S7-FileLogger

documentation for version 2.0.16.0

PLC Types

- S7-1500
- S7-1200
- S7-300/400 with TCP/IP on Board / PN or CP 343-x/443-x
- S7-300/400 MPI/Profibus with S7-LAN
- Win AC RTX
- S7-200 with CP 243-1
- S7-Soft-PLC
- SIMATIC-S5 over S5-LAN

Function Overview

The S7-FileLogger creates snapshots in the form of records from the data of SIMATIC S7. These records can be e.g.:

- production data
- disturbances
- recipes
- process data
- multiple records in the PLC memory stack (data array)

Features of the Editions

Feature	Standard	Advanced	Expert	Evaluation
Trigger-based logfile creation		x	x	x
Stack Memory-orientated data logging		x	x	x
Ring Memory-orientated data logging			x	x
Command Line Interface for data logging		x	x	x
System service integration for data logging	x	x	x	x
Maximum number of channels	4	16	256	256
Maximum number of records displayed	500	500	500	100
Maximum number of records logged per trigger event	1	32767	32767	1
Maximum number of triggers	2	4	8	8
Interval triggers	x	x	x	x
Value Change triggers	x	x	x	x
Boolean triggers		x	x	x
Conditional / Edge triggers		x	x	x
Maximum number of variables	100	500	1000	1000
Supported logfile formats	CSV	CSV, XML	CSV, XML	CSV, XML

Application Range of the S7-FileLogger

- logging
- fault diagnosis

- archiving
- back-up
- real-time data logging (by FIFO in the PLC)

Record Storage

Data format

The records are stored as CSV or XML files. For each entry a time stamp can be included. This way it is possible to re-use the data with Excel, Access and other programs at any time.

The following picture shows how to get an Excel file out of defined variables and the record .

Name	Data Type	Length	Address	Format
☑ Chargen-Nr.	String	254	DB1000.DBB 0	String, "ABC..."
☑ pellets temperature (degree C)	Int	2	DB1000.DBW 255	Dec, fixed
☑ barrel temperature (degree C)	Int	2	DB1000.DBW 257	Dec, fixed
☑ Form temperature (degree C)	Int	2	DB1000.DBW 260	Dec, fixed
☑ pressure (psi)	Double	4	DB1000.DBD 264	Dec, float (
☑ period in ms	Int	2	DB1000.DBW 268	Dec, fixed
☑ part/form	Int	2	DB1000.DBW 272	Dec, fixed

Connection | Variables / Columns | Logging | Records | Events

Time Stamp	Chargen-Nr.	pellets temperature (degree C)	barrel temperature (degree C)	Form temperature (degree C)	pressure (psi)	period in ms	part/form
12:21:34.755	CH-984F5-67JK-37	26	255	67	10,4938	1376	40
12:21:33.099	CH-984F5-67JK-36	27	244	43	10,8828	1206	40
12:21:31.449	CH-984F5-67JK-35	25	248	56	10,8489	1336	40
12:21:29.669	CH-984F5-67JK-34	23	250	58	10,4385	1265	40
12:21:27.918	CH-984F5-67JK-33	23	240	77	11,0847	1213	40
12:21:26.155	CH-984F5-67JK-32	20	240	44	10,3551	1263	40
12:21:24.444	CH-984F5-67JK-31	20	240	78	11,1134	1280	40
12:21:22.820	CH-984F5-67JK-30	20	254	64	11,1148	1335	40
12:21:21.152	CH-984F5-67JK-29	26	252	75	11,6726	1313	40
12:21:19.494	CH-984F5-67JK-28	24	254	46	11,2760	1368	40
12:21:17.844	CH-984F5-67JK-27	30	244	80	11,9027	1219	40

CSV

2015.02.02.csv

```
1   Time Stamp;Chargen-Nr.;pellets temperature (degree C);barrel temperature (degree C);Form temperature (degree C);
2   12:20:51.257;CH-984F5-67JK-12;25;244;75;11,4059;1206;40
3   12:20:52.947;CH-984F5-67JK-13;30;241;48;11,3993;1374;40
4   12:20:54.945;CH-984F5-67JK-14;27;242;52;10,8299;1335;40
5   12:20:56.505;CH-984F5-67JK-15;29;258;60;11,2426;1330;40
6   12:20:58.280;CH-984F5-67JK-16;28;241;55;10,2535;1391;40
7   12:20:59.962;CH-984F5-67JK-17;24;252;46;11,1060;1306;40
8   12:21:01.715;CH-984F5-67JK-18;22;243;60;10,5059;1282;40
9   12:21:03.711;CH-984F5-67JK-19;23;241;43;10,2671;1379;40
10  12:21:05.485;CH-984F5-67JK-20;23;247;43;10,7733;1396;40
11  12:21:07.160;CH-984F5-67JK-21;20;257;63;11,8342;1222;40
12  12:21:09.056;CH-984F5-67JK-22;25;243;75;10,2934;1388;40
13  12:21:10.756;CH-984F5-67JK-23;27;260;55;10,4789;1268;40
14  12:21:12.683;CH-984F5-67JK-24;30;246;80;10,1237;1255;40
15  12:21:14.268;CH-984F5-67JK-25;22;241;46;11,1034;1276;40
16  12:21:15.973;CH-984F5-67JK-26;23;259;53;10,5940;1357;40
17  12:21:17.844;CH-984F5-67JK-27;30;244;80;11,9027;1219;40
```

Start | Layout | Tabellen | Diagramme | SmartArt | Formeln | Daten | Überprüfen

Bearbeiten | Schriftart | Ausrichtung | Zahl

Ausfüllen | Calibri (Textkör... | 12 | abc Zeilenumbruch | Standard

Einfügen | Löschen | F K U | Zusammenführen | % 000

A39

	A	B	C	D	E	F	G	H	I	J	K
1	Time Stamp	Chargen-Nr.	pellets temperature (degree C)	barrel temperature (degree C)	Form temperature (degree C)	pressure (psi)	period in ms	part/form			
2	12:20:51.257	CH-984F5-67JK-12	25	244	75	11,4059	1206	40			
3	12:20:52.947	CH-984F5-67JK-13	30	241	48	11,3993	1374	40			
4	12:20:54.945	CH-984F5-67JK-14	27	242	52	10,8299	1335	40			
5	12:20:56.505	CH-984F5-67JK-15	29	258	60	11,2426	1330	40			
6	12:20:58.280	CH-984F5-67JK-16	28	241	55	10,2535	1391	40			
7	12:20:59.962	CH-984F5-67JK-17	24	252	46	11,106	1306	40			
8	12:21:01.715	CH-984F5-67JK-18	22	243	60	10,5059	1282	40			
	12:21:03.711	CH-984F5-67JK-19	23	241		2671	1379	40			

Location / File Name

The directory and file name can be freely specified by the user. The following items can be included in generating the file name:

- date
- time
- channel name

Triggers

The storage operation of a record is triggered by a triggering event. S7-FileLogger provides the following trigger types:

- manual trigger
- iime-based / interval trigger
- state-level trigger
- value change trigger
- conditional / edge trigger

The user can define these triggers to his needs. By that, time and condition of the logging process are determined. The trigger can be interconnected with each other, meaning a trigger can influence the start / stop behavior of another trigger.

The interval time should at least be half the time the value is held in the PLC. This way you assure that the trigger can determine the changed data reliably.

Start Options

Starting the logging process can be approached in the following ways:

- manually, by pressing a button
- automatically at the startup
- through a logging cycle by starting the logger via the command line (e.g. Windows batch file)

Requirements

Connection to the PLC

The connection to the S7 happens via TCP/IP. There is no need for special configuration of the PLC. S7-FileLogger can connect to any reachable S7 PLC in the network. You need:

- the IP address, the slot , the rack of the PLC
- the address of the desired variables (e.g. DB10.DBB20)

Supported Operating Systems

Windows

- 10
- 8
- 7
- Vista
- XP

Windows Server

- 2019
- 2016
- 2012 R2
- 2012
- 2008 R2
- 2008
- 2003

with .NET Framework

- min. 4.0 without dongle
- min. 4.6 with dongle

Installation

Delivery takes place either via email or download. You will receive a zip package.
Also included in the delivery of a license is a license file. This is a text file that contains the license key. It includes the encrypted licensee, the license type and the license period.
A particular installation process is not necessary. Unzip the downloaded zip package to the desired destination directory. Start S7FileLogger.exe and, if necessary, enter your license code from the license file (copy / paste). You can also enter the license using the "Licenser.exe" tool (included in the package.

Use USB Dongle

The License key is also available as a USB-Dongle.
We use the products from MARX Software Security. To use the Dongles you have to do following steps:

- minimum .NET Framework 4.6 (check version / install)
- install MARX "CBIOS Server Windows" as a service"
- plug in the Dongle
- only using S7-FileLogger: install S7-FileLogger for Dongle
- start the program
- Under ⓘ you will find the license informations

Uninstall

You can remove the S7-FileLogger at any time. To do this, simply delete the directory created from the ZIP package. Do not forget to save your recorded data beforehand.

The First Start

After the first start you will receive the following message:
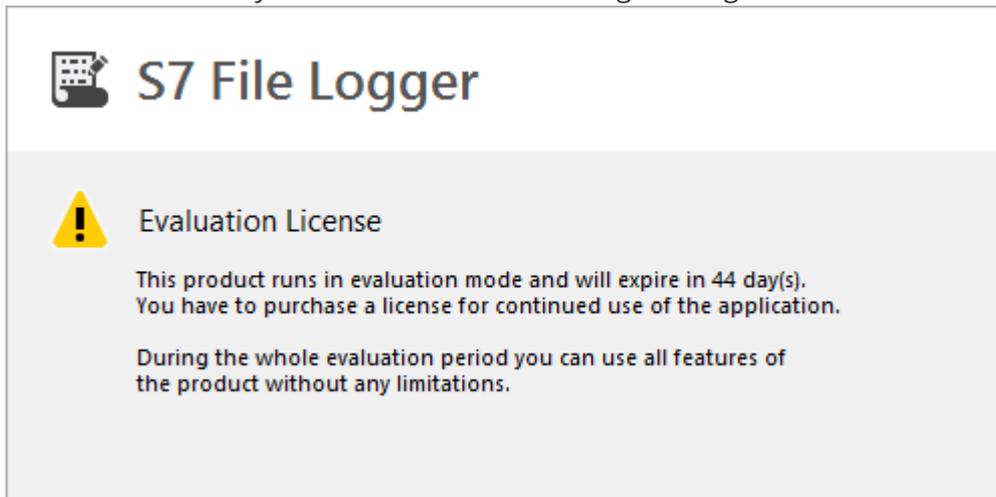
This dialog tells you that at the moment the installed version of S7-FileLogger is running with an evaluation license, which will expire after 14 days. After this period, the application can be used exclusively after acquiring a valid license key.

