Weintek × CODESYS

All-in-One Control: From HMI to PLC

Weintek HMI + CODESYS SoftPLC

Weintek Integrates CODESYS into HMIs:
All-in-One Control for HMI + PLC + I/O Solutions

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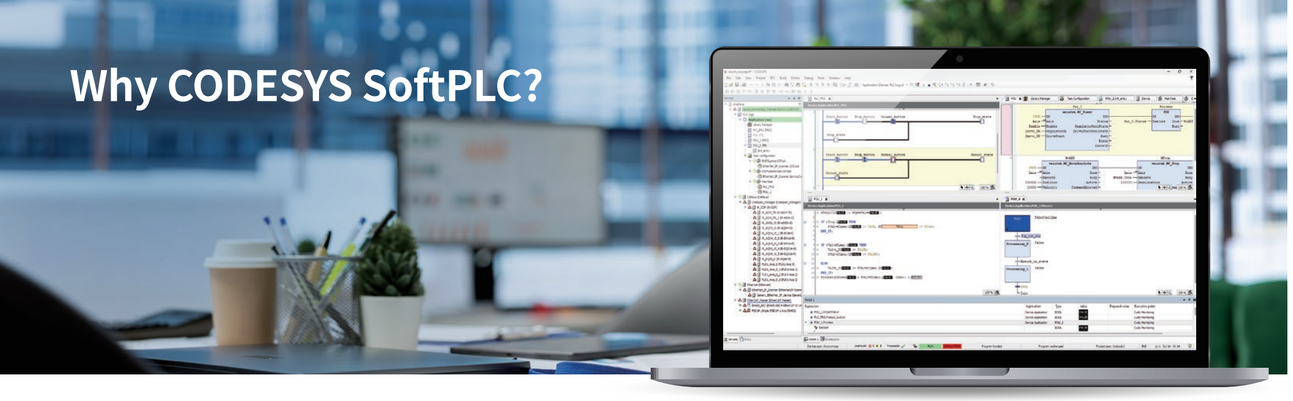
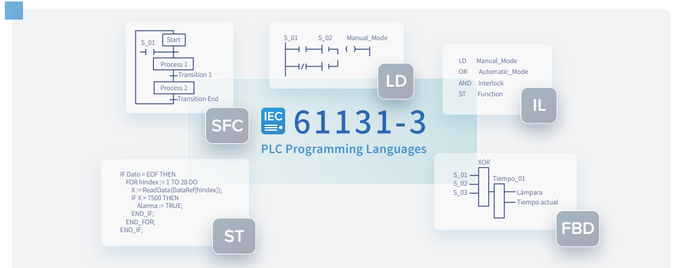
Why CODESYS SoftPLC?

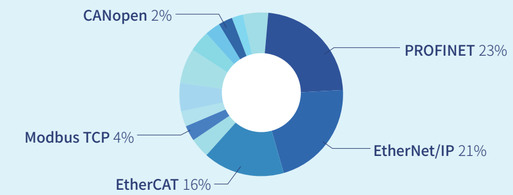


- CODESYS, the world's most widely used SoftPLC platform, supports all five IEC 61131-3 languages and integrates PLC programming, object-oriented development, visualization, motion control, and safety into one intuitive interface.
- Its open architecture and strong extensibility enable seamless integration with major industrial protocols and easy adaptation to diverse automation devices and controllers. This scalable control solution is key to smart manufacturing.
- CODESYS stands as the global SoftPLC market leader, and SoftPLC solution is set to grow steadily, securing even greater market share in the years ahead.

Key Applications:

- Factory Automation
- Mobile Automation
- Energy Automation
- Production Automation
- Building Automation





Weintek HMIs with CODESYS support the five most popular industrial protocols.

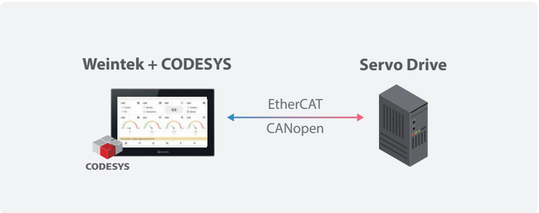
Advantages of Weintek + CODESYS Solution

1. Powerful Development Platform for Simplified Integration

CODESYS provides a universal, open development environment that supports over 500 controller brands and thousands of devices, enabling logic control on a single platform. Combined with Weintek EasyBuilder Pro for HMI graphic design, it allows developers to greatly reduce time and cost for integration.

