



Application Note

S7A Driver V 8.00

connecting to a

S7-1200/1500

via

Symbolic Addressing

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Author: J. Stähler, InCoSol - Industrial Communications Solutions

Draft

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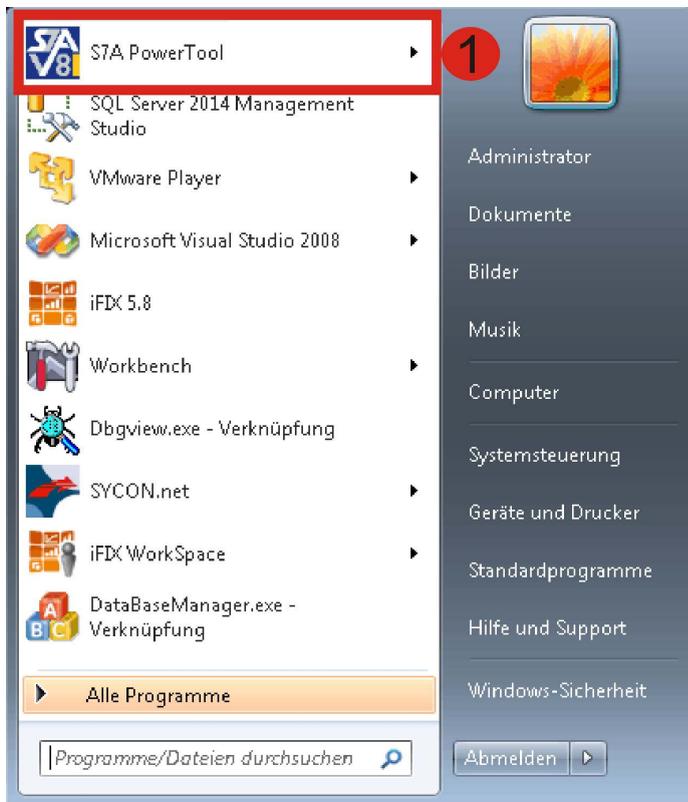
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1 Configuration via S7A Power Tool

1.1 Start the S7A Power Tool

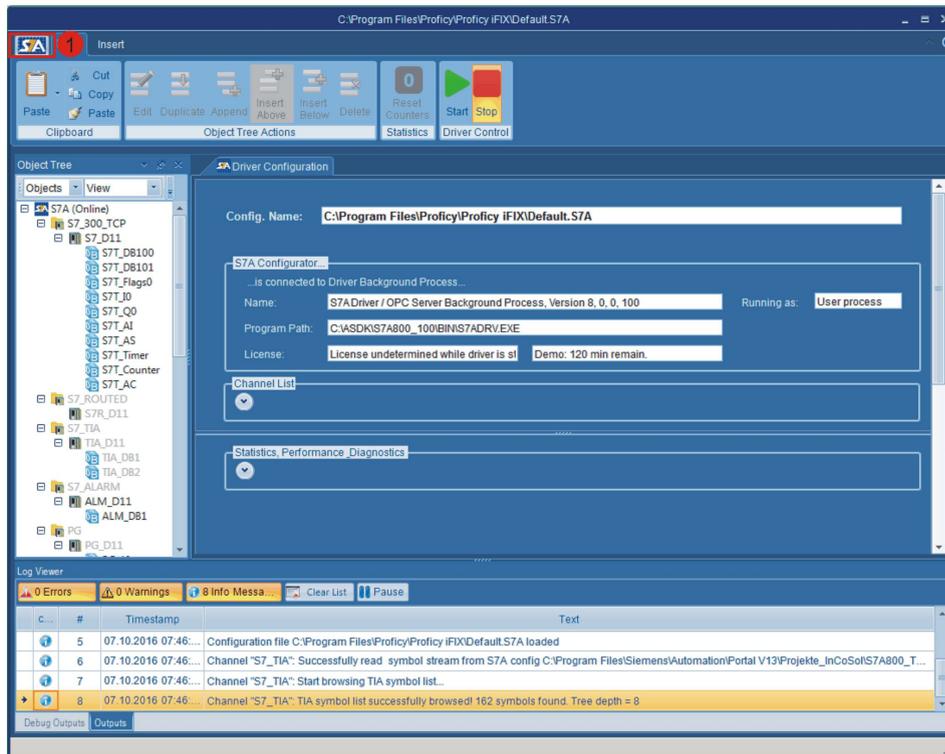


Picture 1: Starting S7A Power Tool via Windows Start Menu

1

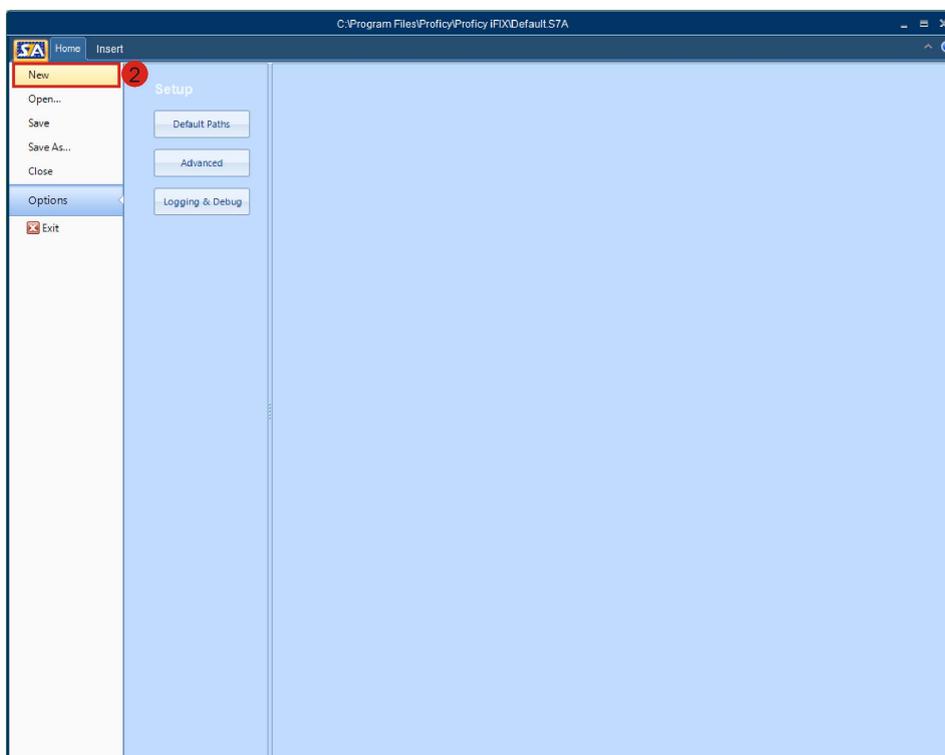
You can start the S7A Power Tool via Windows Start Menu.

