

# SCL Source Converter from STEP 7 V5.x to STEP 7 V1x

SCL Converter

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## SIMATIC SCL Converter

SCL V5.x, V1x

**Problem**

**1**

**Solution**

**2**

**Installation**

**3**

**Operation of the  
Application**

**4**

**Related Literature**

**5**

**History**

**6**

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# Table of Contents

<b>Warranty and Liability .....</b>	<b>4</b>
<b>1 Problem.....</b>	<b>6</b>
1.1 Overview .....	6
<b>2 Solution.....</b>	<b>6</b>
2.1 Solution overview .....	6
2.2 Description of the core functionality .....	7
2.3 Required Hardware and Software Components .....	8
<b>3 Installation .....</b>	<b>9</b>
3.1 Installation des SCL Converters.....	9
<b>4 Operation the Application .....</b>	<b>10</b>
4.1 Description of the user interface .....	10
4.2 Description of storing the constants .....	13
<b>5 Related Literature .....</b>	<b>15</b>
5.1 Bibliography.....	15
5.2 Internet link specifications .....	15
<b>6 History.....</b>	<b>15</b>

# 1 Problem

## 1.1 Overview

### Introduction

The changed program structure of the TIA Portal makes alterations necessary for the implementation of SCL sources created in STEP 7 V5.x.

Commands and expressions in the program code of an SCL source must be adapted to the valid rules in the TIA Portal.

# 2 Solution

## 2.1 Solution overview

### Schematic layout

The SCL Converter supports the user when converting an SCL source from STEP 7 V5.x to STEP 7 V1x (TIA).

### Advantages

The application on hand offers you the following advantages:

- facilitated SCL source conversion from STEP 7 V5.x into STEP 7 V1x
- reduced susceptibility to errors
- users can select or unselect the options of the transformation
- transformed SCL sources can be imported and compiled in TIA Portal

## 2.2 Description of the core functionality

### SCL Converter

You can use the SCL Converter for automatic conversion of your SCL sources from STEP 7 V5.x to STEP 7 V1x. In the SCL tool, you can load the SCL sources, view the results of the transformation, and then save them.

The table below shows you the transformations made by SCL Converter.

Table 2-1: Representation of the transformations

Actions	SIMATIC V5.x	TIA Portal
Convert "DIV" → "/"	3 DIV 7	3 / 7
Convert "OK" → "ENO"	OK := true;	ENO:=true;
Convert "ENO" → "?ENO?"	myBool:=ENO;	#myBool := ?ENO?;
Convert built in function EXPD(...)	EXPD(..)	10**(..)
real numbers must have '.'	3 E10	3.0 E10
indexed memory access	IB[2], MD[3]	IB(2), MD(3)
direct periphery access	PEB1, PQB2	%EB1:P, %QB2:P
indexed periphery access	PEB[1], PQX[4]	EB(1):P, OX(4):P
indexed DB access	DB100.DW[5]	DB100.DW(5)
Migration of constants	CONST	CONST → csv Data
String breaks	'Test1\$> \$<Test1'	'Test1Test1'
NIL → NULL	myAny := NIL;	myAny := P#P 0.0 VOID 0
Array of array (Interface) 1	ARRAY[0..10] of Array [0..10] of INT	ARRAY[0..10,0..10] of INT
Array of array (Interface) 2	ARRAY [0..MAX] ; MAX:=5	ARRAY [0..5]
UDTs in AT constructs	UDT1	"UDT1"
Convert built in function EXPD(...)	EXPD(...)	(10**(..))
LOG(...)	LOG(...)	(LN(...) / LN(10))

SCL Converter provides the option of unselecting the individual transformations via an option window.