This message will appear until you enter a valid license key. Enter the license key in the license dialog. You can find the license dialog in the upper right corner of the toolbar of the main window.
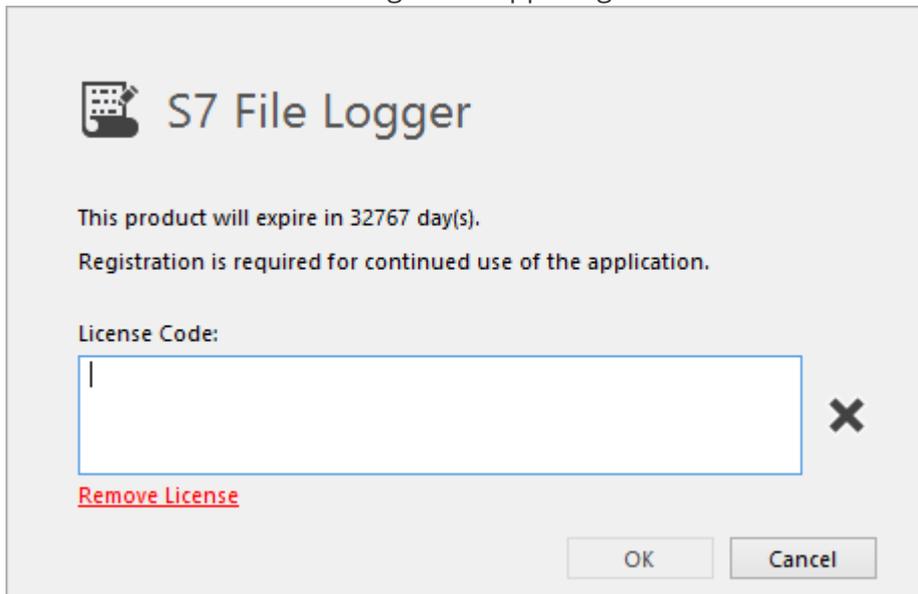
The license key is checked on validity during entry. The result of the check can be seen on the right next to the text box. ✖ invalid, ✔ valid.

If the key is valid, you can adopt it by clicking **OK**.

S7-FileLogger starts very slowly

Ever software released by us contains a digital signature..

If your computer cannot connect to the internet in order to check the signature, the application only starts after the timeout expiration.

In order for the application to start faster, you can deactivate the function "Check for signatures on downloaded programs" under *Control Panel ▢ Internet Options ▢ Advanced* and there under Security.
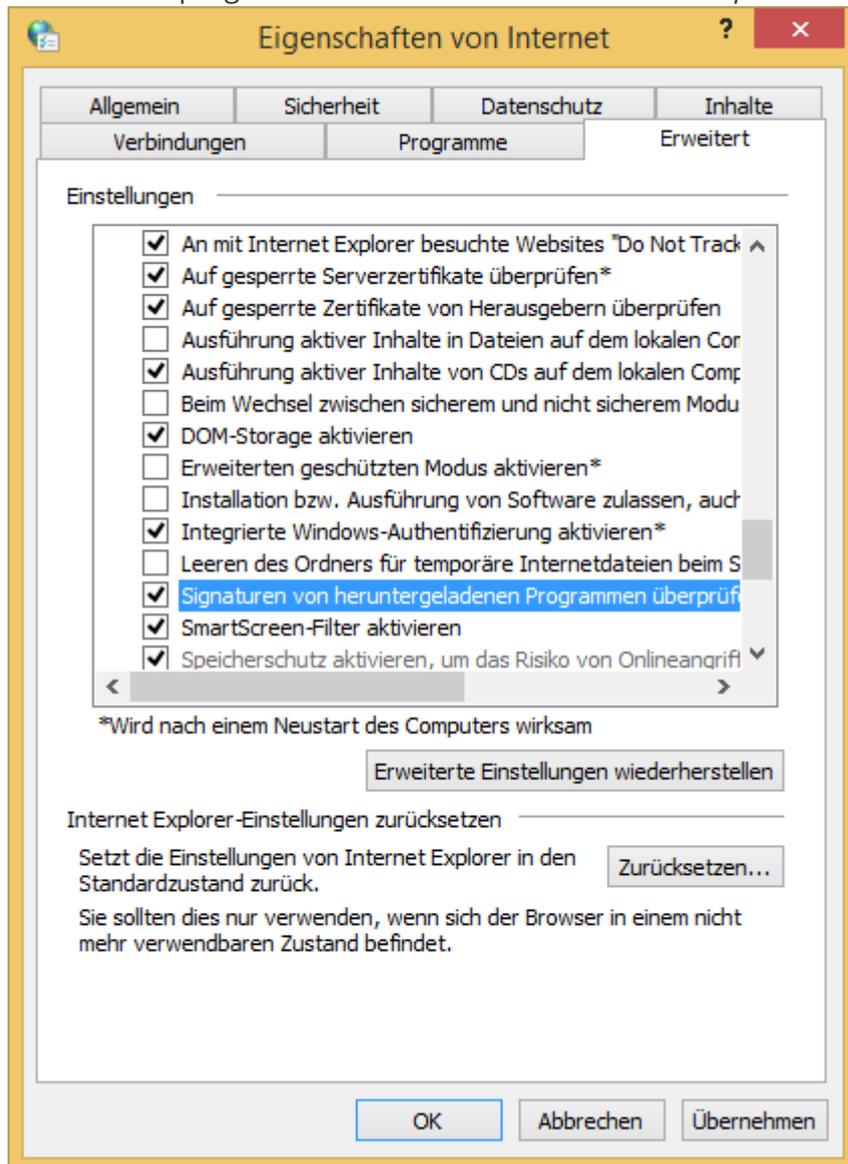
General

The S7-FileLogger works according to the function patterns of a wizard and follows a simple principle: Each configuration page in the main window is arranged in descending order of priority from left to right. The first page prodivdes the obligatorily necessary settings whereupon the following pages provide less and less important settings.

Logging is not yet performed at this stage. Records are not recognized by the system until you click **Start**. Up to this command the S7-FileLogger only summarizes those settings to be considered at the logging, that are changeable or discardeable at any point up until the confirmation.

This easy use is taken for granted in the entire manual. It is mostly not explicitly mentioned in the description of the processes that you have to open the next configuration page by clicking on the appropriate tabt.
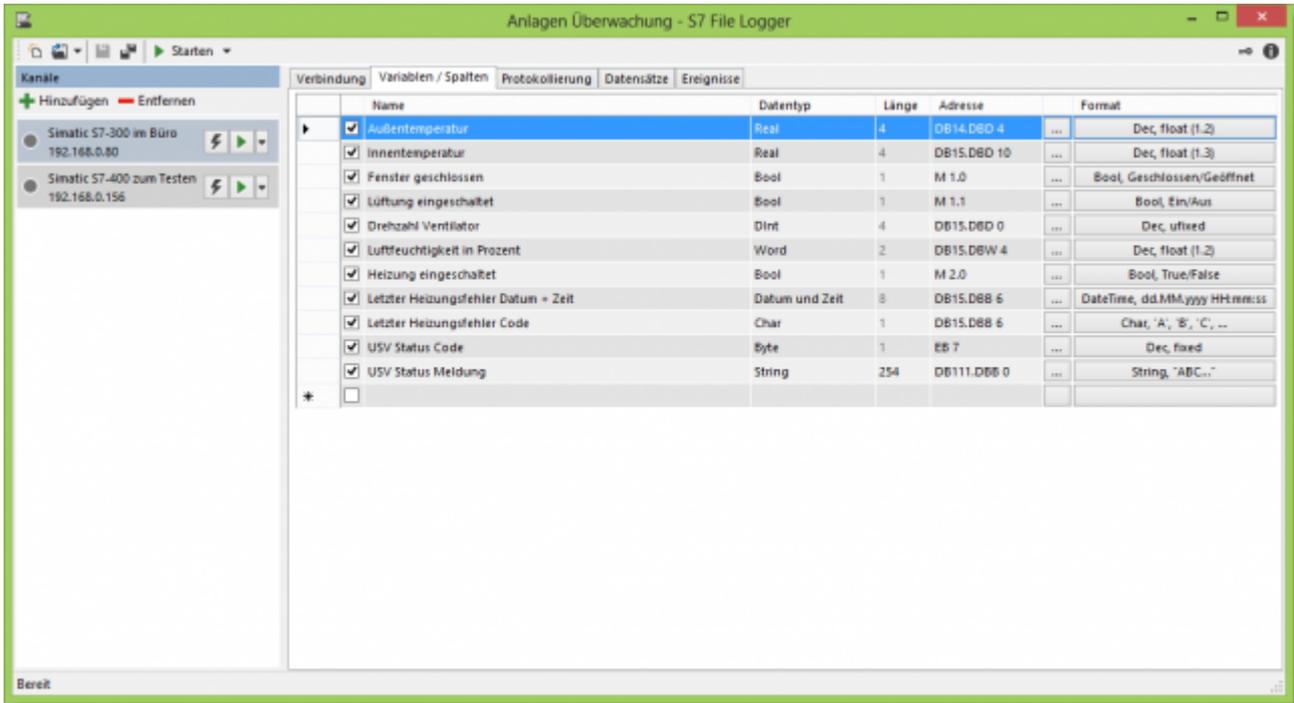
Toolbar

The toolbar icons are all also accessible via keyboard shortcuts. You can see in the short description appearing when hovering the mouse over the buttons what keyboard shortcuts to use in order to trigger the buttons.

The status bar provides the current state of the application at all times.

Other Functions

- **Simulation mode** Logging can also start in simulated mode. It offers the possibility to check and, if necessary, correct the output to the desired format, based on the changes made by test data generated by the S7-FileLogger.
- **File organization** The dynamic as well as automatic assignment of the target directory, the subdirectory and also the file name during logging assists your application-oriented storage of log data.
- **Data integrity** The incremental logging (append data) ensures even after repeated logging runs, that the same file is always used as the data target while a parallel "read along" the written data is ensured and even with complex documents the integrity of the log files is maintained.
- **Data types system** The context-sensitive data types system of the S7-FileLogger is supporting you in configuring the variables. This way, for example, an unwanted wrong addressing of a data block at the change of the output data type can be prevented. The appropriate output format is automatically pre-assigned to selected data types.

