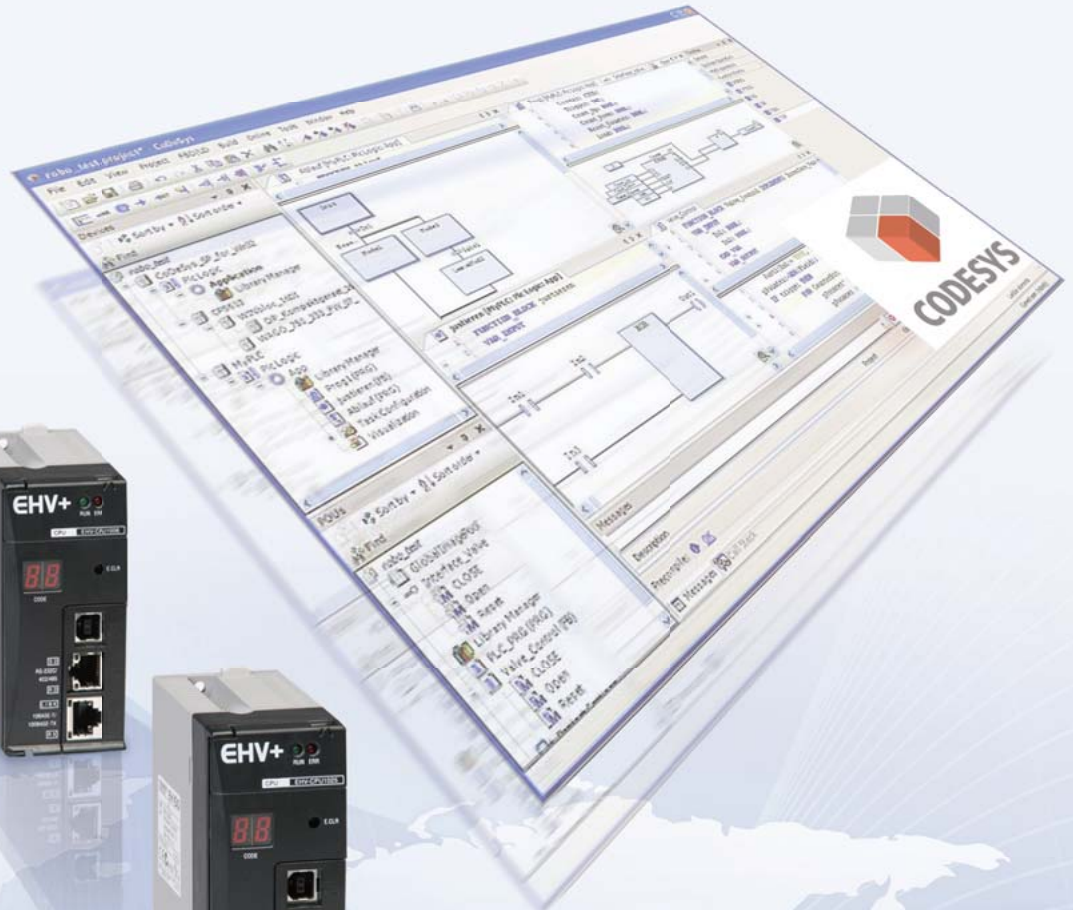


Programmable Logic Controllers

# EHV+ Series

**HITACHI**  
Inspire the Next

Full compliance with the  
IEC61131-3 International Standard



# EHV+ Series CPU modules

The EHV+ Series is a fully IEC61131-3 compliant PLC Series which offers effective programming features and reduced debugging and commissioning time.

## CPU module “EHV+”

The powerful hardware performances of existing EHV Series are succeeded to EHV+, such as multi-programming port (USB, Ethernet, Serial), compatibility of I/O modules for EH-150 Series, high reliability, superior in quality and much more.

## Programming software “HX-CODESYS”

HX-CODESYS is a professional development tool based on CODESYS V3.5 by 3S. Compared to standard CODESYS, following components are additionally included in the installation file (setup.exe)

- Device description files (.xml) for EHV+ Series
- Special libraries for EHV+ Series. (get\_error\_info, Counter\_interface, etc.)

Well over 200 renowned device manufacturers from different industrial sectors program their automation devices with CODESYS. Today, CODESYS is the widest-spread IEC61131-3 development tool in Europe and has established itself as the standard in controller and PLC programming. Advantages of CODESYS are introduced as follows.

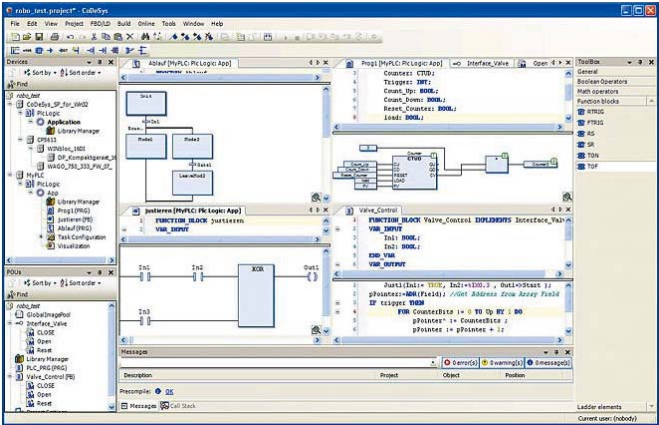
- Standardized programming style with 5 programming languages (LD, FBD, IL, ST, SFC).
- No need to study manufacturer’s specific programming way.
- Easy to start using Hitachi PLC for those who having;
  - No experience of PLC
  - Experience of other manufacturer’s programming
  - Experience of high level languages
- Same Variable names are shared by PLC, HMI, SCADA, and other I/O devices.
- Offline simulation function on programming software.

## EHV+ CPU Series: Scalable memory size (2 Models)

EHV-CPU1025 (512 KB)  
EHV-CPU1102 (2,048 KB)



## Hitachi version of CODESYS by 3S-Smart Software Solutions GmbH



## EHV+ CPU module

**User program memory**  
Max. 2,048 KB

**7 Segment LED Display**  
Error code is displayed here.

**3 commutation ports**

- USB port (Ver2.0 FullSpeed 12 Mbps)
- Serial port (RS-232C / RS-422 / RS-485)
- Ethernet port (10BASE-T/100BASE-TX)

**User program is stored in non-volatile FLASH memory.**  
(Data is stored in volatile RAM memory retained by battery.)

The battery can be replaced easily with CPU module mounted.

