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ProductivityCODESYS

CODESYS

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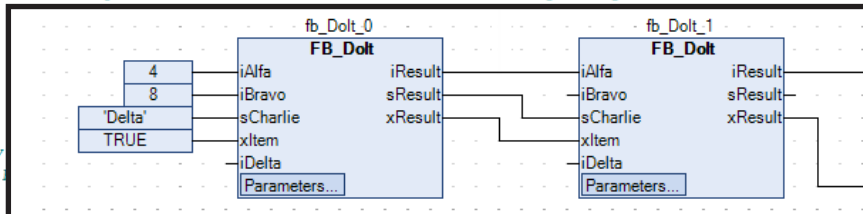
IEC 61131-3

```
1
2   countloop := countloop + 1;
3
4   // used to trgger the Exectution of the Explicit commands "startEIP" and "start2EIP" every 100 cycles.
5    IF ( countloop >= 100 ) THEN
6         countloop := 0;
7         startEIP := TRUE;
8         startEIP2 := TRUE;
9     END_IF
10
11  // Function in the ENIP Library
12  //   In this case, the data to
13  getAttributeSingle(
```



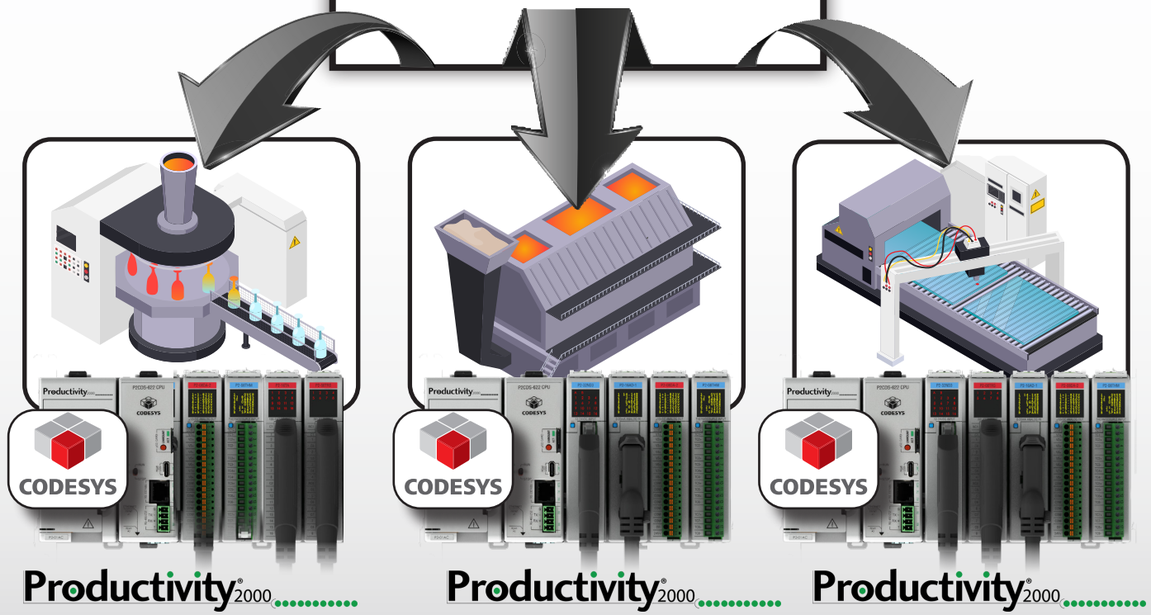
Unleash the power of CODESYS with Productivity

If you know and love CODESYS but have stayed away from implementing it in many of your applications because of high hardware costs, then the Productivity family of controllers has what you need. We've taken the time-tested Productivity2000 hardware and combined it with a CODESYS processor so you can afford to deploy CODESYS in many more ways, bringing a powerful world-renowned IEC-based programming package to applications large and small.

Break the chains of high prices! Add more programming power to your systems for less with ProductivityCODESYS!

CODESYS

CODESYS is the most widely used manufacturer independent IEC 61131-3 development system on the market. With over 5 million device licenses sold worldwide, more than 500 control system manufacturers, and tens of thousands of companies using CODESYS products, this programming package has reliably served a wide variety of industries and applications.



For the latest prices, please check AutomationDirect.com.

CODESYS

The P2CDS-622 CPU features a CODESYS runtime application housed in a Productivity2000 controller form factor. This CPU has ample communication capabilities, works seamlessly with low-cost Productivity2000 I/O modules, and includes the CODESYS IEC 61131-3 -compliant software package along with several add-on licenses free of charge, so you can now reap the benefits of this powerful platform without breaking the bank.

