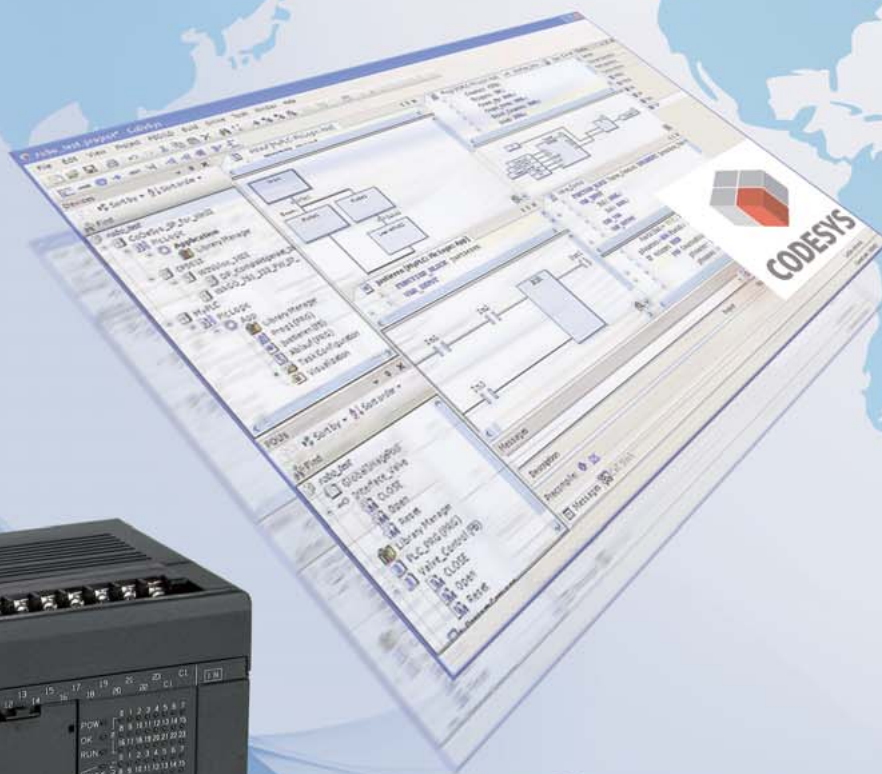


Programmable Logic Controllers

MICRO-EHV+

Full compliance with
the IEC61131-3 International Standard



Hitachi new compact PLC MICRO-EHV+



“MICRO-EHV+” is an all-in-one type compact PLC packed with powerful functions.

Full IEC compliant 3S CODESYS V3.5 platform

Standardized programming style with 5 programming languages (LD, FBD, IL, ST, SFC)

<p>LD Ladder Diagram</p>	<p>FBD Function Block Diagram</p>	<p>IL Instruction List</p> <pre>LD D5AC ST I0.1/IN JNCP S1 CAL SINT1(I FFI=S1, LD RTI=>COUNT) SINT1.Q ST I0.2/IN</pre>	<p>ST Structured Text</p> <pre>1 0 := 0 + 1; 2 G1(IN:=FALSE, PT:= T#50); 3 G1(IN:=TRUE); 4 FOR I := 0 TO COUNT DO 5 Start_Sint1(); 6 END_FOR 7 IF value < 7 THEN 8 WHILE value < 0 DO 9 value:=value+1; 10 END_WHILE; 11 END_IF;</pre>	<p>SFC Sequential Function Chart</p>
-------------------------------------	--	--	--	---

- No proprietary programming languages
- Easy start-up for users with;
 - no PLC experience or
 - experience of other manufacturer's programming language or
 - experience of high level programming languages
- Variable names for PLC, HMI, SCADA, and other I/O devices can be consolidated.
- Features Offline simulation function

Powerful communication performance in one CPU

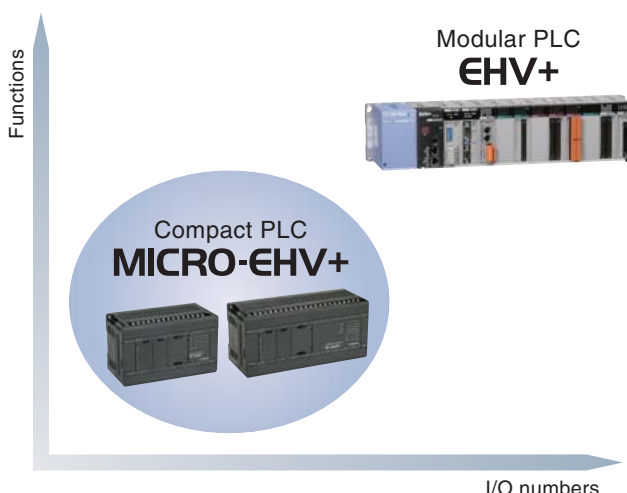
All models have Ethernet, serial, USB (host & device) communication ports as standard. Additional communication ports can be realized by option boards.