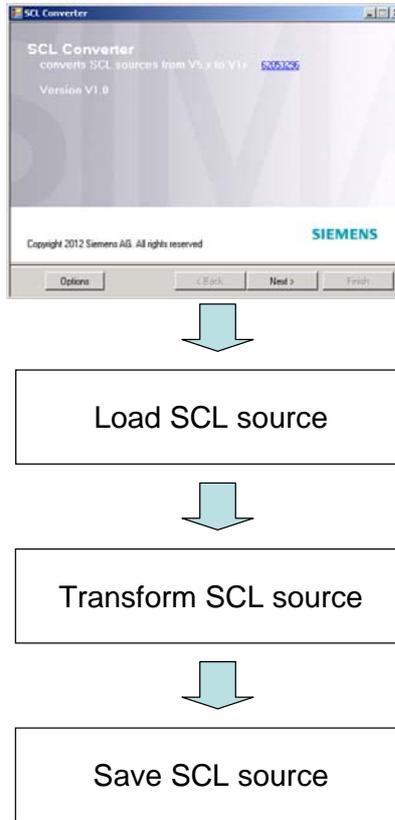
#### Note

For a transformation, "reserved words" in comments (e.g. FUNCTION etc.) are changed ("\_SCLConverter"), since otherwise, they are recognized and may disturb the transformation.

**Overview**

The following schematic layout illustrates the functionality of the SCL Converter.

Figure 2-1



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## 2.3 Required Hardware and Software Components

The application was generated with the following components:

### Standard software components

Table 2-1

Component	No.	Order number	Note
Microsoft Visual Studio .NET	1		

### Sample files and projects

The following list includes all files and projects that are used in this example.

Table 2-2

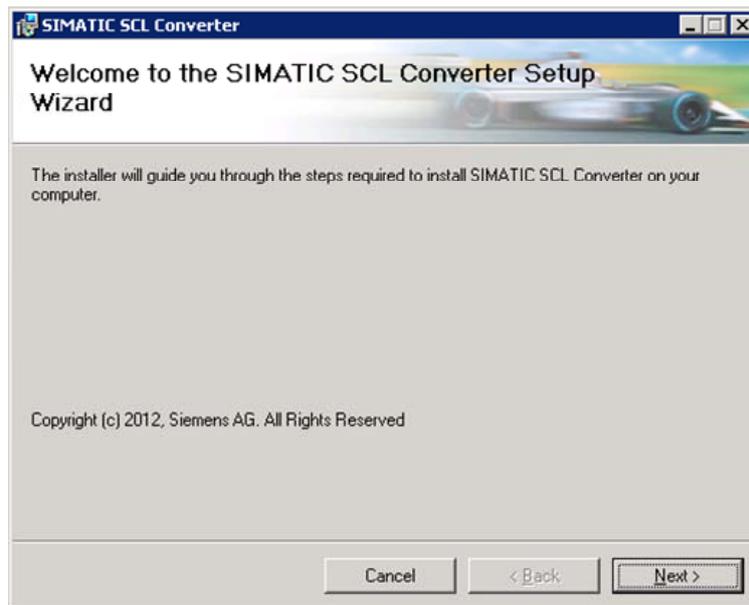
Component	Note
62053296_SCLConverter_CODE_v10.zip	Tool – SCL Converter
62053296_SCLConverter_DOKU_v10_en.pdf	This document.

## 3 Installation

### 3.1 Installation des SCL Converters

Retrieve the zip-file (62053296\_SCLConverter\_CODE\_V10.zip) and go through the setup process by activating the setup.exe file.

Figure 3-1: Start dialog



After successful installation, the tool is available at "Start → Programs → Siemens Automation".

## 4 Operation the Application

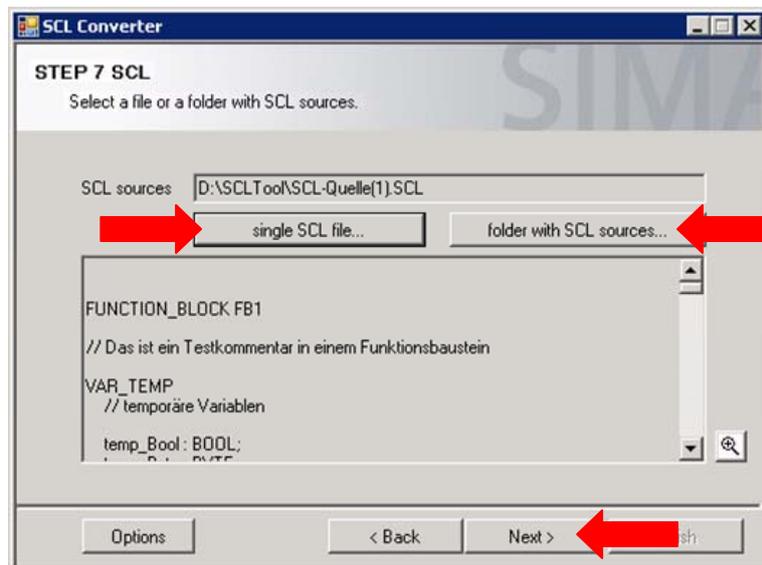
### 4.1 Description of the user interface

