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Introduction of HXCPU

2025/12/04 R0

Hitachi Industrial Equipment Systems CO., Ltd.

Digital Innovation Sales Division

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Document Purpose

- This document is prepared to describe what HX can do and how it can be used.

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Lineup Explanation

- HXCPU is successor of EHV+ CPU which follows with IEC programming standard

CODESYS

HXCPU
(Module Type)

HXCPU
(Stand Alone Type)

MICRO-EHV+
(All-in-one Type)

Lineup Explanation

- HXCPU has 7 CPU models. Also planned to expand as 8 in future.

HX-CP1H16	Full Function Model
HX-CP1S08	Standard Model
HX-CP1H16-0	Full Function Model (Stand Alone Version)
HX-CP1S08-0	Standard Model (Stand Alone Version)
HX-CP1H16M	Full Function Model (CNC Motion Control Version)
HX-CP1S08M	Standard Model (Motion Control Version)
HXC-CP1H16	Hybrid Model (Codesys PLC + C/C++ Program Version)
HX-CP1H16R-0	Full Function Model (Redundant Version) / Coming Soon in 2026 JAN

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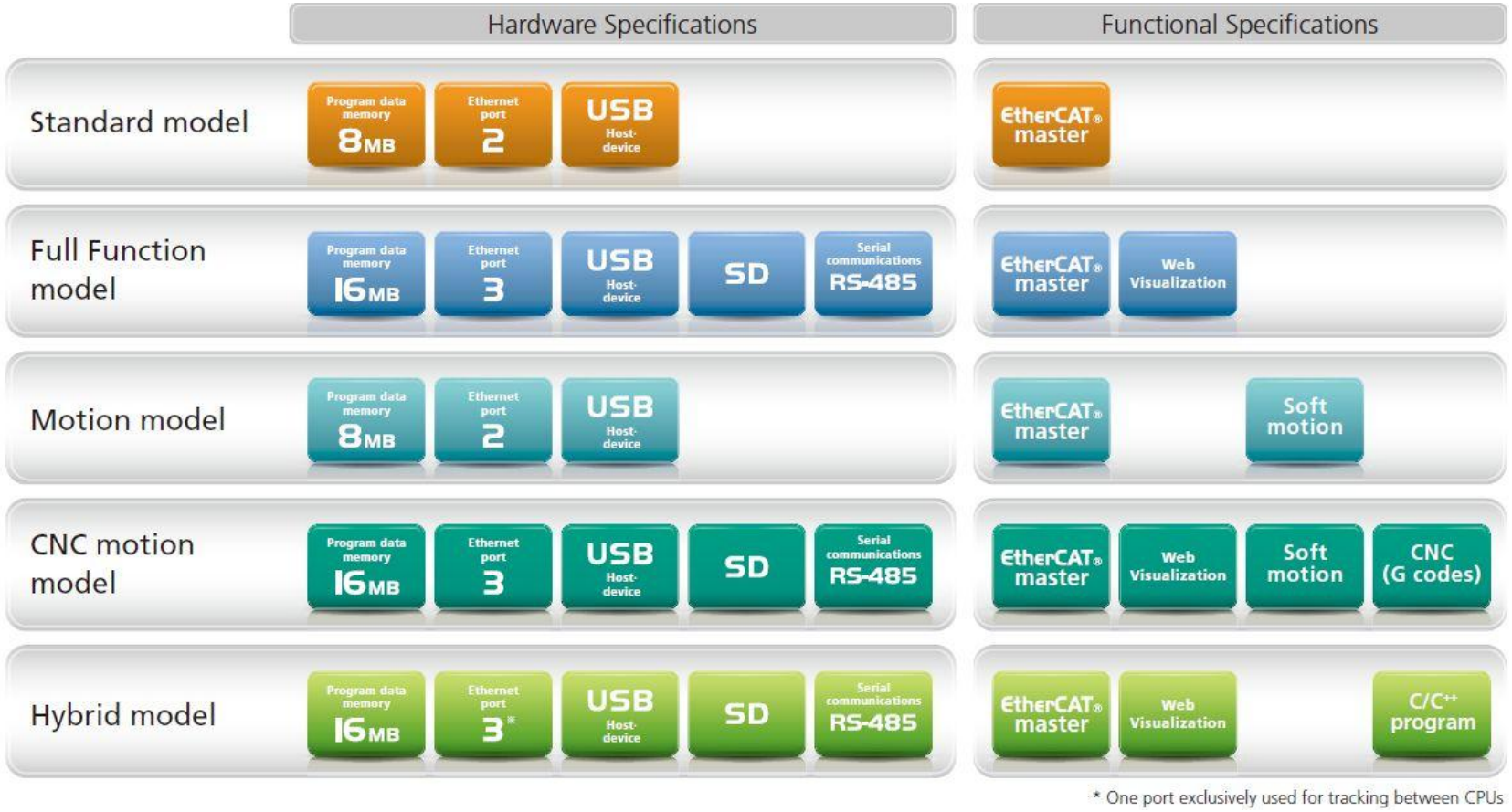
Lineup Explanation

- Full Function has 3Ethernet port and 1Serial, while Standard has only 2Ethernet



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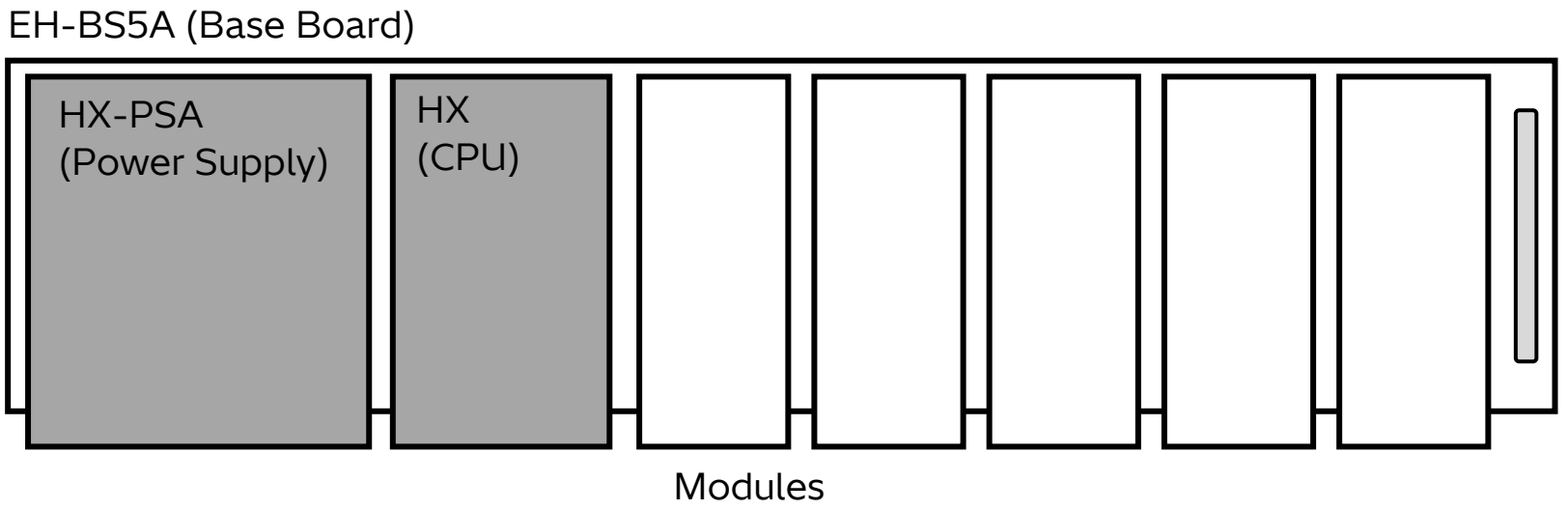
Lineup Explanation