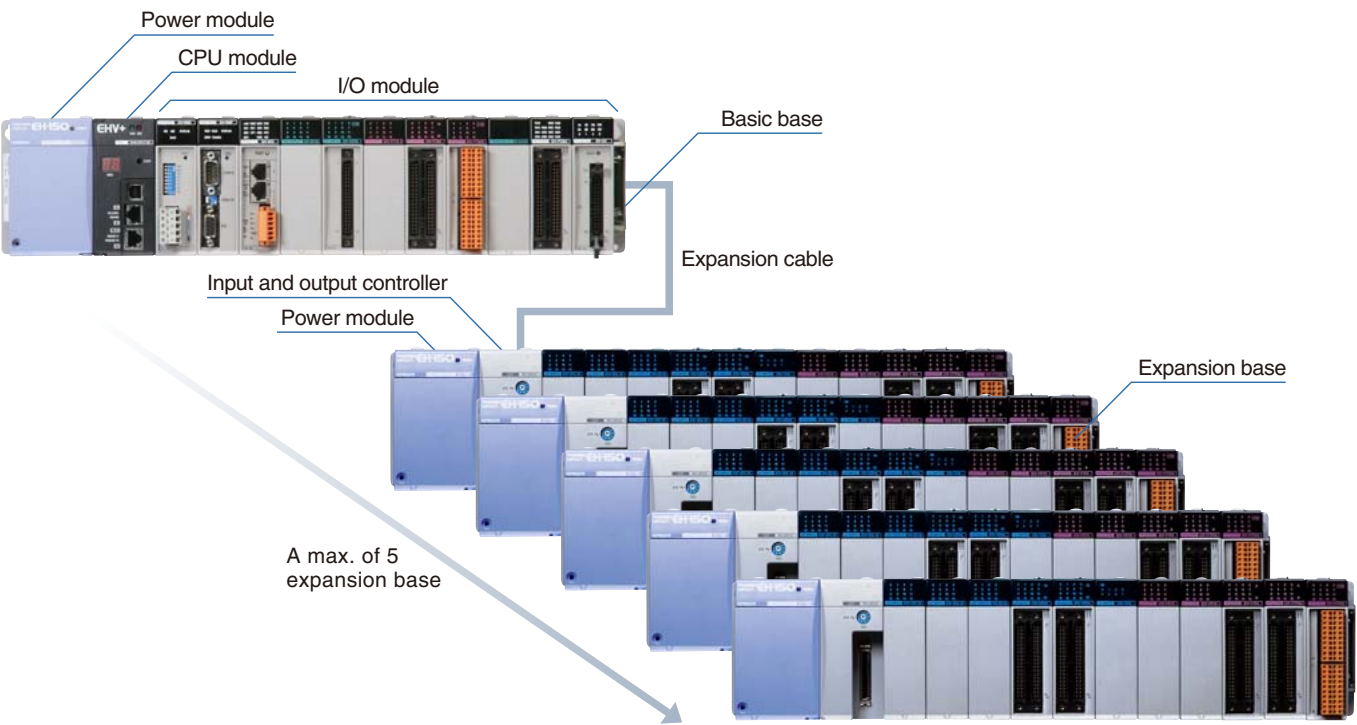
Battery  
Battery connector

The Ethernet and the Serial port have LEDs of communication status.

**Modbus-TCP master / slave function EtherCAT® master function.**

EtherCAT® master function is incorporated into the LAN port of the CPU module. A combined use of an EtherCAT® slave (I/O terminals, Variable Frequency Drivers and so on) is possible.

## No. of I/O is Max. 4,224 (using 64 pts. modules)



EHV+ Series is small size but powerful PLC covering wide range of applications since it is possible to expand up to 5 expansion bases, which offers max. 4,224 I/O points in 66 I/O modules.



Specifications



CPU Module

| Items                            |              | EHV-CPU1025                                                                                                                                                                                                      | EHV-CPU1102 |
|----------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| User program memory              |              | 512 KB                                                                                                                                                                                                           | 2,048 KB    |
| Source file memory               |              | 4,864 KB                                                                                                                                                                                                         |             |
| Data memory (non retain)         |              | 384 KB                                                                                                                                                                                                           |             |
| Data memory (retain)             |              | 64 KB                                                                                                                                                                                                            |             |
| Data memory (persistent)         |              | 64 KB                                                                                                                                                                                                            |             |
| Data memory (Fieldbus)           |              | 16 KB (2 KB×8 = 1 KW×8)                                                                                                                                                                                          |             |
| No. of expansion base            |              | 5                                                                                                                                                                                                                |             |
| No. of I/O (using 64 pts module) |              | 4,224                                                                                                                                                                                                            |             |
| No. of logical port for Gateway* |              | 6                                                                                                                                                                                                                |             |
| Programming languages            |              | IEC61131-3 compliant 5 languages<br>LD : Ladder Diagram<br>FBD: Function Block Diagram (incl. CFC: Continuous Function Chart)<br>SFC: Sequential Function Chart<br>IL : Instruction List<br>ST : Structured Text |             |
| I/O updating cycle               |              | Refresh processing                                                                                                                                                                                               |             |
| Communication                    | Protocol     | CODESYS V3 protocol                                                                                                                                                                                              |             |
|                                  | USB          | USB 2.0 Full speed (Gateway*)                                                                                                                                                                                    |             |
|                                  | Ethernet     | 10BASE-T / 100BASE-TX (Gateway*, Modbus-TCP client / server, EtherCAT® master, Global network variables)                                                                                                         |             |
|                                  | Serial       | RS-232C / 422 / 485 (Modbus-RTU master, General purpose)                                                                                                                                                         |             |
| Switch, indications              | Indications  | RUN LED, ERR LED, 7-segment LED (2 digits)                                                                                                                                                                       |             |
|                                  | RUN switch   | STOP / RUN (Remote RUN / STOP enabled when the switch position is in RUN.)                                                                                                                                       |             |
|                                  | E.CLR button | Reset error information                                                                                                                                                                                          |             |
| Calendar clock                   |              | Support (Built-in RTC)                                                                                                                                                                                           |             |
| Battery                          |              | LIBAT-H (for RTC and RETAIN data)                                                                                                                                                                                |             |
| Maintenance function             |              | Diagnosis (micro processor error, watch dog timer error, memory error, battery error, etc.)                                                                                                                      |             |