CODESYS CPU $529.00

Productivity2000

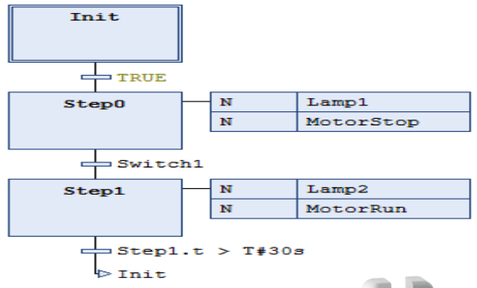
I/O Modules starting at $57.00

The ProductivityCODESYS CPU is designed to work effortlessly with inexpensive Productivity2000 I/O modules. Numerous I/O modules are available to choose from including analog, discrete, relay, and temperature modules, so you can create the custom I/O configuration needed for your specific application.

For the latest prices, please check AutomationDirect.com.

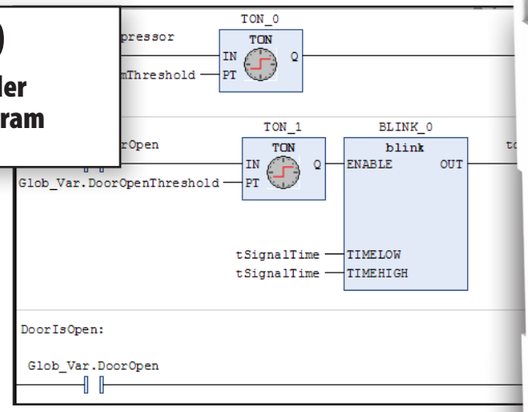
The most affordable CODESYS solution available - CPU only $529.00

SFC
Sequential Function Chart

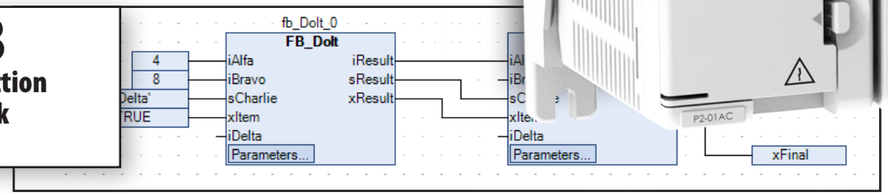


IEC 61131-3

LD
Ladder Diagram



FB
Function Block



ST
Structured Text

```
countloop + 1;

ger the Exectution of the Explicit commands "startEIP" and "sta
p >= 100 ) THEN
p := 0;
 := TRUE;
2 := TRUE;

// Function in the ENIP Library that Reads a single Attribute to the Adapater
//   In this case, the data to be read is three(3) variables of Data size.
getAttributeSingle(
    xExecute:= startEIP ,
    itfEtherNetIPDevice:= Generic_EtherNet_IP_device,   // instance of the de
    eClass:= ENIP.CIPClass.AssemblyObject,              // cip class (0x04)wh
    dwInstance:= 101,                                   // value of 101 (0x65
    pData:= ADR(byteHostDataGet),                       // ADR yields data bu
    udiDataSize:= 3,                                    // size of the data b
    wAttribute:= 3,                                     // attribute no. 3 of
    xDone=> myDone ,
    xBusy=> myBusy ,
    xError=> myxError,
    eError=> myeError,
    udiReceivedDataSize=> udiReceivedData);
// 3 bytes of data recieved from the Adapter
bTempMotor1 := byteHostDataGet[1];                      // first location of
```

For those unfamiliar with CODESYS, this software package was first developed by 3S-Smart Software Solutions in 1994. Since then, it has become the most widely used manufacturer independent IEC 61131-3 development system in the world. CODESYS is used in all sectors of the automation industry and in a wide variety of applications. OEMs, end users, system integrators, and more have found CODESYS to be a powerful, versatile solution for their project needs.

The CODESYS IDE provides a wealth of functionality and includes all IEC 61131-3 languages. Any hardware platform capable of supporting the CODESYS runtime application can be used with this amazing software, including the Productivity2000 series.

The CODESYS software platform has found its home with numerous PLC manufacturers over the years. Many of these manufacturers charge premium rates for their CODESYS-enabled hardware which makes deploying CODESYS systems very cost prohibitive. Well, not anymore! Since CODESYS is hardware independent, any existing project can be easily ported over to the ProductivityCODESYS controller, so you can start saving big with each new system!

BIG SAVINGS!
EASY CONVERSION

OVERPRICED BRANDS

COMPLETE CODESYS SYSTEM
with over $400 in add-on licenses included!!!

(no additional add-on licenses supported)

Low-cost, reliable Productivity2000 hardware:
- CPU priced at $529
- I/O modules start at $57

CODESYS Development Environment:
- Full IEC 61131-3 compliant
  - Sequential Function Chart
  - Ladder Diagram
  - Function Block
  - Structured Text
- "Stock" CODESYS allows for possible reuse/ migration to other platforms
- Continuous Function Chart (CFC) programming is an extension to the IEC 61131-3 standard and uses interconnected function blocks to represent control logic visually
- Tons of existing how-to videos and open sourced code available
- Updates are managed by CODESYS directly and released quickly
- Very robust software security team for quick patches, etc.