- Module Type can attach modules on boards to expand its functions



Lineup Explanation

- Base Rack shall be defined with its number of slots

<General Base Rack>

EH-BS3A	Base rack with 3 module slots available
EH-BS5A	Base rack with 5 module slots available
EH-BS6A	Base rack with 6 module slots available
EH-BS8A	Base rack with 8 module slots available
EH-BS11A	Base rack with 11 module slots available

<Special Base Rack>

EH-BS8R	Base rack for Power redundant (2 power onboard available)

Lineup Explanation

- Power modules shall be defined by its input type

<General Power Module>

EH-PSA	Power module for 100-240VAC input
EH-PSD	Power module for 24VDC input

<Special Power Module>

EH-PSR	Power module for Redundant power supply (2 powers load on EH-BS8R)

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Lineup Explanation

- Digital, Analogue, Pulse, Communications, Expansions are supported by module

DC and AC digital input and output modules

8 / 16 pts. Input module (terminal block)

EH-XD8 : 8 pts. 24 V DC (response time 5 ms max.)
EH-XD16 : 16 pts. 24 V DC (response time 5 ms max.)
EH-XDL16 : 16 pts. 24 V DC (response time 16 ms max.)
EH-XDS16 : 16 pts. 24 V DC (response time 1 ms max.)
EH-XA16 : 16 pts. 100 to 120 V AC (response time 15 ms max.)
EH-XAH16: 16 pts. 200 to 240 V AC (response time 15 ms max.)

32 pts. Input module (connector)

EH-XD32 : 32 pts. 24 V DC (response time 5 ms max.)
EH-XDL32: 32 pts. 24 V DC (response time 15 ms max.)
EH-XDS32: 32 pts. 24 V DC (response time 1 ms max.)

8 / 16 pts. Output module (terminal block)

EH-YT8 : 8 pts. Transistor (sink)
EH-YTP8 : 8 pts. Transistor (source)
EH-YT16 : 16 pts. Transistor (sink)
EH-YTP16 : 16 pts. Transistor (source)
EH-YTP16S: 16 pts. Transistor (source with short circuit protection)
EH-YS16 : 16 pts. Triac
EH-YR12 : 12 pts. Relay
EH-YR16 : 16 pts. Relay
EH-YR8B : 8 pts. Isolated relay
EH-YR16D : 16 pts. Relay (2 common)

32 pts. Output module (connector)

EH-YT32 : 32 pts. Transistor (sink)
EH-YTP32: 32 pts. Transistor (source)

Lineup Explanation

- Digital, Analogue, Pulse, Communications, Expansions are supported by module

64 pts. Input module (connector)

EH-XD64: 64 pts. 24 V DC
(response time 1 ms max.)

64 pts. Output module (connector)

EH-YT64 : 64 pts. Transistor (sink)
EH-YTP64: 64 pts. Transistor (source)

32 pts. Input module (Spring type terminal block)

EH-XD32E : 32 pts. 24 V DC
(response time 5 ms max.)
EH-XDL32E: 32 pts. 24 V DC
(response time 16 ms max.)

32 pts. Output module (Spring type terminal block)

EH-YT32E : 32 pts. Transistor (sink)
EH-YTP32E: 32 pts. Transistor (source)

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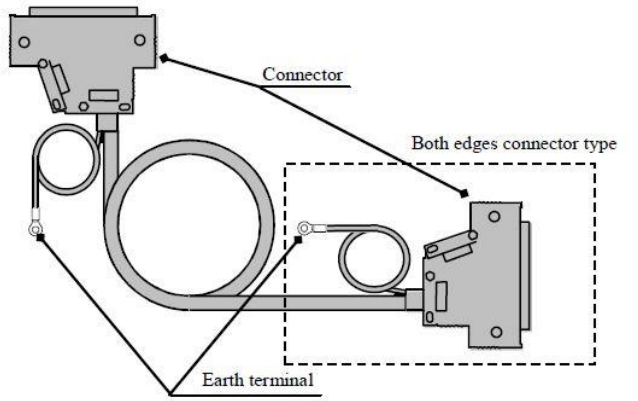
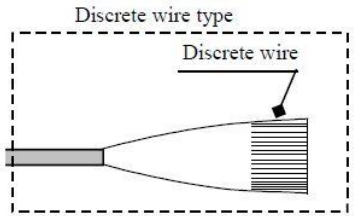
Lineup Explanation

- Digital, Analogue, Pulse, Communications, Expansions are supported by module

32points & 64points are required to connect via EH-CBM cables

Name and function of each part





Type (Length) (Both edges connector type)	EH-CBM01W (1 m (3.28 ft.))
	EH-CBM03W (3 m (9.84 ft.))
	EH-CBM05W (5 m (16.4 ft.))
	EH-CBM10W (10 m (32.8 ft.))
Type (Length) (One edge connector type)	EH-CBM01 (1 m (3.28 ft.))
	EH-CBM03 (3 m (9.84 ft.))
	EH-CBM05 (5 m (16.4 ft.))
	EH-CBM10 (10 m (32.8 ft.))
Diameter	AWG# 28

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Lineup Explanation

- Digital, Analogue, Pulse, Communications, Expansions are supported by module

Analog input and output modules

Analog Input module

EH-AX44 : 12-bit analog input, Current 4 to 20 mA, Voltage 0 to 10 V, 4 ch each
EH-AX8V : 12-bit analog input, Voltage 0 to 10 V, 8 ch
EH-AX8H : 12-bit analog input, Voltage -10 to 10 V, 8 ch
EH-AX8I : 12-bit analog input, Current 4 to 20 mA, 8 ch
EH-AX8IO : 12-bit analog input, Current 0 to 22 mA, 8 ch
EH-AXH8M: 14-bit analog input, Current 0 to 22 mA / 4 to 22 mA, Voltage -10 to 10 V / 0 to 10 V, 8 ch
EH-AXG5M: 16-bit analog input, Current 0 to 22 mA / 4 to 22 mA, Voltage -10 to 10 V / 0 to 10 V, 5 ch Isolated

Analog Output module

EH-AY22 : 12-bit analog output, Current 4 to 20 mA, Voltage 0 to 10 V, 2 ch each
EH-AY4V : 12-bit analog output, Voltage 0 to 10 V, 4 ch
EH-AY4H : 12-bit analog output, Voltage -10 to 10 V, 4 ch
EH-AY4I : 12-bit analog output, Current 4 to 20 mA
EH-AY2H : 12-bit analog output, Voltage -10 to 10 V, 2 ch
EH-AYH8M: 14-bit analog output, Current 0 to 22 mA / 4 to 22 mA, Voltage 0 to 10 V, 8 ch
EH-AYG4M: 16-bit analog output, Current 0 to 22 mA / 4 to 22 mA, Voltage -10 to 10 V / 0 to 10 V, 4 ch Isolated

