



WAGO Controllers with CODESYS 3.5 Colossal Performance in Minimum Space

The image is a composite graphic illustrating the integration of WAGO hardware with CODESYS 3.5 software. It features three main elements:

- Top Left:** A computer monitor displaying the CODESYS 3.5 software interface. The main window shows a ladder logic program for 'PLC_PRG'. The program text is as follows:

```
PROGRAM PLC_PRG
VAR
  GENAlarmState: BOOL;
  GENShutDown: BOOL;
  GenRunRequest: BOOL;
  StartDelay: TON;
  StartDealyET: TIME;
  StartDelayQ: BOOL;
  GENOverHeat: BOOL;
  TempDelay: TON;
END_VAR
```
- Bottom Left:** The CODESYS logo, consisting of a 3D cube with a red front face and grey sides, and the text 'CODESYS' below it.
- Bottom Right:** A physical WAGO PLC controller unit, model 200-9100-1125-002, shown in a perspective view. It is a compact, grey industrial device with various ports and a terminal block.

A large, stylized white cross is overlaid on the center of the image, connecting the software interface to the hardware unit. A schematic diagram of a temperature delay timer is also visible at the bottom, showing a 'GT' (Greater Than) comparator block and a 'Ton' (On-Delay Timer) block. The 'GT' block has an input 'Temp' and a setpoint 'I#10s'. The 'Ton' block has an 'IN' input and a 'Q' output, with a 'PT' (Preset Time) of 'I#10s'. The output of the 'Ton' block is labeled 'TempDelayET'.



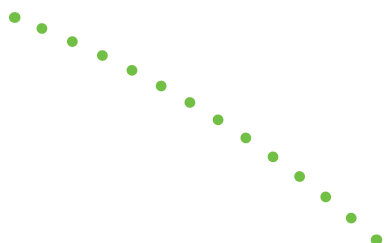
A Matched Set

WAGO Controllers

Bring innovations to market faster and earn a quicker return on investment (ROI) by matching WAGO's full line of controllers, which include the Compact Controller 100, PFC200s, TP600s and Edge Controller, with CODESYS 3.5, the market's leading engineering tool. Complete your logic programming, develop visualizations and manage your network communications in a straightforward approach.

Your Benefits:

- Programming according to IEC 61131-3 using CODESYS 3.5
- Provides visualization features via any HTML 5 web server
- PLC, IT and OT combined operations/functions in one device
- Multiple controller options optimizing your application
- High cybersecurity standards (SSL, SSH, OpenVPN and firewall)
- Remote access via mobile communications
- Linux® real-time operating system
- Docker-ready controllers
- Multiple controller options to optimize your application
- IIoT Cloud access



CODESYS 3.5 Engineering Tool

WAGO Controllers are programmed using market leading CODESYS 3.5 software to help reduce development time, costs and enable engineers to use the appropriate language for their applications. In addition, this software is used to create web visualizations that can be used by equipment operators and maintenance staff to interface with machines.

Professional engineering software for IEC 61131-3 compliant projects

- Support of all IEC 61131-3 programming languages
- Program Organization Units (POUs) for code optimization
- User developed Function Blocks with security for IP protection
- Code documentation via single and multi-line comment tools

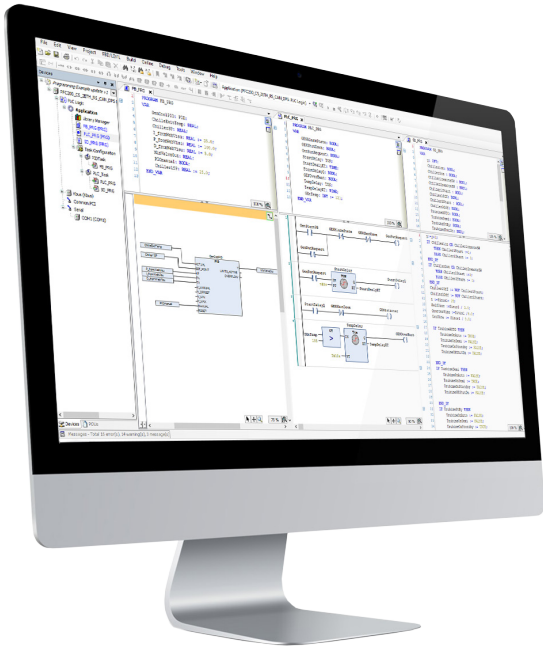
Build your own operator interfaces via HTML5 Web Visualizations