Fieldbuses included (*normally purchased separately*):
- Modbus RTU
- Modbus TCP
- EtherNet/IP Scanner
- EtherNet/IP Adapter

Visualization - WebVisu included (*normally purchased separately*)

IIoT library included (*normally purchased separately*):
- MQTT Client w/ TLS
- Web Client (http, https)
- AWS IoT Core Client
- Azure IoT Hub Client
- Mail Service (POP3, SMTP)
- SNTP Service
- SNMP Library
- SMS Service
- JSON

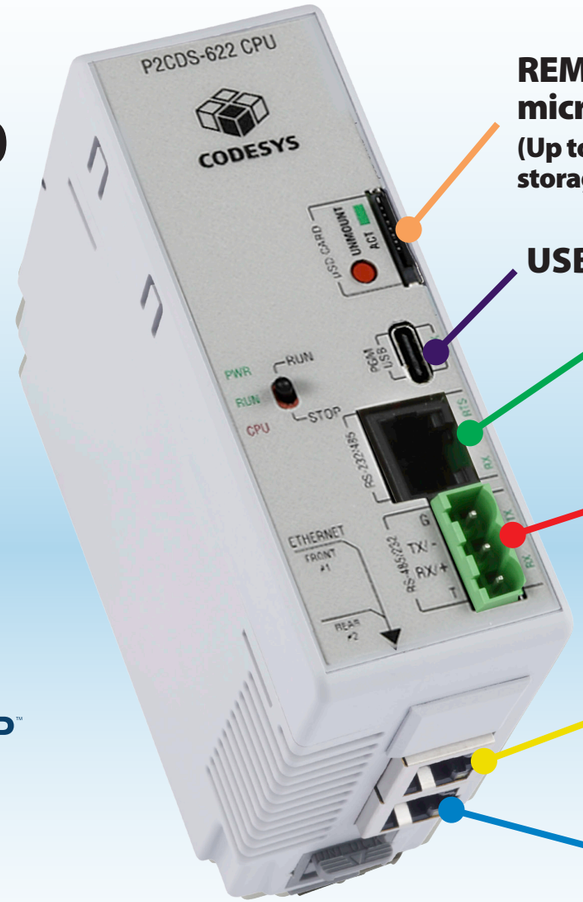
Built with proven Productivity hardware

By combining the time-tested durability of Productivity hardware with the flexibility and power of CODESYS software, FACTS Engineering has created a value-packed advanced control solution that can be deployed in almost any application. The P2CDS-622 CPU features an ample 50MB of memory, fast scan times, a compact footprint, plus:

- Plug-and-play USB programming
- A high-speed Ethernet port for HMI and peer-to-peer or business system networking (no Ethernet communications module needed)
- A secondary multipurpose Ethernet port for applications with multiple networks
- Support for EtherNet/IP devices
- MQTTS (encrypted) protocol support for secure cloud based communication
- Two software selectable (RS-232 or RS-485)serial ports for peripheral device interfacing or controller networking
- Micro SD data logging right from the CPU
- 2-year warranty and 45-day money-back guarantee!

CODESYS

CODESYS CPU
$529.00



REMOVABLE micro SD SLOT
(Up to 32GB of data storage per card)

USB

SOFTWARE SELECTABLE RS-232/485

SOFTWARE SELECTABLE RS-485/232

10/100 ETHERNET
Multipurpose

10/100 ETHERNET
Multipurpose

50MB
OF BUILT-IN MEMORY

5 COMM PORTS

Modbus®
TCP/IP AND RTU

EtherNet/IP™

MQTT

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The ProductivityCODESYS system utilizes Productivity2000 I/O modules for monitoring and control signals. These I/O modules are easily inserted/removed from the base chassis and boast many convenience features including the patented high-contrast OLEDs on the analog/temperature modules. These ultra-clear displays make it simple to view up to 8 channels of analog values in an instant and without any extra equipment. Voltage, current, temperature, and even fault conditions are displayed for your convenience and eliminate the need to disconnect signal wires in order to get a reading with a meter.

Wiring these I/O modules is also made easy with the removable screw or clamp type terminal blocks. ZIPLink pre-wired cables and terminals are also available and will not only save you valuable time but make your installation well organized and efficient.

- Discrete modules are available with 8, 16, or 32-point DC inputs; 8, 15, 16, or 32-point DC outputs (in sinking or sourcing); and 8 or 16-point AC I/O and relay output modules.
- Analog modules are available in 12, 13, and 16-bit resolutions giving you an option of lower price or higher precision for your application measurement requirements. 0-4095 counts on a typical 12-bit 0-10V module gives you a graduation of 2.44mV per count, where a 16-bit module with 0-65535 counts has a graduation of 0.152mV per count.
- Temperature modules offer 16-bit resolutions with up to 8 channels of thermistor or thermocouple inputs, or up to 6 channels of RTD inputs (both with 0.1°C or °F resolution).

