PC-Based Automation Solutions Soft-Logic Fieldbus Control by COESYS Ready Edge SRP





PC Based Control Solutions Target Market & Product Position



Data Acquisition, AI, AO, DI, DO, Counter, Pulse...etc

Enabling an Intelligent Planet

Distributed I/O, Inverter, Fieldbus I/O...etc



PC-based SoftPLC & SoftMotion Control Solutions





Go-To-Market Strategy & Target Customers



CODESYS

- Partnership with CODESYS
 Distributor & System Integrator.
- Target Region: Europe, U.S.A. Japan, Korea, Russia, Turkey, Israel, Brazil,



Distributed I/O

- Collaboration with Local Distributed I/O's **System Integrator** & **VAR**.
- Target local Machine Builder to provide Advantech Soft-Logic PC based total solutions.



High-End PLC

- Collaboration with Local High-End PLC (Over 1000 tags application)
 System Integrator.
- Target local Machine Builder using High-End PLC who need cost down solutions.



- Collaboration with Local Motor Drives
 & Inverter System Integrator.
- Target local Machine Builder who need EtherCAT real-time SoftMotion control solutions.



Benefits of CODESYS Solution



Easy Management

- Application are integrated and can be edited using a single interface that support all PLCopen IEC-61131-3 programming languages (FBD,LD, IL,ST, SFC)
- Support Web HMI design and visualization for management.

Abundant Application

- Support real-time industrial fieldbus protocols
- Support OPC UA and Modbus servers/ clients
- Software has wide applicability for diverse projects & applications.



Powerful Control

- High-performance control IPC ideal for complex motion control operations.
- Support real-time dual fieldbus data acquisition of PROFINET and EtherCAT communications
- Comprehensive library of proven components for reuse in diverse applications.



CODESYS Control Solutions Architecture Overview



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CODESYS Control Design Features





Advantech CODESYS Solutions Value Proposition

Optimization

- Platform BIOS adjustment.
- MRAM memory retained.
- Embedded O.S. Benefit.

One-Stop-Shop

 Select suitable Platform, CODESYS module, Distributed I/O in one way.

Distributed I/O



- Modbus RTU/TCP
- EtherNet/IP
- ProfitNet
- EtherCAT

ODBC Database

Direct Database Connection



Cloud Function

• Data connect to Advantech WISE-PaaS Cloud.





CODESYS Edge SRP Solutions Product Portfolio

Panel Controller





Engineering in the CODESYS Landscape

Transfer Trusted IPC to be Intelligent Controller





IEC-61131-3 Cross Languages for PLC Programming



CODESYS development environment for SoftPLC

Features :

- Display of application data at runtime in simulation mode on SoftPLC and discrete controllers.
- Supports reading, writing, and forced setting of variable values, directly in the respective editor.
- Enables monitoring of specifically selected values in watch lists.
- Supports code execution in single steps or complete cycles
- Supports the setting of conditional and absolute breakpoints and execution points





CODESYS Visualization

Create visualization screens directly in the PLC development system for display on a target device, PC, or web browser

CODESYS – On-Site Machine Operation and Systems Monitoring Local HMI

The platform-independent variant shows the user interface directly on the controller via an integrated or connected display. Thus, control and visualization functions are integrated into a single TPC or UNO device for machine operation and systems monitoring. An optional extension of the runtime system is necessary in order to use CODESYS TargetVisu.

CODESYS – Remote Web-Based Access for Service and Diagnosis

The web-based display variant enables remote access, monitoring, diagnosis, and service over the Internet. Standard web-browsers communicate (with optional SSL decryption) with the web-server on the controller using JavaScript, while HTML5 is used for visualization displays. This technology is supported by most browsers and compatible with iOS and Android.

Remote Web HMI









HMI Visualization Element Toolkit

Manufacturers and users can expand the available elements with their own system- or industry-specific visualization elements, and **all new visualization elements are automatically integrated into the CODESYS Development System.**

However, the optional CODESYS VisuElement toolkit is required for this functionality. Additionally, because the elements are created directly in the CODESYS Development System using IEC 61131-3 programming languages, no additional platforms are required



HMI visualization function list :

lasic lements	Basic controller elements	Input options	Special controller elements	Graphical elements	Practical controls	Animation options		Blue Brown Darkblue Darkgray Darkgreen Darkred * Element	0, 0, 255 165, 42, 42 16, 2, 148 128, 128, 128 182, 16, 55 182, 16, 41
lectangles Ilipses Jurves Jolygons Litmaps Litmaps Luttons rames rézier curves	Buttons Tables Text fields Scroll bars Slide controls Progress bars Radio buttons Checkboxes	Keys Toggles Image switches Mouseovers Function calls	Trace ActiveX elements Waiting symbols Text editors	Banners & tables for the alarm management	Pointer instruments Lamps Switches Potentiometers Bar graphs	Text display Color change Visible/invisible Operable/inactive Shift Resizing Rotation Font properties	((Ford Gry Gry Gry Gry Gry Gry LipHue LipHue LipHue LipHue LipHue LipHue Gry Gry	199, 199, 199 0, 200, 205 0, 20
						Character properties			



Direct Variety Database Connection by ODBC

Easy and Fast Way to Log & Get Real-time Data!



Easy 3-Steps Connecting to Database



Step 2 Configure DB Connection in Agent

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Open Control System Target Markets

Capture Industry 4.0, IoT Opportunities by Solution Ready Platform

Industry 4.0 Smart Factories & Facilities control



- Food and beverage manufacturing.
- Automotive assembly
- PCB/SEMI/FPD/Logistic.
- Precision machinery industry.
 (Consumer electronics equipment)
- Solar machinery builders.
- Machinery builders.
- System integration builders. (SI partners)

Environment Monitoring & Smart Agriculture



- Monitoring & control solution.
- Intelligent agriculture.
- Smart city infrastructure
- Air pollution monitoring systems.
- Intelligent water treatment.
- Waste water management and water distribution.

