (no line feed please, write all in one line!)

```
<path>\remotestage.exe /mode=recipe_download /v=<project binary>
/recipe=<recipe name> /record=<record file(s)>
```

Parameters

project binary	Binary file of visualization project
recipe name	In VisuStage projected recipe name (ATTENTION: not view name!)
record file(s)	Recipe data to download into remote device

Samples

Following command line downloads ONE recipe record „Rot_123.rec“ of the recipe „Recipe_Rot“ from the folder D:\recipes into the remote device with the IP address 192.168.80.50 (supposed remotestage.exe is at C:\):

Command line (no line feed please, write all in one line!)

```
C:\remotestage.exe /mode=recipe_download /v=d:\visu\process.vsbin
/recipe=Recipe_Rot /record=d:\recipes\Rot_123.rec /r=192.168.80.50
```

Following command line downloads ALL recipe record of the recipe „Recipe_Rot“ from the folder D:\recipes into the remote device with the IP address 192.168.80.50 (supposed remotestage.exe is at C:\):

Command line (no line feed please, write all in one line!)

```
C:\remotestage.exe /mode=recipe_download /v=d:\visu\process.vsbin
/recipe=Recipe_Rot /record=d:\recipes\*.rec /r=192.168.80.50
```

Remote access with the software „RemoteStage“

Read in (upload) data (DB-) archive from remote device

This function copies the data(DB-) archives created by S7-program with SFC207 to the requested target path into the PC. A modification of the csv-format is not possible.

Command line

C:\remotestage.exe /mode=data_archive /r=<remote> /archive=<archive file> /o=<output file>

Parameters

mode	data_archive = read in the date (DB-) archive from remote-device
remote	Remote device IP address
archive file:	File name of the data (DB-) archive If there is no archive file assigned to this parameter, the RemoteStage stores all data (DB-) archives in a folder assigned by the parameter "/o=" before.
output file:	Path and file name of the data (DB-) archive for the storing in the PC (optional parameter) If nothing is assigned for the parameter "/o=", a folder "UserData" is created in the program folder (where the remotestage.exe is kept. If file name includes space character, it should be quoted with " (quotation mark).

To read in e.g. a data (DB-) archive „Test-DB“ from the INSEVIS Panel-PLC with the IP-address 192.168.80.50 and to store it as csv-file to „D:\archive\Testdaten.csv“ this command line is required (supposed remotestage.exe is at C:\):

Command line (no line feed please, write all in one line!)

**C:\remotestage.exe /mode=data_archive /r=192.168.80.50
/archive=Test-DB /o=D:\archive\Testdaten.csv**

Write back (download) data (DB-) archive into remote device

With this function the uploaded (and maybe modified) data (DB-) archives will be written back (downloaded) into the remote device. (from rev. 1.0.4.17 and PLC firmware 2.3.9 (all CPUs))

Attention: The programmer itself is responsible to keep the structure of the data (DB-) archives. If they will be modified, all referring reports must be adapted too!

Command line

<path>\remotestage.exe /mode=data_download /archive:=<archive file(s)>

Parameters

archive file(s) S7 User data archive file(s) to download to remote PLC

Samples

Following command line downloads ONE archive file "default_cfg.csv" from the folder D:\configs into the remote device with the IP address 192.168.80.50 (supposed remotestage.exe is at C:\):

<path>\remotestage.exe /mode=data_download /archive=d:\configs\default_cfg.csv /r=192.168.80.50

Following command line downloads ALL archive files from the folder D:\configs into the remote device with the IP address 192.168.80.50 (supposed remotestage.exe ist at C:\):

<path>\remotestage.exe /mode=data_download /archive=d:\configs*. * /r=192.168.80.50

Remote access with the software „RemoteStage“

Return codes

Return codes of remotestage.exe indicate the result of operation.