Productivity2000

SOFTWARE: Automation Direct
HARDWARE: FACTS engineering

Productivity2000

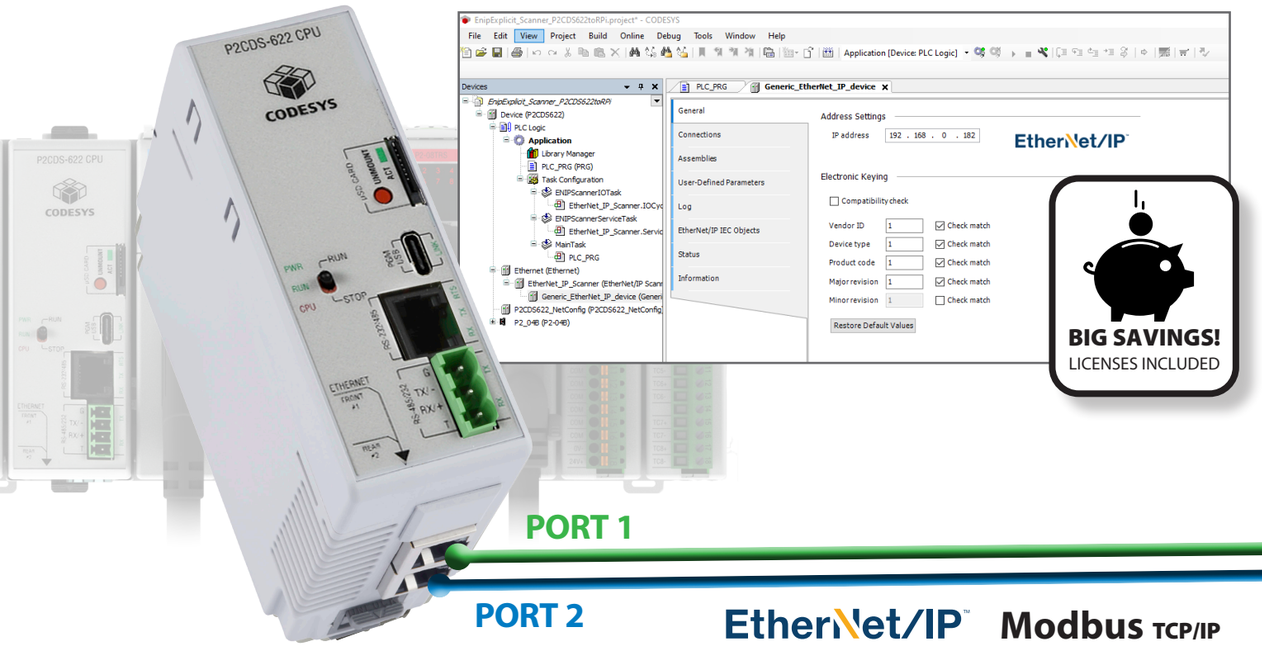
SOFTWARE: CODESYS
HARDWARE: FACTS engineering

Same great, reliable hardware as the Productivity2000 PLC but with a high-powered CODESYS engine!

For the latest prices, please check AutomationDirect.com.

Versatile Ethernet - included!

The CODESYS system offers a powerful IDE with additional licenses required for various other functions. One license is for communication protocols used with fieldbus devices. Normally, this license comes with an extra cost but with the ProductivityCODESYS PLC, we have included the Fieldbus licensing free of charge so you can communicate right out of the box using two of the most popular industry protocols - Modbus and EtherNet/IP. Pair that with the P2CDS-622 CPU's numerous built-in communication ports, and you have everything you need to get your ProductivityCODESYS PLC online quickly.

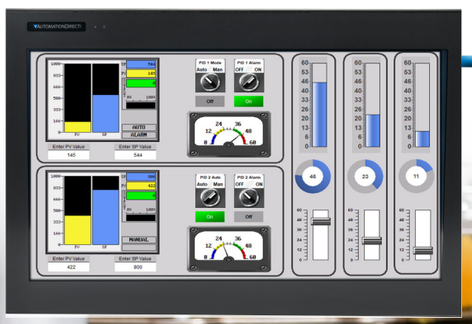


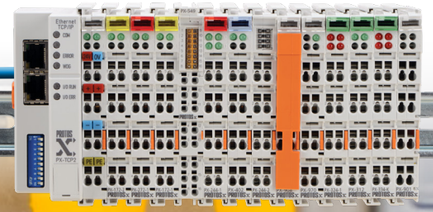
One great hardware feature of the ProductivityCODESYS CPU is the dual Ethernet ports. With them, you can configure the CPU to communicate over two separate networks which is great for IT/OT communication:

PORT 1: This multipurpose Ethernet port can be used with numerous networks, for example, use this port to connect to IT systems like high-level production analysis programs, inventory management software, etc. (additional converters/gateways may be required).

PORT 2: Use this multipurpose Ethernet port to gather real-time data from factory-floor process controllers, control-room HMIs, field I/O systems, VFDs, etc.

By using the dual Ethernet ports in this way, the P2CDS-622 CPU can act as a data bridge, transferring vital process data from the factory floor to upper-level enterprise systems.





CONTROL NETWORK

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Easy IIoT - included!