2. Software-Defined Architecture for Enhanced Control Capabilities

By fully software-enabling traditional PLC functions, CODESYS turns Weintek HMIs into powerful control centers—no extra PLC hardware needed. With native support for EtherCAT, CANopen, and Modbus TCP, it delivers seamless communication, direct servo control, and modular, high-performance motion systems.



3. All-in-One Solution for Automation and IIoT Applications

Beyond programming, visualization, and communication, CODESYS combined with Weintek's Weincloud enables remote monitoring and cloud connectivity—accelerating smart manufacturing and IIoT deployment.

4. Proven Control Foundation for Global Reliability

Trusted by hundreds of thousands of developers worldwide and adopted by leading manufacturers, CODESYS combined with Weintek iR Series Remote I/O modules delivers a stable, scalable control architecture for modern automation.

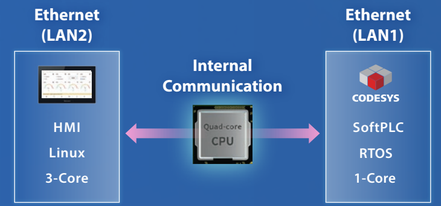
Dual OS Architecture for Versatile Performance

Independent Operating Systems: Linux + RTOS

An HMI with dual functionality of display and PLC control. Thanks to its independent operating system design, even if one side fails, the other can continue running normally.

Internal Communication Architecture

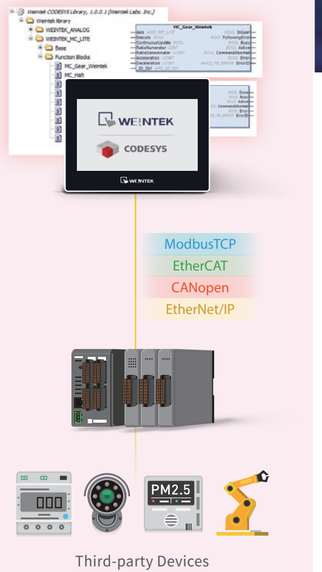
Direct internal pass-through communication between the HMI and PLC via EasyBuilder Pro enables the HMI to control end machinery and equipment.



iR Series

Key Features of Remote I/O Modules

The iR Series offers couplers, digital I/O, and analog I/O modules with the performance and reliability to meet market demands.

Weintek Coupler	Weintek I/O Module	Exclusive Function Blocks
iR-ETN (Modbus TCP / EtherNet/IP) Modbus TCP: The classic protocol for industrial devices and general manufacturing automation. EtherNet/IP: Built on TCP/IP and CIP for strong compatibility, multi-topology support, and seamless IT integration—widely adopted in factory automation.	**Digital Module** Digital Input: Sink & Source Digital Output: Sink, Source & Relay	
iR-COP (CANopen Slave) Simple structure with excellent real-time performance, ideal for embedded systems and high-reliability equipment such as medical and automotive devices.	**Analog Module** Wide Voltage & Current Range: Voltage: –10 to 10 V Current: –20 to 20 mA	
iR-ECAT (EtherCAT Slave) Ultra-low latency with tight synchronization, supporting multi-node daisy-chain topologies—perfect for high-speed, precision motion control, robotics, and automated assembly.	**Temperature** Thermocouple (TC) and RTD Type Compatibility User-defined Table Support	
3rd Party PROFINET Coupler High-speed real-time networking with multi-topology support and large-device capacity, suited for complex, high-speed automation systems.	**Motion Control** Single-Axis Motion Control Support	

Industry Applications

Smart Farm Irrigation Systems

The Smart Farm Irrigation System is a mobile intelligent irrigation solution built with Weintek cMT X Series HMI and CODESYS SoftPLC. Using Modbus TCP/IP, it controls iR Series I/O modules (iR-ETN, DI, DQ, AM). Featuring modular design, high flexibility, and smart control, it is ideal for precision agriculture and environmental monitoring.

Key Benefits

- Centralized Control with Visual Interface
- Smart and Efficient Irrigation via Closed-Loop Control
- Remote Management with Instant Alerts
- Modular I/O Design for Easy and Flexible Expansion

Solutions

- **cMT X HMI + CODESYS SoftPLC**
  The cMT X HMI provides high-performance control with an intuitive graphical interface.
- **Modbus TCP/IP Integration + iR-ETN Coupler**
  iR-ETN serves as a Modbus TCP/IP slave to aggregate DI, DQ, and AM module data for the master.
- **Sensors + Irrigation Loop Control**
  DI modules read soil moisture valve on/off signal and flow-switch signals; AM modules capture analog data (e.g., humidity %, pressure); DQ modules drive valves and pumps.
- **Remote Monitoring + Data Logging**
  The cMT X HMI supports EasyAccess 2.0, multi-protocol databases, and MQTT/OPC UA to export field data to the cloud or central SCADA.