Figure 4-1: Start dialog



This dialog starts the SCL Converter. It gives you the option to select or unselect the individual transformations via the “Options” button. The “Next>” button takes you to the input mask of the SCL sources.

Figure 4-2: Input mask of the SCL sources



Here, you can load an SCL source for the transformation. Alternatively, you can select a directory with SCL sources which is searched for SCL sources (with sub-directories).

The bottom part displays the SCL source before transformation. When clicking on the enlargement icon, the SCL source is opened in a standard SCL editor. If no

editor is installed on the computer, the SCL source can be displayed in the SCL window of the converters.

When pressing the “Next>” button, the transformation of the SCL source is started.

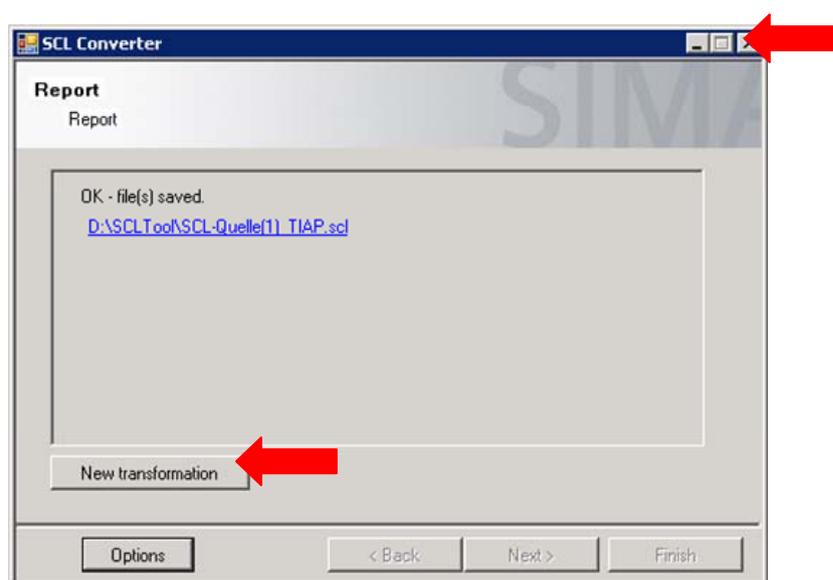
Figure 4-3: Mask of the transformed source



In this window, the result of the transformation is displayed. When clicking on the enlargement icon, the transformed SCL source is displayed in the SCL window of the converter.

When pressing the “Finish” button, the transformed SCL source can be saved to a local directory.