RTD and thermocouple Input module

EH-PT4 : Signed 15-bit, Pt100 / Pt1000, 4 ch
EH-RTD8 : Signed 15-bit, Pt100 / Pt1000, 6 ch (3 wire) / 8 ch (2 wire)
EH-TC8 : Signed 15-bit, Thermo-couple (K, E, J, T, B, R, S, N) 8 ch

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Lineup Explanation

- Digital, Analogue, Pulse, Communications, Expansions are supported by module

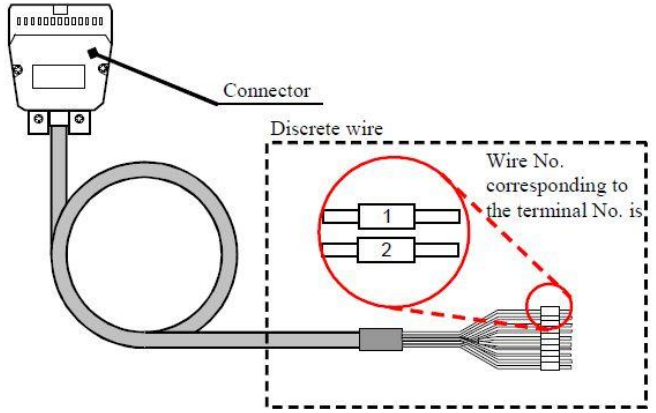
Counter modules

High speed counter module

EH-CU : Maximum 100 kHz, 2 ch
EH-CUE: Maximum 100 kHz, 1 ch

Counter modules are required to connec via EH-CUC cables

Name and function of each part



Type (Length) (One edge connector type)	EH-CUC01 (1 m (3.28 ft.))
	EH-CUC02 (2 m (6.56 ft.))
	EH-CUC03 (3 m (9.84 ft.))
	EH-CUC04 (4 m (13.1 ft.))
	EH-CUC05 (5 m (16.4 ft.))
Diameter	AWG# 24

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Lineup Explanation

- Digital, Analogue, Pulse, Communications, Expansions are supported by module

Serial communication Module: EH-SIO
Interface: RS-232C×1, RS-232C / 422 / 485×1
Communication mode : Half-duplex
Communication speed : 300-57,600 bps
Communication protocol: Non-protocol
Modbus-RTU master

PROFIBUS® DP V0 Master / Slave Controller
Number of slave-connected units: Max. 125
(of which maximum 22 units are EH-IOCP2)
Communication speed Max. 12 Mbps
Communication distance Max. 1,200 m (Lower than 93.75 kbps)
Input / Output data 512 words / 512 words

*Other TCP/IP based communications are all supported from CPU

Modbus-TCP
EtherCAT
Ethernet I/P (Scanner & Adapter)
Profinet

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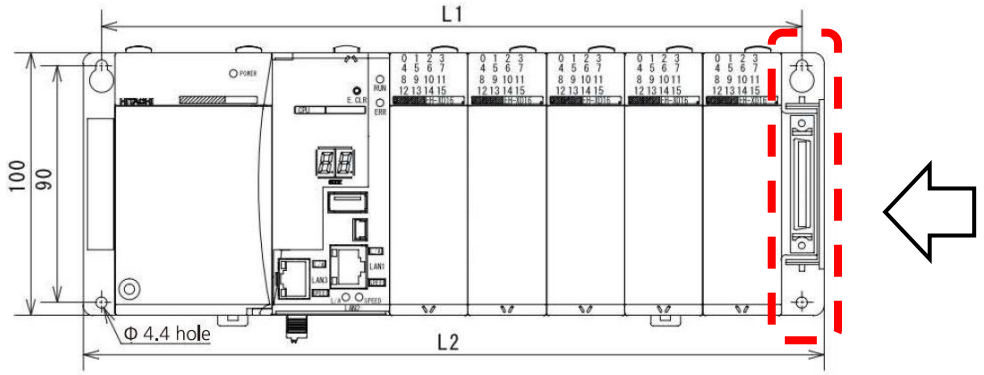
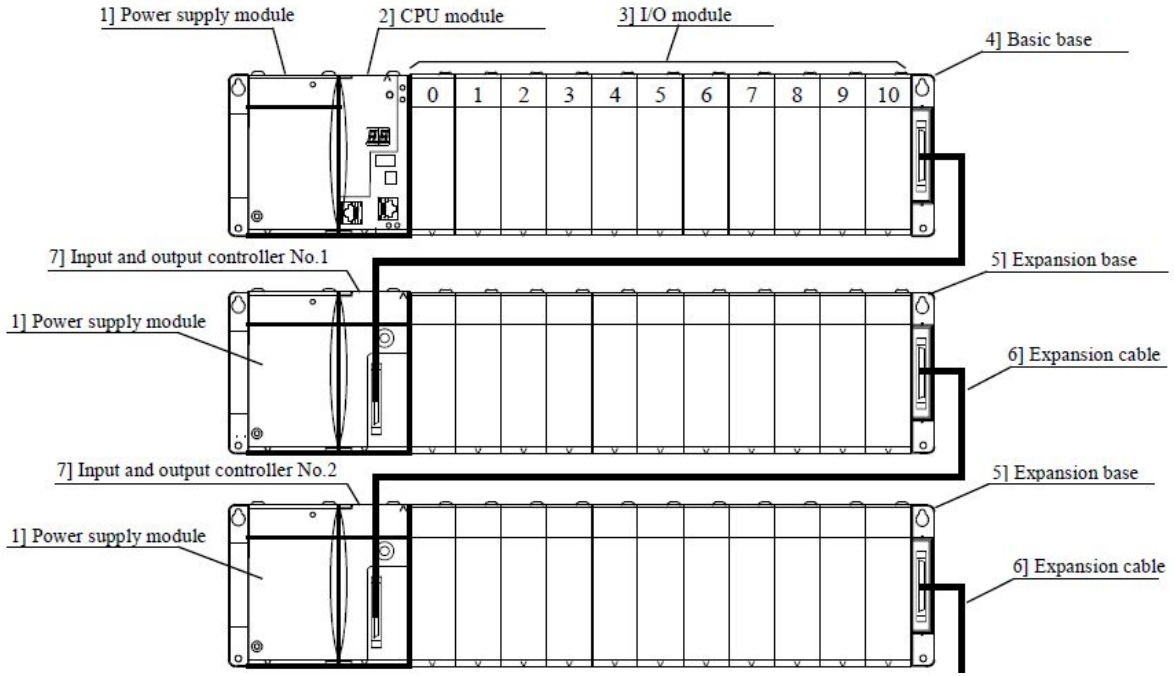
Lineup Explanation

- For expansion of base rack, connect with EH-IOCH2



*Connect with EH-IOCH2



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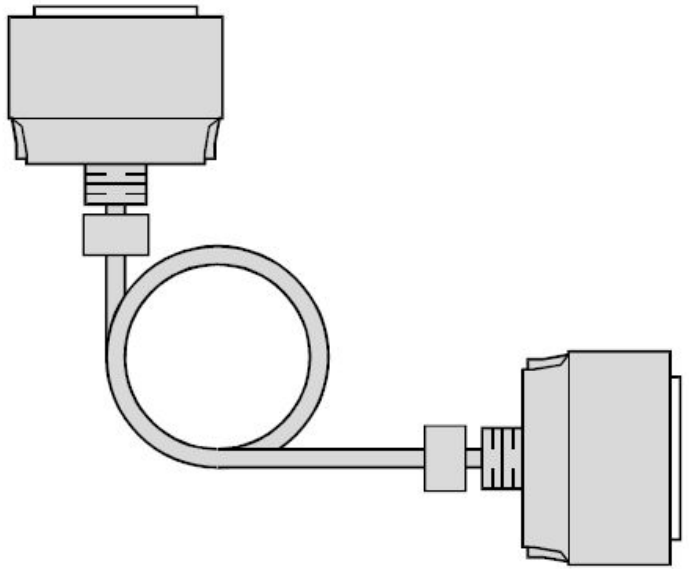
Lineup Explanation