Industry Applications

Water-Cooled Pressure Test Stations

An automated leak and pressure testing system was developed for water-cooled components in server, automotive, and high-power equipment production. Integrating Weintek HMI with CODESYS SoftPLC, the solution ensures precise control and monitoring, addressing challenges like parameter variability, scattered data, and human error to enhance testing efficiency and reliability.

Key Benefits

- Streamlined Test Automation for Higher Efficiency
- Integrated Data Logging with Traceable Reporting
- Flexible Configuration for Seamless Equipment Integration
- Multi-Level Access with Visual Alerts for Error Prevention

Solutions

- cMT X HMI + Bidirectional Communication

  The visual interface exchanges test data with the SoftPLC in real time and supports trend display, alarms, and logging.

- CODESYS SoftPLC + EtherCAT Control

  The controller serves as an EtherCAT master to control iR modules with high-speed, real-time response.

- Automated Test Logic + Alarm Handling

  The PLC executes staged pressure control and triggers NG alarms when faults are detected.

- Sensor Integration + HMI Data Logging

  The DI/AI modules collect sensor signals, while the HMI performs threshold checks and records results.

Industry Applications

Cleanroom Fan Filter Unit Monitoring Systems

Designed for pharmaceutical, semiconductor, and precision industries, this cleanroom FFU and monitoring solution leverages Weintek HMI with CODESYS SoftPLC to optimize environmental control. It reduces energy waste, enables centralized monitoring, and supports remote maintenance—boosting efficiency, stability, and smart energy management.

Key Benefits

- EC Fans with Closed-Loop Control for Energy Saving
- Remote Monitoring with Historical Data Management
- Auto Alerts and Fan Calibration for Cleanroom Stability
- Graphical HMI with Role-Based Access for Easy Maintenance

Solutions

- Centric Control + CODESYS SoftPLC

  The cMT X HMI enables multi-zone FFU monitoring and control via touchscreen interface.

- Closed-Loop Feedback + Modbus Monitoring

  The system reads airflow, differential pressure, and RPM for real-time auto calibration.

- Integrated Sensing + Data Logging

  Temperature, humidity, pressure, and particle data are fed into the HMI for alerts and records.

- Adaptive Energy Management + EC Motor Control

  Smart control dynamically adjusts fan speed and air exchange rates for optimized efficiency.

iR Series Specifications

Coupler Module		iR-ETN	iR-COP	iR-ECAT
Expansion I/O Module	Number of Bus Terminals	Depends on Power Consumption		
	Digital Input Point	Max. 256		
	Digital Output Point	Max. 128		
	Analog Input Channel	Max. 64		
	Analog Output Channel	Max. 64		
Data Transfer Rate		10/100 Mbps	50k~1 Mbps	100 Mbps
Max. Number of TCP/IP Connections		8 Connections	-	-
Protocol		Modbus TCP/IP Server, EtherNet/IP adapter	CANopen Slave	EtherCAT Slave
Isolation		Network to Logic Isolation : Yes	CAN bus Isolation : Yes	Network to Logic Isolation : Yes
Power	Power Supply	24 VDC (-15%/+20%)		
	Power Consumption	Nominal 100mA@24VDC		
	Current for Internal Bus	Max 2A@5VDC		
	Current Consumption	220mA@5VDC	170mA@5VDC	270mA@5VDC
	Power Isolation	Yes		
	Back-up Fuse	≤ 1.6A Self-recovery		
Specification	PCB Coating	Yes		
	Enclosure	Plastic		
	Dimensions WxHxD	27 x 109 x 81 mm		
	Weight	Approx. 0.15 kg		
	Mount	35mm DIN rail mounting		
Environment	Protection Structure	IP20		
	Storage Temperature	-20° ~ 70° C (-4° ~ 158° F)		
	Operating Temperature	0° ~ 55° C (32° ~ 131° F)		
	Relative Humidity	10% ~ 90% (non-condensing)		
	Altitude	3,000 m		
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)		
Certification	CE	CE marked		
	UL	cULus Listed		