Renewable Energy & Energy Automation



- Renewable energy solutions.
- PV solar tracker.
- Energy monitoring control system





F&B Industries Decentralize Control Machinery



Description

- Achieve machinery Soft-Logic control through the integration of IEC 61131-3 CODESYS software and PC-based controller to reduce dependence on manpower, reach lean production, even the realm of unmanned production.
- Soft-Logic control in Packaging Machinery, Printing Machinery, Labeling Machinery.
- Multi-axis control SoftMotion control for operation management.
- Fieldbus Distributed I/O for Motor health monitoring. (Voltage, Current, Temp., Humidity, Vibration)

Target Customer

- Local Servo Motor Drive's System Integrator.
- Local **Machine Builder** who need EtherCAT realtime SoftMotion control solutions.
- Local Distributed I/O's **System Integrator** & **VAR**.





Ultrasonic Vibration Welding Machinery



Description

Vibration welding generates frictional heat to produce robust, pressure-tight joints in thermoplastic parts. It creates precise seals for a wide range of sizes, intricate areas, multi-plane objects and curved surfaces. This energy-efficient technology can optimize productivity on automated assembly lines at a lower cost than many alternative methods.

Target Customer

- Distributed I/O's **System Integrator** & **VAR**.
- Inverter's System Integrator & VAR.
- Local Machine Builder using High-End PLC who need cost down solutions.



Car Wash Decentralize Control Machinery



Description

- During the complete washing process, a variety of washing programs & recipe control to use the right amount of chemicals and water for a successful result.
- Real-time Dual Fieldbus control with Less software Development Time (IEC-61131-3)
- Multi-axis control SoftMotion control for operation management.
- Fieldbus Distributed I/O for Motor health monitoring. (Voltage, Current, Temp., Humidity, Vibration)
- Direct connect to SQL Server database no middleware necessary.

Target Customer

- Local Servo Motor Drive's System Integrator.
- Local Machine Builder who need real-time
 SoftMotion control solutions.
- Local Distributed I/O's System Integrator & VAR.





Textile Centralize Control Machinery



Description

With the increasing demand for yarn diversification and production speed in the market, mechanical cams that have been widely used in the past due to simple processing & low cost have been unable to meet flexible production & customization.

- Soft-Logic control solutions replace mechanical cams with electronic cams.
- Dual Fieldbus with CANOpen & EtherCAT control.
- The capacity of continuous fixed positioning & speed equipment has been greatly increased from 75 m/min to 120 m/min.

Target Customer

- Local Servo Motor Drive's System Integrator.
- Local Machine Builder who need real-time
 SoftMotion with Dual Fieldbus control solutions.
- Inverter's System Integrator & VAR.





Real-Time Multi-Axis Motion Control Use Case Demonstration

Demo in box



Demo Suitcase



Demo Project and Guide Line

Demo Guide line slide





Motion Control with Visualization Demo Feature



Complete Integration through IT & OT Network Topology





Demo Guide - Motion Control Use Case Architecture





Demo Guide - Position Control





Demo Guide - Jog Control





Demo Guide - Speed Control



Speed Control with EtherCAT servo motor



Demo Guide - Gear Operation Speed Synchronize



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Speed

Marketing Materials





https://www.youtube.com/watch?v=vJZ8Zze4l0Q



Advantech's CODESYS solutions enable flexible real-time machine control programming for a wide range of factory automation operations, including motion and vision control and pick and place machine control. Featuring a softPLC design, Advantech's CODESYS solutions support multiple fieldbus protocols, specifically EtherCAT, CANopen, PROFINET, and EtherNET. Moreover, web-based visualization is supported to allow remote monitoring using any mobile device.

Equipped with an Intel® Core™ i3-6100U dual-core processor, 15" XGA touch panel, and CODESYS software to support multiple fieldbus communication protocols, Advantech's SRP-M2i240-AH provides the ideal solution for complex real-time machine control operations that facilitate factory automation.

Benefits of Advantech's CODESYS Solutions

Abundant application Supports master real-time Ethernet/fieldbus protocols PROFINET Ethernet/PP EtherCAT CANopen Supports OPC UA and Modbus servers/clients Software has wide applicability for diverse projects and applications Supp

Easy management Applications are integrated and can be edited using a single interface that supports all PLCopen IEC 61131-3 programming languages (FBD.LD.IL.ST.SFC)

Support HMI design and visualization for management

Powerful Control High-performance control IPC ideal for complex

IPC ideal for complex motion control operations

- Support real-time dual fieldbus data acquisition of PROFINET and EtherCAT communications.
- Comprehensive library of proven components for reuse in diverse applications

http://advcloudfiles.advantech.com/cms/e5ac97a1-106a-43e7-8ef4-161596b41859/eDM%20HTML%20Zip%20File/Content/2018%20CODESYS%20eDM/eDM.htm

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Marketing Materials-Landing Page



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Manufacturers around the world are widely adopting machine control for complex automation projects. However, several programmable logic controllers (PLCs) are typically required to perform separate motion and vision control operations, resulting in time-consuming programming and high equipment costs.

Advantech developed it SRP-M2i240 solution to serve as a single integrated interface for conducting real-time machine control. Compliant with the IEC 61161-3 international standard, this solution supports object-oriented programming (OOP), allowing users to effectively reduce development time. Moreover, by enabling dual fieldbus data acquisition (PROFINET, CANopen), SRP-M2i240 provides a cost-effective tool for control, communication, and





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THANK YOU