Industrial machines/systems are more connected than ever before, whether internally with upstream IT management systems or externally with remote support personnel, modern day plant floor machines/systems need to communicate to a variety of networks. Cloud networking, with its computing and data storage platforms, has also become a viable solution for analyzing and accessing production data from anywhere at anytime. Using powerful cloud platforms such as Microsoft Azure® to analyze production-floor data can provide better process efficiency, improved plant-wide resource management, and less operational downtime.

But how does data from a simple level switch on a tank get to the cloud? With ProductivityCODESYS, it's easy! The ProductivityCODESYS CPU has the communication capabilities and processing power needed to not only control plant-floor machines but gather valuable data from them, package it, and send it on to higher level analysis systems.

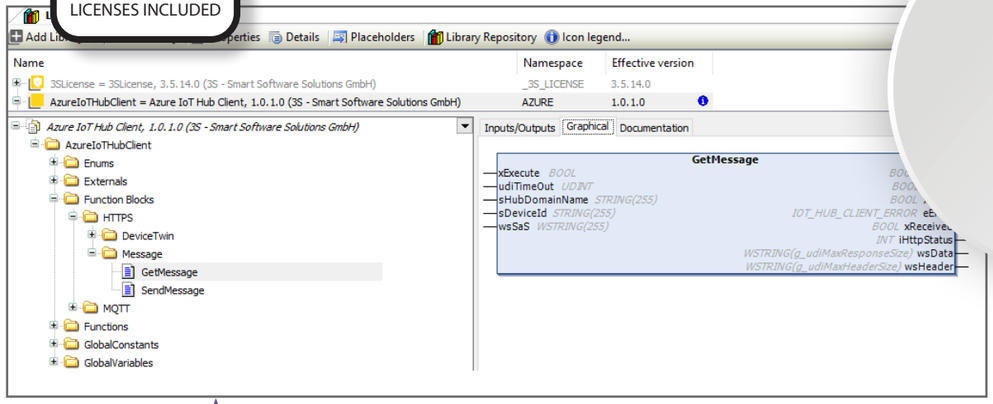
Multiple data gathering options

ProductivityCODESYS controllers utilize proven Productivity2000 series I/O, offering many options to choose from for your system data collection. I/O modules, available in analog, discrete, relay, and temperature versions, allow you to create the custom I/O configurations your application needs. And with the included licensing for Modbus RTU, Modbus TCP, and EtherNet/IP protocols, ProductivityCODESYS controllers can easily gather raw data from a variety of VFDs, sensors, switches, encoders, pilot devices, or almost any other control component your system may have.

FREE CODESYS IIoT Library

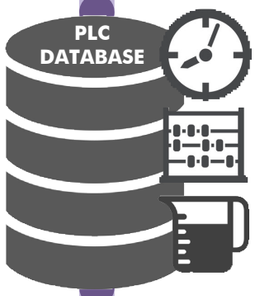
The ProductivityCODESYS system includes the CODESYS IIoT Library free of charge so you can easily communicate with numerous MQTT brokers and cloud platforms/services including:

- AWS® IoT Core
- Azure® IoT Hub
- Mosquitto®
- HiveMQ®
- Thingsboard®
- and many more!



MQTT.ORG

The MQTT protocol has become the frontrunner for many machine-to-machine (M2M) and IIoT/cloud networking applications, due to its lightweight overhead and reduced bandwidth consumption. The ProductivityCODESYS system includes support for MQTTS messaging, so you can securely deliver vital data to advanced cloud computing platforms.



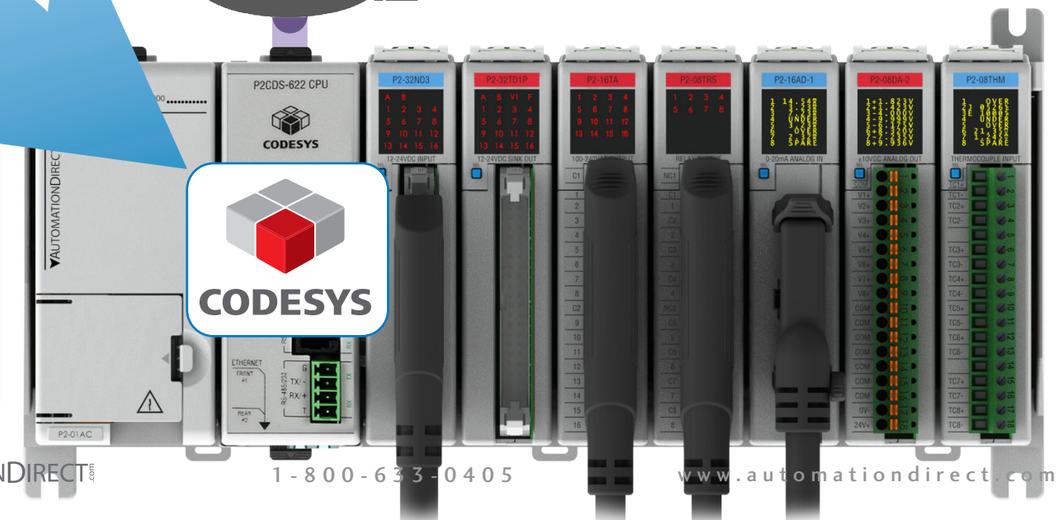
PRODUCTION RUN TIME

TOTAL JAR COUNT

SUPPLY CONSUMPTION RATE

Refining data into something meaningful

The CODESYS software offers advanced IEC 61131-3 programming which can easily transform a raw process signal, like 4-20mA, into a consumption rate, a production throughput, an energy efficiency score, a rejection percentage, or any other metric that's vital to you.