\* Gateway: Communication with HX-CODESYS

EtherCAT® Master Specifications

| Items                        | Specifications                                           |
|------------------------------|----------------------------------------------------------|
| Communication protocol       | EtherCAT® protocol                                       |
| Supported services           | CoE (process data communications and SDO communications) |
| Synchronization              | None (DC is not supported)                               |
| Physical layer               | 100BASE-TX                                               |
| Modulation                   | Baseband                                                 |
| Baud rate                    | 100 M bits/s (100BASE-TX)                                |
| Duplex mode                  | Full / Auto                                              |
| Topology                     | Daisy chain, branch wiring                               |
| Transmission media           | Category 5 shielded twisted-pair cable or higher         |
| Transmission distance        | Distance between nodes: 100 m or less (IEEE802.3)        |
| Maximum number of slaves     | 255                                                      |
| Maximum process data size    | Input 5,736 bytes, Output 5,736 bytes                    |
| Maximum data sizes per slave | Input 1,434 bytes, Output 1,434 bytes                    |
| Maximum message size         | 2,048 bytes                                              |
| Minimum communications cycle | 10 ms                                                    |
| Sync jitter between slaves   | 1 μs                                                     |
| Process data communications  | PDO mapping using CoE                                    |
|                              | Fail-soft operation for slave communications errors      |
|                              | Stop operation for slave communications errors           |
| SDO communications           | CoE                                                      |
|                              | - Emergency message server (receptions from slaves)      |
|                              | - SDO requests and responses                             |
| Configuration                | Setting node address using HX-CODESYS network scan       |
|                              | Display of network configuration information             |
| RAS functions                | Slave configuration check when starting network          |
|                              | Reading of error information                             |
|                              | Trouble shooting information                             |
| Slave information            | - Automatic reboot of the slaves                         |
|                              | - Scanning slaves supported                              |
| Mailbox support              | CoE (CAN open / CAN application layer over EtherCAT®)    |
|                              | SoE (Servodrive over EtherCAT®)                          |
|                              | FoE (File over EtherCAT®)                                |
|                              | VoE (Vendor over EtherCAT®)                              |

- Note:
- Please note that using various Ethernet based communication (EtherCAT®, Modbus-TCP, NVL, Gateway) at the same time will limit the communication performance.
  - If connected slave devices are drives (e.g. servo drives), it is strongly recommended to use profile mode in their operation mode. Since EtherCAT® cycle of the CPU is not fast enough, cyclic synchronous mode may not work in full performance.

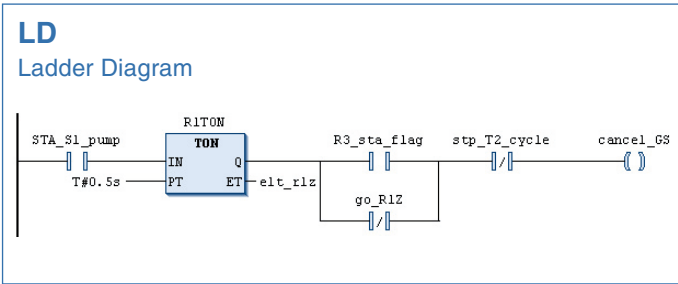
# Programming software “HX-CODESYS”

## ● Five programming language editors

The user can freely select among the 5 programming languages of the IEC61131-3 standard according to the intended purpose and the programmer’s skills and experience.

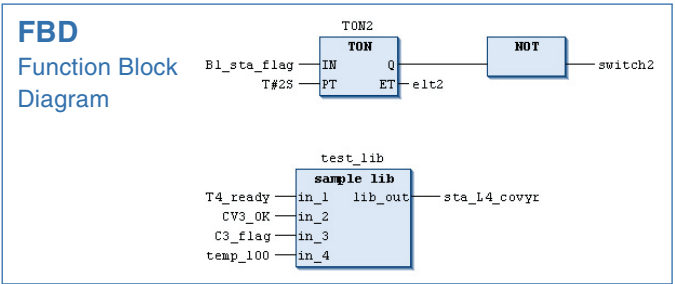
### LD

Ladder Diagram



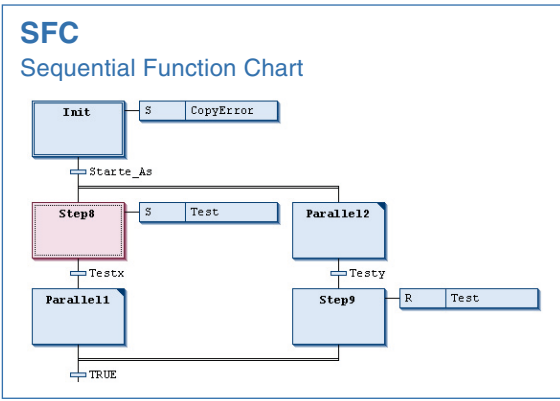
### FBD

Function Block Diagram



### SFC

Sequential Function Chart



### IL

Instruction List

```
LD      bVar
ST      inst1.IN
JMPC    m1
CAL     inst1(
        PT:=t1,
        ET:=tout1)
LD      inst1.Q
ST      inst2.IN
```

### ST

Structured Text

```
1  a := a + 1;
2  t1(IN:=FALSE, PT:= T#5S);
3  t1(IN:=TRUE);
4  FOR i := 0 TO count DO
5    test_l_int();
6  END_FOR
7  IF value < 7 THEN
8    WHILE value < 8 DO
9      value:=value+1;
10   END WHILE;
11 END_IF;
```

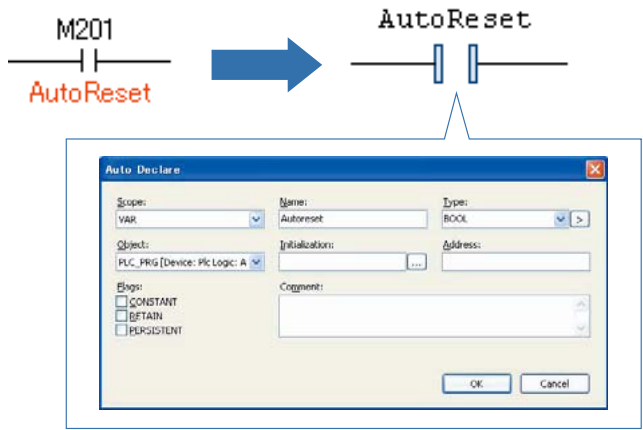
## ● Easy and efficient programming

### Structured Programming

Task configuration and structured-based editors on POU (Program Organization Unit) enable flexible programming.