- User interfaces via a web browser
- Develop dynamic HMI screens for operators and maintenance
- Tag commands with role based permissions
- Leverage pre-designed objects such as push-buttons, pilot lights, trend graphs and more
- Embedded graphic files as backgrounds for user clarity

Expand your options via a Linux based real-time operating system

- Docker applications in parallel with IEC61131
- Add data handling apps like Node Red

Software



CODESYS

Multiple Programming Languages

The WAGO Controllers are programmed with CODESYS, the leading software platform for IEC61131-3 compliant project engineering. This system combines advanced programming with capabilities of professional software development for modern control applications.

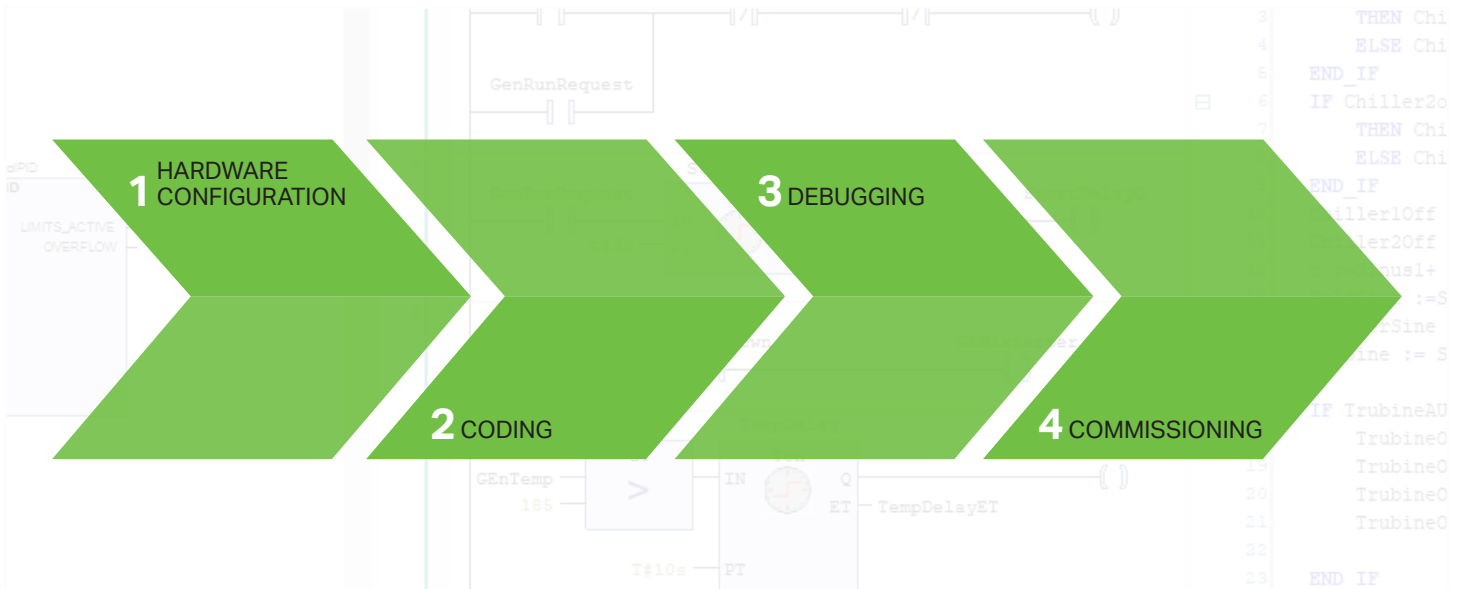
Supported IEC61131-3 Languages include:

- Ladder Diagram (LD)
- Structured Text (ST)
- Function Block Diagram (FBD)
- Sequential Function Chart (SFC)
- Instruction List (IL)

Development of HMI screens directly in the IEC61131-3 environment

Developing a human machine interface (HMI) and PLC application will enable users to operate & maintain their systems in a very efficient manner. The HTML5 based visualizations are hosted within the PFC200 and can be viewed using most web browsers on your PC and mobile devices. With the logic and HMI development tools using a common database, engineering development time and maintenance costs can be reduced.

