



Data Sheet CODESYS Profiler

The CODESYS Profiler enables the detailed measurement of runtime behavior and code coverage at program block level.

The CODESYS Profiler is part of the tool bundle CODESYS Professional Developer Edition.

Product description

With the CODESYS Profiler, software engineers and application developers can perform an early measurement and evaluation of the processing times and code coverage of the different POU's in an IEC 61131-3 application. These measurements can be performed on the CODESYS SoftPLC or a physical device without changing the IEC 61131 application code in the project. Application development and measurement can be done in parallel in one and the same development environment.

Functionality

- Dynamic measurement by instrumentation of code upon each function entry and exit after activating the runtime measurement in the development environment
- Only during measurement: temporary code increase and prolongation of runtime by 10-50% dependent on PLC platform and program structure
- Starting measurement via variable or on command
- Clear presentation of measurement results on the development interface

Benefit

- Performance and code coverage measurement of the machine code already at the beginning of the development phase
- Timely notice of runtime issues
- Identification of time consuming program parts and the portion of unprocessed statements
- No modification of the application code by the user needed for measurement
- Collective or single measurement of application POU's possible
- Determination of code efficiency by comparing historical and current measurements
- Improved software quality

The CODESYS Profiler provides the following main functions:

- Measurement of application runtime ("Profiling") on controllers with CODESYS Control Runtime
- Conditional execution using any Boolean variable
- Runtime measurement of single POU's or POU instances with "Profiler Watch List"
- Measurement of unprocessed statements or "Code Coverage" per POU
- Implicit extension of the binary code during compilation without changing the code of the project
- Application-specific setting options
 - Display of the critical path in the measurement results
 - Selection of measured task
 - Selection of units of measure (ticks, milliseconds, or microseconds)
 - Definition of memory allocated for the measurement
 - Setting of the measurement function (storing the next or maximum cycle)
 - Selection of measured calls
 - Selection of measured POU's for code coverage
- Display of results
 - Summarized overview
 - Call tree (by time or process)
 - Tables
 - Watch list

- Calculation of different information
 - Percentage of time spent in call
 - Total time spent in call
 - Average time of all POU calls of a single cycle
 - Minimum and minimum processing time over multiple cycles
 - Number of calls
 - Display of time spent for each call
 - Standard deviation of average measured time
 - Percentage of processed code
- Export of results in CSV format

Extended menu

Measurement details

Multiple result windows

Details of individual call times

The screenshot displays the CODESYS Profiler interface. The main window shows the 'Profiler results' for a project named 'Machine_1_project'. The interface is divided into several panes:

- Call Tree:** Shows the hierarchical structure of the program, including 'Machine_1', 'P_LC_RPG', and 'P_LC_RPG (RPG)'.
- List:** Displays a list of POU calls with columns for 'Time (ms/µs)', 'Average', 'Min.', 'Max.', 'Own Time', 'Own T.', 'Calls', and 'Standard'. The list includes calls for 'HABITASK', 'P_LC_RPG (RPG)', 'GetNumOfCoils(PUN)', 'SetTiming(PRG)', 'Play (PRG)', 'SettableTime (PUN)', 'ano2Lc_chnng(PUN)', and 'MplConvert(PUN)'.
- Back Traces:** Shows the sequence of calls leading to the current call.
- Times for STF_ENTRY_FB_INIT:** A dialog box showing a table of call times for the 'STF_ENTRY_FB_INIT' function block. The table has columns for 'Duration' and 'Calls'.

Duration	Calls
0.014 µs	1
0.015 µs	2
0.009 µs	3
0.009 µs	4
0.009 µs	5
0.009 µs	6
0.009 µs	7
0.009 µs	8
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0.009 µs	96
0.009 µs	97
0.009 µs	98
0.009 µs	99
0.009 µs	100

Image: Display of the results from a runtime measurement using CODESYS Profiler

General information

Supplier:

CODESYS GmbH
 Memminger Strasse 151
 87439 Kempten
 Germany

Support:

<https://support.codesys.com>

Item:

CODESYS Profiler

Item number:

2101000004

Sales:

CODESYS Store

<https://store.codesys.com>

Included in delivery:

- Package for the CODESYS Development System including license agreement and online help
- License key

System requirements and restrictions

Programming System	CODESYS Development System V3.5.17.0 or higher
Runtime System	CODESYS Control V3.5.0.0 or higher
Supported Platforms/ Devices	The runtime measurement is independent of platform and device (for all CODESYS Control Runtime devices).
Additional Requirements	Subscription of the CODESYS Professional Developer Edition.
Restrictions	<ul style="list-style-type: none"> • Runtime measurement for IEC 61131 program parts only • Potential temporary code increase and prolongation of runtime by 10-50% dependent on PLC platform and program structure • Enabling or disabling the profiling feature or changing the profiling settings requires a download (online change is not possible). • Demo version: limited time and range of functions • 64 bit support with version 1.2.0.0 and higher
Licensing	see CODESYS Professional Developer Edition
Required accessories	Optional: CODESYS Key

Detailed compatibility information

Version	Programming System
2.0.0.0	3.5.17.0 - newest
1.3.1.0	3.5.13.0 - 3.5.16.0
1.3.0.0	3.5.13.0 - 3.5.16.0
1.2.1.0	3.5.12.30 - 3.5.16.0
1.2.0.0	3.5.11.0 - 3.5.16.0

Note: Not all CODESYS features are available in all territories. For more information on geographic restrictions, please contact sales@codesys.com.

Note: Technical specifications are subject to change. Errors and omissions excepted. The content of the current online version of this document applies.