Wide range of expansion units are available*

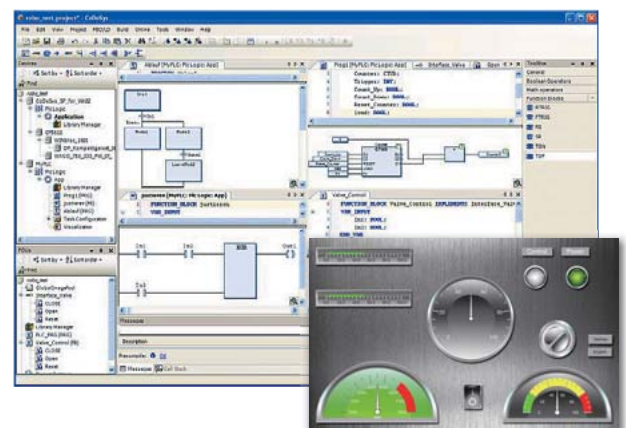
*Expansion units, terminal block and dimensions are compatible with previous compact series MICRO-EH

MICRO-EHV+

EHV-CODESYS



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



MICRO-EHV+ Basic unit

User program memory 1,024kB
Data memory (non-retain) 640kB
Data memory (retain) 256kB

3 communication ports

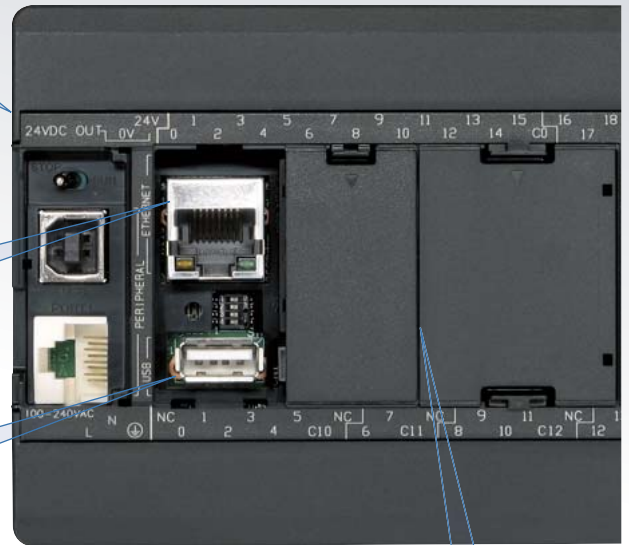
- Ethernet port (10BASE-T/100BASE-T)
- USB port (Ver.2.0 Full Speed 12Mbps)
- Serial port (RS-232C)

USB host function

- Memory storage can be used for data logging, program upload/download.

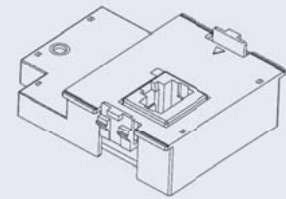
User program is stored in non-volatile FLASH memory

(Data is stored in volatile RAM memory Retained by battery.)



Option board

- RS-485 port can be added as option



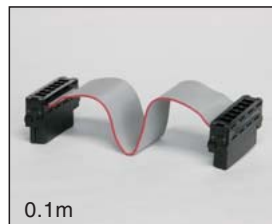
No. of I/O Is Max. 320 (using 64 pts expansion unit)