- For expansion of base rack, connect with EH-IOCH2

*Use EH-CB cables for connection with EH-IOCH2

Name and function of each part		Type	EH-CB05A / 10A / 20A
		Weight	Approx. 0.21 (0.46) / 0.24 (0.53) / 0.30 kg (0.66 lb)
		Length	0.5 (1.64) / 1.0 (3.28) / 2.0 m (6.56 ft.)
Function	Connects to the expansion cable connector of the base unit and to the connector of the I/O controller. There is no directivity in the cable. Either connector can be connected to the base side.		

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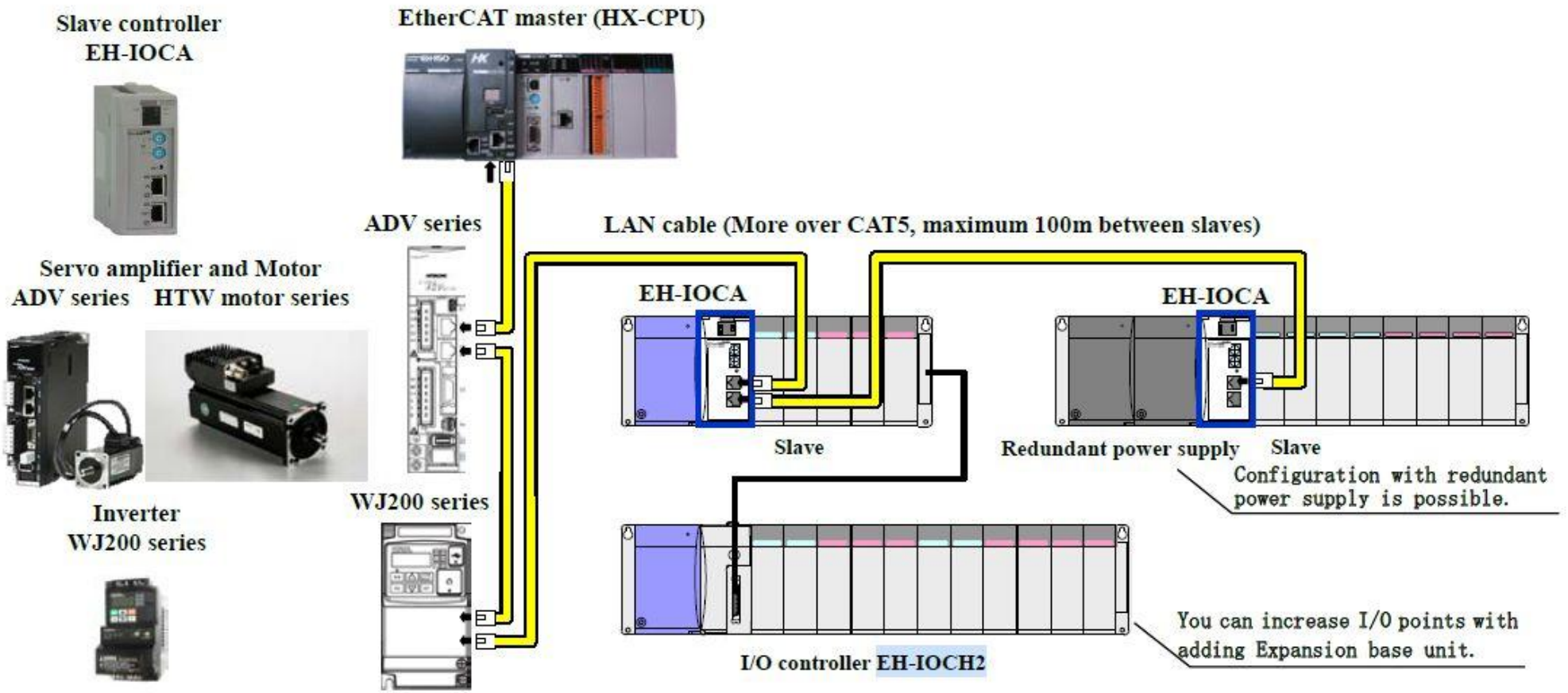
Lineup Explanation

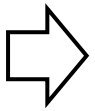
- For remote IO control, connect with EtherCAT based EH-IOCA



CPU Functions

- HXCPU supports programming via CODESYS

HX-CODESYS V3.5 SP16 Patch 2 +



*Planned to be updated as SP20 by early of 2026 (FEB-MAR)
*Also planned to be updated as SP21 around end of 2026 (SEP-DEC)

CRA requirement shall be covered by SP21
2038 year clock issue shall be covered by SP21

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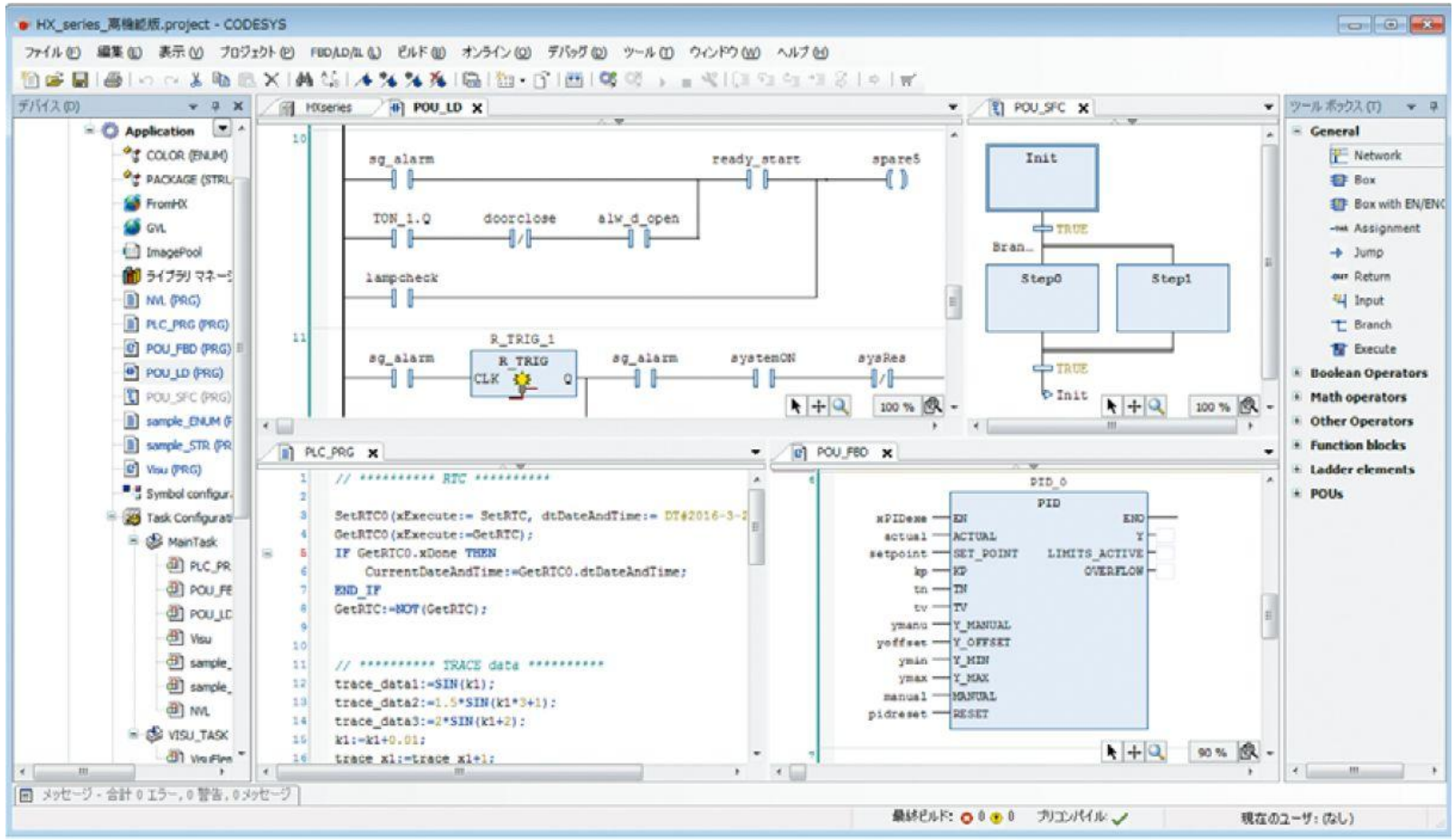
CPU Functions