Figure 4-4: Final dialog



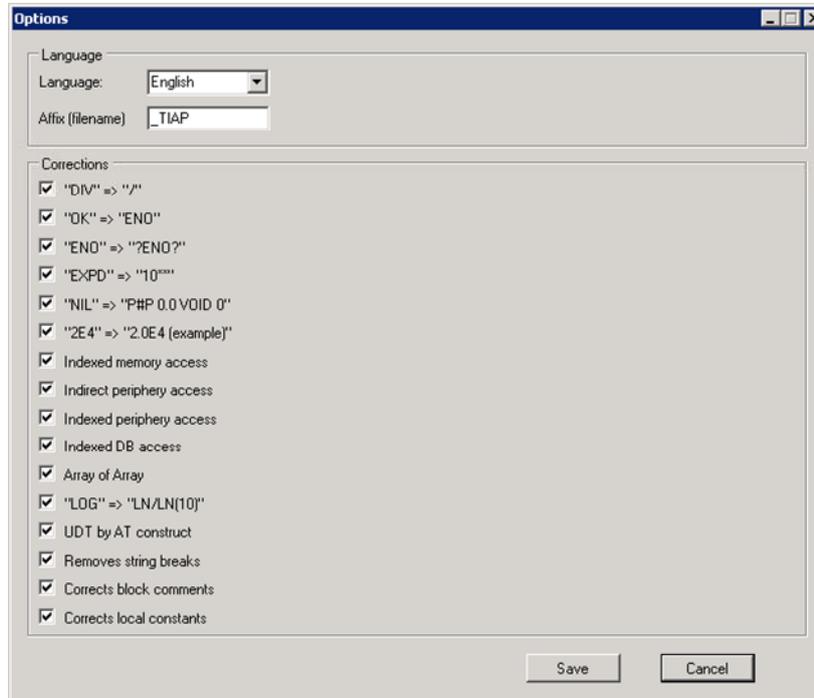
## 4 Operation the Application

### 4.1 Description of the user interface

After saving the transformed SCL source, a final dialog appears. Here, the performed actions and the storage path of the saved SCL sources are displayed.

When pressing the “New transformation” button, a new SCL source can be transformed. The SCL Converter is terminated by closing the window.

Figure 4-5: Options dialog



In the options dialog, the transformations represented in Table 2-1 can be selected or unselected.

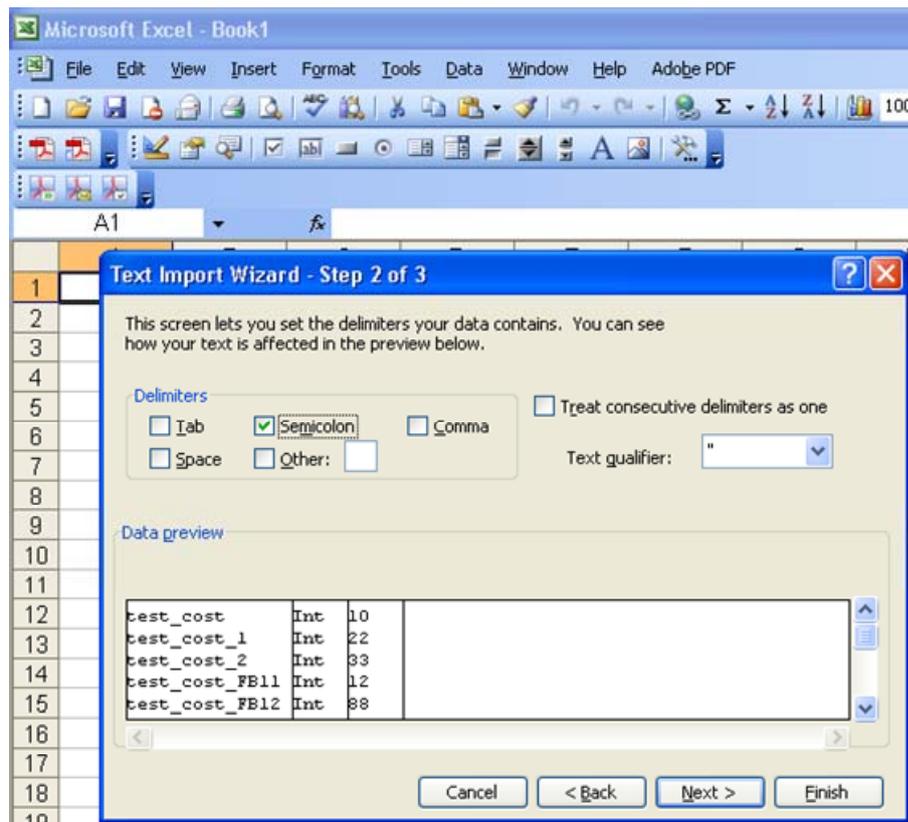
Furthermore, the language can be changed in this dialog as well as file name specified for saving the transformed source.

## 4.2 Description of storing the constants

During the transformation, the constants existing in an SCL source are inserted into a TIA suitable source in a csv file. The data can be imported in MS Excel, for example. Start Excel with an empty workbook. Use the "Data" -> "Import External Data" -> "Import Data" and select the csv-file.

Semicolon is used as a separator.