Basic unit



Expansion cable

Expansion cables are prepared in 3 different lengths



Maximum 4 expansion units

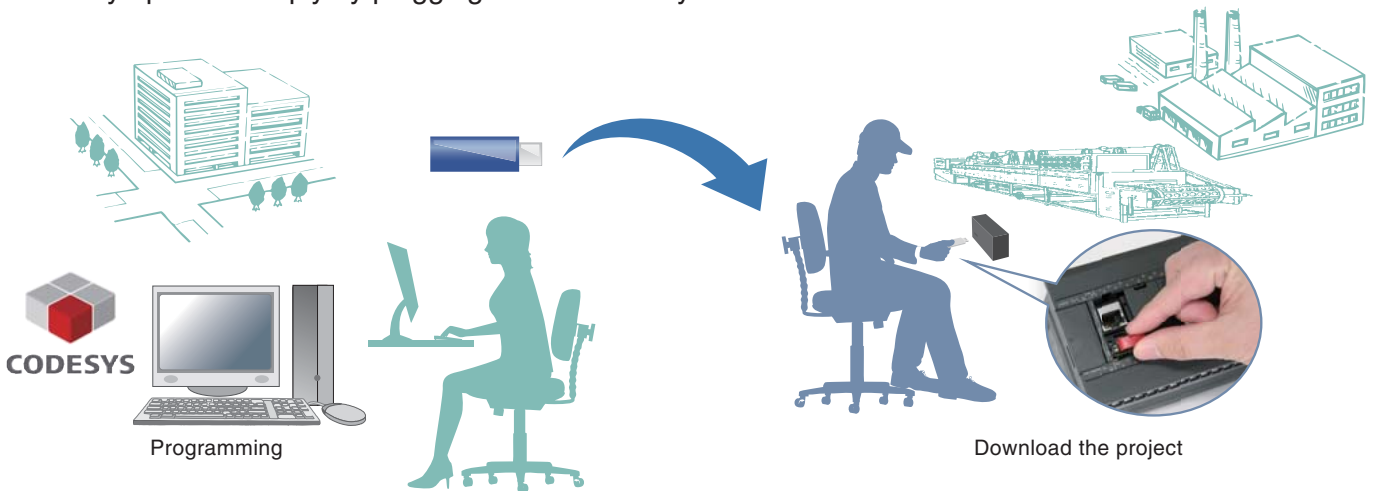
Advantage in your application

USB storage



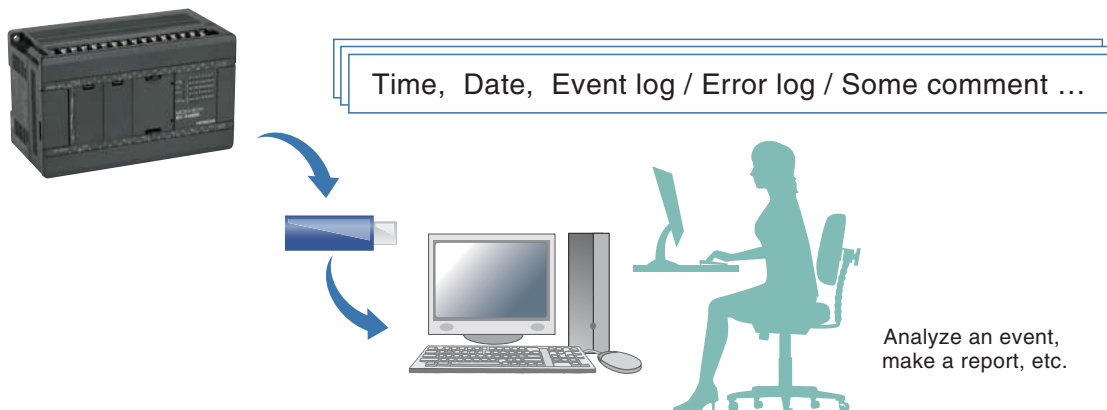
Program Download/Upload without a PC connection

If end users don't have EHV-CODESYS or are not familiar with PLC programming, the user-program can be easily updated simply by plugging a USB memory device into the PLC.



Data logging to USB storage

Logging data can be stored on to a USB memory device using a specific library. Logging data can then be analyzed or edited remotely.