Return code	Meaning
0	Successfully read out and saved.
1	Invalid parameter or mandatory parameters are missing
2	Project binary file is invalid or not found
3	Remote IP address is invalid
4	Could not connect to remote device
5	SD card not inserted on remote device
6	Archive file not found on remote device
7	Remote device does not support archive file read service
8	Invalid archive data
9	Not enough system resource
11	Not enough system resource on remote device
14	Could not write to in give <output file>
15	Connection is broken

Sample of RemoteStage usage in batch process:

```
@remotestage /mode=alarm_archive /r=192.168.80.50 /o=d:\archive\alarm.csv /v=d:\visu\myvisu.vsbin
@echo.
@goto res%ERRORLEVEL%

:res4
@echo Could not connect to remote device
@goto :EOF

:res0
@echo Successful read out and saved
@goto :EOF
```

Working with the software „ServiceStage“

With the free-of-cost software „ServiceStage“ it is possible to recognize INSEVIS-CPUs online to check their state, backup/update programs, set a know-how protection, etc. This software can be used with operating system Windows 10 only.



VIDEO-tutorials available

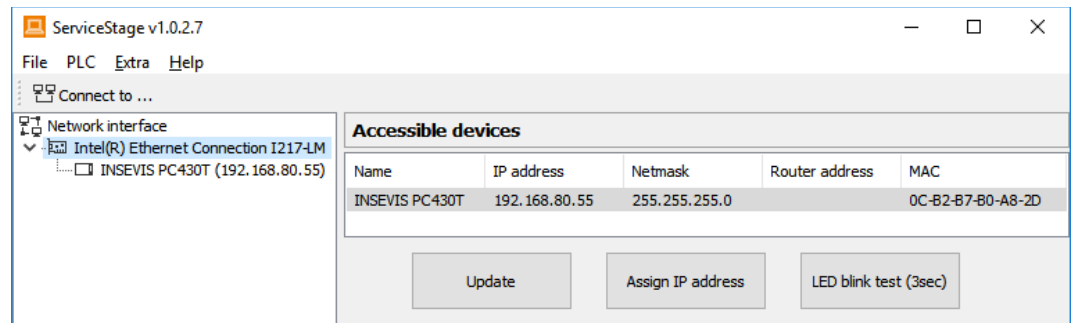
More information are provided in different video tutorials in the ServiceStage play list at INSEVIS YouTube®-channel “INSEVIS EN”.

With this program a member of the service-team can do all the main functions for diagnostics and update by his PC/Laptop without other expensive tools.

Therefore you choose the network adapter of your PC (This one, who makes the network access to the CPUs).

Select one of the CPUs displayed in the left window and press „Update“.

The „LED blink test“ helps to identify the selected CPU. (yellow battery-LED blinks for 3 seconds).



In this view you can assign a new IP-address of the connected device (Assign IP address).

Function overview

General information

Displays the system data to inform only (like serial number, firmware version, MAC-address).

Shows editable data like

- IP-address,
- Net mask and
- Router-IP-address

as well as a blink test button to identify your CPU again.

Only for CPU-T:

Firmwareupdate possible by Ethernet

Operating mode

Here you can change the operating mode of you CPU between RUN and STOP (not for Panel-HMI). This change must be confirmed in an extra window.

Date and time

For manual adustment of system date and time.

By checking the box „Take from PC“ these data will be taken over from your PC after pressing „Apply“.

General information

Device name:	PC430T
Station name:	PC430T
Plant designation:	
Location designation:	
Serial number:	201162
Firmware version:	V2.6.1
PN/DP version:	
IP address:	192.168.80.55
Netmask:	255.255.255.0
MAC address:	0C-B2-B7-B0-A8-2D

Firmware update
Assign IP address
LED blink test (3sec)

Operating mode

Current mode:	RUN	STOP
Mode switch position:	RUN	RUN

Date and Time

03.01.2019	17:12:59
<input checked="" type="checkbox"/> Take from PC	Apply

Working with the software „ServiceStage“

Memory

Shows the workload of the load- and work- memory (not for Panels-HMI).

The function „**Compress memory**“ should be used manually after multiple download of S7-programs to clear the memory.

The function „**Copy RAM to ROM**“ copies the battery buffered load memory content (like process data) to the onboard flash, to prevent a loss of data.