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Complete system visualization - included!

Develop and deploy HMI screens with ease using CODESYS WebVisu

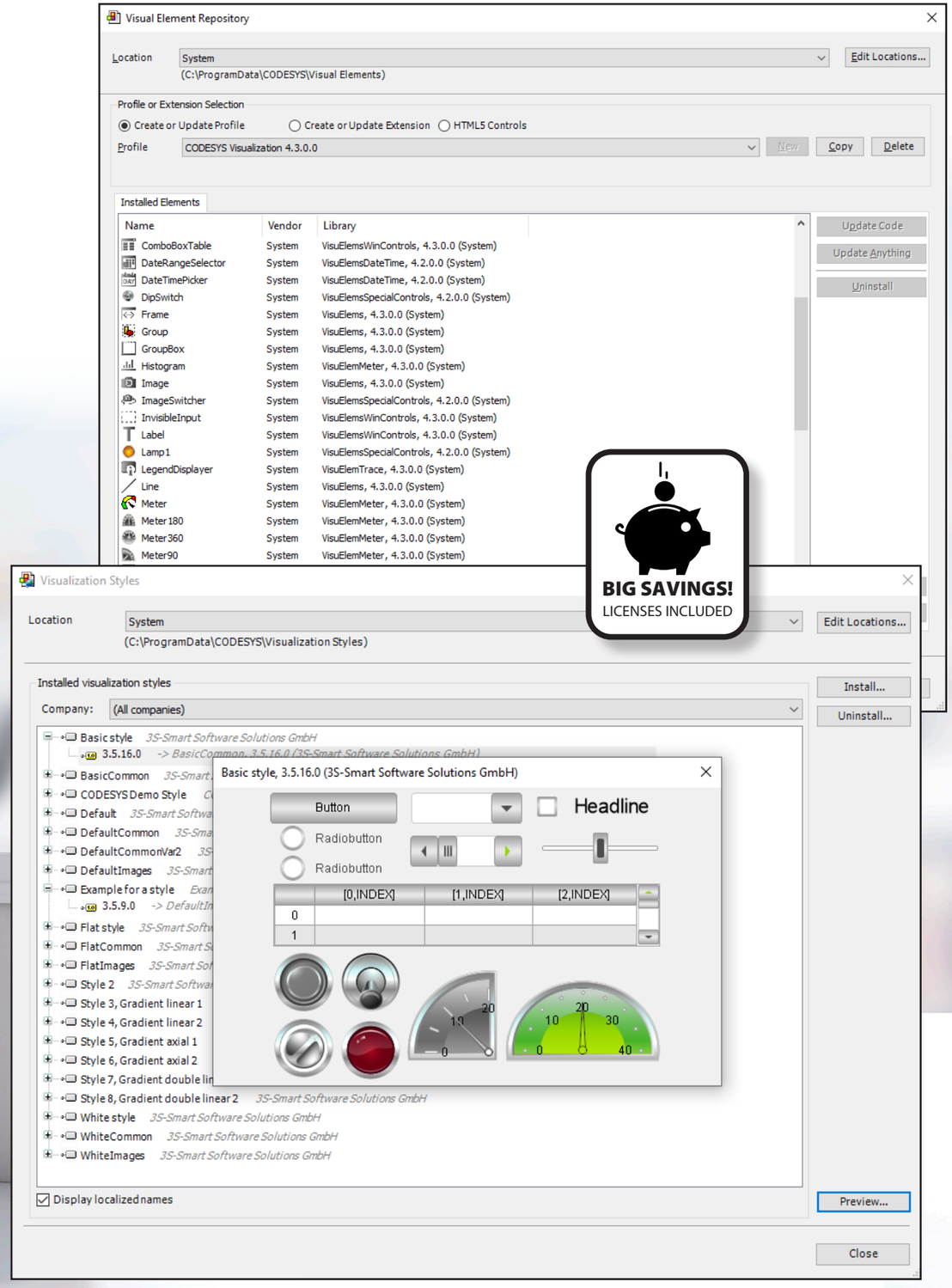
A vital component of any automated system is the ability to monitor system status and manually control its operation. Simple devices like pushbuttons, indicators, meters, etc., provide basic interfacing but HMIs, with their detailed and interactive display screens, are preferred by many. Installing a physical HMI will incur additional hardware cost, but utilizing a "virtual" HMI can alleviate the added hardware, installation, and maintenance expense.