- Programming can be done in IEC 5 languages + CODESYS 1 original language



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CPU Functions

- Programming can be done in IEC 5 languages + CODESYS 1 original language

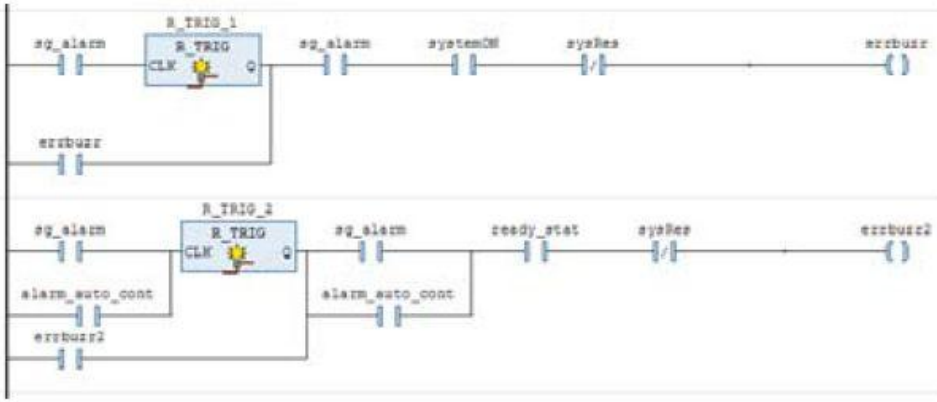
■ST (Structured Text)

A text language based on PASCAL. It is perfect for uses that are not handled well by LD, such as branching, repeating, and numerical operations.

```
count_M3:=count_M3+1;
L2_wait_time (IN:=FALSE, PT:=T#3.6S);
L2_wait_time (IN:=TRUE);
FOR i:=0 TO count_T DO
    K1_temp[i]:=B1_init; //Reset B1
END_FOR
IF count_Nmax <24 THEN
    WHILE vxcount<10 DO
        T1max:=125;  //Max.=125 digC
    END_WHILE
END_IF
B100status:=FALSE;  //B100 complete
```

■LD (Ladder Logic Diagram)

A graphic language based on relay circuits. It is suitable for bit operations, such as interlock processing.



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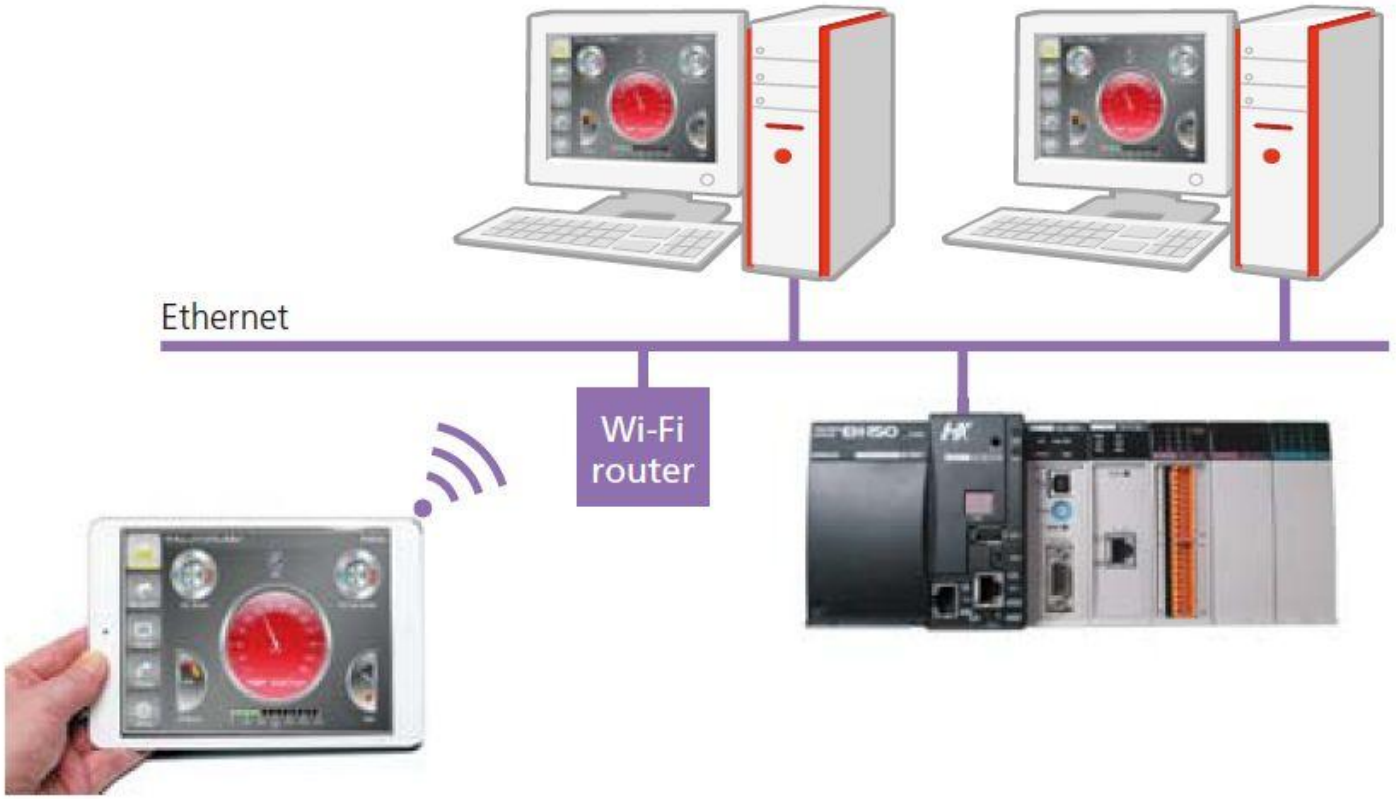
CPU Functions

- Possible to prepare dashboard (Virtual SCADA, HMI) as Web visualization

*For remote control & monitoring (via Factory LAN, VPN remote access, etc.)