The Main Application Window

After starting the application, the main application window is the first window that will open (except from the dialog that appears when using an evaluation license).

The middle part of the main window can be divided furthermore into a left and a right part.
In the left part the overall management of channels configured in the project takes place, wheras in the right part the actual configuration and monitoring of logging of a single channel is done.
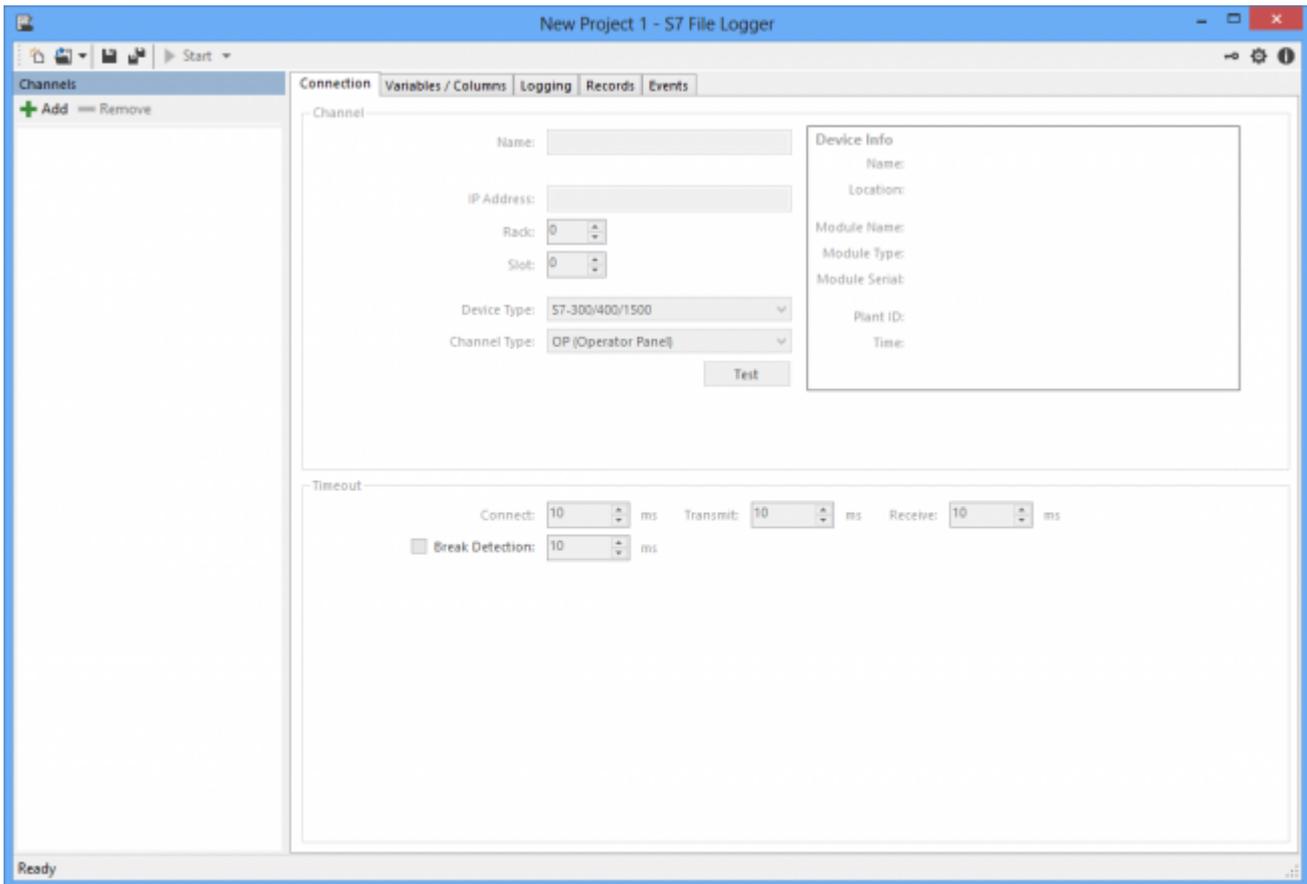
While working with S7-FileLogger, the main window is the primary and only dialogue with which you can configure and monitor the logging.
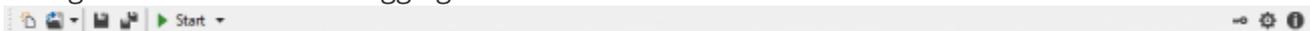
In the upper part of the main window is the toolbar, which provides direct access to key functions. The toolbar is divided into the following buttons and their tools:

"New Project"

	Creates a new project

"Open Project"

✖	Load an existing project or open one from the list of "Recent projects" by clicking on the arrow to the right of the icon.

"Save Project"

	Save Project . If it is a new project the target directory and name of the project file will be requested. Otherwise, the currently open project will be overwritten.

"Save Project As ..."

[x]	Save a project under a different name.

"Start"

▶ Start ▾	Run the logging for all configured channels synchronously. As soon as at least one channel has been created the button will be available. Using the arrow to the right of the symbol, the loggin mode can be selected in which the logging shall take place in. Available modes: * Standard mode (PLC based logging) = direct click on the button * Simulation mode (logging is simulated without establishing a real connection to PLC)

"Stop"

■	Stop all created channels synchronously. Once logging is active for at least one channel, this button will be available.

"License"

⌐o	Opens the license dialog for entering the license data and displaying the license info

"About"

ⓘ	"About" dialog provides general information about the software and your license

The middle part of the main window can be divided furthermore into a left and a right part. The left part is for the overall management of configured channels while in the right part the actual configuration and monitoring of logging of each channel takes place.

Channel Configuration and Channel Monitoring

The combined overview of configuring and monitoring a channel summarizes all necessary information and groups it logically into tabs. This way the navigation between the different areas of the configuration and monitoring of the channel is possible .

| Connection | Variables / Columns | Logging | Records | Events |
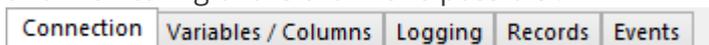
The tabs

- Connection
- Variables / Columns
- Logging

refer to the configuration section of the selected channel.
The tabs

- Records
- Events

show all necessary information about the current logging run.

The Channel Management

The channel management provides all features for managing the channels. These include :

- Creating and deleting a channel
- Controlling the logging
- Monitoring the channel state

Also you will get information on:

- Error conditions
- a brief preview of the main communication data of the channel
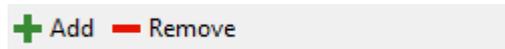
The toolbar used in this view consists of the following buttons:

"Add Channel"

+ Add	Create a new channel

"Channel Remove "

— Remove	irreversible deletion of the channel

For each channel there is an entry in the administration list over which further channel-context based actions are executed. This display has the following elements :
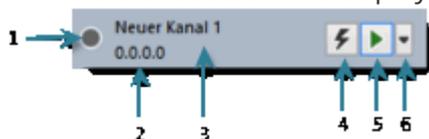
1. Status LED, current status of the channel	
Color	**Description**
	Logging is not active, the last active logging was flawless
	An error was detected during communication. The type of error is displayed when pointing to the LED with the mouse

1. Status LED, current status of the channel	
Color	**Description**
🟢	Logging is flawlessly active
🟣	simulated logging active
2. IP address of the connection	
3. channel name	
4. manual trigger	
Makes it possible during the active and inactive logging to create a "snapshot" record regardless of trigger conditions if a manual trigger is configured	
5. Logging start / stop	
Explicitly start / stop logging for this channel depending on the state of the icon (green arrow starts, red square stops)	
6. Start logging as ...	
Select specific logging mode under which the logging shall be started. (PLC based or simulation)	

Channel configuration

The tabs are arranged in logical order. When configuring a new channel you should work from left to right. Each tab provides the recommended default settings by itself.

Connection

In the right area the primary configuration of the channel occurs.

Field	Function
Name	Name of the channel
IP address	IP address of the PLC
Rack	number of the rack where the PLC (S7) is plugged
Slot	Number of the slot in which the PLC (S7) is plugged
Device Type	Type of PLC (S7-1200, S7-1500, S7-300/400, LOGO!, S7-200)
Channel Type	Type of connection channel (OP, PG or other)

Information

You will receive an error when pushing the test button in a LOGO! controller because the LOGO! does not support this function.

Connection parameters:

- Rack = 0
- Slot = 0

After a new channel has been created in the channel management, continue the configuration of the channel directly in the tab "Connection". This tab is divided into "channel" and "timeout" .

The values set in the area **timeout** are used to establish the connection to the PLC and during communication.

Field	function
Connect	timeout in ms for connecting
Transmit	timeout in ms for sending to the PLC
Receive	timeout in ms for receiving data from the PLC
Break Detection	KeepAlive time for monitoring the TCP/IP connection (interesting for large intervals)

Before you proceed to the next area, you already have the opportunity to let your configuration be checked by clicking **Test**. On successful completion you will receive all data provided by the device in the righthand part of the view.

Variables / Columns / Data

Here you set the definition of the variables in the PLC, including addresses. You define one variable per line that is part of the record to be archived or logged. A "variable line" corresponds to a column in the logging.

Meaning of the columns	
☑	Write the value
☐	Don't write the value
Name	Name = of a variable = Name for a column header for logging, e.g. in CSV
Data Type	see list **Permitted operands**
Length	Size of the data to be read; at Byte or String: Length of the data to be read. If a value is set to other types, an array of the type will be read. As you see in the example *Motors Conveyor Belt* a Bool array with the length of 10 is read. Output in file: Variablename_ArrayIndex, e.g. motors_0;motors_1;…
Address	Address of the PLC variable in the syntax. The format behaves as shown in the following table for SIMATIC S7
Format	Defines the desired output format

Create an Array

You can´t create Byte and String variables as an array.
If you insert a length in all other types an array will be generated.

Sample:
For each charge the condition of the engine 10.5 and the 4 states of the engines of the conveyor belt shall be logged.