Coupler Module		iR-ETN40R	iR-ETN40P
Expansion I/O Module	No. of Bus Terminals	Depends on Power Consumption	
	Digital Input Point	Max. 224	
	Digital Output Point	Max. 112	
	Analog Input Channel	Max. 64	
	Analog Output Channel	Max. 64	
Communication Interface Specifications	Data Transfer Rate	10/100 Mbps	
	Max. Number of TCP/IP Connections	8 connections	
	Protocol	Modbus TCP Server, EtherNet/IP adapter	
	Network to Logic Isolation	Yes	
	No. of Ports	1	
Digital Output	Total Number of Outputs	16	
	Output Type	Relay	Source
	Output Voltage	250VAC/30VDC	11~28VDC
	Output Current	2A per channel (Max 8A)	0.5A per channel (Max 4A)
	Response Time	10 ms	OFF->ON: 100 µs, ON->OFF: 600 µs
	Isolation	Yes, electromagnetic isolation	Yes, optocoupler isolation
High-speed Output	Total Number of Outputs	0	2
	Output Type	N/A	Source
	Output Voltage	N/A	5VDC
	Output Current	N/A	50mA per channel
	Max. Output Frequency	N/A	40KHz
	Isolation	N/A	Yes, optocoupler isolation
Digital Input	Total Number of Inputs	24	
	Isolation	Yes, optical isolation	
General Input	Total Number of Inputs	20	
	Input Type	Sink or Source	
	Logic 1 Input Voltage	15~28 VDC	
	Logic 0 Input Voltage	0~5 VDC	
	Response Time	OFF->ON: 5 ms, ON->OFF: 1 ms	
High-speed Input	Total Number of Inputs	4	
	Input Type	SINK INPUT (PNP)	
	Logic 1 Input Voltage	15~28VDC	
	Logic 0 Input Voltage	0~5VDC	
	Max. Input Frequency	20KHz	
Power	Power Supply	24 VDC (-15%/+20%)	
	Power Consumption	Nominal 255mA@24VDC, Max. 540mA@24VDC	Nominal 100mA@24VDC, Max. 530mA@24VDC
	Current for-Internal Bus	Max. 2A@5VDC	
	Current Consumption	520mA@5VDC	350mA @ 5VDC
	Electrical Isolation	Logic to Field Power Isolation: Yes	
	Back-up Fuse	≤ 1.6A Self-recovery	
Specification	PCB Coating	Yes	
	Enclosure	Plastic	
	Dimensions WxHxD	64x 109 x 81 mm	
	Weight	Approx. 0.27 kg	
	Mount	35mm DIN rail mounting	
Environment	Protection Structure	IP20	
	Storage Temperature	-20° ~ 70° C (-4° ~ 158° F)	
	Operating Temperature	-10° ~ 60° C (14° ~ 140° F)	
	Relative Humidity	10% ~ 90% (non-condensing)	
	Altitude	3,000 m	
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)	
Certification	CE	CE marked	
	UL	cULus Listed	
	EtherNet/IP	ODVA Conformance Test	

Digital I/O Module		iR-DI16-K	iR-DM16-P	iR-DM16-N	iR-DQ16-P	iR-DQ16-N	iR-DQ08-R
Input Logic		Sink or Source	Sink or Source	Sink or Source	N/A	N/A	N/A
Number of Inputs		16	8	8	0	0	0
Output Logic		N/A	Source	Sink	Source	Sink	Relay
Number of Outputs		0	8	8	16	16	8
Current Consumption		83mA@5VDC	130mA@5VDC	130mA@5VDC	196mA@5VDC	205mA@5VDC	220mA@5VDC
HIGH Level Input Voltage		15~28VDC	15~28VDC	15~28VDC	N/A	N/A	N/A
LOW Level Input Voltage		0~5 VDC	0~5 VDC	0~5 VDC	N/A	N/A	N/A
Output Voltage		N/A	11~28VDC	11~28VDC	11~28VDC	11~28VDC	250VAC/ 30VDC
Output Current		N/A	0.5A per channel (Max 4A)	0.5A per channel (Max 4A)	0.5A per channel (Max 4A)	0.5A per channel (Max 4A)	2A per channel (Max 8A)
Isolation		Input: Optical Isolation Output: N/A	Input: Optical Isolation Output: Optical Isolation	Input: Optical Isolation Output: Optical Isolation	Input: N/A Output: Optical Isolation	Input: N/A Output: Optical Isolation	Input: N/A Output: Electromagnetic Isolation
Specification	Enclosure	Plastic					
	Dimensions WxHxD	27 x 109 x 81 mm					
	Weight	Approx. 0.12 kg	Approx. 0.12 kg	Approx. 0.12 kg	Approx. 0.12 kg	Approx. 0.12 kg	Approx. 0.13 kg
	Mount	35mm DIN rail mounting					
Environment	Protection Structure	IP20					
	Storage Temperature	-20° ~ 70° C (-4° ~ 158° F)					
	Operating Temperature	0° ~ 55° C (32° ~ 131° F)					
	Relative Humidity	10% ~ 90% (non-condensing)					
	Altitude	3,000 m					
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)					
Certification	CE	CE marked					
	UL	cULus Listed					