1.2 Create a new configuration



Picture 2: Opening the program's backstage menu

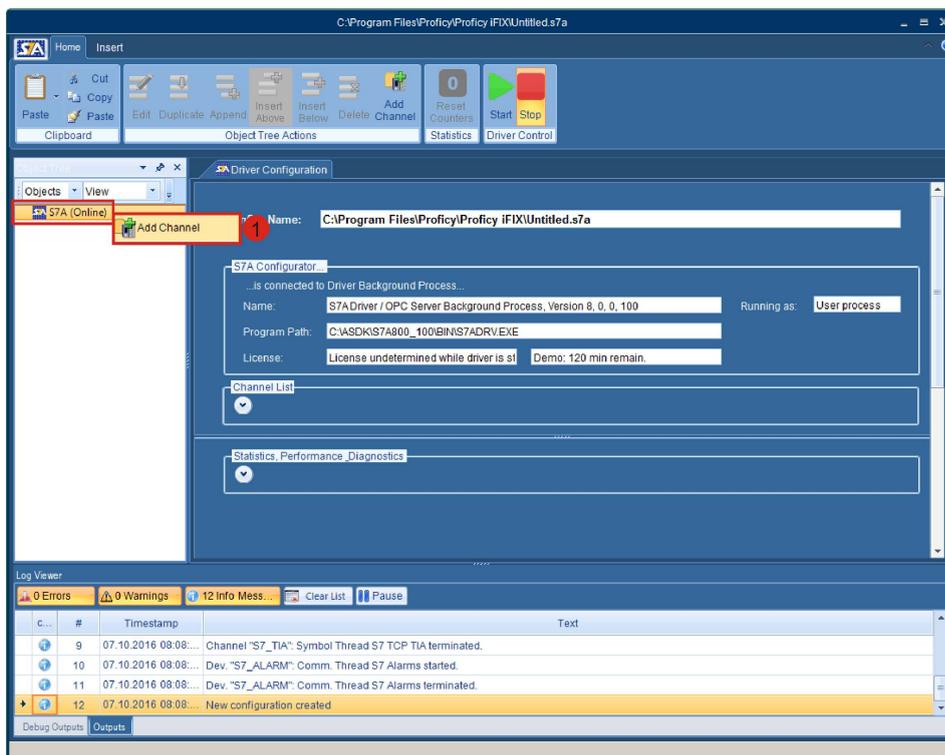
- 1 Click on the S7A Program Icon to open the application (backstage) menu.



Picture 3: Creating a new (blank) configuration.

- 2 Select the menu item **New** to create a new (blank) configuration.

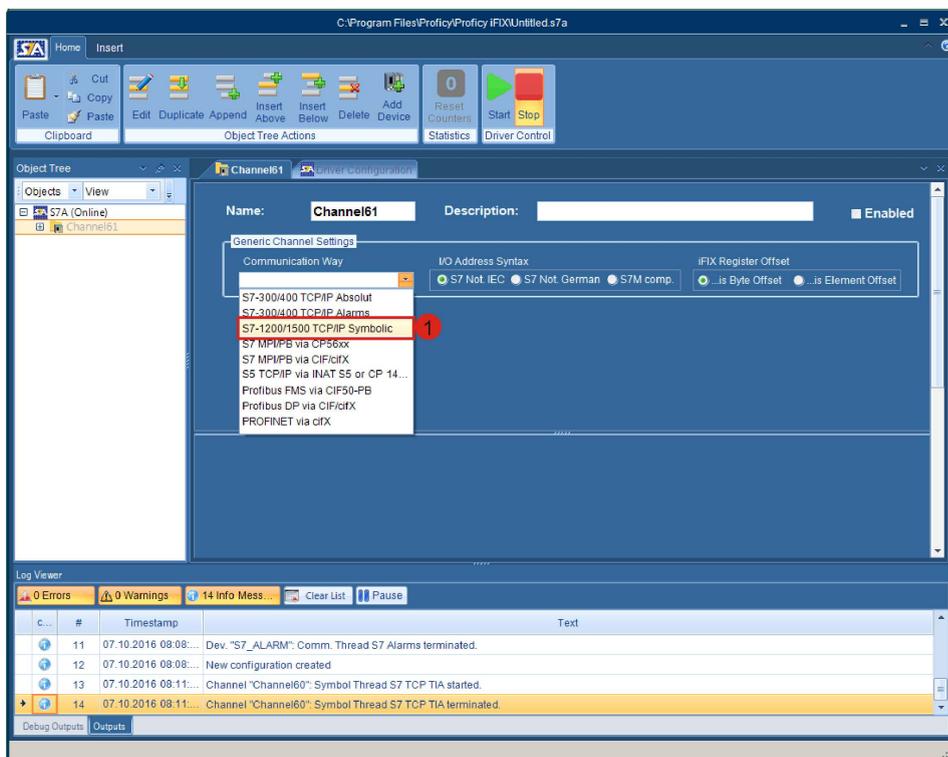
1.3 Create a new channel



Picture 4: Creating a new channel

- 1 Select the root item S7A (Online) in the Object Tree View, open the context menu via right mouse click and select **Add Channel** form the context menu to create a new channel object.

1.4 Configure the new channel

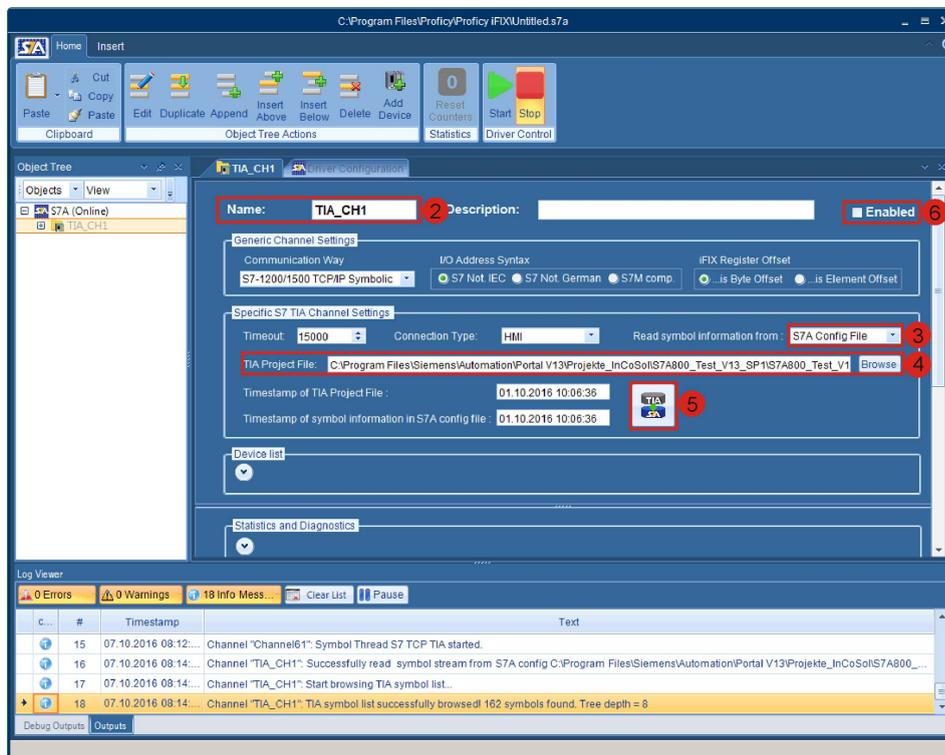


Picture 5: Configuring the new channel, part 1.

- 1 Since the new channel not yet has a specific communication way, you have to select the proper communication way **S7-1200/1500 TCP/IP Symbolic** from the **Communication Way** drop down list. The program then automatically loads the specific dialog for the selected

communication way.