Save adresses:

Name	save adress	Length
Charge	DB1000.DBB 0	15
Engine 10.5	DB1000.DBX 20.0	1
states of the engines of the conveyor belt (short ST)	DB1000.DBX 30.0 - DB1000.DBX 30.3	4

Possible solutions:

- add all variables manually
- add a bit-array with the length of 4

Solution by means of an array:

View variable definition

View records

View CSV-file

Hint: In the variable definition the next value span will be automatically calculated with the help of the data entered before (marked entry in view variable definition).

Permitted operands

Operand

Name	Abbreviation (Siemens, DE)	Abbreviation(IEC)
Input	E	I
Output	A	Q
Flag	M	M
Peripherals	P	P

Name	Abbreviation (Siemens, DE)	Abbreviation(IEC)
Counter	Z	C
Data Block	DB	DB
Timer	T	16

Data types

Name	Abbreviation	Bit size	Range	Description	Array
BOOL	X	1	0 to 1	single bit representing true (1) or false (0)	x
BYTE	B	8	0 to 255	unsigned 8-bit	x
WORD	W	16	0 to 65.535	unsigned 16-bit (Word)	x
DWORD	D	32	0 to 2^{32} -1	unsigned 32-bit (Double Word)	x
CHAR	B	8	A+00 to A+ff	ASCII-Code unsigned 8-bit character	x
INT	W	16	-32.768 to 32.767	signed 16-bit integer	x
DINT	D	32	-2^{31} to $2^{31}-1$	signed 32-bit integer (Double Word)	x
REAL	D	32	+-1.5e-45 to +-3.4e38	IEEE754 32-bit single precision floating point number	x
S5TIME	W	16	00.00:00:00.100 to 00.02:46:30.000	binary coded decimal (BCD) number representing a time span	
TIME	D	32	00.00:00:00.000 to 24.20:31:23.647	signed 16-bit integer representing a time span in milliseconds	
TIME_OF_DAY	D	32	00.00:00:00.000 to 00.23:59:59.999	unsigned 16-bit integer representing a time span in milliseconds	
DATE	W	16	01.01.1990 to 31.12.2168	unsigned 16-bit integer representing a date in days	
DATE_AND_TIME	D	64	00:00:00.000 01.01.1990 to 23:59:59.999 31.12.2089	binary coded decimal (BCD) number representing a date and time	
S7String	B	any	A+00 to A+ff	ASCII-Code, max. 254 Bytes	

The variables are composed of operand and data type. Examples:

Examples	Data type	Example Siemens	Example IEC
Input Byte 1, Bit 0	BOOL	E 1.0	I 1.0
Output Byte 1, Bit 7	BOOL	A 1.7	Q 1.7
Flag Byte 10, Bit 1	BOOL	M 10.1	M 10.1
Data Block 1, Byte 1, Bit 0	BOOL	DB1.DBX 1.0	DB1.DBX 1.0
Input Byte 1	BYTE	EB 1	IB 1
Output Byte 10	BYTE	AB 10	QB 10
Flag Byte 100	BYTE	MB 100	MB 100
Peripherals Input Byte 0	BYTE	PEB 0	PIB 0
Peripherals Output Byte 1	BYTE	PAB 1	PQB 1
Data Block 1, Byte 1	BYTE	DB1.DBB 1	DB1.DBB 1

Data Block 1, Data Block 1 Typ bool, Address 1.0 ⮕ DB1.DBX 1.0

Data Block 1, Data Block Typ Byte, Address 1 ⮕ DB1.DBB 1

Peripherals Input, Typ DWORD, Address 0 ⮕ PED 0

Help:

DB#.DBB # = Data Block#.Data Block Byte #

DB#.DBW # = Data Block#.Data Block Word #

DB#.DBD # = Data Block#.Data Block Doubleword #

= Address

The Editor supports you with the entry:

- When pressing the ENTER key
    - the name entered will be copied and an incremented number is appended
    - the next possible address will be registered on the basis of the previously entered address
    - the previous format will be taken on
- After selecting the data type (after a click in another column), the corresponding address format is automatically set, for example:

Type	address	format
bool	DB100.DBX 0.0	**Bool , True / False**
word	DB100.DBW 0	**Dec, ufixed**

Addresses Editor
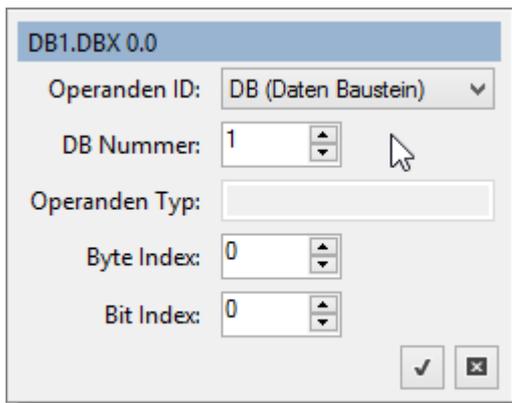
The addresses editor appears when you press the "**...**" button next to the address input. The editor is useful if you are unfamiliar with the addressing of a variable by Siemens S7 or IEC format.

type	Description
Title	preview of the address of the variable
Operands ID	data area of the PLC
DB number	data block number DB
Operand type	- just the heading -
Byte Index	byte address
Bit Index	Bit number
✓	Take data
X	Discard input

Format Editor
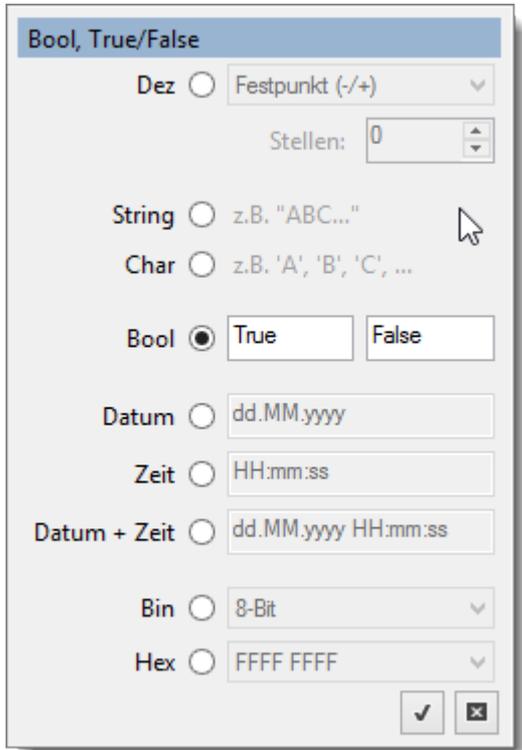
In the Format Editor you set the output format of the variable.

Type	options
Dez	Choice between fixed point, floating point and scientific values
Bool	any value for the display is enterable
The date and / or time	You cen enter the default system placeholders as follows: day (dd) month (MM) year (yyyy) hours (HH) minutes (mm) seconds (ss) \ \ You define the length of each number by the number of characters used.
Bin and Hex	to be defined using an appropriate selection. Since V2.0.10.0 output HEX with prefix 0x possible
Title	small preview of the output
✓	Confirm selection
X	Discard selection.

Logging

This configuration page provides further options on how the S7-FileLogger shall proceed the logging.

Location

Directory

Category	Description
Directory:	destination directory where the log data shall stored by the S7-FileLogger
Subdirectory:	Optional: Creates a subdirectory in the root directory in dependance to a predefined name format or a custom name
LinkLabel:	Preview of the destination file directory. The directory will be opened when clicked.

File

Filename:	ways of generating *dynamic *custom formatting Keywords: *{ChannelName}* *{Year}* *{Month}* *{Day}* *{Hour}* *{Minute}* *{Second}* *{DateTime}* = Date and Time {Hour**=HH**} = 24 hour format {Hour**=hh**} = 12 hour format {Month**=MMM**} = short form of the month e.g. Nov After the = all data is valid that is shown in the tooltip (see section "Implement Timestamp")
Combine data name at:	every logging start every logging
Format:	output file format (CSV, XML …)
LinkLabel	Preview destination directory and file name. If the file exists it will be opend when clicked.

Data Management

General

Behavior: **How** and **when** is data written?

Mode	Description
Append new entries	Records are appended to the existing file
Truncate old entries on start	The log file is emptied at each protocol start (deleted and recreated)
Truncate onld entries on write	The log file is deleted at each protocol process, then newly created and the current record and the log file are written. Only one protocol cycle is stored in the log file
Autostart on startup	Automatic start of the channel when starting the application When used as a service, only channels with active auto start are used!

Options: additional options of the S7-FileLogger.

Version	Option	Description
from Advanced	Close log file after each write operation	Closes the file after each write operation. This is helpful in long interval timings, if the file is in the meantime e.g. to be read / copied / cut out
	Do not write header in CSV file	Deactivates the writing of the header when starting a new file
from Standard	Timestamp Embed:	If enabled, a timestamp is added by default at the beginning of each record
	?	Tooltip for time logging: Take the mouse over the icon. Thereafter, the possible date / time formats appear as depicted below d The day of the month, from 1 through 31. dd The day of the month, from 01 through 31. ddd The abbreviated name of the day of the week. dddd The full name of the day of the week. f The tenths of a second in a date and time value. ff The hundredths of a second in a date and time value. fff The milliseconds in a date and time value. ffff The ten thousandths of a second in a date and time value. h The hour, using a 12-hour clock from 1 to 12. hh The hour, using a 12-hour clock from 01 to 12. H The hour, using a 24-hour clock from 0 to 23. HH The hour, using a 24-hour clock from 00 to 23. m The minute, from 0 through 59. mm The minute, from 00 through 59. M The month, from 1 through 12. MM The month, from 01 through 12. MMM The abbreviated name of the month. MMMM The full name of the month. s The second, from 0 through 59. ss The second, from 00 through 59. y The year, from 0 to 99. yy The year, from 00 to 99. yyy The year, with a minimum of three digits. yyyy The year as a four-digit number.

Event logging: the maximum count of entries in the *.err-file.

Acknowledgement: Add an acknowledgement when logging was successful

Category	Description
Use Acknowledgement via	Bit address in the PLC
Type	Set Flag: value 1 Delete Flag: value 0 Toggle Flag: value 1 is read and inverted

Data

Set reading pattern of data management.