### Programming with variable names

Programming with variable name enables you to be free from I/O addressing of PLC.



### Specifications of HX-CODESYS

| Items                |                   | Descriptions                          |
|----------------------|-------------------|---------------------------------------|
| System requirements  | RAM               | 1 GB                                  |
|                      | Operating system  | Windows® 7 / 8 / 10 (32 / 64 bit)     |
|                      | CPU               | x 86 1 GHz                            |
|                      | Hard disk         | 1 GB                                  |
|                      | Screen resolution | 1,024x768                             |
| Communication cables | USB               | Standard USB cable (Type-B connector) |
|                      | Ethernet          | UTP or STP cable (cat 5E)             |

Minimal requirements for small projects with up to 100 POU's, 10 visualizations, 8 field bus devices.

## ● Reduces software development costs

### Local variables and global variables

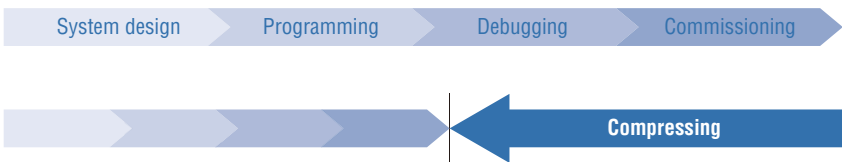
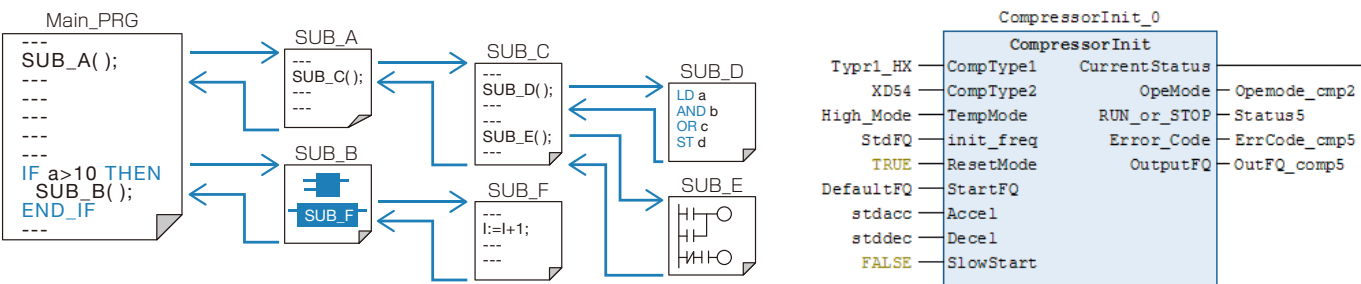
It is possible to define local variables, which are only effective for each program, and global variables, which are common to all programs. Properly using local variables and global variables makes it possible to create application programs with high rates of reusability.

### Structured programming

It is possible to create a hierarchy of programs and function blocks. This enhances the readability of application programs, and improves the stability, and as a result enhances efficiency in application development.

### Creating a library

Since function blocks of commonly used process can be registered in the library, frequently used process can be easily reused in other application programs. Process contents of these function blocks can be also set as hidden, therefore can be distributed to end users without disclosing technical information to outside.



## ● The powerful debugging function reduces launch costs

- Online monitor
- Offline simulation
- Break points
- Force
- Single step execution
- Single cycle scan
- Flow control
- Changes while running
- Trace
- Visualization



# Overview of the I/O module lineup

## Big variety of modules to meet various applications demands

### DC and AC digital input and output modules



#### 8 / 16 pts. Input module (terminal block)

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



#### 32 pts. Input module (connector)

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



#### 64 pts. Input module (connector)

- EH-XD64 : 64 pts. 24 V DC  
(Input lag 1 ms max.)



#### 32 pts. Input module (Spring type terminal block)

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



#### 64 pts. Output module (connector)

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



#### 32 pts. Output module (Spring type terminal block)

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

### Digital input and output modules



#### DC Input and DC Output modules

- EH-XD32H : 32 pts. DC 24 V input  
(EM / H-200 compatible connector type)
- EH-YT32H : 32 pts. DC 24 V output  
(EM / H-200 compatible connector type)

### 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

#### Temperature Detective Input module

- EH-PT4 : Signed 15-bit, Pt 100 / Pt 1,000, 4 ch
- EH-TC8 : Signed 15-bit, Thermo-couple (K, E, J, T, B, R, S, N) 8 ch
- EH-RTD8 : Signed 15-bit, Pt 100 / Pt 1,000, 6 ch (3 wire) / 8 ch (2 wire)

### Counter modules



#### High speed counter module

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



Communication and Network modules



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



DeviceNet™ Master / Slave Controller

Number of slave-connected units: Max. 63  
(of which maximum 22 units are EH-IOCD2)  
Communication speed Max. 500 Kbps  
Communication distance Max. 500 m (Lower than 125 kbps)  
Input / Output data 256 words / 256 words

EtherCAT® slave controller



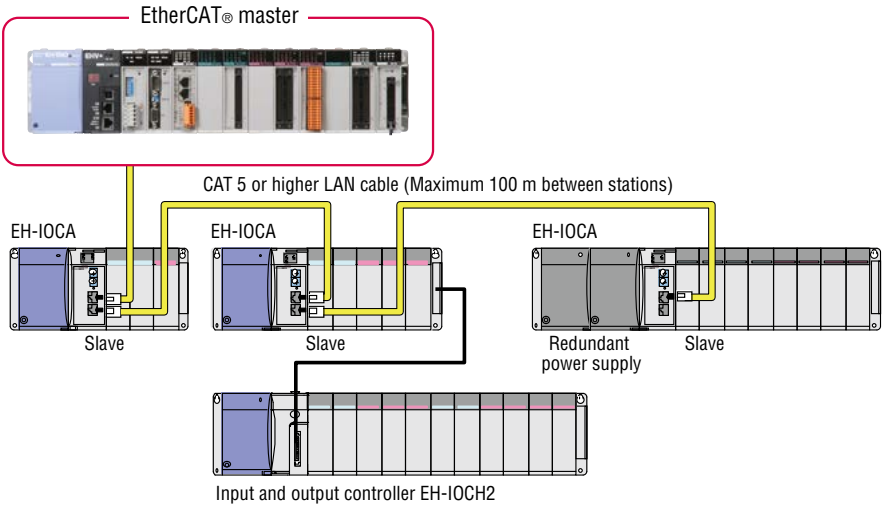
- ✓ **1,408 points for maximum input and output (analog input and output 176 ch)**  
Users can create any configurations because of the coupler type. It can be also applied to the large-scale control system.
- ✓ **Passing down the I/O module assets of the EH-150 / EHV / EHV+ Series**  
Power supplies, bases, and I/O modules (some are excluded) of the EH-150 / EHV / EHV+ Series can be used.
- ✓ **High-speed response and high reliability**  
At the fastest pace, the communication cycle is 200 μs. When communication abnormalities occur, the output data can be retained.