1.4.1 Configure the specific channel parameters

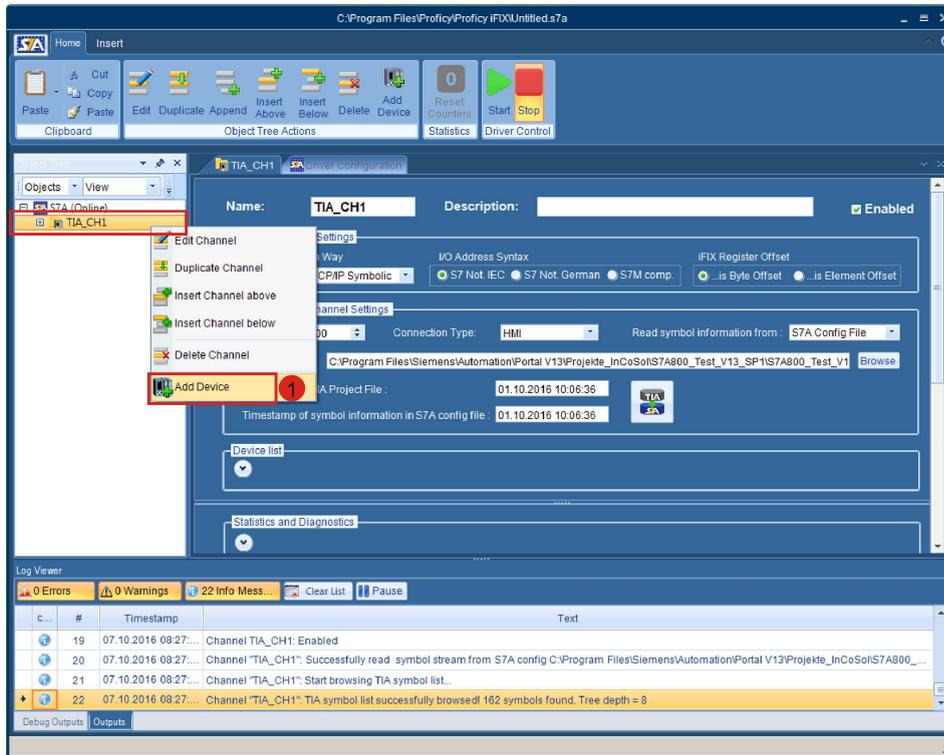


Picture 6: Configuring the specific channel parameters.

- ② Give the channel an unique name. This name must not be used for another channel!
- ③ Select the item "S7A Config File" from the "Read symbol information from" drop down list. With this option the S7A driver stores the symbol information in its configuration file. A permanent access to the TIA project file is not required.
- ④ Select the TIA project file which contains the PLC project you want to access via symbolic addressing.
- ⑤ Click the Button "TIA > S7A" to transfer the symbol information from the TIA project file into the S7A driver configuration file.
- ⑥ Enable the channel.

For all other parameters the default values are suitable.

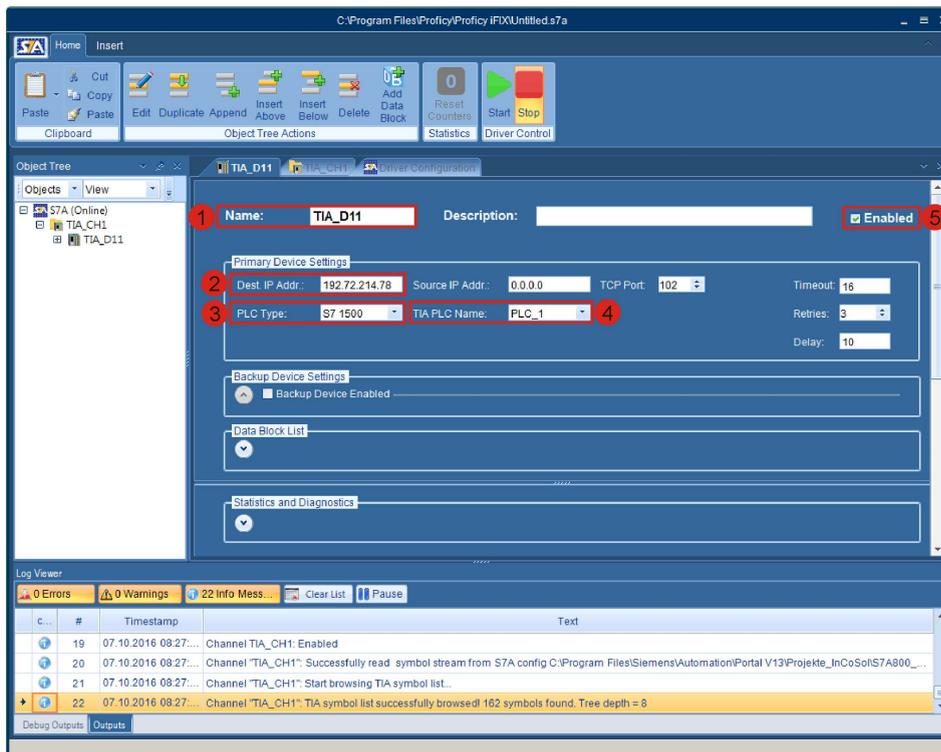
1.5 Create a new device



Picture 7: Creating a new device

- 1 Select the previously created channel in the Object Tree View, open the context menu via right mouse click and select **Add Device** from the context menu to create a new device object.

1.6 Configure the new device



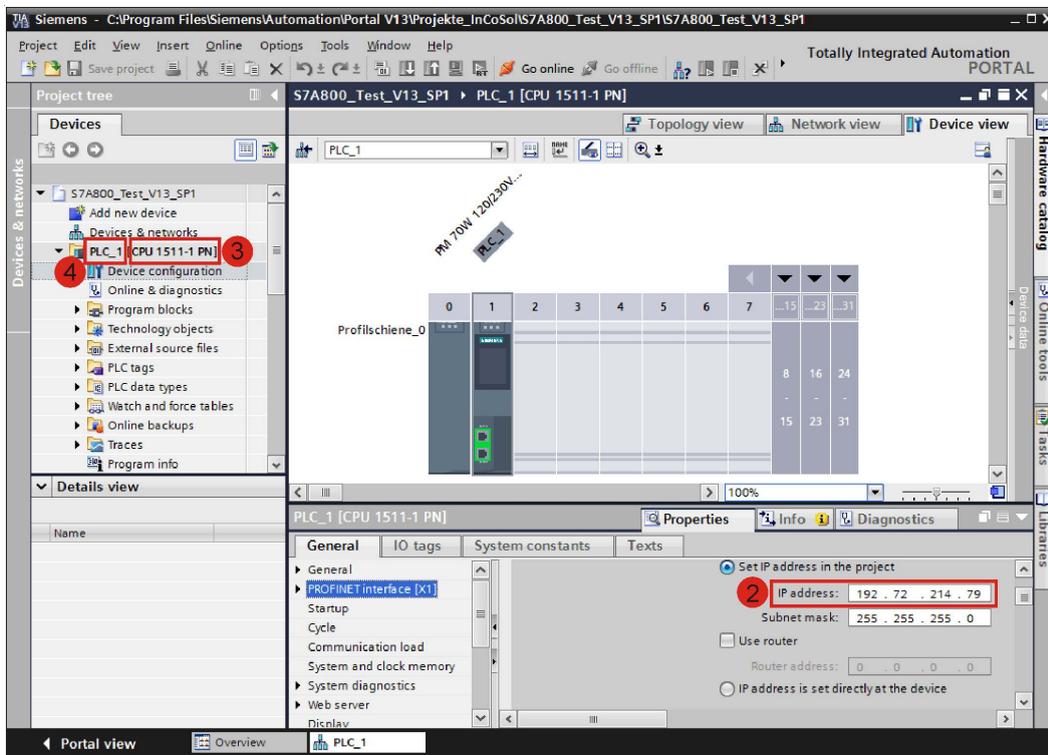
Picture 8: Configuring the specific device parameters.