Structured Data Management

If this option is selected, all configured variables are read each time one of the configured triggers is raised, while the values of the acquired record are always read by the same addresses.
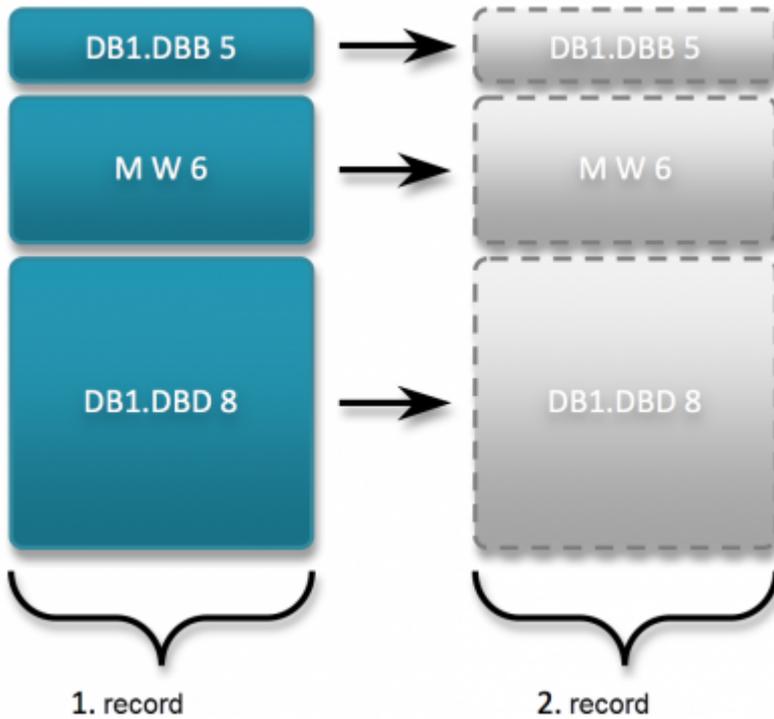
Stack and Ring-oriented Data Management

These types of data management support setting **number of records (per read operation)**. The data is stored consecutively in memory or in the PLC following an equal pattern and the S7-FileLogger reads this scheme using the defined variables.

Explanation to Byte Offset:
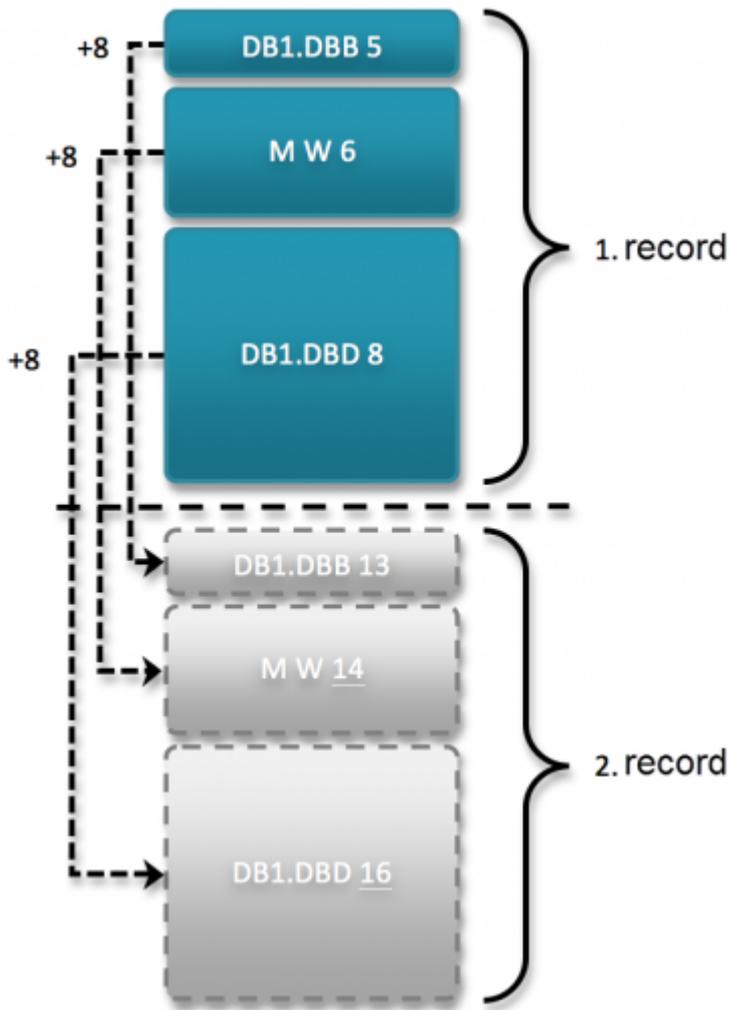
The chart shows what and how much is read when the option **Number of records** is set to the value **two** and also the option **data byte offset** is set to the value **8**.

Once you make use of the **data byte offset** setting you exhaust the full potential of these two options. The S7-FileLogger allows you to read 1-n records that are, for example, stored consecutively in the PLC memory. The best part is that this function is not limited to one data area, but is also applicable to several different data areas.

The example shown here consists of three variables with two variables addressing a data block and one variable addressing a flag. Through the settings of the option "number of records (per read operation)" the S7-FileLogger here reads, as just described, two records per read operation. In this case , however, by setting the "data byte offset", the S7-FileLogger is always adding eight bytes ("data byte offset" = 8), conjecturing from the previously read record, and uses this offset to read the next value from the PLC. Thus, you are able to read a stack or a ring of same-structured data from your PLC with a single transaction without being forced to configure all variables again or even devide a single record in its components afterwards.

Stack Settings	Description
Number of records per read operation	Number of records to be read (defined variables are start addresses)

| Stack Settings	Description
Manual data byte offset	0 = always read the same address ranges > 0 = buffer between the records or possibly unneeded byte values between the records. If this option is not selected, the maximum defined address variable is used the operand type adds this value. Example: maximum address variable DB1.DBB 10 second read operation start address DB1.DBB 21 this is true for each defined operand type

Each trigger raises logging.

Ring Settings	Description
Number of records	maximum number of records in the defined buffer to be read (defined variables are start addresses)
Manual data byte offset	0 = always read the same address ranges > 0 = buffer between the records or possibly unneeded byte values between the records.

Triggers are not relevant here. Data is read cyclically if the value of the end pointer is not equal to value of the start pointer.

Functionality:

After a record has been read, the S7-FileLogger sets the value of the start pointer to the position of the last record read. In return, the PLC must always make the end pointer show to the position of the record to be written next, while the values of all records collected from different addresses, beginning with the start address of the defined variables, are read. The addresses of all further records are thereby detected either automatically or by the defined manual data byte offset. The principle of this data storage is also referred to as a FIFO (First-In-First-Out).
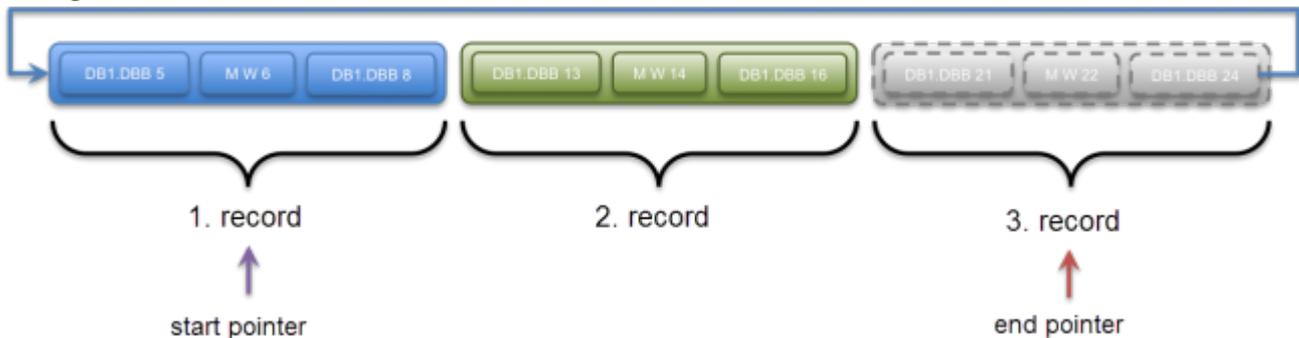
Trigger

The rider **Trigger** itself is divided into an overview of the defined triggers and the configuration of a trigger selected in the overview.

Overview of Triggers

Button	Description
Add	Define new trigger
Remove	Delete selected trigger
Checkbox next to Name	set : is used for logging
Symbol	**description**
▶ always.	Indicates when the trigger is started
✗	Indicates when the trigger is stopped
Click on Trigger	Settings of the trigger are shown

Settings of the Trigger

The following basic functions are given for all triggers:

Setting	Description	
Controls logging	☑	creates a record
	☐	is , for example, used to control other triggers

Setting	Description	
Controls the creation of the log file	Through this trigger the generating of a new output file is enforced. If the same names exist they are numbered e.g.: file name: Extruder1200 date format: {Year}.{Month}.{Day} current file name: Extruder1200_2016.11.02.csv next file name: Extruder1200_2016.11.02 (1).csv Hint: If active, data logging occurs only after the trigger has been raised.	
Starts :	Time of activation of the trigger. Here all defined triggers are displayed	
Runs :	running time of the trigger, adjustable in milliseconds	
Runs max:	running time of the trigger, adjustable in the number of runs. After activtion of the trigger it will be executed n-times	
Stops :	Time upon which the trigger becomes invalid. Here all defined triggers are displayed	
Type:	type of trigger	
Interval:	time interval in which trigger conditions are checked	

It is possible to link triggers with each other. Thus, a trigger can raise another, even if it is not currently active, e.g. because the term has expired.

The stop trigger immediately terminates the currently running trigger even if it is still valid.

Trigger options

- Manual trigger
- Interval trigger
- Conditional / edge trigger
- Value change trigger
- Boolean trigger

Manual Trigger

By clicking on the **flash** the trigger for the selected channel is raised.

Interval Trigger

Cyclic triggering according to a set interval.

☑ Intervaltrigger

   ☑ Controls logging

   ☐ Controls file creation

Starts: `<always>` ▾

☐ Runs: `00:00:00` ▲▼ = `0` ▲▼ ms after start.

☐ Runs max: `1` ▲▼ times.

Stops: `<never>` ▾

Type: `Invervaltrigger` ▾

Interval: `00:00:01` ▲▼ = `1000` ▲▼ ms.

Conditional / Edge Trigger

Cyclically checks the value at the address set according to a set interval and starts logging when the value becomes either
equal to, greater, greater or equal, less than, less or equal.
Since V2.0.10.0: Option "not" added. Trigger raises when the negative result of the condition(s) is TRUE (see examples).

Logging is triggered once each time at the transition to the defined area (edge treatment).