Motion Control Module		iR-PU01-P	
		Digital input/ output	Differential input/ output
Input Logic		Sink Input	Differential Input
Number of Inputs		4	3 (A/B/Z phase)
Output Logic		Source Output	Differential Output
Number of Outputs		4	2 (A/B phase)
HIGH Level Input Voltage		15~28 VDC	-
LOW Level Input Voltage		0~5 VDC	-
Input current		24 VDC, 5 mA	Meets the Requirements of ANSI Standards TIA/EIA-485-A
Input Impedance		3 KΩ	-
Indicators		Red LED Input State	
Output Voltage		24VDC	Meets the Requirements of ANSI Standards TIA/EIA-485-A
Output Current		50 mA	
Max. input frequency		200KHz	2MHz
Max. Output frequency		40KHz	2MHz
Number of Axis		1- Axis	
Specification	PCB Coating	Yes	
	Enclosure	Plastic	
	Dimensions WxHxD	27 x 109 x 81 mm	
	Weight	Approx. 0.12 kg	
	Mount	35mm DIN rail mounting	
Environment	Protection Structure	IP20	
	Storage Temperature	-20° ~ 70° C (-4° ~ 158° F)	
	Operating Temperature	0° ~ 55° C (32° ~ 131° F)	
	Relative Humidity	10% ~ 90% (non-condensing)	
	Altitude	3,000 m	
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)	
Certification	CE	CE marked	
	UL	cULus Listed	

Analog I/O Module		iR-AI04-VI	iR-AM06-VI	iR-AQ04-VI
Number of Analog Inputs		4 (±10V/ ±20mA)	4 (±10V/ ±20mA)	0
Number of Analog outputs		0	2 (±10V/ ±20mA)	4 (±10V/ ±20mA)
Current Consumption		70mA@5VDC	70mA@5VDC	65mA@5VDC
Analog Power Supply		24 VDC(20.4 VDC~28.8 VDC) (-15%~+20%)		
Specification	PCB Coating	Yes		
	Enclosure	Plastic		
	Dimensions WxHxD	27 x 109 x 81 mm		
	Weight	Approx. 0.12 kg		
	Mount	35mm DIN rail mounting		
Environment	Protection Structure	IP20		
	Storage Temperature	-20° ~ 70° C (-4° ~ 158° F)		
	Operating Temperature	0° ~ 55° C (32° ~ 131° F)		
	Relative Humidity	10% ~ 90% (non-condensing)		
	Altitude	3,000 m		
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)		
Certification	CE	CE marked		
	UL	cULus Listed		

Temperature Module		iR-AI04-TR
Number of Input Channels		4 (RTD/Thermocouple)
Current Consumption		65mA@5VDC
Analog Power Supply		24 VDC(20.4 VDC~28.8 VDC) (-15%~+20%)
Specification	PCB Coating	Yes
	Enclosure	Plastic
	Dimensions WxHxD	27 x 109 x 81 mm
	Weight	Approx. 0.12 kg
	Mount	35mm DIN rail mounting
Environment	Protection Structure	IP20
	Storage Temperature	-20° ~ 70° C (-4° ~ 158° F)
	Operating Temperature	0° ~ 55° C (32° ~ 131° F)
	Relative Humidity	10% ~ 90% (non-condensing)
	Altitude	3,000 m
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)
Certification	CE	CE marked
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www.weintekiiot.com

Tel: +886-2-22286770 | Fax: +886-2-22286771
Sales: salesmail@weintek.com | Product Support: servicemail@weintek.com
Address: 14F., No. 11, Qiaohe Rd., Zhonghe Dist., New Taipei City 235029, Taiwan, R.O.C.

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