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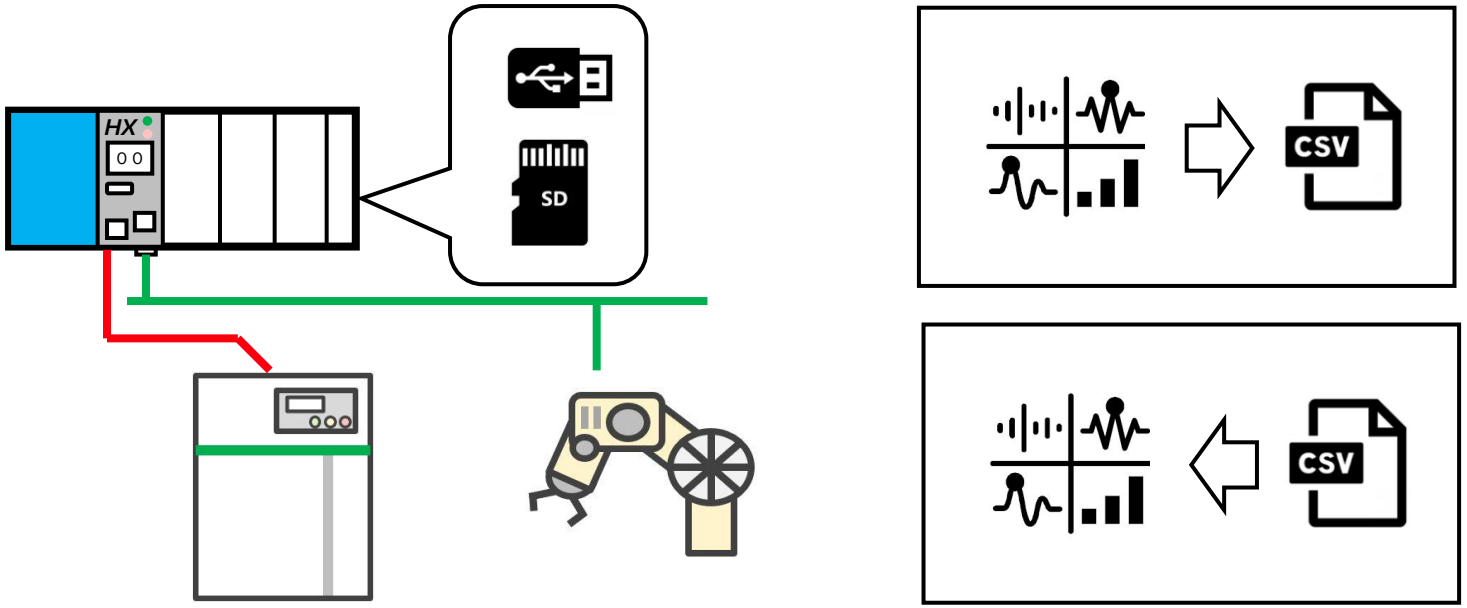
CPU Functions

- Possible to handle PLC data as text outputs on csv files

*For historical data recording, sharing data with other IT services



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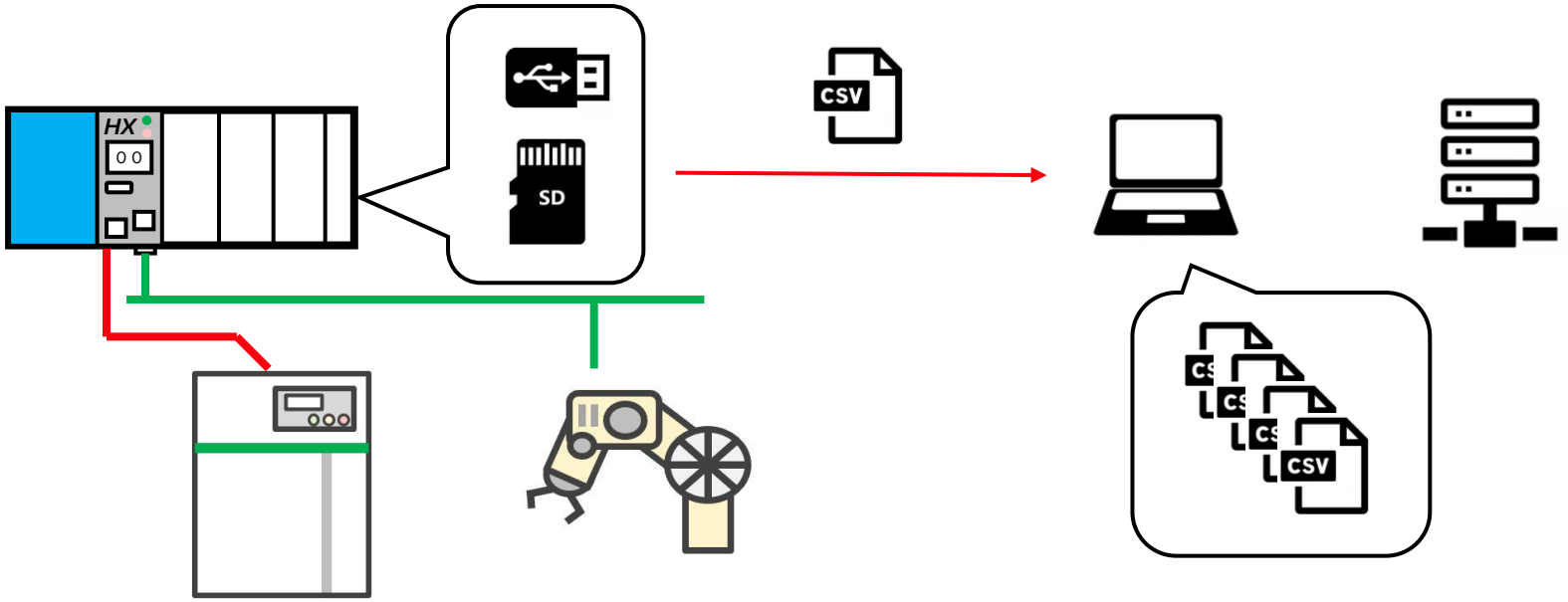
CPU Functions