EtherCAT® Slave Controller Specifications

| Items                        |                             | Model | Specifications                                                                          |
|------------------------------|-----------------------------|-------|-----------------------------------------------------------------------------------------|
| Communication specifications |                             |       | EH-IOCA                                                                                 |
|                              | Communication protocol      |       | EtherCAT® dedicated protocol                                                            |
|                              | Modulation method           |       | Baseband                                                                                |
|                              | Transmission speed          |       | 100 Mbps                                                                                |
|                              | Physical layer              |       | 100BASE-TX (IEEE802.3)                                                                  |
|                              | Connector                   |       | RJ45 (IN, OUT)                                                                          |
|                              | Topology                    |       | Daisy chain                                                                             |
|                              | Communication cable         |       | Category 5 or higher STP cable                                                          |
|                              | Communication distance      |       | Within 100 m in distance between nodes (slaves)                                         |
|                              | Communication cycle         |       | 200 μs or higher*1                                                                      |
|                              | Node address range          |       | 1 to 99: Setting by the node address switch<br>1 to 65,535: Setting by EtherCAT® master |
|                              | Process data                |       | Fixed PDO mapping                                                                       |
|                              | Mail box                    |       | Support                                                                                 |
|                              | Synchronous mode            |       | Free Run mode (asynchronous)                                                            |
| Functional specifications    | Output hold function        |       | Support (set by master)                                                                 |
|                              | Usable base                 |       | EH-BS3A / 5A / 6A / 8A / 11A / 8R                                                       |
|                              | Number of mounted modules   |       | Maximum 22 units per slave device                                                       |
|                              | Input and output points     |       | 1,408 points for digital input and output, 176 ch for analog input and output           |
|                              | Number of extendable stages |       | 1 stage                                                                                 |
|                              | Refresh time                |       | 500 μs fixed                                                                            |
|                              | Self-diagnostics            |       | WDT check                                                                               |
|                              | Error display               |       | LED                                                                                     |
|                              | Consumption current         |       | 350 mA                                                                                  |

\* 1: The communication cycle depends on EtherCAT® master specifications.

[Configuration Example]