- 1 Give the device an unique name. This name must not be used for another device!

Note! The device name will later on be used as part of an iFIX I/O address or an OPC item id.

- 2 Enter the IP address of the S7-1200/1500 PLC you want to access.
- 3 Select the proper PLC family type from the list.
- 4 Select the TIA PLC name you want to access within your TIA project. Since a TIA project can contain multiple PLCs it is necessary to select the specific PLC name which has the previously entered IP address.

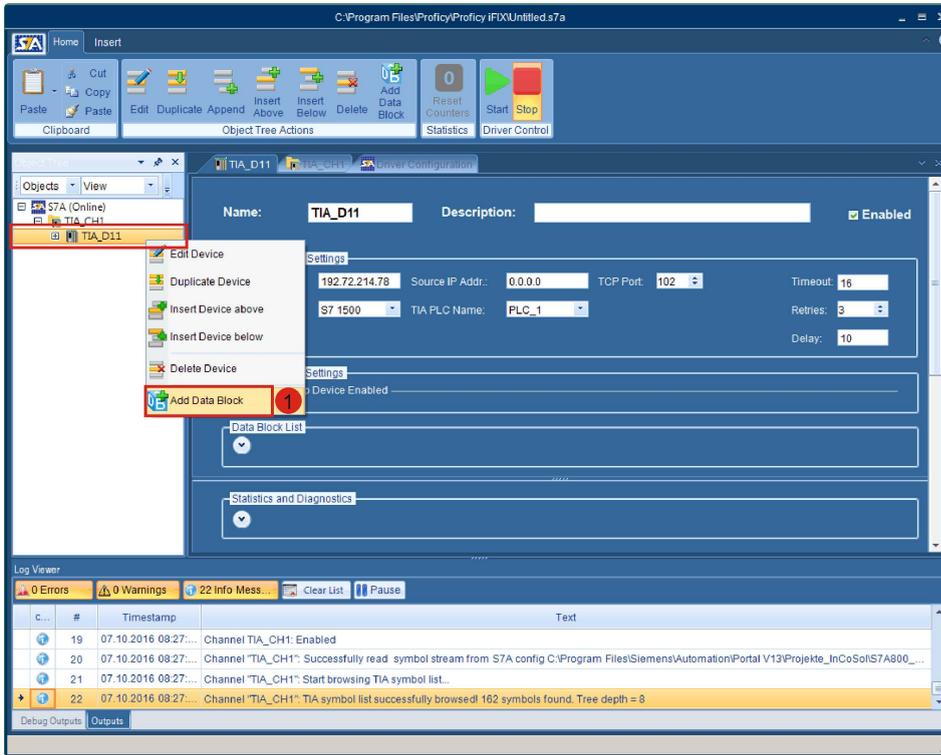
The following screen shot shows the PLC device configuration of the example PLC (with name PLC_1). The numbers in the red dots correspond to those in the above picture which shows the S7A device configuration.



Picture 9:TIA PLC type, name and IP address.

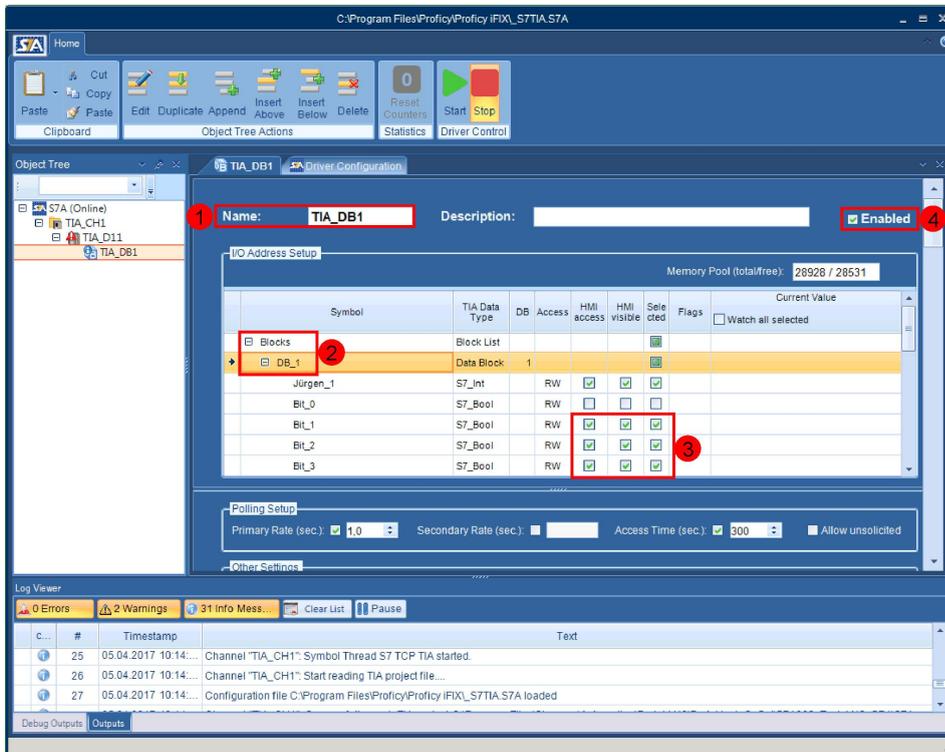
- 5 Enable the device.

1.7 Create a new data block



Picture 10: Creating a new data block

1.8 Configure the new data block



Picture 11: Configuring the Data Block

- 1 Give the data block an unique name. This name must not be used for another data block!
- 2 Expand the TIA symbol tree till you reach the level with the simple variables you want to

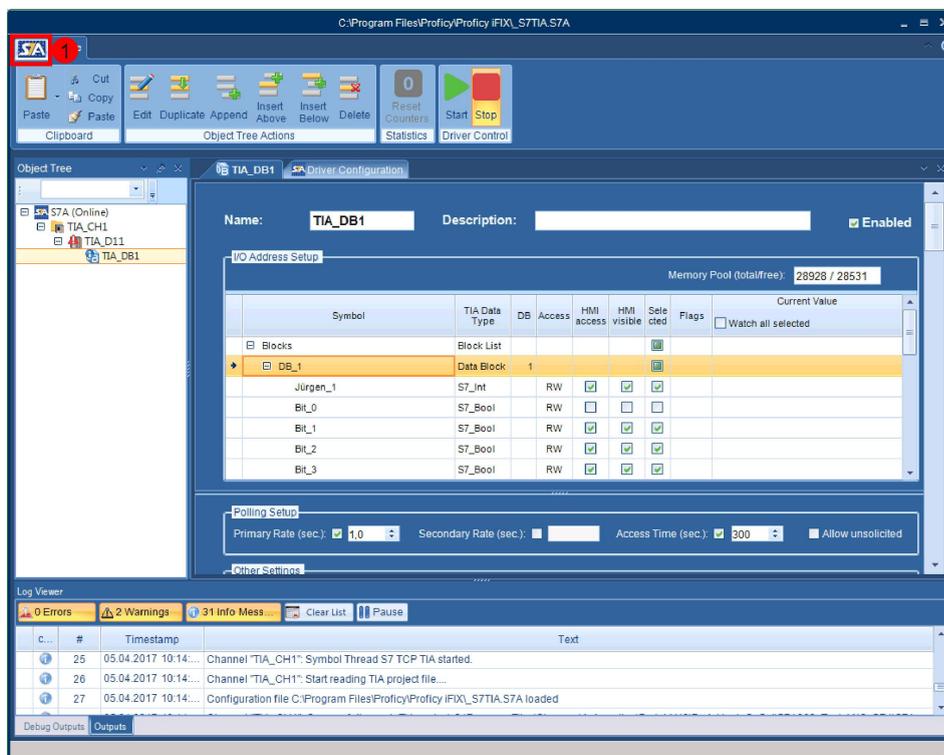
access in this data block.