☑ Conditional-/ Slope trigger

   ☑ Controls logging
   ☐ Controls file creation

Starts:	`<always>`
☐ Runs:	`00:00:00` = `0` ms after start.
☐ Runs max:	`1` times.
Stops:	`<never>`
Type:	Conditional/Slope Trigger
Interval:	`00:00:01` = `1000` ms.
Verifies:	`DB1.DBX 1.0` ... on changes and raises if it is ...
	☐ ... not ...
... equals to: ○	`0`
... within the range: ○	☐ greater ☐ equals `0` becomes.
	☐ lower ☐ equals `0` becomes.

Samples:

Trigger shall be raised when the value at the address DB1.DBD 30 becomes higher than or equal to 100 and lower than or equal to 200.

Configuration:

Behavior:

Old value	New value	Trigger state
99	100	triggered
100	180	not triggered
300	180	triggered

Trigger shall not be triggered if the value at the address DB1.DBD 30 becomes higher than or equal to 100 and less than or equal to 200.

Configuration:

☑ Sampletrigger

    ☑ Controls logging

    ☐ Controls file creation

Starts:	<always>
☐ Runs:	00:00:00 = 0 ms after start.
☐ Runs max:	1 times.
Stops:	<never>
Type:	Conditional/Slope Trigger
Interval:	00:00:01 = 1000 ms.
Verifies:	DB1.DBD 30 ... on changes and raises if it is ...

☑ ... not ...

... equals to: ○ 0

... within the range: ○ ☐ greater ☐ equals 100 becomes.
           ☐ lower ☐ equals 200 becomes.

Behavior:

old value	new value	Triggerstate
99	100	not triggered
100	80	triggered
180	280	triggered

Value Change Trigger

Cyclic testing for change of value at the set address.

☑ Value change trigger
  ☑ Controls logging
  ☐ Controls file creation

Starts: <always>
☐ Runs: 00:00:00 = 0 ms after start.
☐ Runs max: 1 times.

Stops: <never>

Type: Value Change Trigger
Interval: 00:00:01 = 1000 ms.

Verifies: DB1.DBX 1.0 ...

Boolean Trigger

Cyclic testing of a boolean value to **true** and **false** according to a set interval with the possibility to ☑automatically reset the state (the logger inverts).
As long as the check is true the trigger raises.
Due to the automatic inversion of the S7-FileLogger the PLC can e.g. determine if the data was fetched and a new record can be written.

☑ Boolean trigger
  ☑ Controls logging
  ☐ Controls file creation

Starts: <always>
☐ Runs: 00:00:00 = 0 ms after start.
☐ Runs max: 1 times.

Stops: <never>

Type: Boolean Trigger
Interval: 00:00:01 = 1000 ms.

Verifies: DB1.DBX 1.0 ... on changes and raises if it is ...
... in state: ◉ ○ True ○ False ☐ that the Logger inverts.

Application scenario

- Collect data every 10 seconds
- Every second an error condition shall be checked
    - If an error has occurred , then …
    - log for 20 seconds every 500ms
    - after 20 seconds log every 10 seconds

To solve the problem:

- Set an interval trigger with the name "Every 10 seconds"
- Set the interval to 10 seconds (10000ms)

- Create a conditional / edge trigger with the name "error trigger 1 second"
- Set the interval to 1000ms
- Fill in the address being read, here **DB1.DBB 100**
- Set the condition, here **value equal 1**

- Create a new interval trigger with the name "Trigger all 500ms after error"
- Set **Starts with:** to **error trigger 1 second**
- Set **Runs:** to **20s**
- Set the interval to **500ms**

General | Data | **Trigger**

+ Add — Remove

- ☑ All 10 seconds
  - ▶ always.
  - ■ never.
- ☑ Error on Trigger 1 second
  - ▶ through 'All 10 seconds'.
  - ■ never.
- ☑ Trigger all 500ms after error
  - ▶ through 'Error on Trigger 1 second'.
  - ■ never.

☑ Trigger all 500ms after error

☑ Controls logging

Starts through: Error on Trigger 1 second ▼

☑ Runs: 00:00:20 ▲▼ = 20000 ▲▼ ms after start.

Stops: <never> ▼

Type: Invervaltrigger ▼

Interval: 00:00:00 ▲▼ = 500 ▲▼ ms.
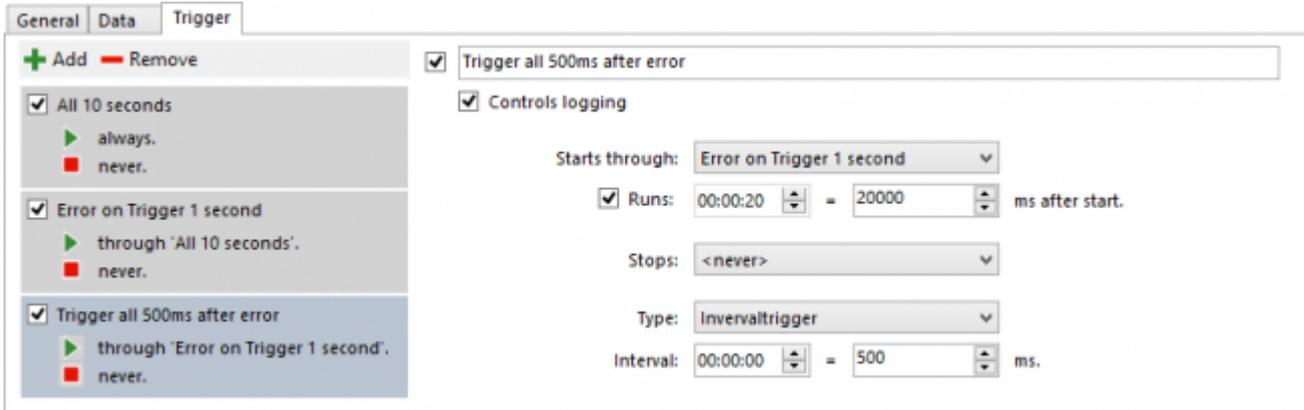
Channel Monitoring

Records: all records currently detected
Events: the events that occured

Records

Once you have completed the channel configuration, you can start the logging. Regardless of the selected logging mode (e.g. simulation), each detected record is displayed in real-time in this tab. In contrast to the log file, in this view the last recorded data is always in the first row of the table.

Time Stamp	db1000.dbb0
14:18:07.034	32

If a record has been recorded it is displayed in the table according to your set configuration up with formatted values. In this case each record always at least contains the timestamp at which it was read. All further columns in this view are displayed according to your configured variables.

Again, it should be noted that "inactive" variables are not included in the log file and in the record view.

Events

If a logging was carried out or is currently carried out, you can see the actions of the S7-FileLogger carried out here and their outcome in the tab **Events**.

If you have problems with the logging, usually you can detect a hint on the problem here.

Time Stamp	Type	Source	Message	Event ID	Variable
22.01.2015 14:1...	Information	Observer	Stopped.	0	
▶ 22.01.2015 14:1...	Information	Observer	Started.	0	

| Column	Description
Timestamp	time of the event specified in day.month.year hour:minute:second
Type	type of event such as information errors, ...
Source	Event trigger, information about from which functional part of the S7-FileLogger the event originates
Message	brief explanation of the event
Event ID	program internal event number to identify the venue and type of event

Column	Description
Variable	if a variable has triggered the event, it will be enrolled here

Operating as a Service

Install the Service

To install S7-FileLogger as a service proceed as follows:

- Open the settings dialog ⚙
- Select the tab "Service"
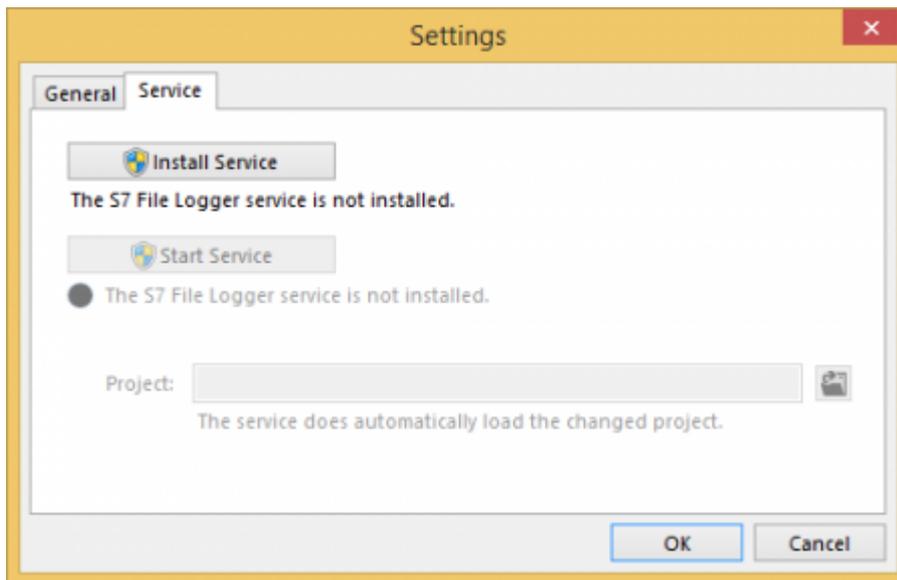
- Click "Install Service", the S7-FileLogger is registered as a service. Required admin rights are requested via a login dialog.
- Choose the S7-FileLogger project (*.fgg) which you want to use in "service mode".
- All channels with hooks "Autostart" are processed to service operation, all others remain unaffected.
- After successful installation you can start / stop the service.

The service automatically registers changes to the selected project. With reassignment of a project the service will automatically restart.
In "Service" mode the S7-FileLogger generates entries in the EventLog of the system. These can be found at:
Event Logs ⯈ Windows Protocols ⯈ Applications ⯈ S7-FileLogger
In the target directory of the log files .err files are created additionally. These include possible errors and notifications that occur during the logging.
Events that are logged:

- selected / modified project file
- channels that are monitored
- status of the service (started / stopped)
- error in the project file e.g. "Project does not contain a channel", "File does not exist", ...

Uninstall Service

If the service is started, the "Service" dialog shows "Uninstall service".
If this button is still displayed after clicking it, it may be useful to perform a restart of the computer.

Command Line Interface

The S7-FileLogger additionally offers the support for execution via a command line or via a batch script.

Application Scenarios

Through this interface, automated logging runs, which can be manually triggered when the system starts or via batch file are imaginable.

Links to Parameters

This way you can always create a shortcut for the S7-FileLogger and also use the same parameters in its properties that are available in the command line.