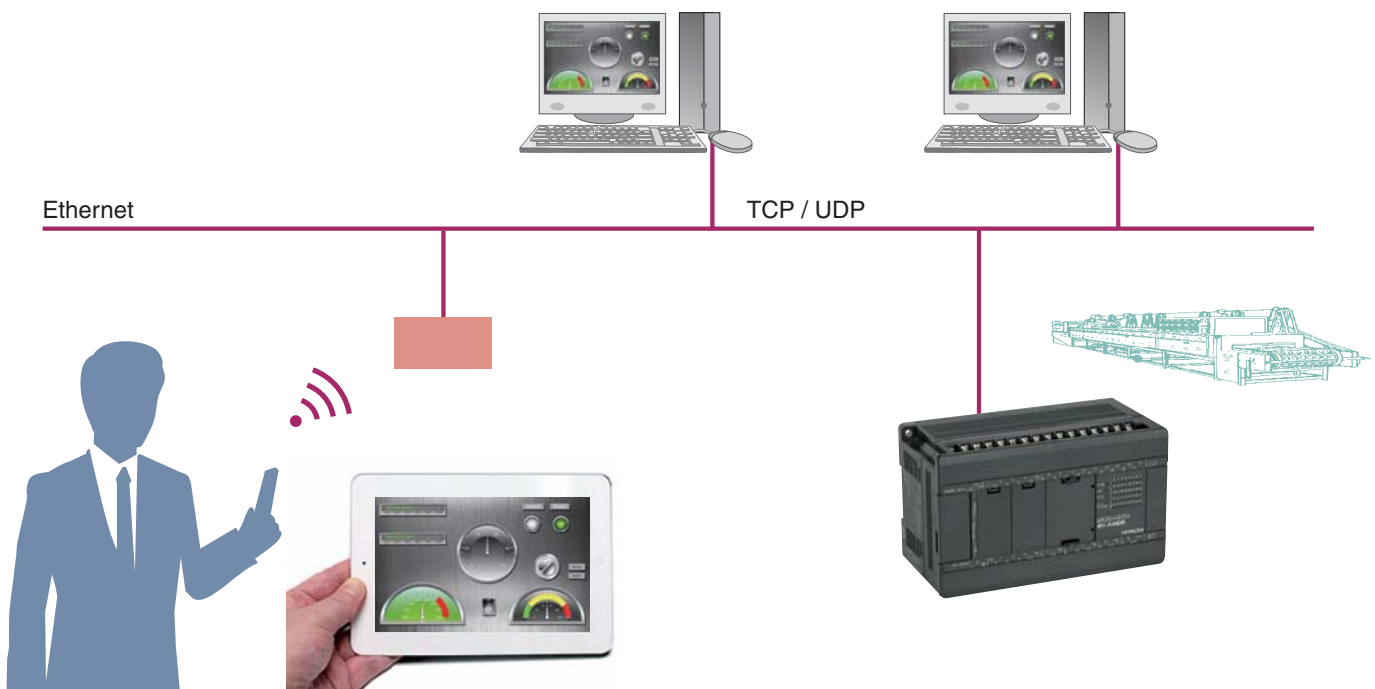


Note : Using USB memory does not mean to expand MICRO-EHV+ CPU memory .

Web visualization



Worldwide access to MICRO-EHV+ via an Internet browser.
I/O data can be monitored like HMI via a PC, Smartphone or Tablet.



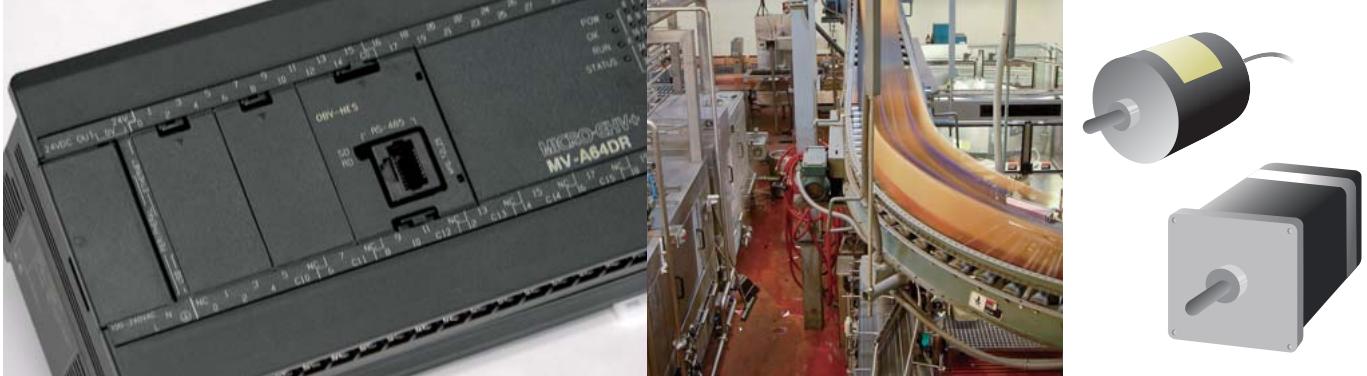
Functionality

- Visualization over Internet / Intranet
- Web Server is adopted as standard
- JavaScript Execution