- Create modern and professional visualization screens quickly
- Integrated alarm management tools
- Language, images and unit conversion switching
- Multi-level security access features



Software Development Process

With proven tools, engineers can quickly design code, visualizations, debug and commission their projects.

Typical application programming passes through different phases. The CODESYS development system supports users all the way from configuration to commissioning.

Features of the Development Environment:

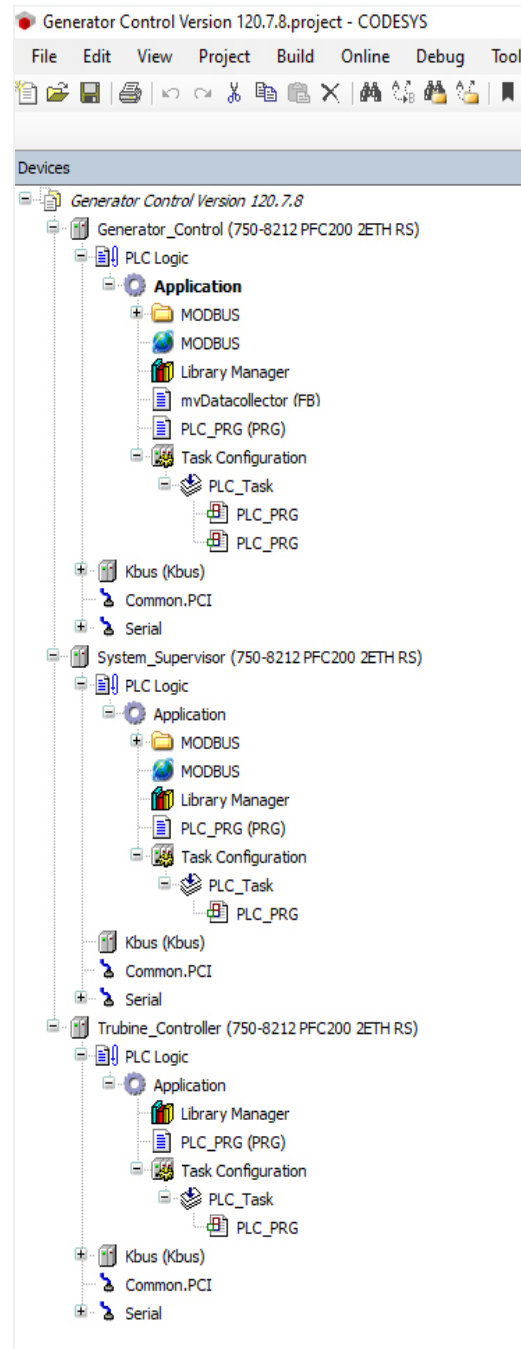
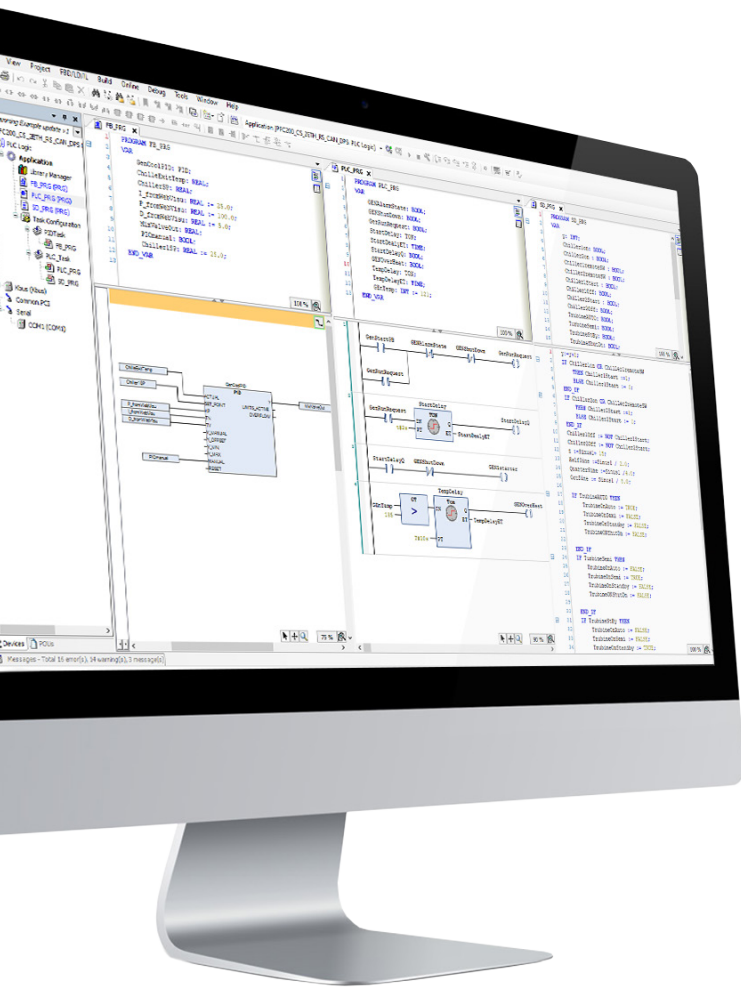
CODESYS 3.5 software provides control engineers and technicians with advanced features within the development environment including:

- Tools for creating structured & efficient applications
- WAGO and CODESYS libraries with documentation
- Multi-Controller development in one application
- Task system to optimize application performance
- Customizable windows
- Color-coded syntax & automatic syntax checking
- Integrated debugging plus tracing tools
- Security built-in: file encryption & communications
- Monitoring of variable values online
- Online programming changes
- CODESYS network variables for data exchange between different controllers
- Device tree for hardware structure mapping

WAGO offers the CODESYS development environment system FREE of charge.

Download at downloadcenter.wago.com/software

Programming



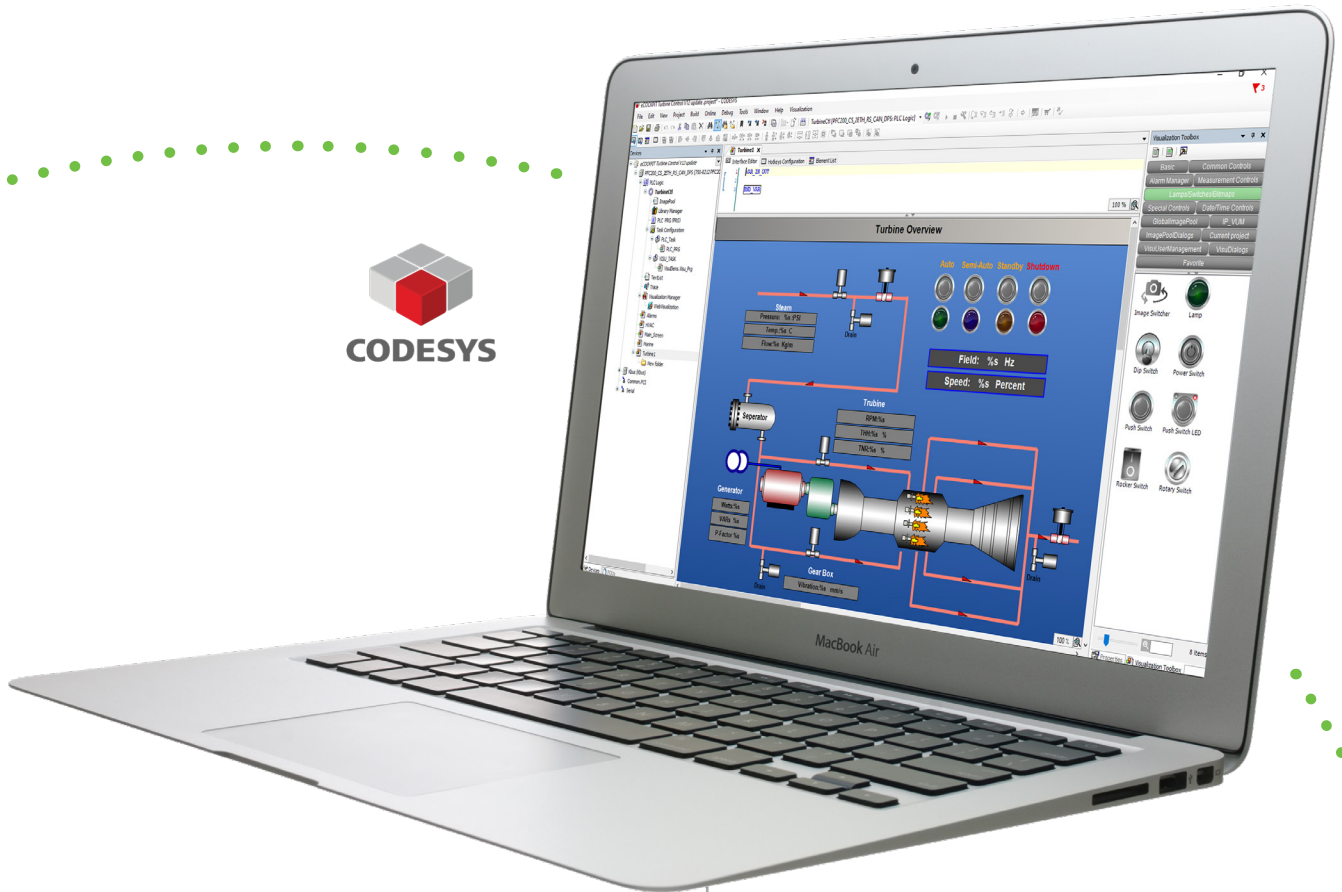
Advanced Technologies

- Object oriented programming support