- 3 Select all variables you want to access in the data block. The data block represents a logical container for a set of TIA symbols. Any symbol of an elementary data type or arrays of elementary data types are allowed to add to the data block's variable set.
- 4 Enable the data block.

Now your minimum configuration is completed. Of course you can add additional channels, devices and data blocks as required for your application.

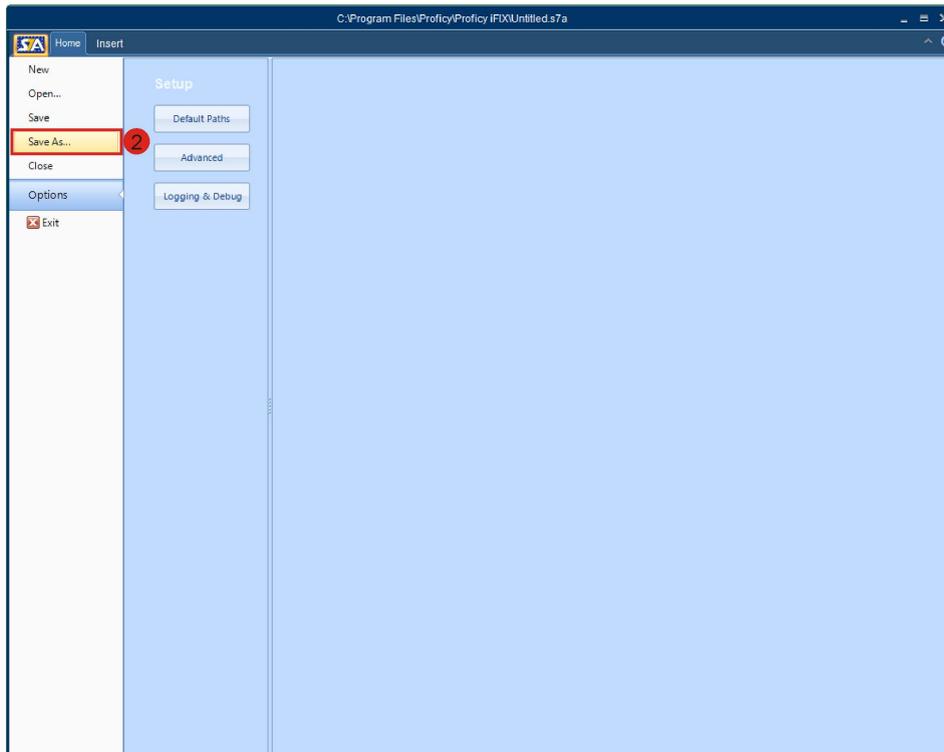
All parameters for channel, device and data block which are not described in this documentation can be left at their default values. The only parameters which may have to be adapted are the polling parameters (primary rate, secondary rate and access time) of the data block.

1.9 Save the new configuration



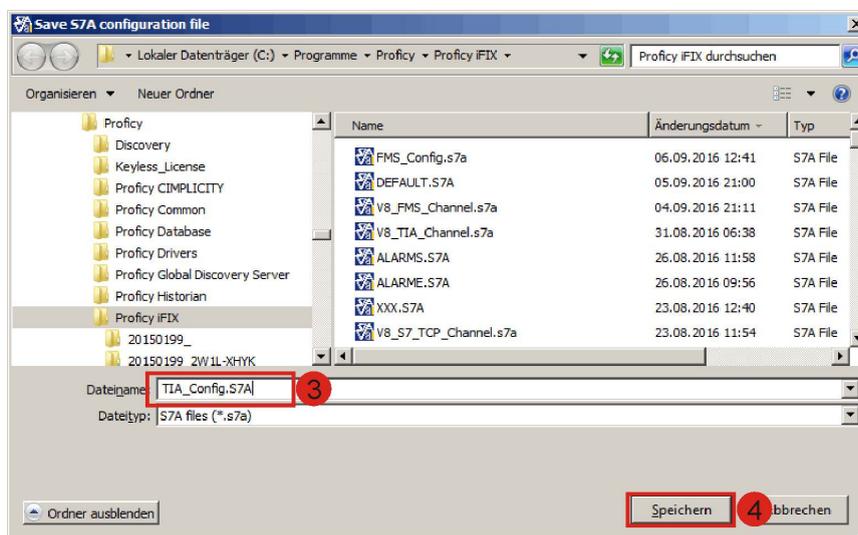
Picture 12: Opening the program's backstage menu

- 1 Click the S7A Program Icon to reach the application (backstage) menu.



Picture 13: Saving the new configuration

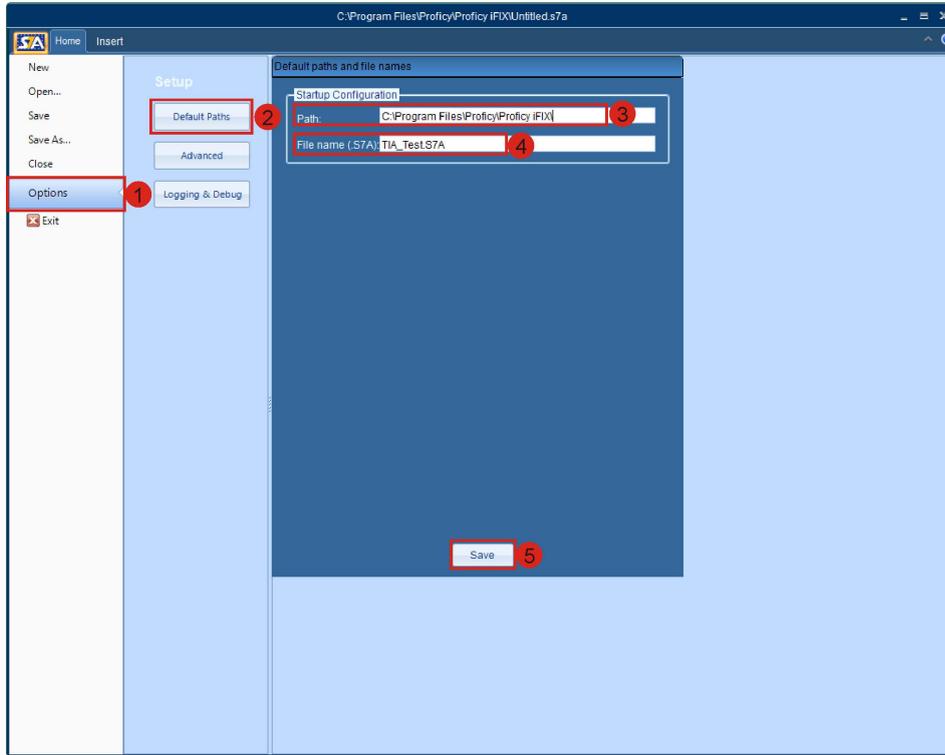
- 2 Select the menu item **Save As...** to open the File Save dialog.



Picture 14: Configuration file save dialog

- 3 Select a folder and enter a valid file name. The name must have the extension .S7A. Click the Save button to finally save the configuration to disk.