Figure 4-6: Import constants

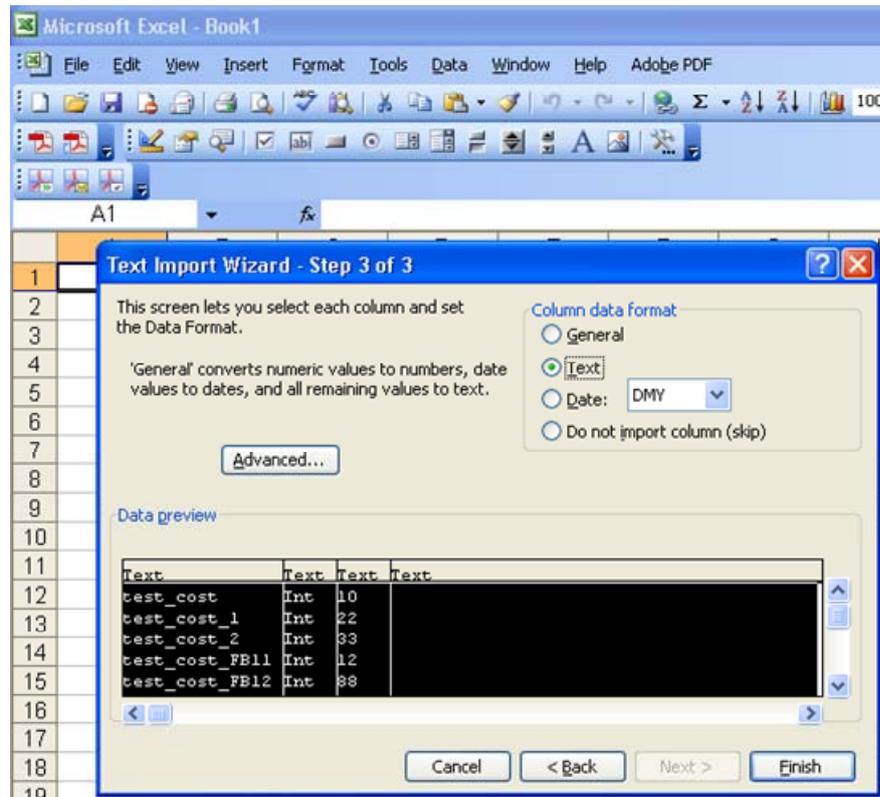


Define all columns as "Text".

## 4 Operation the Application

### 4.2 Description of storing the constants

Figure 4-7: Import constants



Supplement any missing details and calculated the constants.

Figure 4-8: Import constants

Microsoft Excel - Book1

File Edit View Insert Format Tools D

B7

	A	B	C	D
1	test_cost	Int	10	
2	test_cost_1	Int	22	
3	test_cost_2	Int	33	
4	test_cost_FB11	Int	12	
5	test_cost_FB12	Int	88	
6	Zahl_1	Int	45	
7	Zahl_2		45 + 5	
8	Zahl_3	Real	6.3	
9	Zahl_4		6.3 + 22	
10				

Now you can adopt your constants in TIA Portal -> "User constants". Select the data in the Excel table (e.g.: A1:C9). Copy the data into the clipboard (STRG + C). Insert the data into TIA Portal at "User constants" (STRG + V).

## 5 Related Literature

### 5.1 Bibliography

This list is not complete and only represents a selection of relevant literature.

Table 5-1

	Subject	Title
/1/	STEP7 SIMATIC S7-300/400	Automating with STEP 7 in STL and SCL Author: Hans Berger ISBN: 978-3-89578-412-5
/2/	STEP7 SIMATIC S7-300	Automating with SIMATIC S7-300 inside TIA Portal Author: Hans Berger ISBN: 978-3-89578-382-1

### 5.2 Internet link specifications

This list is not complete and only represents a selection of relevant information.

Table 5-2

	Subject	Title
\1\	Reference to the entry	<a href="http://support.automation.siemens.com/WW/view/en/62053296">http://support.automation.siemens.com/WW/view/en/62053296</a>
\2\	Siemens Industry Online Support	<a href="http://support.automation.siemens.com">http://support.automation.siemens.com</a>
\3\	FAQ zum Thema SCL V5.x, V1x	<a href="http://support.automation.siemens.com/WW/view/en/59783677">http://support.automation.siemens.com/WW/view/en/59783677</a>

## 6 History

Table 6-1

Version	Date	Modifications
V1.0	09/2012	First version