- Possible to handle file & folder handling

*For automatic sending out of stored text based files



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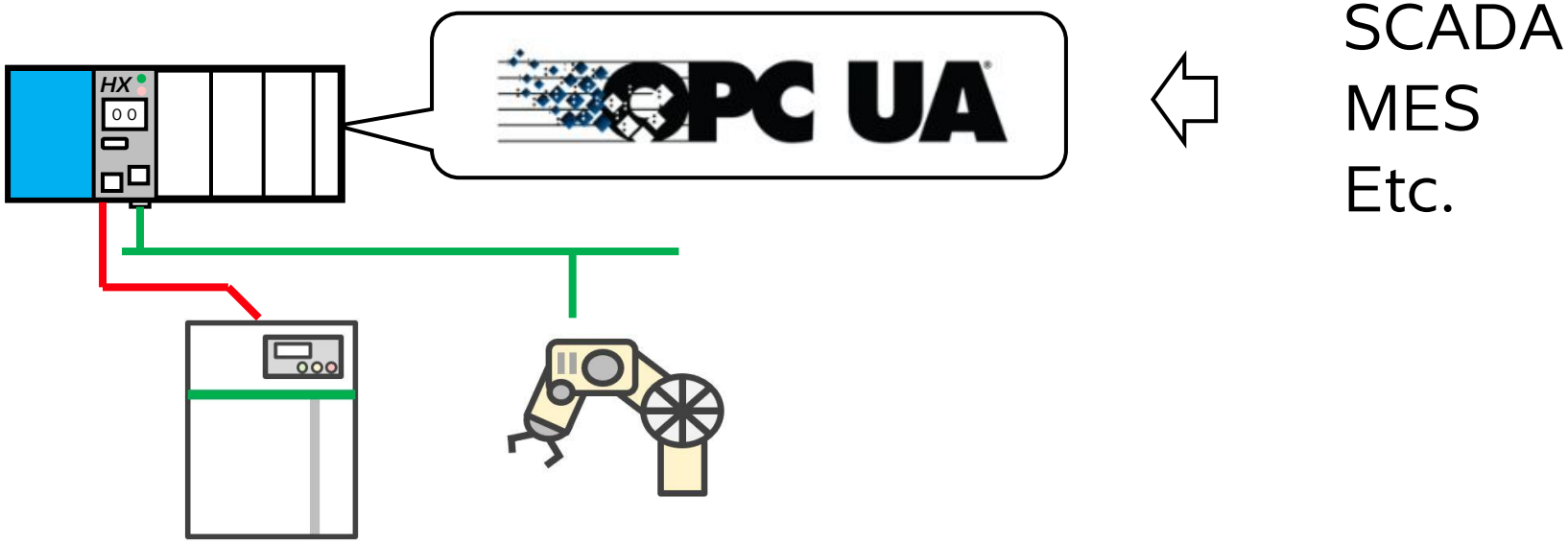
CPU Functions

- Also supports IT Bridge protocols as OPC-UA

*For IT system data sharing in seemless cycle



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CPU Functions

- Enable to add functions by listing library and/or purchasing library from 3S

*Example: Add MC Protocol support to directly connect with Mitsubishi Q CPUs

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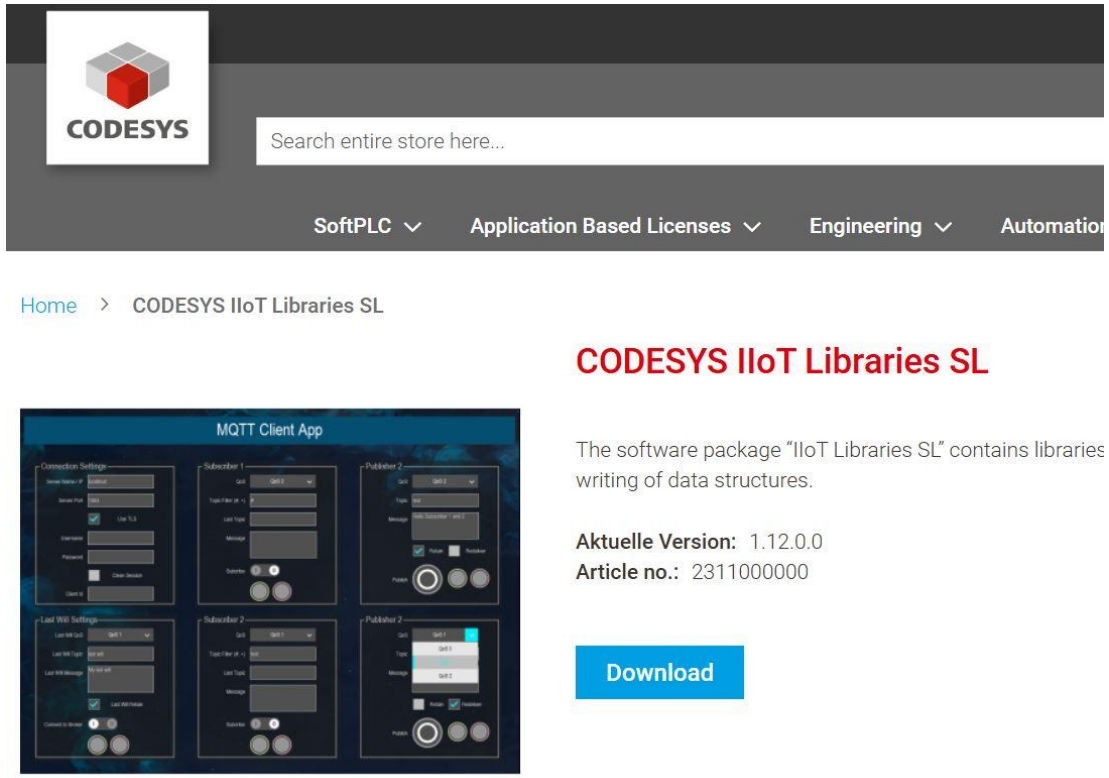
CPU Functions

- Enable to add functions by listing library and/or purchasing library from 3S

*Example: 3S sells additional library for IoT connection (MQTT, Restful HTTP, Emails etc.)



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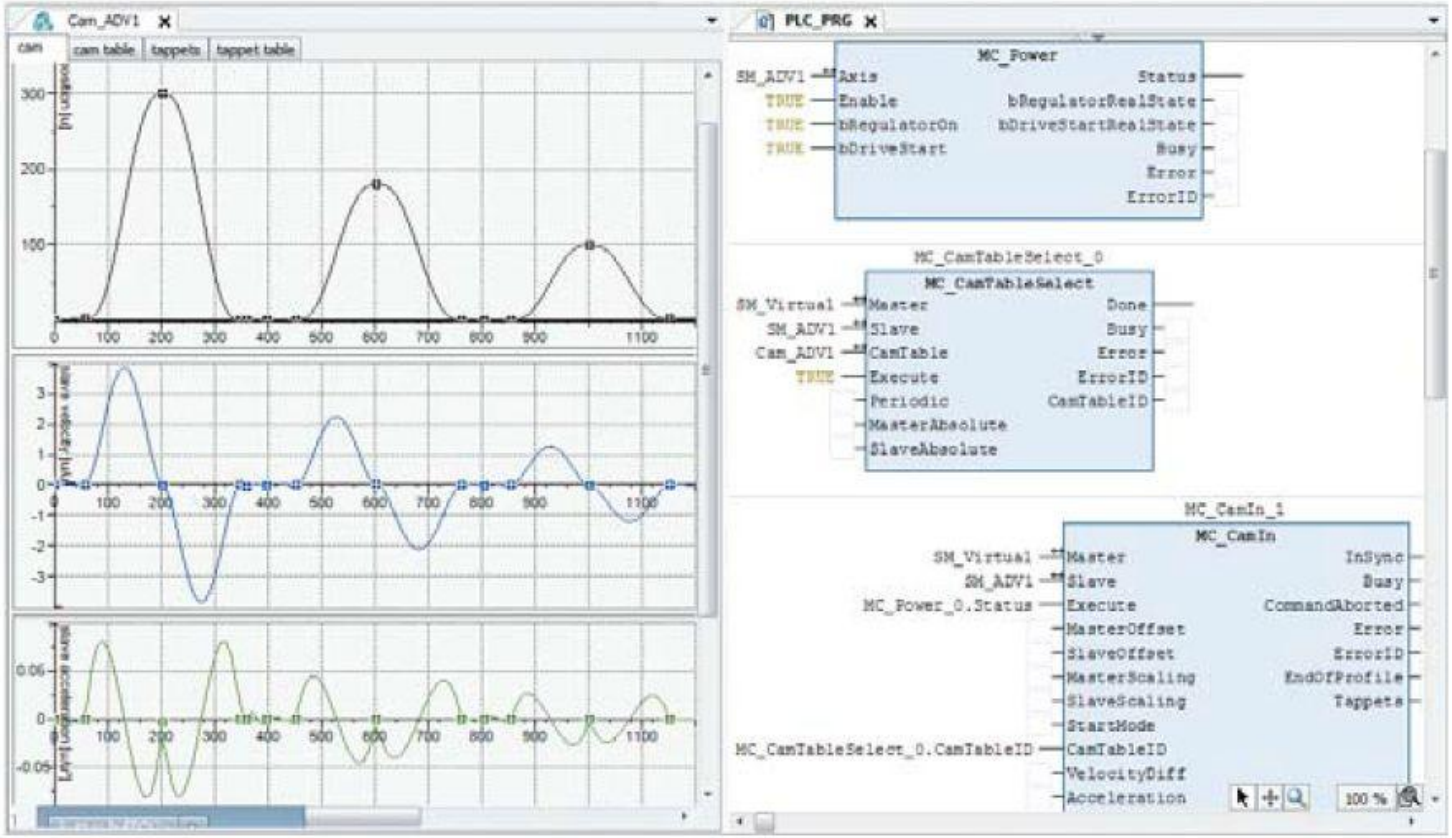
Special Functions