Components list

| Items                | Model       | Specifications                                                                                              | I/O type | Basic base (* 1) | Expansion base (* 2) | Salve (* 3) | Remarks |
|----------------------|-------------|-------------------------------------------------------------------------------------------------------------|----------|------------------|----------------------|-------------|---------|
| CPU module           | EHV-CPU1025 | Program capacity 512 KB, Max. 4,224 I/O points(*5), Ethernet port / Serial port / USB port                  | —        | ☆                | —                    | —           | * 4     |
|                      | EHV-CPU1102 | Program capacity 2014 KB, Max. 4,224 I/O points(*5), Ethernet port / Serial port / USB port                 | —        | ☆                | —                    | —           |         |
| Power module         | HX-PSA      | Input 100 to 240 V AC, Output 5 V DC 3.8 A, 24 V DC 0.4 A                                                   | —        | ☆                | ☆                    | ☆           | * 4     |
|                      | HX-PSD      | Input 24 VDC, Output 5 V DC 3.8 A                                                                           | —        | ☆                | ☆                    | ☆           |         |
| I/O controller       | EH-PSR      | Input 100 to 240 V AC, Output 5 V DC 5.6 A                                                                  | —        | ☆                | ☆                    | ☆           | * 4     |
|                      | EH-IOCH2    | I/O control module (1 unit / expansion base)                                                                | —        | —                | ☆                    | —           |         |
| Base unit            | EH-BS3A     | 3 I/O modules installed                                                                                     | —        | ☆                | ☆                    | ☆           | * 6     |
|                      | EH-BS5A     | 5 I/O modules installed                                                                                     | —        | ☆                | ☆                    | ☆           |         |
|                      | EH-BS6A     | 6 I/O modules installed                                                                                     | —        | ☆                | ☆                    | ☆           |         |
|                      | EH-BS8A     | 8 I/O modules installed                                                                                     | —        | ☆                | ☆                    | ☆           |         |
|                      | EH-BS11A    | 11 I/O modules installed                                                                                    | —        | ☆                | ☆                    | ☆           |         |
| Input module         | EH-XD8      | 8 pts., 24 V DC input (response time 5 ms)                                                                  | DI 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-XD16     | 16 pts., 24 V DC input (response time 5 ms)                                                                 | DI 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-XDL16    | 16 pts., 24 V DC input (response time 16 ms)                                                                | DI 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-XDS16    | 16 pts., 24 V DC input (response time 1 ms)                                                                 | DI 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-XD32     | 32 pts., 24 V DC input (response time 5 ms)                                                                 | DI 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-XDL32    | 32 pts., 24 V DC input (response time 16 ms)                                                                | DI 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-XDS32    | 32 pts., 24 V DC input (response time 1 ms)                                                                 | DI 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-XD32E    | 32 pts., 24 V DC input (response time 1 ms), Spring type terminal                                           | DI 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-XDL32E   | 32 pts., 24 V DC input (response time 16 ms), Spring type terminal                                          | DI 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-XD32H    | 32 pts., 24 V DC input (response time 4 ms), compatible connector with PIM / H-DM (EM / H-200)              | DI 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-XD64     | 64 pts., 24 V DC input (response time 1 ms)                                                                 | DI 64    | ☆                | ☆                    | ☆           |         |
|                      | EH-XA16     | 16 pts., 100 to 120 V AC input (response time 15 ms)                                                        | DI 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-XAH16    | 16 pts., 200 to 240 V AC input (response time 15 ms)                                                        | DI 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YR8B     | 8 pts., Independent relay output, 100 / 240 V AC, 24 V DC                                                   | DO 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YR12     | 12 pts., Relay output, 100 / 240 V AC, 24 V DC                                                              | DO 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YR16     | 16 pts., Relay output, 100 / 240 V AC, 24 V DC                                                              | DO 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YR16D    | 16 pts., Relay output, 100 / 240 V AC, 24 V DC, 2-common type                                               | DO 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YT8      | 8 pts., Transistor output, 12 / 24 V DC (sink type)                                                         | DO 16    | ☆                | ☆                    | ☆           |         |
| Output module        | EH-YTP8     | 8 pts., Transistor output, 12 / 24 V DC (source type)                                                       | DO 16    | ☆                | ☆                    | ☆           | * 7     |
|                      | EH-YT16     | 16 pts., Transistor output, 12 / 24 V DC (sink type)                                                        | DO 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YTP16    | 16 pts., Transistor output, 12 / 24 V DC (source type)                                                      | DO 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YTP16S   | 16 pts., Transistor output, 12 / 24 V DC (source type)                                                      | DO 16    | ☆                | ☆                    | ☆           |         |
|                      | EH-YT32     | 32 pts., Transistor output, 12 / 24 V DC (sink type)                                                        | DO 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-YTP32    | 32 pts., Transistor output, 12 / 24 V DC (source type)                                                      | DO 32    | ☆                | ☆                    | ☆           | * 7     |
|                      | EH-YT32E    | 32 pts., Transistor output, 12 / 24 V DC (sink type), Spring type terminal                                  | DO 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-YTP32E   | 32 pts., Transistor output, 12 / 24 V DC (source type), Spring type terminal                                | DO 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-YT32H    | 32 pts., Transistor output, 5 / 12 / 24 V DC (sink type), compatible connector with POM / H-DM (EM / H-200) | DO 32    | ☆                | ☆                    | ☆           |         |
|                      | EH-YT64     | 64 pts., Transistor output, 12 / 24 V DC (sink type)                                                        | DO 64    | ☆                | ☆                    | ☆           |         |
|                      | EH-YTP64    | 64 pts., Transistor output, 12 / 24 V DC (source type)                                                      | DO 64    | ☆                | ☆                    | ☆           | * 7     |
|                      | EH-YS16     | 16 pts., Triac output, 100 / 240 V AC                                                                       | DO 16    | ☆                | ☆                    | ☆           |         |
| Analog input module  | EH-AX44     | 12 bits, analog input 8 ch. (4 ch. of 4 to 20 mA, 4 ch. of 0 to 10 V)                                       | AI 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AX8V     | 12 bits, analog input 8 ch., Voltage (0 to 10 V)                                                            | AI 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AX8H     | 12 bits, analog input 8 ch., Voltage (-10 to +10 V)                                                         | AI 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AX8I     | 12 bits, analog input 8 ch., Current (4 to 20 mA)                                                           | AI 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AX8IO    | 12 bits, analog input 8 ch, Current (0 to 22 mA)                                                            | AI 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AXH8M    | 14 bits, analog input 8 ch. (0 to 22 mA, 4 to 22 mA, -10 to +10 V, 0 to 10 V)                               | AI 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AXG5M    | 16 bits, isolated analog input 5 ch. (0 to 22 mA, 4 to 22 mA, -10 to +10 V, 0 to 10 V)                      | AI 8     | ☆                | ☆                    | ☆           |         |
| Analog output module | EH-AY22     | 12 bits, analog output 4 ch. (2 ch. of 4 to 20 mA, 2 ch. of 0 to 10 V)                                      | AO 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AY2H     | 12 bits, analog output 2 ch., Voltage (-10 to +10 V)                                                        | AO 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AY4V     | 12 bits, analog output 4 ch., Voltage (0 to 10 V)                                                           | AO 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AY4H     | 12 bits, analog output 4 ch., Voltage (-10 to +10 V)                                                        | AO 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AY4I     | 12 bits, analog output 4 ch., Current (4 to 20 mA)                                                          | AO 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AYH8M    | 14 bits, analog output 8 ch. (0 to 22 mA, 4 to 22 mA, 0 to 10 V)                                            | AO 8     | ☆                | ☆                    | ☆           |         |
|                      | EH-AYG4M    | 16 bits, isolated analog output 4 ch. (0 to 22 mA, 4 to 22 mA, -10 to +10 V, 0 to 10 V)                     | AO 8     | ☆                | ☆                    | ☆           |         |

Note: Please check the usable units, restrictions, and other matters in the product manual before selecting components.

- \* 1: ☆ means mountable on the basic base.
- \* 2: ☆ means mountable on the expansion base.
- \* 3: ☆ means mountable on the EtherCAT® and PROFIBUS®-DP slave, DeviceNet™ slave base.
- \* 4: CPU, power module and I/O controller (IOCH2, IOCD2, IOCP2, IOCA) can be mounted on reserved positions only.
- \* 5: In case of 64 points I/O module is used
- \* 6: Commonly used for basic, expansion or slave base.
- \* 7: With short circuit protection