The function „**Clear Memory**“ deletes all user and process data in the CPU, only the firmware (operating system) remains.

Diagnostic buffer

It displays the last 100 entries of the diagnostic buffer listed by date and time (not at Panels-HMI).

By checking the function „**Information in hexadecimal format**“ it is shown in an hexadecimal system.

By pressing „**Update**“ new events will be displayed, what happened meanwhile.

With „**Save as**“ the displayed entries will be saved into a text file (*.txt).

Block Update

This function makes it possible to download

- the S7-user program as MemoryCard-file ***.wld** * (not for Panel-HMIs)
 - the INSEVIS-binary for visualization file as ***.vsbin** and
 - the INSEVIS-configuration file as ***.csbin** (not for Panel-HMIs)
- separately via the network into the CPU.

If the Hardware configuration block of the target device contains another IP-address than it is assigned to the configuration blocks of the blocks you do download into the device (WLD / VSBIN / CSBIN), it can happen, that you loose the connection after transfer. To avoid this, the ServiceStage from Rev. 1.0.1.9 asks, if the target-IP-configuration shall be replaced or not.

Memory

Load memory:

Used in bytes: 6.768

Total size in bytes: 8.388.608

Work memory:

Used in bytes: 4.268

Total size in bytes: 1.048.576

Update

Compress memory

Copy RAM to ROM

Clear memory

Diagnostic buffer

No.	Time	Date	Event
1	16:59:22.229	03.01.2019	Mode transition from STARTUP to RUN
2	16:59:22.169	03.01.2019	Request for automatic warm restart
3	16:59:22.166	03.01.2019	Mode transition from STOP to STARTUP
4	16:59:22.062	03.01.2019	Power on
5	14:01:46.031	03.01.2019	Power failure
6	13:03:01.228	03.01.2019	Mode transition from STARTUP to RUN
7	13:03:01.168	03.01.2019	Request for automatic warm restart
8	13:03:01.165	03.01.2019	Mode transition from STOP to STARTUP

Event ID: 16# 4302 1 of 10

Mode transition from STARTUP to RUN

Previous operating mode: STARTUP

Requested operating mode: RUN

Hexadecimal: 43 02 FF 68 C7 00 00 00 08 10 77 10 19 01 03 16 59 22 22 95

☐ Information in hexadecimal format

Update

Save as ...

Block

Download blocks:

Memory-card file (*.wld)

Visualization binary (*.vsbin)

Configuration binary (*.csbin)

ServiceStage v1.0.1.9

?

Do you want to keep current TCPIP configuration of the remote device?

Yes

No



* The **WLD-file** is a binary file with S7-system data (SDBs) and S7-program blocks (OBs, FBs, FCs, DBs). After creating a WLD file in SimaticManager/TIA-Portal (at the menu: „File → Memory Card File → New“) you can copy DIFFERENT DBs with or without their system data into the window of the new S7-Memory-Card-File by drag'n drop.

So it is possible to download WHOLE S7-projects OR SINGLE DBs with/without their system data.



ATTENTION: When inserting system data by SimaticManagers/ TIA-Portal,

- they shall be uploaded from a PLC with included ConfigStage-configuration (Menu: „PLC → Upload Station to PG“), because they are „ConfigStage-configured“ already or
- the system data of the Simatic-Manager/TIA-Portal overwrite the ConfigStage-system configuration. In that case the *.csbin-file of the project must be downloaded again after the WLD-file was downloaded.

Working with the software „ServiceStage“

Creating backup files (Online Backup)

This function creates

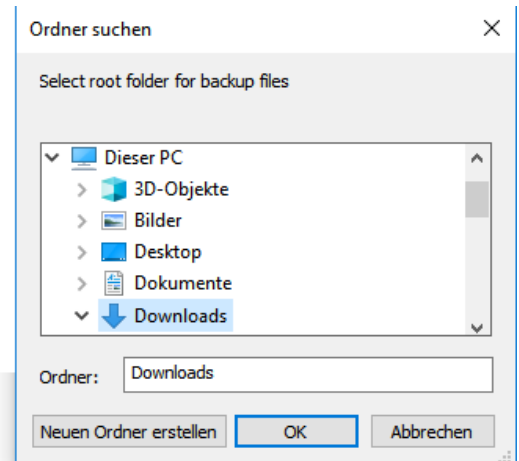
- an WLD-file „S7programs.wld“ with all the S7-system data and all OB, DB, FB, SFB and SFC and
- a visualization binary file „Visudata.vsbin“ and copies this files into a folder „backups“.