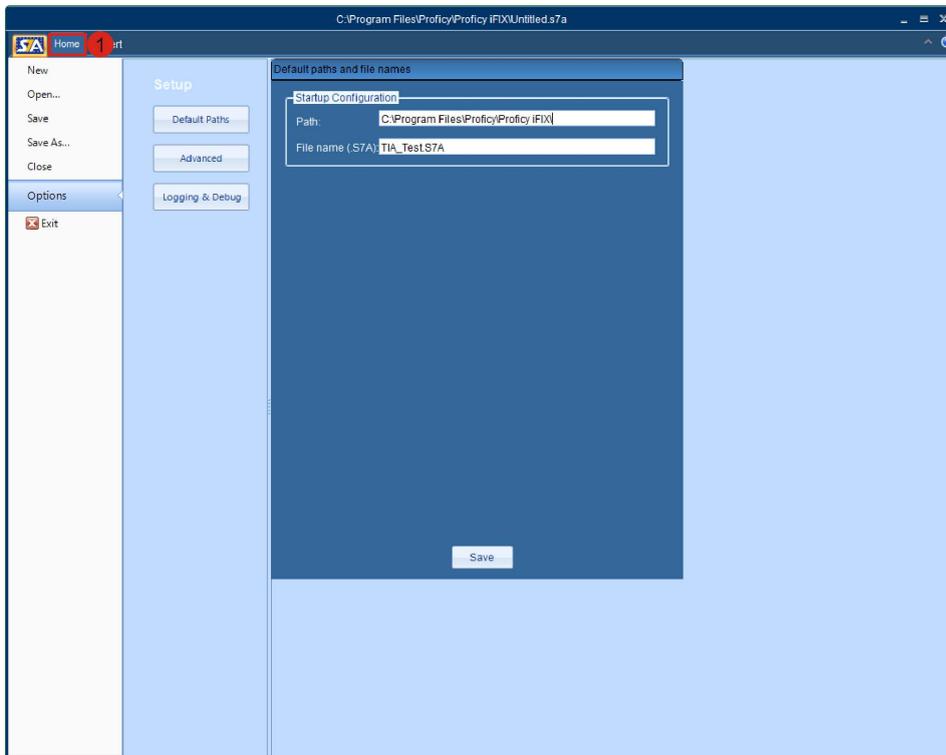
1.10 Set the new configuration as default/startup configuration



Picture 15: Setting default configuration path and file

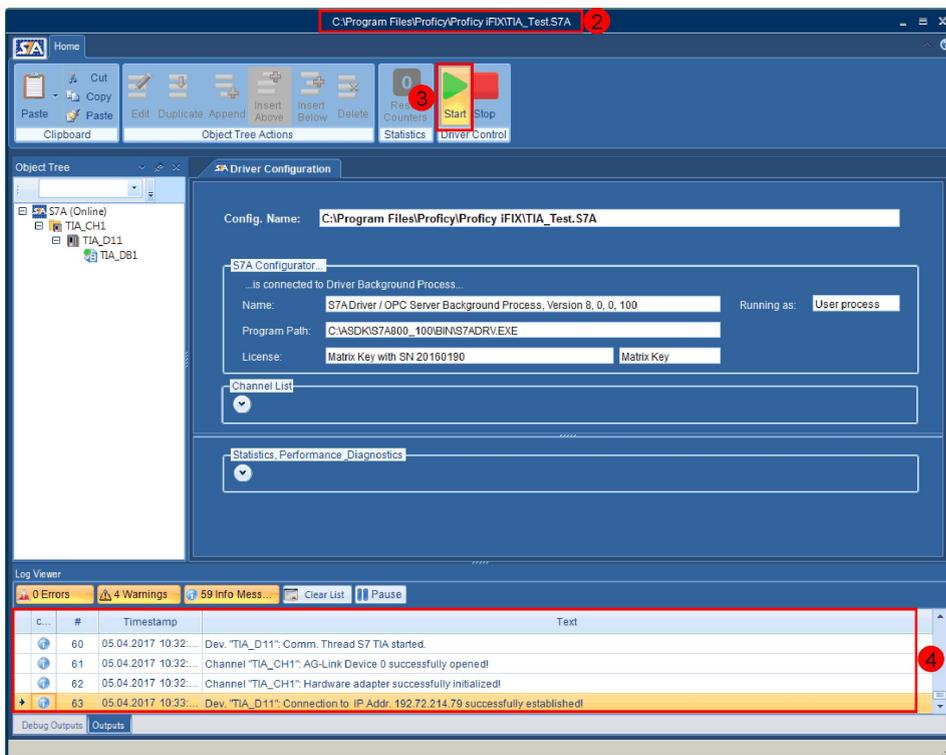
- 1 Open the application (backstage) menu and select the menu item **Options**.
- 2 Click the **Default Paths** button to open the Default paths and filenames dialog.
- 3 Enter the complete path of the previously saved configuration file.
- 4 Enter the name of the previously saved configuration file.
- 5 Click the **Save** button to save the changed parameters permanently.

1.11 Online check of the new configuration



Picture 16: From backstage view to configuration view

1 Click the **Home** tab to go back to the configuration view



Picture 17: Message sequence in Log Viewer window

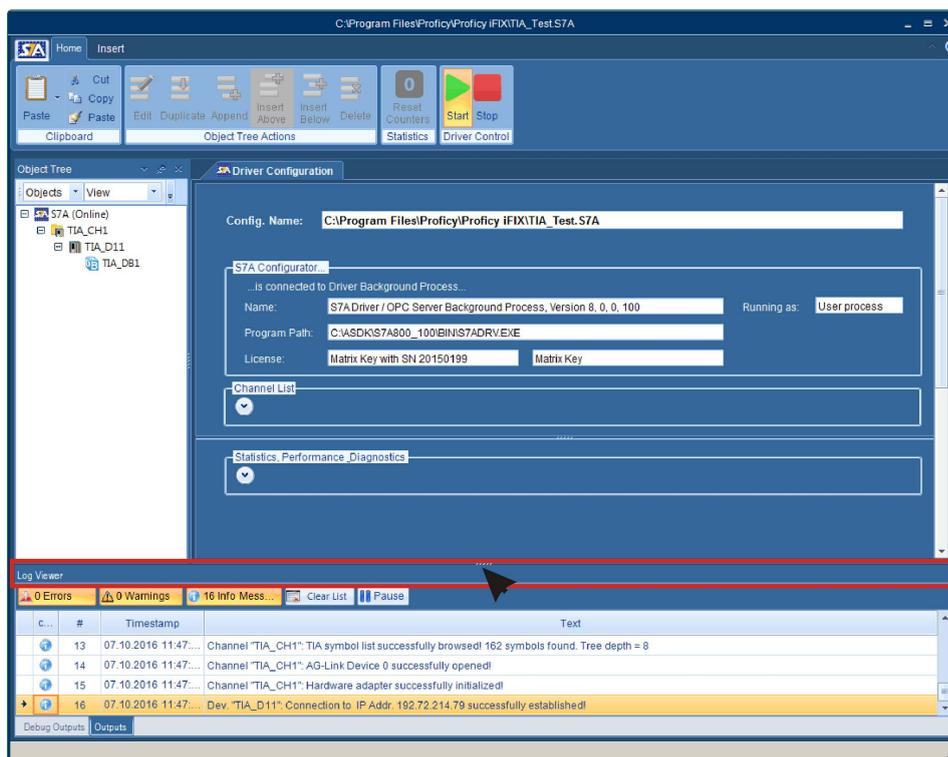
2 Check the program window's header line for the correct configuration file path and name which you have entered as default/startup configuration.