- Offline program simulation for debugging

Multi-Controller Support

- Easily manage multiple controllers & distributed I/O
- Simultaneous controller download

Visualization



Advanced User Interface

- Develop dynamic web pages for cost effective HMI
- Access to all tags to speed design process
- Pre-configured common devices

ETHERNET



HTML5 Technology

Easily display web pages on PCs, tablets or smartphones

Communications

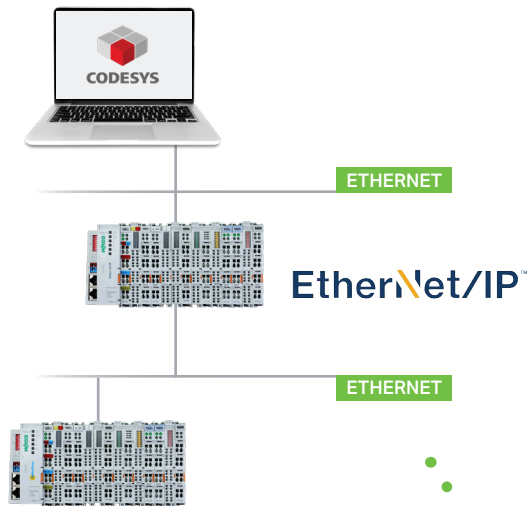
Ethernet Fieldbus Configuration

WAGO's line of controllers support the most popular Ethernet based protocols. Take advantage of setting the controller to an Ethernet Fieldbus master or adapter - including:

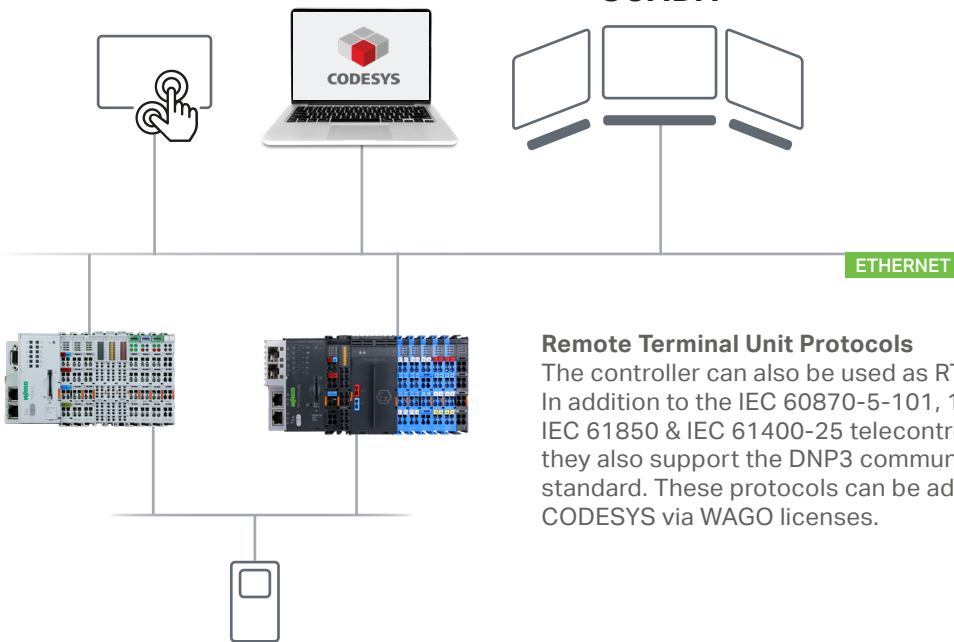
- MODBUS TCP – Master, Server
- EtherNet/IP – Scanner, Adapter
- EtherCAT – Master
- BACnet - Server