- For motion control models, supports PLC Open soft motion controls

*Enable easy servo axis control as software programming basis



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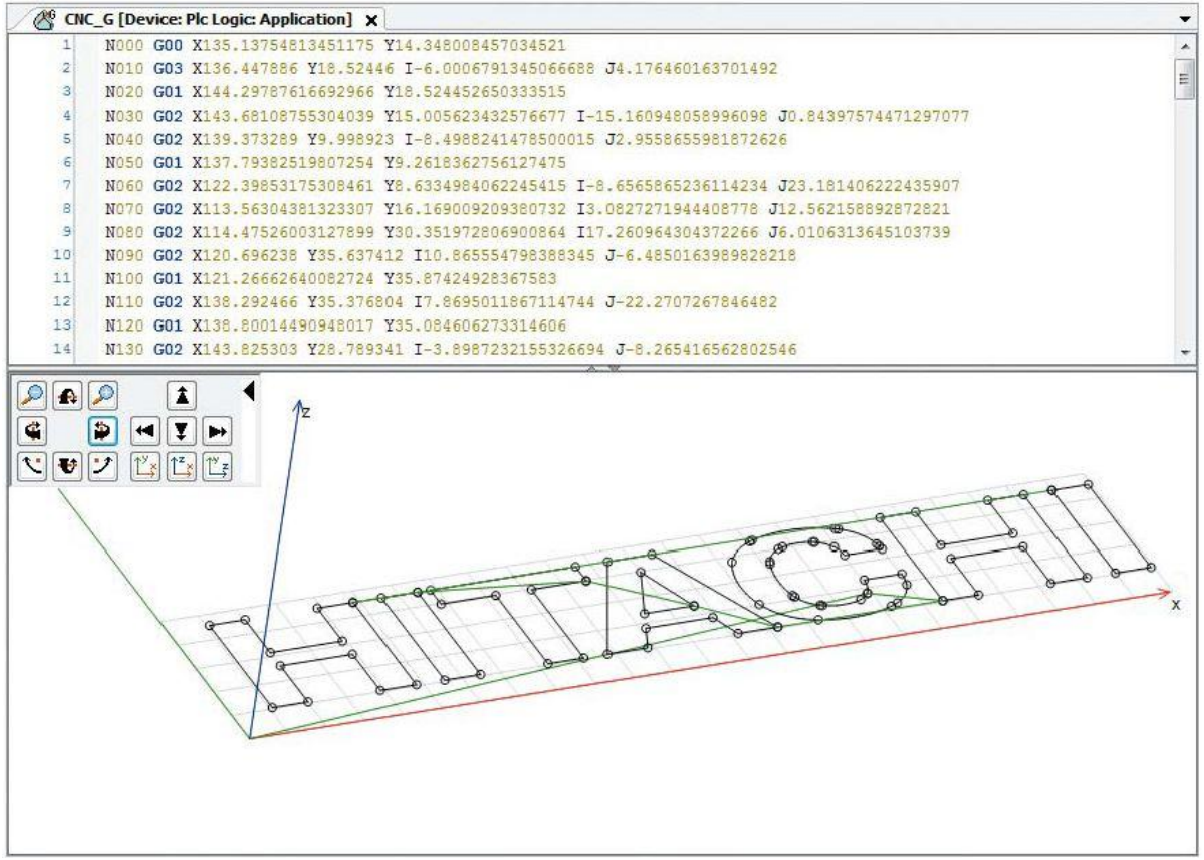
Special Functions

- For CNC motion control models, also supports G code inputs

*Connection with CNC machines



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Special Functions

- For Hybrid CPU model, supports C/C++ programming

*C/C++ program shall be prepared by HX Studio

HX2 available in Japan market which supports other programming language such as Python, PHP, etc. But not applicable for CE marks

Trainings Prepared

- Following topics are prepared for technical training as one example

1) Network Connection Lectures
   - Modbus connection establishment (Basic lecture of how to set up network connection between slave)
   - Modbus-RTU query sending control (Control lecture of which timing to send query to slave devices)
   - Modbus-RTU dynamic query control (Control lecture of establish all setting dynamically in POU)
   - Modbus-TCP establishment & control (Dynamic request sending of Modbus-TCP sending)
   - Manual protocol preparation (Create manual protocol from scratch, for ASCII based old comm like barcode reader etc.)
   - Special protocol handling (Basic lecture of other networks such as EtherCAT, EthernetI/P, Profinet, MC Protocol etc.)

2) Data Logging Lectures
   - CSV file writing lecture (Write out PLC variables as csv file so can output historical data record)
   - CSV file reading lecture (Reverse back generated csv files into PLC binary data to import data from other system)
   - FTP file sending lecture (File & folder handling which enable saved csv files to be transferred to destination NAS/PC)
   - High speed Log lecture (Write out csv file in ms order so can use data for predictive maintenance analysis etc)

3) Web Visualization Lectures
   - Web Visualization Entry (Basic lecture of how to use items prepared by CODESYS. Button/Graph/Chart/Table etc.)
   - Web Visualization Works (Lecture of designing factory monitoring system, machine monitoring service, etc)
   - Web Visualization Controls (Lecture of user management, access control, and dynamic operation from POUs)

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Requirement

- Requirements raised for good operation with Hitachi

1) Preparation of Download site
Distributor link
→ Document, manuals, software can be directly download from this link for smooth distribution activities

2) HX pricelist
Please collect from Hitachi Australia (Joanna san)

3) Tech lecture Preparation
Lecture documents need to be converted as Ladder Diagrams since most members are well used with LD.
(3 system integrator – all using Ladder Diagrams as main programming style)

<Next Action>
Hitachi-IES will settle above two and provide schedule updates around end of DEC,
So that announcement preparation can be made from JAN-FEB to have good start together.


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