| Items                                  | Model    | Specifications                                                                                         | I/O type    | Basic base (* 1) | Expansion base (* 2) | Salve (* 3) | Remarks |
|----------------------------------------|----------|--------------------------------------------------------------------------------------------------------|-------------|------------------|----------------------|-------------|---------|
| RTD input module                       | EH-PT4   | Signed 15 bits, 4 ch. Resistance Temperature Detector input, PT100 / PT1,000                           | AI 4        | ☆                | ☆                    | ☆           |         |
|                                        | EH-RTD8  | Signed 15 bits, 6 ch. (3-wire) / 8 ch. (2-wire) Resistance Temperature Detector input, PT100 / PT1,000 | AI 8 / AI 4 | ☆                | ☆                    | ☆           |         |
| Thermocouple input module              | EH-TC8   | Signed 15 bits, 8 ch. Thermocouple input (K, E, J, T, B, R, S, N)                                      | AI 8        | ☆                | ☆                    | ☆           |         |
| High function and communication module | EH-CU    | 2 ch. high-speed counter input, 100 kHz, 4 points open collector output                                | EH-CU / E   | ☆                | ☆                    | ☆           |         |
|                                        | EH-CUE   | 1 ch. high-speed counter input, 100 kHz, 2 points open collector output                                | EH-CU / E   | ☆                | ☆                    | ☆           |         |
|                                        | EH-SIO   | Serial interface module                                                                                | EH-SIO      | ☆                | ☆                    | ☆           |         |
|                                        | EH-RMD2  | DeviceNet™ master module, 256 / 256 words I/O                                                          | EH-LNK      | ☆                | —                    | —           |         |
|                                        | EH-RMP2  | PROFIBUS®-DP master module, 512 / 512 words I/O                                                        | EH-LNK      | ☆                | —                    | —           |         |
|                                        | EH-IOCD2 | DeviceNet™ slave controller, 1,408 points (176 words) I/O                                              | —           | —                | —                    | ☆           | * 4     |
|                                        | EH-IOCP2 | PROFIBUS®-DP slave controller, 1,408 points (176 words) I/O                                            | —           | —                | —                    | ☆           |         |
| Others                                 | EH-IOCA  | EtherCAT® slave controller, 1,408 points (176 words) I/O                                               | —           | —                | —                    | ☆           |         |
|                                        | EH-DUM   | Module for empty slot                                                                                  | Empty       | ☆                | ☆                    | ☆           |         |
| Expansion cables                       | EH-TMCV  | Half-size terminal block cover (Lot 10 configuration)                                                  | —           | ☆                | ☆                    | ☆           |         |
|                                        | EH-CB05A | Expansion cable (0.5 m)                                                                                | —           |                  |                      |             |         |
| 32/64 points module cables             | EH-CB10A | Expansion cable (1 m)                                                                                  | —           |                  |                      |             |         |
|                                        | EH-CB20A | Expansion cable (2 m)                                                                                  | —           |                  |                      |             |         |
|                                        | EH-CBM01 | 32 / 64-point module cable, open and connector end (1 m)                                               | —           |                  |                      |             |         |
|                                        | EH-CBM03 | 32 / 64-point module cable, open and connector end (3 m)                                               | —           |                  |                      |             |         |
|                                        | EH-CBM05 | 32 / 64-point module cable, open and connector end (5 m)                                               | —           |                  |                      |             |         |
|                                        | EH-CBM10 | 32 / 64-point module cable, open and connector end (10 m)                                              | —           |                  |                      |             |         |
|                                        | CBM-02   | EM / H-200 compatible 32 point module cable, open and connector end (2 m)                              | —           |                  |                      |             |         |
| Counter module cables                  | CBM-05   | EM / H-200 compatible 32 point module cable, open and connector end (5 m)                              | —           |                  |                      |             |         |
|                                        | CBM-10   | EM / H-200 compatible 32 point module cable, open and connector end (10 m)                             | —           |                  |                      |             |         |
|                                        | EH-CUC01 | Counter module cable, open and connector end (1 m)                                                     | —           |                  |                      |             |         |
|                                        | EH-CUC02 | Counter module cable, open and connector end (2 m)                                                     | —           |                  |                      |             |         |
|                                        | EH-CUC03 | Counter module cable, open and connector end (3 m)                                                     | —           |                  |                      |             |         |
| Battery                                | EH-CUC04 | Counter module cable, open and connector end (4 m)                                                     | —           |                  |                      |             |         |
|                                        | EH-CUC05 | Counter module cable, open and connector end (5 m)                                                     | —           |                  |                      |             |         |
| Battery                                | LIBAT-H  | Lithium battery for retentive data and RTC                                                             | —           |                  |                      |             |         |

Note: Please check the usable units, restrictions, and other matters in the product manual before selecting components.

- \* 1: ☆ means mountable on the basic base.
- \* 2: ☆ means mountable on the expansion base.
- \* 3: ☆ means mountable on the EtherCAT® and PROFIBUS®-DP slave, DeviceNet™ slave base.
- \* 4: CPU, power module and I/O controller (IOCH2, IOCD2, IOCP2, IOCA) can be mounted on reserved positions only.

| Items                                         | Model  | Specifications                                                    | Remarks |
|-----------------------------------------------|--------|-------------------------------------------------------------------|---------|
| Integrated development environment HX-CODESYS | HX-CDS | Integrated development environment in conformance with IEC61131-3 | * 8     |

\* 8: A cable for connecting the PC to the CPU (A-mini B type USB cable or LAN cable) must be obtained by the customer.

| General Specifications       |                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Items                        | Specifications                                                                                                                                                                                                                                                                                                                                      |
| Operational temperature      | 0 to 55 °C                                                                                                                                                                                                                                                                                                                                          |
| Storage temperature          | − 10 to 75 °C                                                                                                                                                                                                                                                                                                                                       |
| Operational humidity         | 5 to 95 % RH (no condensation)                                                                                                                                                                                                                                                                                                                      |
| Storage humidity             | 5 to 95 % RH (no condensation)                                                                                                                                                                                                                                                                                                                      |
| Vibration resistance         | Conforms to IEC 60068-2-6                                                                                                                                                                                                                                                                                                                           |
| Noise resistance             | <ul style="list-style-type: none"><li>○ Noise voltage 1,500 Vpp, Noise pulse width 100 ns, 1 μs (Noise input by a noise simulator across input terminals of a power module according to measuring method of Hitachi-IES.)</li><li>○ Based on IEC 61131-2 (not applied for input modules)</li><li>○ Static noise 3,000 V at electrode part</li></ul> |
| Certifications               | CE, RCM                                                                                                                                                                                                                                                                                                                                             |
| Insulation resistance        | 20 MΩ minimum between AC terminal and frame ground (FE) terminal (based on 500 V DC megger)                                                                                                                                                                                                                                                         |
| Dielectric withstand voltage | 1,500V AC for 1 minute between AC input terminal and frame ground (FE) terminal                                                                                                                                                                                                                                                                     |
| Ground                       | Class D grounding (grounding with the power supply module)                                                                                                                                                                                                                                                                                          |
| Usage environment            | No corrosive gases, no excessive dust                                                                                                                                                                                                                                                                                                               |
| Structure                    | Open wall-mount type                                                                                                                                                                                                                                                                                                                                |
| Cooling                      | Natural air cooling                                                                                                                                                                                                                                                                                                                                 |

## Dimensions

[Unit: mm]

The drawing illustrates the dimensions of the EH-150 Programmable Controller. The front view shows a base with a blue cover and a black panel. The black panel features a CPU module, a display, and various ports (USB 2.0, SIGNAL, ETHER NET). The display area is divided into 10 modules, each with a 4-digit 7-segment display. The dimensions are as follows:

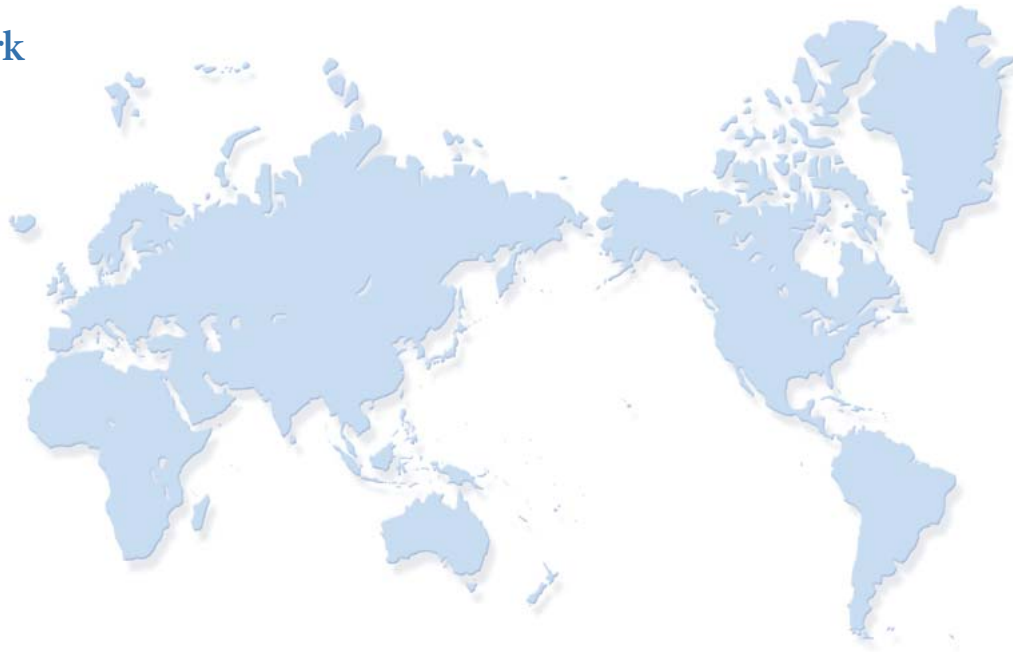
- L1:** The length of the base, ranging from 207 to 447 mm.
- L2:** The length of the main body, ranging from 22.5 to 462.5 mm.
- 109:** The height of the main body.
- 14:** The thickness of the base.
- 100:** The total height of the unit.
- 90:** The height of the base.
- φ4.4:** The diameter of the mounting hole.

| Base                  | EH-BS11A | EH-BS8A | EH-BS6A | EH-BS5A | EH-BS3A |
|-----------------------|----------|---------|---------|---------|---------|
| Number of I/O modules | 11       | 8       | 6       | 5       | 3       |
| L1                    | 447      | 357     | 297     | 267     | 207     |
| L2                    | 462.5    | 372.5   | 312.5   | 282.5   | 22.5    |

- EtherCAT® is patented technology licensed by Beckhoff Germany Automation GmbH, and its registered trademarks.
- DeviceNet™ is a registered trademark of ODVA (Open DeviceNet Vendor Association.)
- PROFIBUS® is a registered trademark of PROFIBUS® User Organization.
- Other company names and product names described in this catalog are the trademarks or registered trademarks of their respective companies.



## Network



### Germany

**Hitachi Europe GmbH,**  
Industrial Components & Equipment Group  
Am Seestern 18 (Euro Center)  
D-40547 Düsseldorf, GERMANY  
TEL: (+49) (211) 5283-0  
FAX: (+49) (211) 5283-649  
<http://www.hitachi-eu.com/>  
<http://www.hitachi-ds.com/>

### U.S.A

**Hitachi America, Ltd.**  
Industrial Components & Equipment Division  
50 Prospect Avenue,  
Tarrytown, NY 10591-4698  
TEL: +1 (914) 332-5800  
FAX: +1 (914) 332-5555  
<http://www.hitachi-america.us/ice/>

### China

**Hitachi Industrial Equipment Systems  
(CHINA) Co., Ltd.**  
(Shanghai Office)  
Industrial Equipment Systems Division  
12th Floor, Rui Jin Building No. 205,  
Maoming Road (S) Shanghai, 200020  
TEL: +86 (21) 5489-2378  
FAX: +86 (21) 3356-5070  
(Beijing Office)  
14th Floor Beijing Fortune Building,  
5 Dong San Huan Bei Lu,  
Chao Yang District, Beijing 100004  
TEL: +86 (10) 6590-8180  
FAX: +86 (10) 6590-8189

**Hitachi Industrial Equipment Systems  
(Hong Kong) Co., Ltd.**  
(Hong Kong Office)  
6th Floor, North Tower, World Finance Centre,  
Harbour City, Canton Road, Tsim Sha Tsui,  
Kowloon Hong Kong.  
TEL: +852-2735-9218  
FAX: +852-2735-6793

**Taiwan Hitachi Asia Pacific Co., Ltd.**  
3rd Floor, Hung Kuo Building No.167  
Tun-Hwa North Road, Taipei (105), Taiwan  
TEL: (+886) (2) 2514-3666  
FAX: (+886) (2) 2514-7664

### Singapore

**Hitachi Asia Ltd.**  
Industrial Components & Equipment Division  
No.30 Pioneer Crescent  
#10-15, West Park Bizcentral  
Singapore 628560  
TEL: (+65) (6305)-7400  
FAX: (+65) (6305)-7401  
<http://www.hitachi.com.sg/>

### Thailand

**Hitachi Asia (Thailand) Co., Ltd.**  
18th Floor, Ramaland Building,  
952 Rama IV Road, Bangrak  
Bangkok 10500  
TEL: (+66) (2) 632-9292  
FAX: (+66) (2) 632-9299  
<http://www.hitachi.co.th/>

### Australia

**Hitachi Australia Pty Ltd.**  
Suite 801, Level 8, 123 Epping Road,  
North Ryde, NSW, 2113, Australia  
TEL: (+61) (2) 9888-4100  
FAX: (+61) (2) 9888-4188  
<http://www.hitachi.com.au/>

Information in this brochure is subject to change without notice.

## Hitachi Industrial Equipment Systems Co., Ltd.

For further information, please contact your nearest sales representative.



**ISO 14001**  
JQA-EM5428



**ISO 9001**  
JQA-1000

The EH-150 series PLCs are produced at the factory registered under the ISO 14001 standard for environmental management system and the ISO 9001 standard for quality management system.