CODESYS Visualization is a visualization editor integrated in the CODESYS Development System. It allows users to create user interfaces for their applications that can animate and display data. CODESYS WebVisu is a web-based display variant of CODESYS Visualization. It allows for remote access, remote monitoring, and diagnostics of a system over the internet.

Normally, the CODESYS WebVisu license is an added cost. However, it is included with the ProductivityCODESYS system for free. With it you can:

- Create detailed user interfaces for your applications
- Visualize data from several CODESYS-compatible controllers in one user interface
- Utilize a wide variety of display elements and styles that are available in the CODESYS Development System
- Remotely access your ProductivityCODESYS controller to service and diagnose issues quickly from anywhere in the world via web browser

With CODESYS WebVisu and the ProductivityCODESYS CPU's integrated web server, process and system data can be displayed on any HTML5-capable display device (such as a thin client PC, tablet, phone, etc.). WebVisu can eliminate the need for a true physical HMI which can save hundreds, maybe even thousands, on each machine build.



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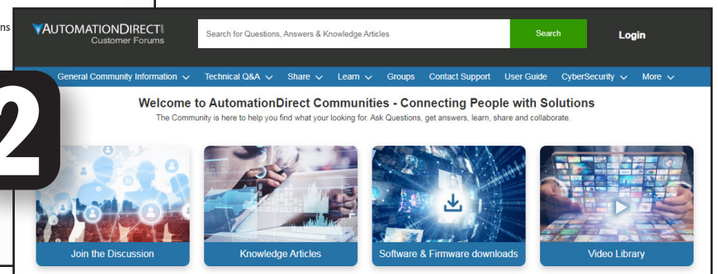
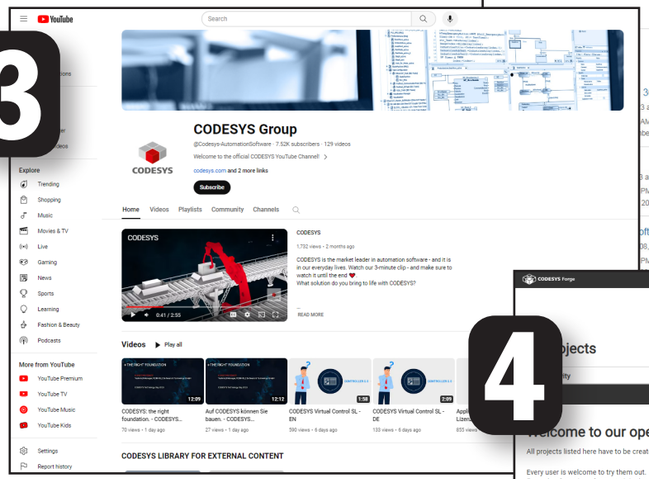
A wealth of FREE resources for an assist with CODESYS

CODESYS has been in use around the world for decades and a vast inventory of supporting documents, videos, tutorials, etc. have been produced to help users get up and running quickly. Here are 5 FREE resources you can use anytime if you need help with your CODESYS system (click images for more information on each).

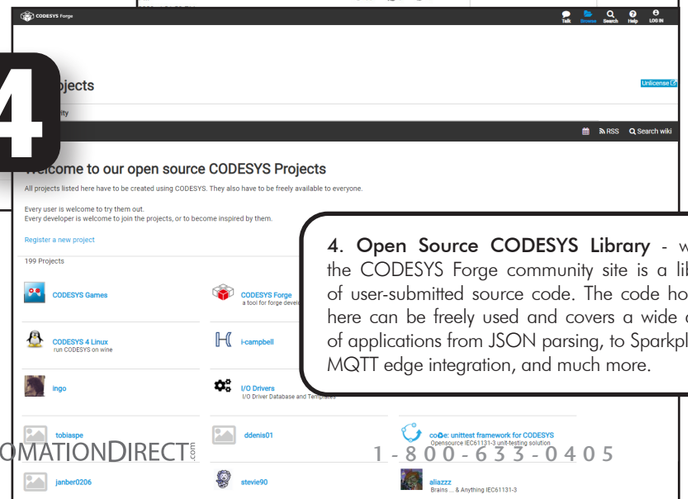
1. **ProductivityCODESYS Support Site** - this site was developed for those new to the ProductivityCODESYS system. With product overviews, getting started information, example projects for the P2CDS-622 CPU, and more, this site will help you get your ProductivityCODESYS system installed and working in no time.