- 3 If the driver is not yet started, click the **Start** button to start it.
- 4 Check the messages in the Log Viewer window. For the previously configured channel and device the following sequence of messages should appear:

```
Channel <Your channel name>: AG-Link Device 0 successfully opened!  
Channel <Your channel name>: Hardware adapter successfully initialized!  
Channel <Your channel name>: Start reading TIA project file...  
Dev. Your device name: Connection to IP Addr. <Your IP address> successfully established!  
Channel <Your channel name>: Successfully read TIA project <your TIA project path and file>  
Channel <Your channel name>: Start browsing TIA symbol list...  
Channel <Your channel name>: TIA symbol list successfully browsed! <x> symbols found. Tree  
depth = <yy>
```

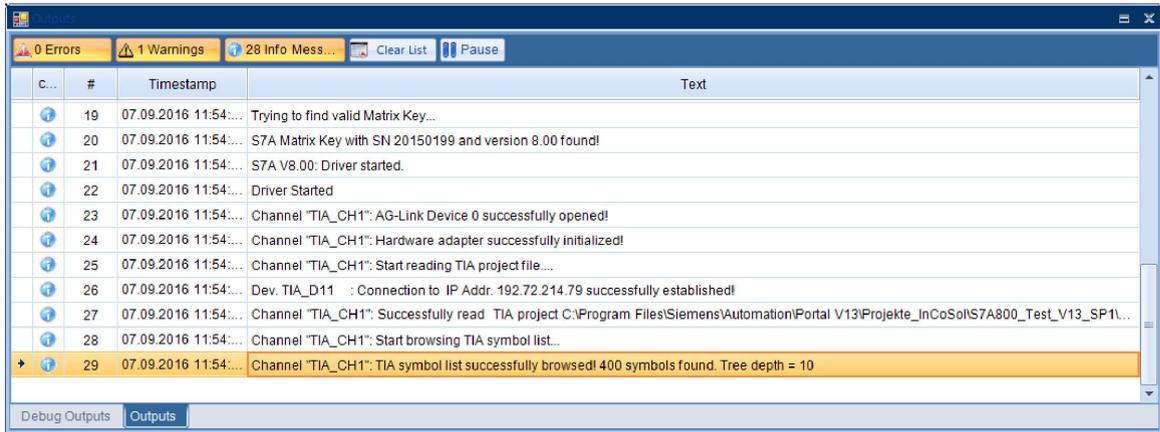
If some of these messages are not shown but instead error messages then you should verify all channel, device and data block parameters, you have configured before. If the problem should persist please contact our support team at support@incosol.de and send us a screen shot of the Log Viewer Window for further analysis.

Hint: For a better presentation of the messages in the Log Viewer window you can drag this window out of the S7A Power Tool's program frame. Afterwards you can resize the separated window in height and width to display a larger amount of messages.



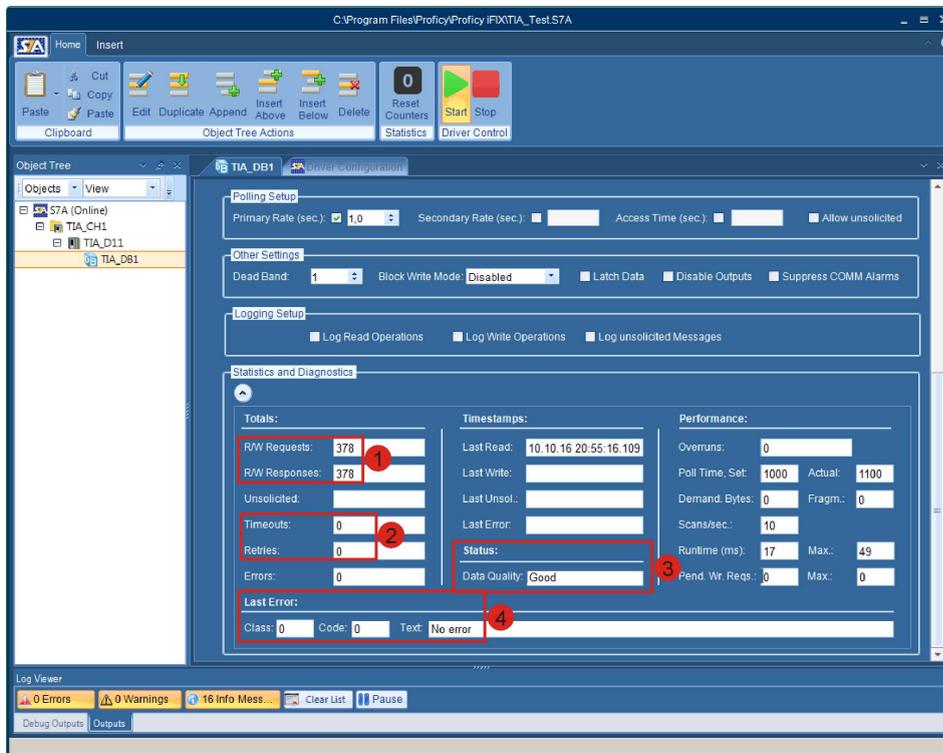
Picture 18: Dragging the Log Viewer window

To drag the window click into the header line of the Log Viewer window, keep the left mouse button pressed and drag the window to the desired area of the desk top. Now you can resize the separated window by pulling it with the mouse cursor at any edge or corner of the window.



Picture 19: Separated Log Viewer Window

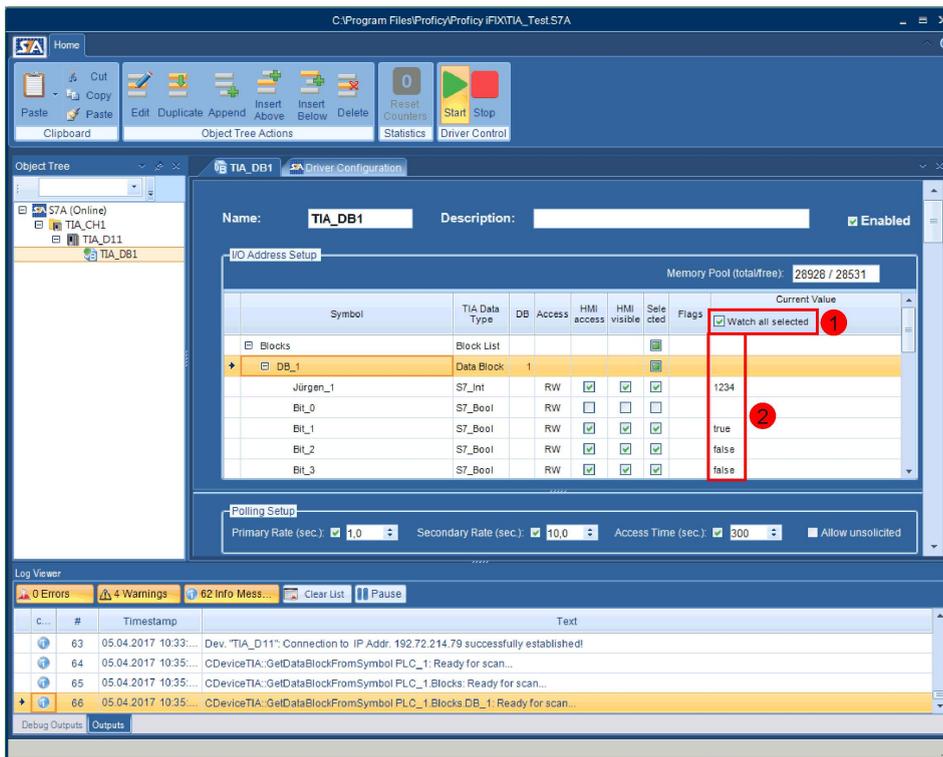
1.12 Check the communication state of a particular data block



Picture 20: Data block statistics

- 1 Click the expand button  in the data block's **Statistics and Diagnostics** Group to expand the dialog. The expanded dialog now shows numerous data fields with counter values, timestamp and other values which give you a detailed view of the runtime behaviour of the data block.
- 2 When the data block (the TIA symbols) is polled properly, the counter fields **R/W Requests** and **R/W Responses** should increase in the rate specified by the Primary Rate field.
- 3 The **Data Quality** should show **Good**.
- 4 The **Last Error Class and Code** should show **0** and the **Text** field should show **No Error**.