Purpose

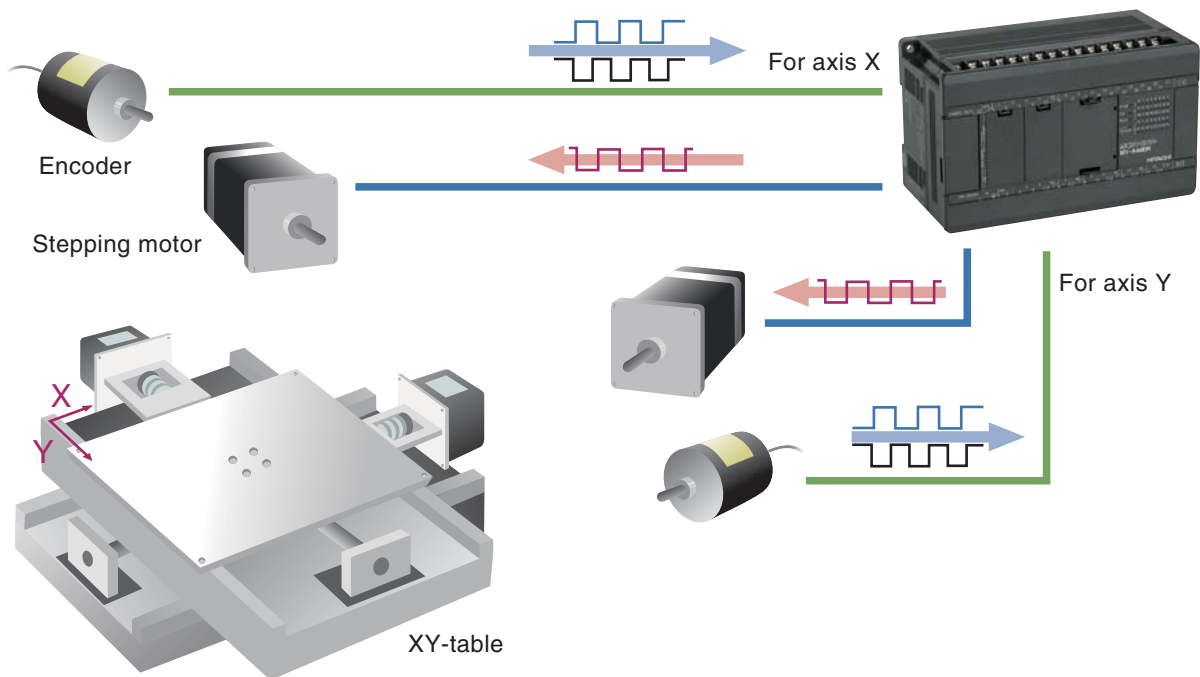
- Remote maintenance
- Diagnostics
- Remote control

Simple automation system



Application Example – Position control

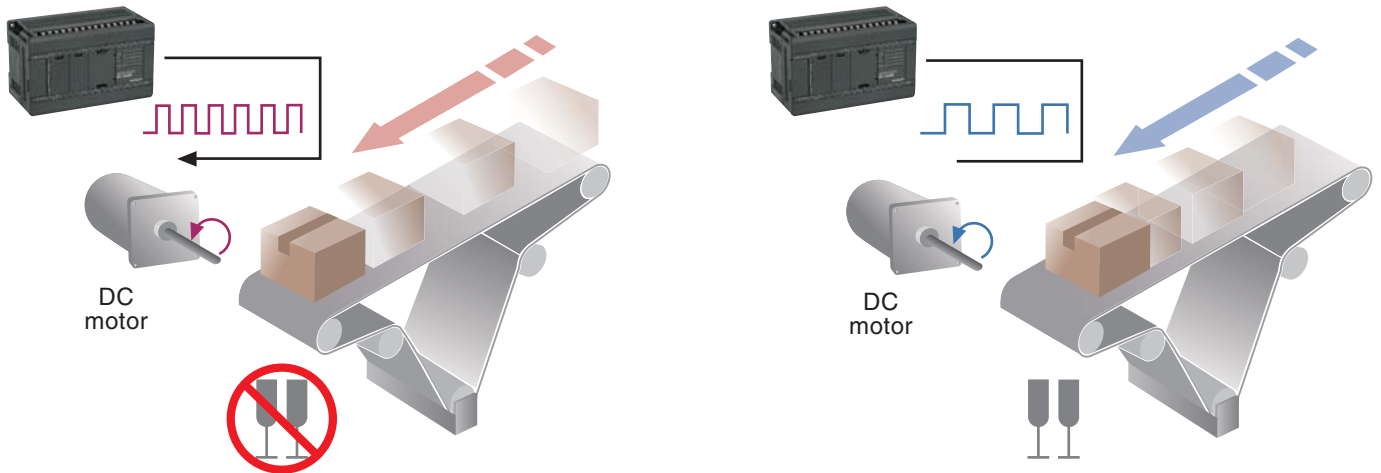
Using the built in High-speed counter and pulse train output a simple position control system can be achieved without the need for a dedicated motion controller.