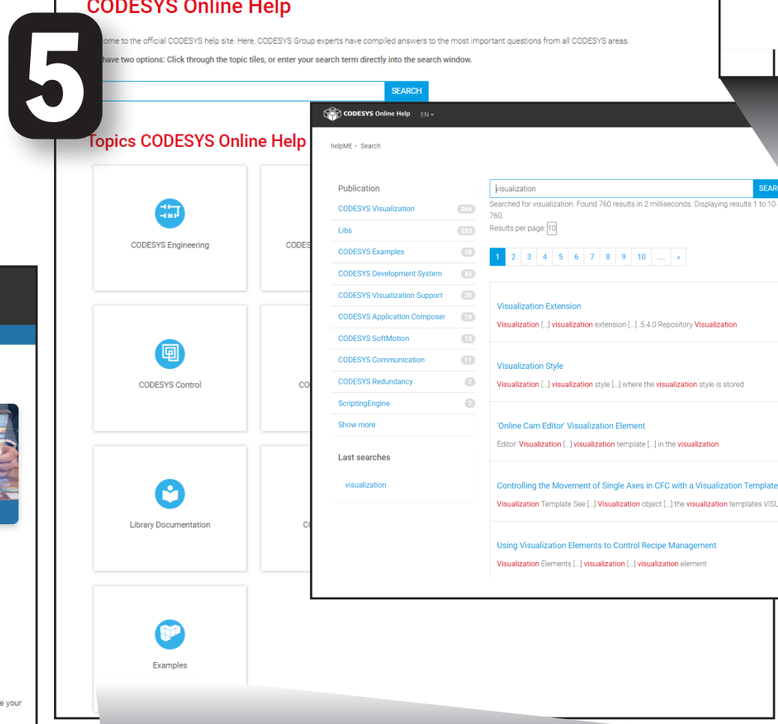
2. **AutomationDirect's Community Forum** - if you need further assistance with ProductivityCODESYS, the AutomationDirect Community Forum is a great place to start. There you'll get solutions and advice firsthand from fellow customers and professionals from a variety of industries.

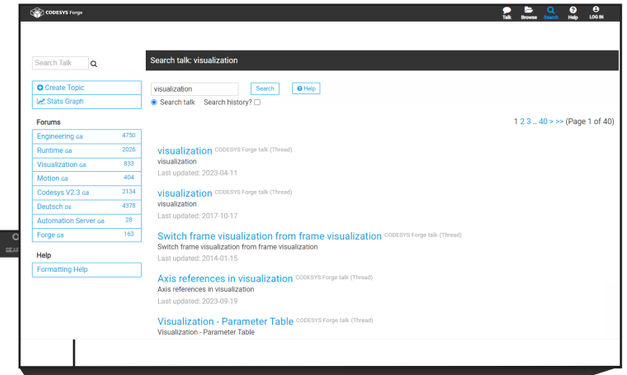


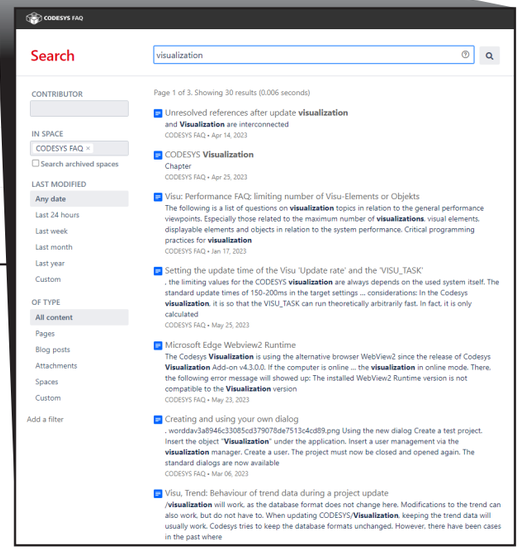
3. **CODESYS How-to Videos** - since CODESYS is a very popular and powerful development system, thousands of videos have been created to demonstrate its capabilities. The CODESYS Group has its own YouTube page but tons of videos are also available from the multitude of end users. Just search for "CODESYS" in YouTube's search bar and you'll see the never-ending scroll of available how-to videos.

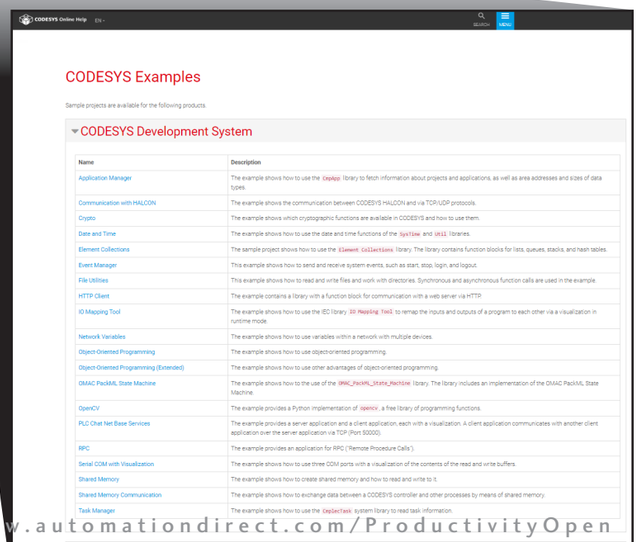


4. **Open Source CODESYS Library** - within the CODESYS Forge community site is a library of user-submitted source code. The code housed here can be freely used and covers a wide array of applications from JSON parsing, to Sparkplug™ MQTT edge integration, and much more.









CODESYS