1.13 Check the values of the selected symbols



Picture 21: Current values of the selected symbols.

- 1 By checking the **Watch all selected** check box, the program starts to read the current values of all the selected symbols.
- 2 The current values are shown and updated cyclically as long as the **Watch all selected** check box is checked. Values of an array type are displayed one after another separated by a comma.

2 Configuration of the Clients (iFIX or OPC)

The Item ID and iFIX I/O Address must follow the following structure:

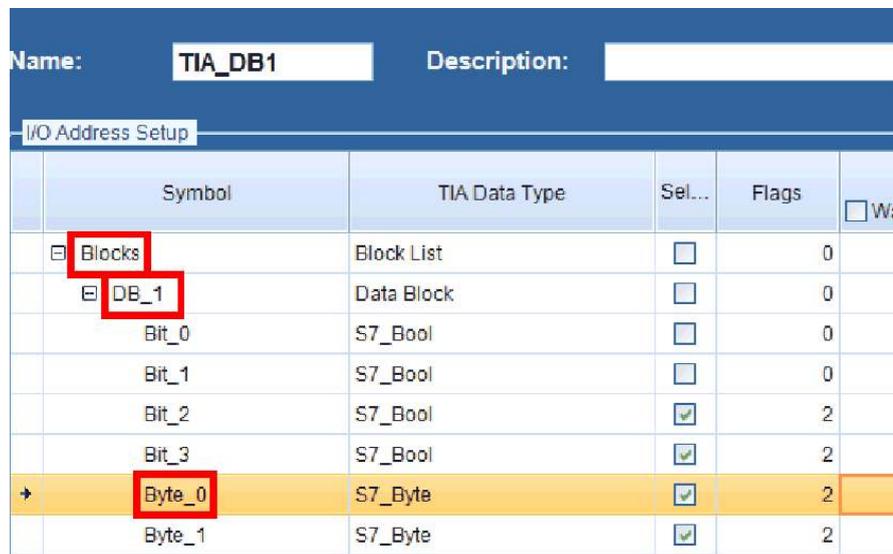
<Device Name>:<TIA Symbol Path>

<Device Name> Is the name of the S7A device as specified in chapter 1.6.



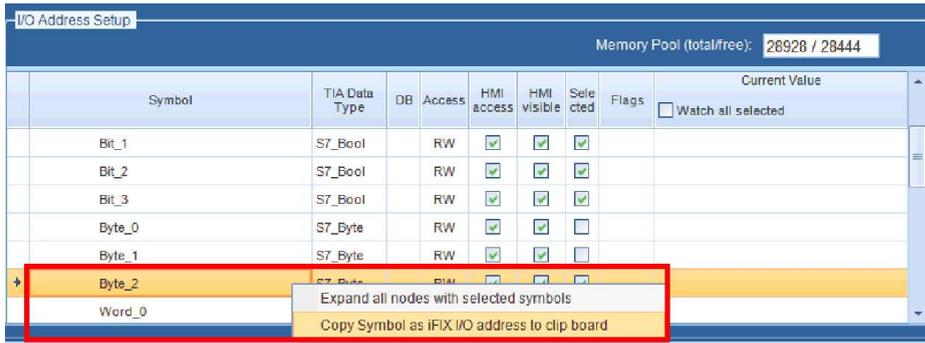
Picture 22: Device name is part of the I/O address

<TIA Symbol Path> Is the full path of a TIA symbol but without the TIA PLC name.



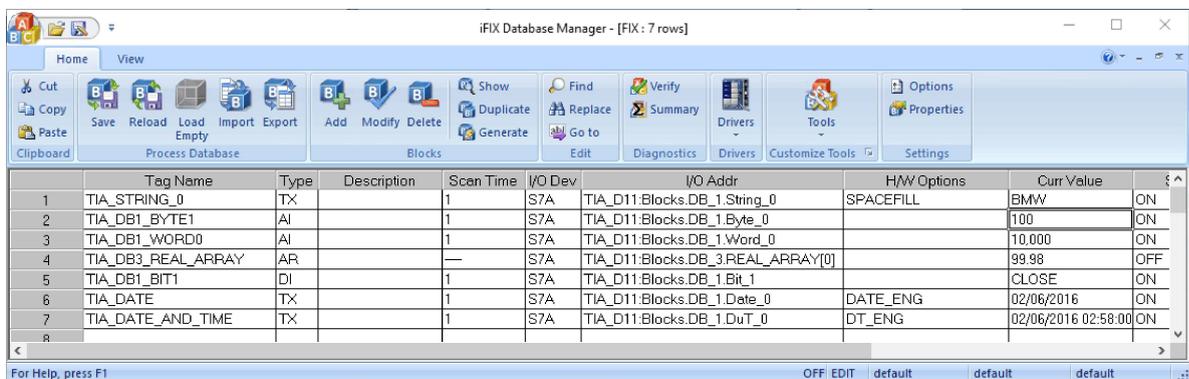
Picture 23: Parts of the TIA symbol path

To make it fast and easy to enter an I/O address in an iFIX data base block, you can select the desired symbol in the S7A data block's symbol tree, open the context menu (right mouse click) and select **Copy symbol as iFIX I/O address to clip board**. Now the clip board contains the full I/O address in the format iFIX or an OPC client it requires and you can paste it directly into the data base block's I/O address field or the OPC client's item ID field.



Picture 24: Symbol context menu to copy symbol path to clip board

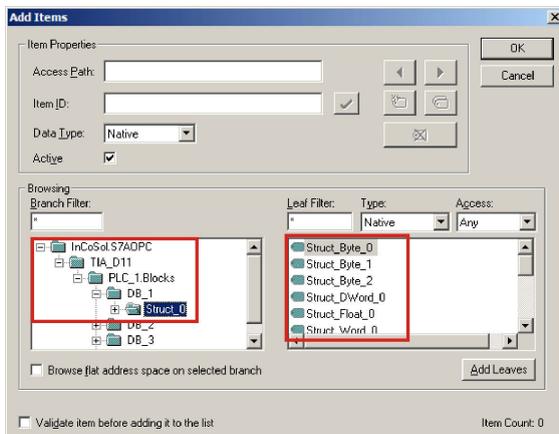
2.1 Example of an iFIX data base



Picture 25: Example of an iFIX data base

2.2 OPC Item Browsing

The driver fully supports OPC item browsing for TIA symbols. The following screen shot shows a browser dialog with expanded symbol tree nodes. The list on the right shows all selectable simple variables of the selected symbol node in the left tree view window.



Picture 26: Example of an OPC item browser