What is PLCcom for S7?

The PLCcom for S7 library is a highly optimized and modern component specially provided for Java / .net software developers to provide software developers with convenient access to a Siemens S7 PLC to read or write data.

PLCcom for S7 offers you the possibility to access address ranges in an absolutely addressed manner by means of put/get, as well as optionally to access variables within optimized and also non-optimized ranges via symbolic addressing.

Depending on the version, the libraries are 100% Java or .net files.
The driver can be integrated directly as a reference, API calls are not necessary. It is easily possible to use the component in 32- or 64-bit environments as well as across platforms.

General

- Publisher: Indi.An GmbH (Copyright ©)
- System: SDK/Library for Siemens S7 communication (put/get and symbolic)
- Current version: 16
- Surroundings: .net and java (depending on the delivery package)

Code examples

For extensive code examples, please see:

- the code examples in the Git repositories
  - https://github.com/Indi-An/PLCcomforS7-examples-dotnet
  - https://github.com/Indi-An/PLCcomforS7-examples-java

- the code examples and online help on our website
  - https://www.indi-an.com/de/plccom/for-s7/fuers7-code-beispiele/

- as well as the respective online help in the delivery package (index.html)

Licensing by license key

A license key is required for operation (User/Serial). Trial keys are available.

Note: You can generate a 14-day trial key on our website at https://www.indi-an.com/en/plccom/for-s7/fors7-download/

System Requirements

PLCcom is a pure .net or java library.
There are no special hardware requirements, the requirements of your application and runtime are decisive.

.net Version

- Microsoft .NET Framework 4.7.2 or newer (.net Framework packages)
- Microsoft .net 5 to .net 10 (.net packages)
- .net Standard 2.1 (compatibility variant)
- Typical target platforms (depending on the package): .net Framework/.net, Xamarin, UWP, Unity.
- Visual Studio 2022 or newer (for sample projects)

Note: MPI/PPI over serial ports is not available outside of Windows.

Java Version

- Java JRE/OpenJRE 11.23 or newer, tested up to version 25
- Eclipse in current version (for example projects)

Note: MPI/PPI over serial ports is not available on Android.

Android (Java)

- Android API 21 or newer
- FileSystemConnector: Android API 26 or newer
- MPI_Device / PPI_Device are not available on Android

Note: Symbolic access on Android is experimental, support for this is not part of the maintenance plans

Operating System Environments

.net / .net Framework

PLCcom .net is available as a .net framework variant (from 4.7.2) as well as a modern .net variant (.net 5 to .net 10).
The .NET Framework variants are designed for Windows; the .net (5+) variants can be used across platforms depending on the .net runtime.

Java

PLCcom Java runs on all systems that provide a compatible Java JRE/OpenJRE
(from version 11.23, tested up to 25).

For Android, the Java version is available from Android API 21.
Notes: Due to the lack of serial ports, MPI_Device and PPI_Device are not usable on Android (java.lang.NoClassDefFoundError).
FileSystemConnector on Android requires at least API 26.

Connection Types / Interfaces

PLCcom supports different connection paths depending on the type of device.

- Ethernet TCP/IP (ISO-on-TCP)
- Serial MPI
- Serial PPI

Note: Due to incomplete support of serial ports by the .NET Framework outside the Windows operating system, the MPI or PPI interface can only be used on Windows.

If you want to use the .net version on Linux, Mac, etc., we recommend that you use a standard Netlink Pro Compact adapter which provides you with a TCP interface.

No support for MPI-PPI interfaces on Android.

To connect devices via the MPI or PPI interface, a serial interface with a Serial-MPI/USB adapter must be used, e.g. Serial-MPI-Adapter or Green Cable (VIPA only).

Access Types

PLCcom supports both classic put/get access (absolutely addressed) and modern symbolic access to variables.

Symbolic access is available as TLS access (from TIA V17) or as legacy access (up to TIA V16), depending on the TIA version.

- • Put/Get access (absolutely addressed)
- • Symbolic TLS access (from TIA V17)
- • Symbolic legacy access (up to TIA V16)

For put/get access to S7-1200/1500, access must be enabled in the CPU, DBs must not be optimized. Symbolic access is subject to firmware and project requirements (see the Compatibility section).

Optimization options

Put/Get: Bundling and reduced round-trips

For high-performance put/get cycles, read and write operations can be bundled in a ReadWriteRequestSet.

PLCcom thus reduces round trips and combines accesses – depending on the mode – into larger transfers.

The execution returns a ReadWriteResultSet with individual results.

- NONE: No optimization (each variable separately).
- COMBINE_AREAS: Combines requests within the same range (e.g. within a DB).
- CROSS_AREAS: Aggregates requests across divisions (e.g., across multiple DBs/Areas).
- AUTO (Expert only): Automatic selection of the most effective strategy, minimal PLC access.

Symbolic: Read Optimization with Execution Plan (Expert)

When symbolically reading many variables, PLCcom can reduce the number of PLC read operations. Optimization mode only affects read accesses. SMART is only available on TLS connections.