Command Line Parameters

The arguments provided in the command line based interface of the S7-FileLogger are, as described in the integrated help, to use as follows:

| Argument	Description
/c /capture	If this argument is stated, the S7-FileLogger creates exactly one record per configured channel and closes itself again.
/cl /console logger	If this argument is stated, the S7-FileLogger additionally depicts the records collected in the command line.
/p, /prj /project	This argument is the only mandatory argument. Along with this switch you state the full file path to the S7-FileLogger project that the S7-FileLogger shall use. This would look e.g. like this: /p="C:\folder\Projekt.fgg"
/help	If this argument is stated, the S7-FileLogger issues a brief summary of the supported arguments. If this argument is stated, the S7-FileLogger provides additional information in the command line.
/v /verbose	Alternatively, you can request a short feedback after the detection of a record as a graphical dialog by stating "/verbose=gui".

Settings S7-1200/S7-1500/Logo

Settings for S7 1200/1500

The optimized block access needs to be deactivated in the data block attributes for access to the S7-1500 and S7-1200.
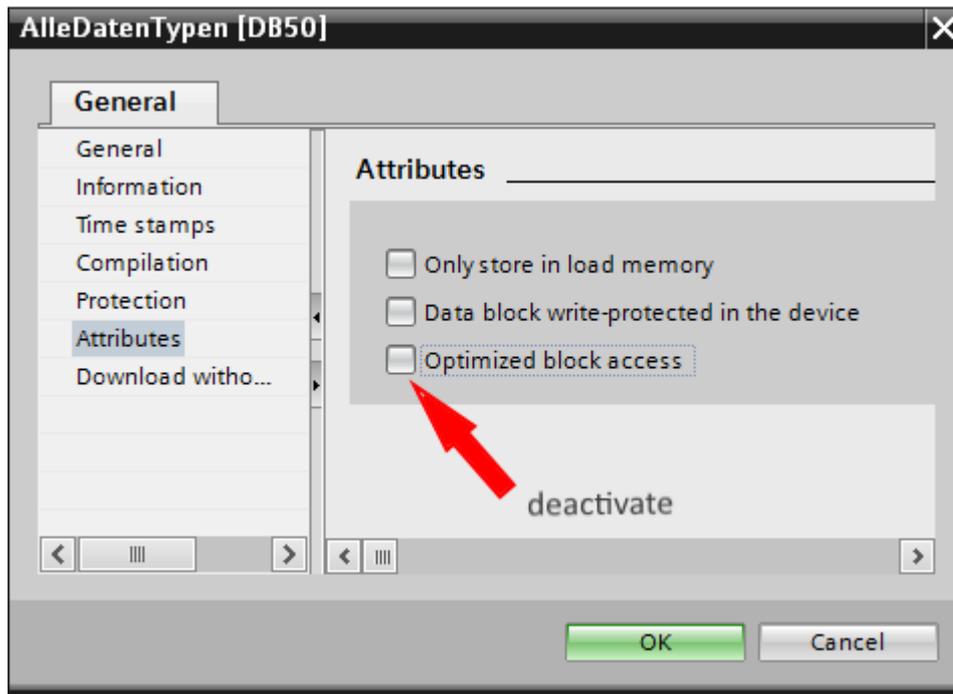

In the S7-1500 must be enabled in the communication setting in addition to the PUT / GET access . How this works you see here (snapshot from TIA Portal) .
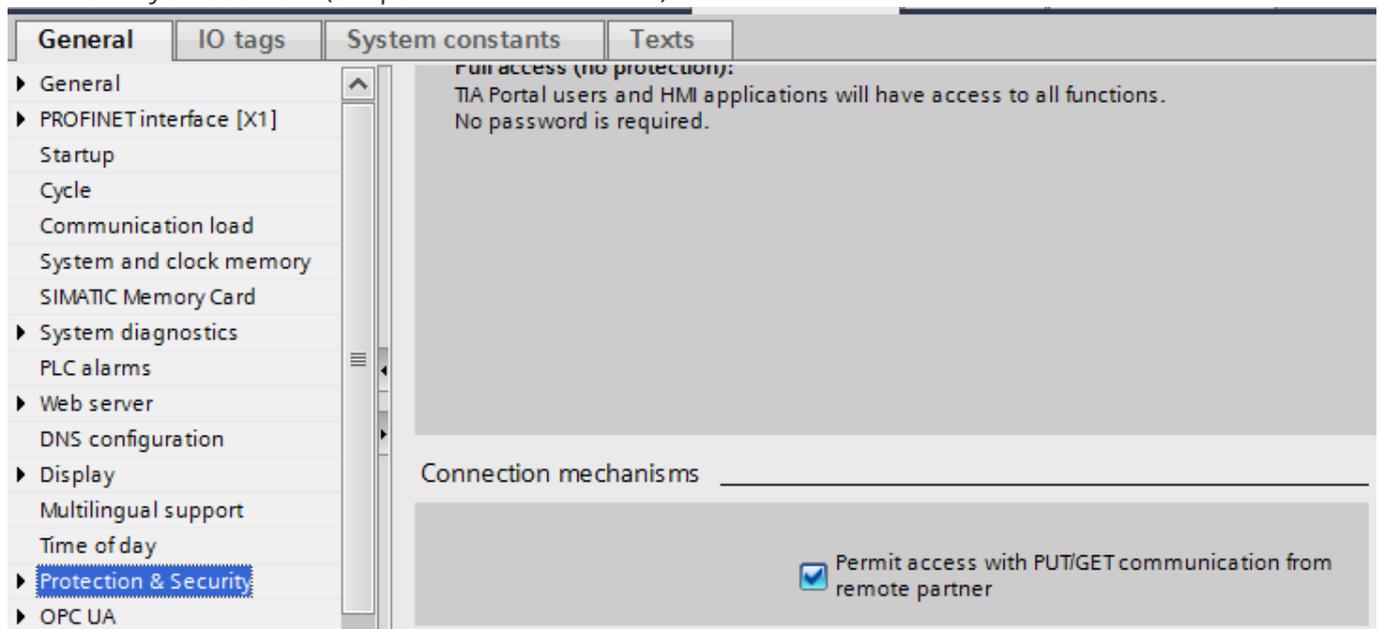

Settings Logo

1. Use the Logo Soft Comfort the IP address of a logo! PLCs:
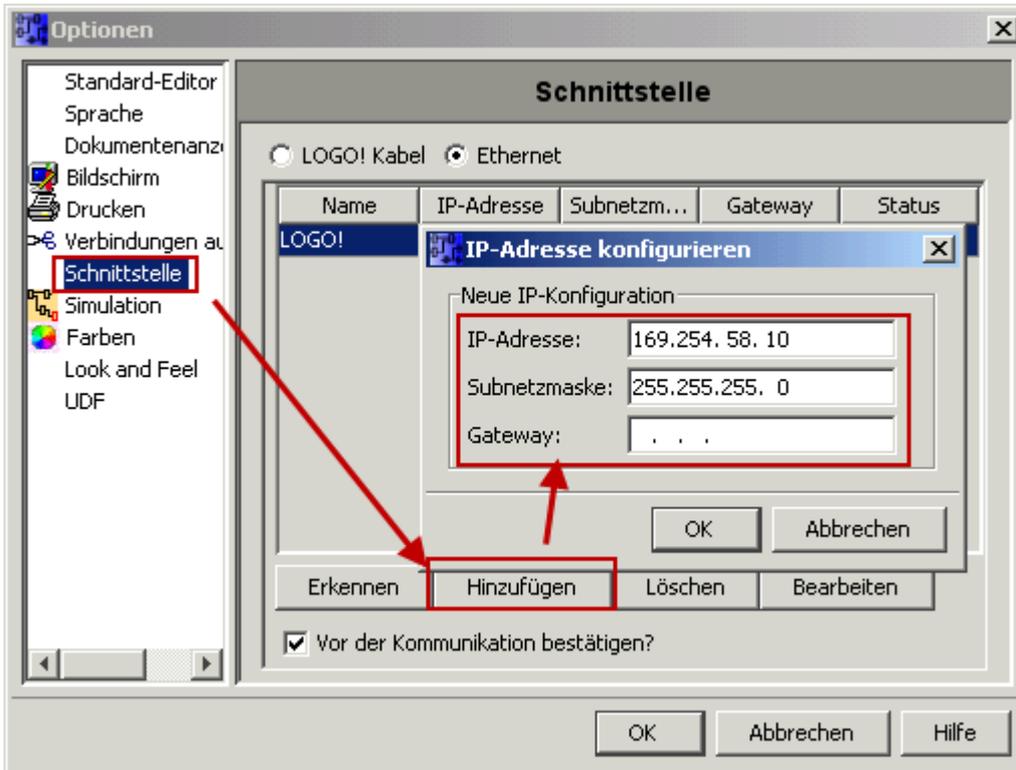
2. Configure PLCs so that connections from an HMI device accepted the Logo!. To do so, go to "Tools- > Ethernet Connections" and then add a new connection.
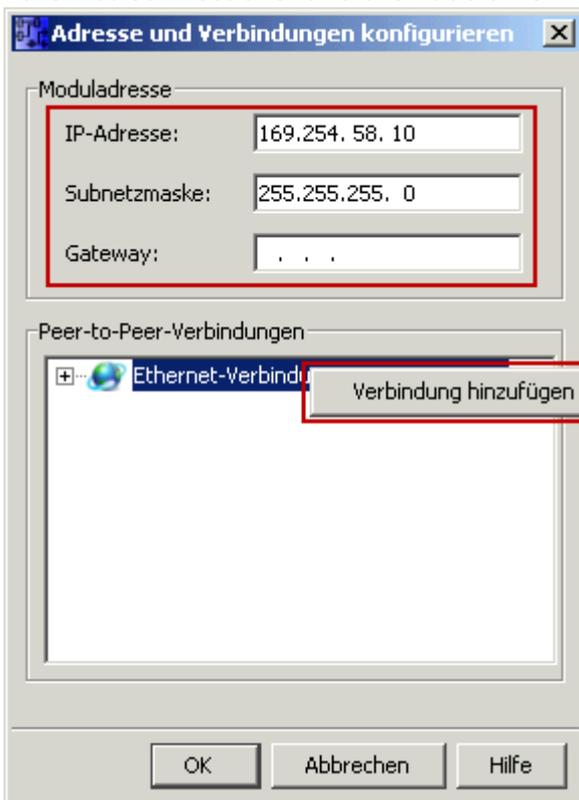
3. Double-click on the newly created connection to access the properties.
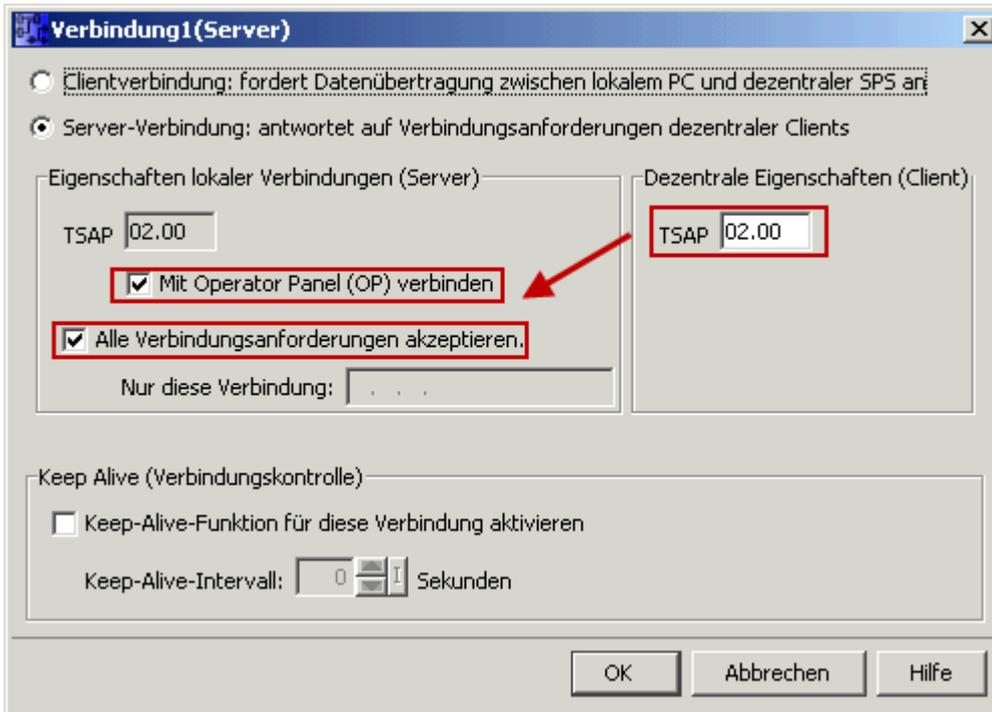
Select:

1. Server Connection
2. Local TSAP: 02:00 - 02:00 decentralized TSAP
3. accept all connections.

You can access DB1, inputs , outputs, flags , counters and timers with IP -S7 -LINK . Now put on " Tools- > VM parameter map " the variables that are to be transferred to the DB1.

WinCC (TIA-Portal) Variablentabelle

LOGO!Soft Comfort

Please note when accessing the LOGO!

Rack 0

Slot 0

The test button in the connection delivers a timeout error because it cannot find the requested data.

The deposited data in the data block can be called nevertheless.

Versionshistory

25.02.2020 - V2.0.16.0

- New CSV: Option: "Do not include Header in CSV File"

03.04.2019 - V2.0.15.1

- Fixed Issue with permanent use of Life Counter.
- Fixed Wrong default PLC address displayed in Life Counter address field.

26.02.2019 - V2.0.15.0

- New Life Counter in Advanced edition to notify a PLC about running Logger instances.
- Fixed Issue with handling the license machine code

09.04.2018 - V2.0.14.1

- New Project wide option to consolidate multiple connections to the same PLC device. The option can be found within the settings dialog on the "Project" tab.

18.07.2018 - V2.0.13.1

- Fixed Issue with logging to XML files

07.09.2017 - V2.0.13.0

- Changed Behaviour for event logging to not longer log reccuring events. This means that an previously logged event will not re-logged in case it will be recognized by the next trigger event within the same logging session.
- New Added new option to re-enable the old logic to always log reccuring events.
- Fixed Issue with re-written log events until the maximum number of log records is reached.

30.05.2017 - V2.0.12.1

- Fixed Issue with reading data areas reaching the limits of a data block.
- Fixed Issue with reading string values longer than 221 characters.

17.05.2017 - V2.0.12.0

- New Increased maximum number of supported variables.

08.04.2017 - V2.0.11.1

- Fixed Issue with reading the same PLC data multiple times using different variables.

11.10.2016 - V2.0.11.0

- Fixed Issue in drag & drop of variables which led to hanging drag & drop visualization.
- Fixed Issue with lost log file in case there the logging is configured to close the file after each write and old entries are to be truncated before writing.
- New Improved Drag&Drop experience by keeping the dragged and dropped row(s) selected including the current row bookmark.

17.08.2016 - V2.0.10.0

- New Improved logging behaviour of CSV logging to always append a commata although the value of a variable is empty and to also write a new line although the whole log record is empty, this does then at least log a new line with the time stamp (if activated).
- Fixed Issues with updating the channel status when logging.

- Fixed Issue with not selected trigger after loading a project or creating a new channel.
- New Reduced amount of used triggers to realize trigger chains.
- Fixed Issue with endless loop in cases there triggers are linked in cyclic order.
- New Implemented new conditional trigger negation option.
- New Implemented support for a maximum number of trigger runs.

04.08.2016 - V2.0.9.0

- New Implemented additional hexadecimal formats with leading "0x".
- New Enhanced "Include Time Stamp" option to differ between a compound or partitioned time stamp in the log file. While in partitioned mode the time stamp is formatted using seperate date and time formats.

27.07.2016 - V2.0.8.0

- New Implmented acknowledgement which can set, clear and toggle a bit after data has been logged.
- New Implemented support for array data on all numerical data types including char and boolean. Just modify the value in the "Length" column when defining a variable. Clear out the length column of a variable to get a scalar variable; otherwise it will be handled as a array variable.

02.06.2016 - V2.0.7.0

- New Different view changes to improve auto-scaling behavior when changing screen resolution/scaling.
- New Improved handling when closing an opened log-file to ensure that the internal logger instances can be reused also when closing a file does fail.
- New Reworked handling when stopping a started observer instance to ensure that case the stop-thread's does fail to stop the observer, it does correctly reflect this outcome.

14.03.2016 - V2.0.6.1

- New The service mode does now use automatic start up mode when installing the logger as a Windows service.

26.02.2016 - V2.0.6.0

- New Implemented event log record limitation. It's default value is 100 records in the *.err file and can be configured up to 10.000 records. See settings dialog.

25.02.2016 - V2.0.5.2

- New Updated to V1.6.9.2 of IPS7LnkNet.Advanced with improved read cache behavior.

20.01.2016 - V2.0.5.1

- New Updated to V1.6.9.1 of IPS7LnkNet.Advanced to read string values multiple times without auto-decrementing its length.

17.12.2015 - V2.0.5.0

- New Implemented channel duplication functionality to directly duplicate an existing channel o use it as a template when adding an additional channel.
- New Implemented find and replace in the variables tab to simple find and replace within variable names and addresses.

16.12.2015 - V2.0.4.5

- New Updated to V1.6.8.1 of IPS7LnkNet.Advanced to be now able to read string values until the end of the datablock.

14.12.2015 - V2.0.4.4

- New Improved notifications in case of support expired and license expiry.

13.12.2015 - V2.0.4.3

- New Implemented support for partner information.
- New Implemented support for license dongles.

25.11.2015 - V2.0.4.2

- Fixed Issue with not longer startable service application.

24.11.2015 - V2.0.4.1

- Fixed Issue with exceptions during start/stop of logging. They lead to a total crash of the logger or was not displayed/logged.

23.11.2015 - V2.0.4.0

- New Added new log file path preview link.
- New Added new log directory path preview link.
- New Added new placeholder '{DateTime}' for log file / directory path. This can be used instead of the 'Date + Time' format.
- New Casing of placeholder names is not longer relevant.
- New Added optional placeholder arguments to specify custom format expressions. Use now '{Hour}' (as before) or e.g. '{Hour=HH}' to get 03 as 15 o'clock. All possible format expressions are displayed when moving the cursor over the question mark by the time stamp option. This format expressions are supported by all DateTime placeholders (Year, Month, Day, Hour, Minute and Second).

09.10.2015 - V2.0.3.1

- Fixed Issues with formatting DateTime values (e.g. in file names).

09.10.2015 - V2.0.3.0

- New Implemented possibility to specify whether the logger stores event log files besides the channel records files or within an application wide specific event log directory.

01.10.2015 - V2.0.2.3

- Fixed Issue with not correctly saved changes in case there was directly clicked on save after editing a project property.

17.09.2015 - V2.0.2.2

- Fixed Issue with still enabled logging controlls when service configuration has been changed while the current user does not have elevated privileges.

17.09.2015 - V2.0.2.1

- Fixed Issue with still enabled trigger and start logging functionality although the project is currently in use by a service.

17.09.2015 - V2.0.2.0

- New Reworked service application monitoring to better inform the user about cases there the currently loaded project is already in use by a running service.
- New In cases there the license is expired it is now still possible to use the UI without the possibility to save project changes and to start logging.
- New In cases there the maximum number of concurrently running applications is exceeded the user will be informed now about that case by a message box instead of the license dialog. Because there is no need to enter a new license.
- New Then a project is currently in use by the service it is not longer possible to save project changes and start logging as long as the service is running.
- New After a new license has been entered and the license dialog will be closed using a message will be displayed which informs the user that the application needs to be restarted to take use of the new license. Additionally the user will be asked whether the application is to be restarted now.

15.09.2015 - V2.0.1.0

- Fixed Issue with hanging application when closing it while logging is started.
- Fixed Issue with some times hanging application when stopping logging on multiple channels when logging is started for multiple channels.
- Fixed Issue with hanging application when an exception during stop of logging occurred.
- Fixed Issues with synchronizing the UI thread with data changes performed in background threads. This affected the main and settings views.

Terms of Use

Terms of the software

The conditions for the use of the software S7 FileLogger are described in license conditions at the end of this manual. The unique license key is proof of your legal purchase and use of the S7-FileLogger on your computer. This was given in electronic form.

Technical support (Support)

If you have any problems with the installation or use of the Program, and can solve neither the manual nor the installation using the program, please contact the Traeger Industry Components GmbH at the address http://www.traeger.de. Or send send us your request by e-mail to the address support@traeger.de.

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