With these function S7-programs and visualizations can be backed up from connected devices and by Block update these devices can be updated either by ServiceStage or by a Micro-SD-card only – complete without any PC.

(more at „System functions“, chapter „Data backup and restore“)

Online backup:

Create backup files



ATTENTION:

- To make a visualization backup, it must be allowed to RemoteStage BEFORE, when doing the visualization in VisuStage (check the upload-function in VisuStage-project-header), if necessary a PIN-input is required. Additional a password for communication must be typed in, when assigned in SimaticManager/ TIA/ ConfigStage.
- If „Read Protection“ is assigned to the device an „Online Backup“ is not possible any more.



ATTENTION: When using Block Upload for backup / restore

- With firmware 2.3.6 a Restore can only be done by WLD- and VSBIN-file. The CSBIN-file will be ignored. So the WLD-file MUST CONTAIN these system data, who where downloaded with CSBIN before.
- If the WLD-file does not contain system data, program stops after restore because of missing data.

Know-how-protection

There are different levels of to protection of the S7-program against unauthorized reading or writing.

Therefore the PLC will be switched to STOP-mode.

From firmware 2.7.5 (PLC CPU-T) the present protection level is displayed at the checkbox.

KNOW-HOW Protection		
Protection level	Read access	Write access
<input type="checkbox"/> No protection	✓	✓
<input checked="" type="checkbox"/> Read protection	✗	✓
<input type="checkbox"/> Write protection	✓	✗
<input type="checkbox"/> Read write protection	✗	✗
Set protection level		

No protection: The S7-program blocks (DBs) can be read and overwritten from everyone. The protection level can be increased by assigning another level in the „ServiceStage“. There will be asked for an authentication by password, if it was configured so in the Simatic-Manager or TIA-Portal. So only authorized personnel can activate higher protection levels.

Read protection: The S7-program blocks (DBs) can still be manipulated from everyone, but not read any more. Only the Panel-HMIs can still read out the process data (DBs) to visualize it. This protection level can be reset by the PG-function „Clear All“ or by ServiceStage. Than the S7-program is deleted in the PLC and the unprotected original program may be downloaded into the PLC again.

Write protection: The S7-program blocks (DBs) can be read from every one, but no more manipulated. This protection level can only be reset by general reset by hardware directly on the device. Than the S7-program is deleted in the PLC and the unprotected original program may be downloaded into the PLC again.

Read/Write protection: The S7-program blocks (DBs) can no more be read or manipulated. Only the Panel-HMIs can still read out the process data to visualize it. This protection level can only be reset by general reset by hardware directly on the device. Than the S7-program is deleted in the PLC and the unprotected original program may be downloaded into the PLC again.

Working with the software „ServiceStage“

Variable monitoring

From ServiceStage V 1.0.3.3, the monitoring table function is available for quick monitoring of variables.

This can be used to monitor individual values.

These values can also be controlled. Variable tables (***.vartab files**) can also be imported so that large amounts of data can be quickly observed or used for quick function tests.

All functions of the observation table are described with a tooltip when the mouse pointer hovers over the button.

Variable monitoring					
	Address	Display format	Monitor value	Modify disable	Modify value
1	M128.0	BOOL	false	<input type="checkbox"/>	
2	M1.0	BOOL	true	<input type="checkbox"/>	
3	MW12	DEC (+/-)	231	<input type="checkbox"/>	
4	MW7	DEC (+/-)	411	<input type="checkbox"/>	



Note: The ServiceStage as a quick monitoring tool

In parallel to other programmes, you can monitor selected variables with the service stage. This works very efficiently and as a small window. A simplification if you need to keep an eye on data from several programmes at the same time.

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