The ETHERNET interfaces also support all common protocols such as DHCP, DNS, NTP, FTP & HTTP.

A secure connection is provided via SSH, HTTPS, FTPS & TLS

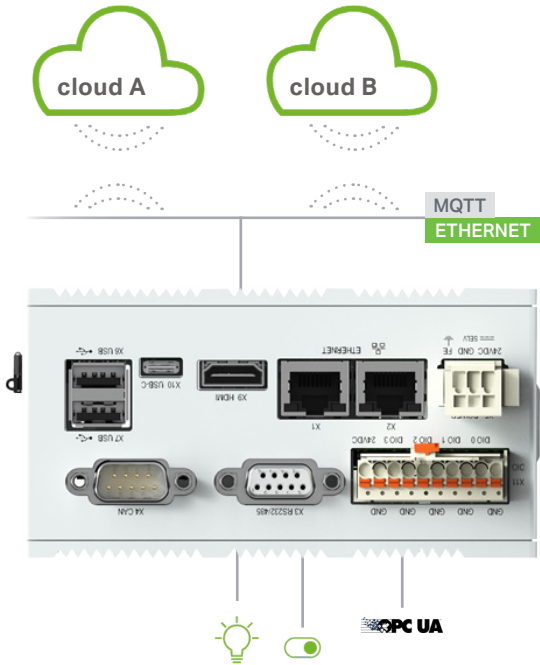


SCADA



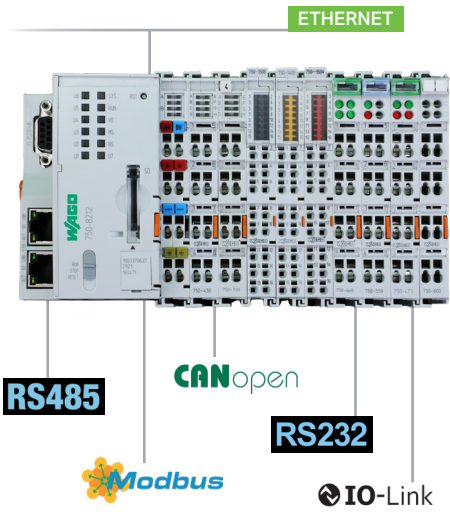
Remote Terminal Unit Protocols

The controller can also be used as RTUs. In addition to the IEC 60870-5-101, 103, -104, IEC 61850 & IEC 61400-25 telecontrol protocols, they also support the DNP3 communication standard. These protocols can be added to CODESYS via WAGO licenses.



IIoT Protocols

OPC UA and MQTT capabilities are integrated into WAGO’s line of controllers in order to make them IIoT-ready. Each controller supports MQTT, a powerful IIoT protocol that has developed into a standard in many industrial automation applications, by default. For customized solutions, the OPC UA interface can be implemented. With “Multi Cloud Connectivity”, the option for a parallel connection of a WAGO Controller to two different cloud systems, IIoT platforms or MQTT brokers is possible. This means that different tasks can be implemented in the appropriate cloud application using OPC UA or MQTT.



Industrial Protocols

Use the WAGO Controller for stand alone control or as a communications gateway between common serial-based communication and Ethernet based protocols. Interface via CANopen, Modbus RTU, IO Link, RS232 or RS485 with end devices for holistic system control without the need for communication converters.