- NONE: No optimization.
- OBJECT_BASED: Bundles variables within a root object (e.g. B. DB/struct/array).
- CROSS_OBJECT: Additionally bundles across multiple root objects.
- SMART (TLS only): Intelligent execution plan for maximum performance.

Note: On the first read, depending on the mode, an internal execution plan is created and reused in subsequent cycles. If the list of variables changes, the plan is rebuilt. For cyclic applications, it is therefore advisable to reuse requests.

DualChannelMode (Expert)

In DualChannelMode PLCcom distributes read/write requests to two parallel sessions (two independent communication channels) to the PLC. The aim is to achieve a higher effective data rate or shorter cycle time for larger variable quantities by processing requests in parallel and better overlapping waiting times (round trips).

The assignment of return values remains consistent; the only change for the user is that communication is parallelized internally.

Deep Lookup (Expert)

PLCcom can return values not only for "directly requested" variables, but also for subvariables within a structure. This means that you can, for example, read an entire data block or structure and then query individual fields from it using their symbolic names (e.g., "DB1...Temperature," "DB1...Status").

This means you don't have to include each individual subvariable separately in the query beforehand.

Compatibility with S7 controllers

In its current version, PLCcom is compatible with S7 controllers (200 , 300, 400, 1200, 1500, SoftSPS WinAC RTX as well as Logo! 0BA7 / 0BA8 / 0BA0 / 0BA1 / 0BA2) as well as CPUs from other manufacturers (e.g. VIPA 100V/200V/300V/300S, etc.)

Symbolic access is possible to S7 controllers of the 1200, 1500 an ET200SP series.

Note: Due to the lack of availability of S7-200 SMART controllers within Europe, these controllers are not officially supported.

Put/Get

- Ranges: I/O, Markers, Timers, Counters, Unoptimized DBs
- S7-1200/1500: Put/Get is disabled by default and must be enabled in the CPU under **Protection & Security / Users & Roles** .
- DB access: **Disable "optimized access"**

Symbolic – TLS (from TIA V17)

- CPUs: S7-1200, S7-1200 G2, S7-1500, PLCSim
- Authentication: Password or username/password
- Prerequisite: Project/hardware configuration at least **TIA V17**, then **recompile and commit**

Symbolic – Legacy (up to TIA V16)

- CPUs: S7-1200, S7-1500
- Authentication: Password (PLCSim without password)
- Note: Depending on the firmware, Legacy must be explicitly enabled in the controller.

Tested Firmware Ranges (TIA V21)

TLS Access:

- S7-1200 **V4.5–V4.7**
- S7-1200 G2 **V4.0–V4.1**
- S7-1500 **V2.9–V4.1**

Legacy Access:

- S7-1200 **V4.1–V4.7**
- S7-1500 **V2.1–V4.1**
- Note: Release is valid within the mentioned firmware ranges; other versions have not been tested.

Other functions at a glance (depending on the edition, see https://www.indi-an.com/de/plccom/for-s7/)

- Access via put/get or symbolic addressing
- High-performance accesses through intelligent bundling and reduced round-trips (minimal PLC accesses)
- Parameterizable put/get optimization: NONE, COMBINE_AREAS, CROSS_AREAS, AUTO (Expert)
- Symbolic read optimization: NONE, OBJECT_BASED, CROSS_OBJECT, SMART (TLS only, Expert)
- DualChannelMode (Expert)
- Deep Lookup (Expert)
- Read and write DBs, inputs, outputs, markers, timers and counters
- Extensive data type support including time/date, strings, BCD and raw
- Arrays and structs in symbolic access (read; write element-by-element)
- Multiple operations per function call with detailed return values per operation
- Simultaneous access to multiple/different CPUs
- Subscribing to data ranges (put/get) or variables (symbolic)
- Alarm functions: Subscribe to alarms, read out the current alarm list, acknowledge alarms
- PLCcom DataServer (Expert, Put/Get): cyclic monitoring with event on changes
- Logging connectors: file system or SQL databases
- Optional: Updating logging and data image in the file system/SQL
- Optional: encrypted storage in the file system (password)
- CPU functions: start/stop the CPU (depends on CPU/edition)
- Read and set PLC time
- Device/diagnostic information: type/order number/serial number/firmware, CPU mode, key switch position, LED status readout
- Reading System Health Lists (SZL)
- Read diagnostic data
- Send Password / Password Transfer to Protected Controllers (Expert)
- Blocks (Expert): Read block list and block lengths
- Blocks (Expert): Backup/restore of blocks (MC7) incl. restore with changed block number
- Blocks (Expert): Deleting blocks
- Blocks (Expert): Output block details (code, creation languages, author, ...)
- AutoConnect (configurable automatic connection management)
- Asynchronous Connection
- Internal auxiliary and conversion functions for PLC data types
- and much more

Professional support, maintenance plans (Maintenance Plan)

For PLCcom for S7, maintenance plans are available with a term of 1, 2 or 3 years. During the term, all upgrades and updates are provided free of charge; technical support is also included in case of technical problems.
After the maintenance schedule expires, there is no automatic renewal.
If desired, the maintenance plan can be extended – you will receive a quote before it expires.

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