Support

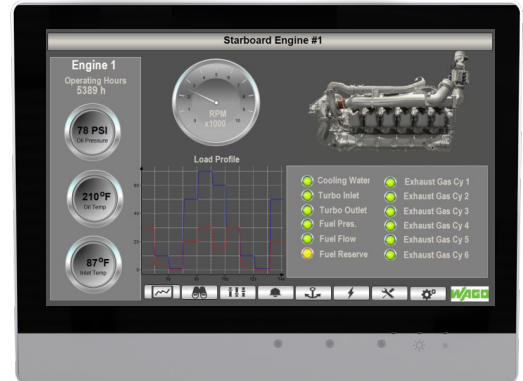


CODESYS 3.5 Ethernet Based Industrial Protocols

CODESYS 3.5 offers users powerful communication capabilities by natively supporting multiple Ethernet based industrial fieldbuses.

Available Licenses for Compact Controller 100 and PFC200 Controllers with CODESYS 3.5

Description	License	Comment
BACnet 300	2759-283/211-1000	BACnet Unlimited Tag Objects
BACnet 300 M	2759-2283/211-1000	BACnet 256 Tag Objects
BACnet 300 S	2759-2273/211-1000	BACnet 48 Tag Objects
IEC 60870 Server	2759-290/211-1000	Simultaneously maintain up to 4 connections to the control system
IEC 60870 Master M	2759-293/211-1000	Support connections up to 16 IEC 60870-5 devices
IEC 61850 Server	2759-2240/211-1000	Creation of gateway converter & supports GOOSE Publisher
IEC 61850 Client M	2759-2243/211-1000	Process data from up to 4 servers with each 10 requests
DNP3 Server	2759-2290/211-1000	Send digital, analog & count values to the controller
DNP3 Master M	2759-2293/211-1000	Maintain connections for up to 4 DNP3 devices
Sparkplug	2759-247/210-1000	Add MQTT-based Sparkplug & define both topic and payload
Multi Cloud Connectivity	2759-248/211-1000	Two different cloud systems, IoT platforms or MQTT brokers
Library Controller Redundancy Master	2759-245/211-1000	Operate redundant master PLCs



Available Licenses for TP600 Control Panel & Edge Controllers with CODESYS 3.5

Description	License Part Number	Comment
BACnet 600	2759-286/211-1000	BACnet Unlimited Tag Objects
BACnet 600 M	2759-2286/211-1000	BACnet 256 Tag Objects
BACnet 600 S	2759-2276/211-1000	BACnet 48 Tag Objects
IEC 60870 Master L	2759-296/211-1000	Up to IEC 60870-5 connections
IEC 60870 Client L	2759-2246/211-1000	Process data from up to 4 servers with 10 requests each
DNP3 Master L	2759-2296/211-1000	Connection up to 4 DNP3 Server Connections
Multi Cloud Connectivity	2759-248/211-1000	2 different cloud systems, IoT platforms or MQTT brokers
Sparkplug	2759-247/210-1000	Add MQTT-based Sparkplug & define both topic and payload
MicroBrowser	2759-230/211-1000	Enable Java-based visualization

CODESYS 3.5 Common Environment

Controls engineers can use one common programming tool to manage systems no matter the protocols used. Users do not have to purchase, learn or maintain multiple software platforms, helping to save money and speed up program development. The following protocols are standard and come with free technical support and training from WAGO:

- CODESYS 3.5 supports the real-time Ethernet system EtherNet/IP as a Scanner or Adapter. WAGO's line of controllers can be used with either of these modes without the need for additional hardware.
- The CODESYS programming software also supports EtherCAT master functionality, enabling diagnostics and monitoring through the IEC 61131-3 application. Users can use any of the WAGO Controllers as a gateway between EtherCAT fieldbuses and other protocols such as MODBUS, MQTT, OPC UA and many others.
- Users are also able to use CODESYS 3.5 with MODBUS TCP/UDP master and client applications. This common protocol offers users the ability to connect with an endless number of devices.

WAGO has also developed tools for additional protocols not found in standard CODESYS 3.5 software. These protocols extend the IEC61131-3 based programming software to many other applications and are available with CODESYS 3.5 software when used with WAGO Controllers. The addition of these protocols to the system can be completed via licenses that can be ordered by part numbers shown in the tables above.

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