- High-speed counter Single counter / Max. 5ch, 100kHz, 32bits
 2 phase counter / Max. 2ch, 60kHz, 32bits
- Pulse train output Max. 3ch, 65kHz, Specific libraries will be prepared

Application Example – Speed control using PWM output

Speed control can be achieved without a dedicated speed control unit.

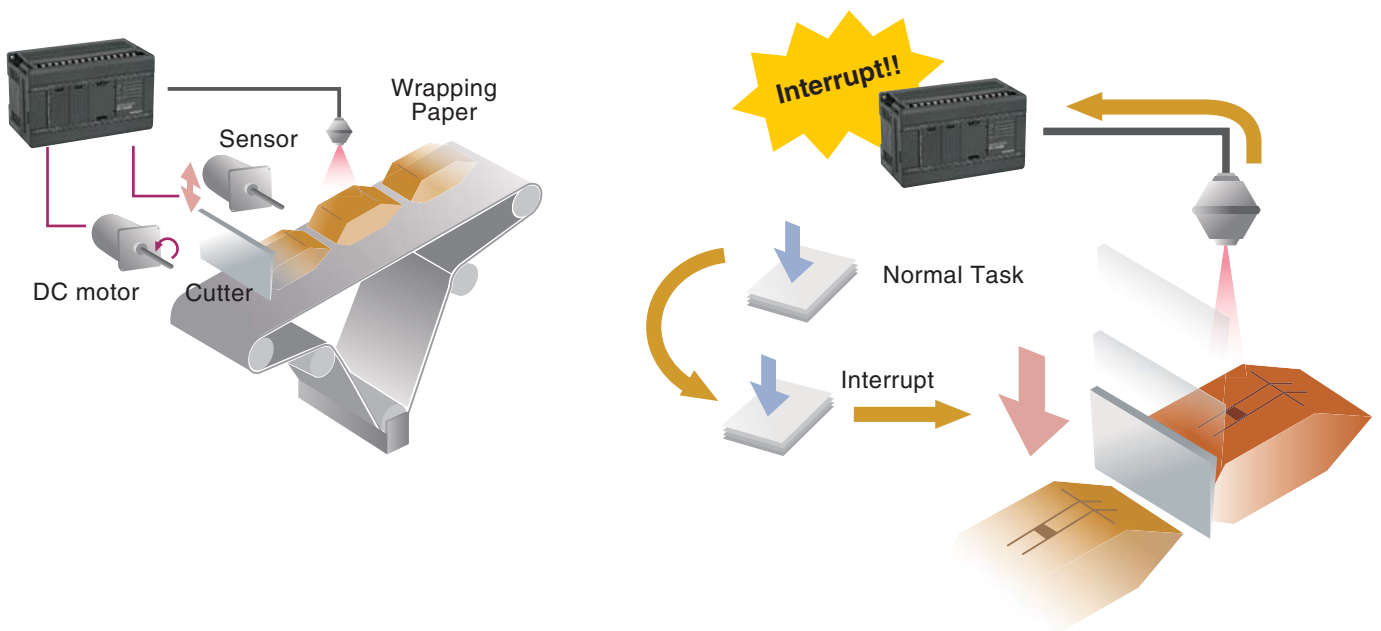


Conveyor speed can be changed depending on the contents of packages.

- PWM output Max. 3ch, 65kHz, Specific libraries will be prepared

Application Example – Interrupt input

Specific processing can be executed without jitter.



- Interrupt input Max. 5ch

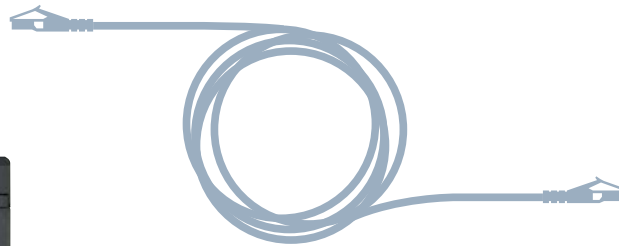
Easy communication with Hitachi Inverter



Economical Inverter NE-S1

MICRO-EHV+ can be used as a controller for multiple Hitachi inverters. The new option board OBV-NES can turn the MICRO-EHV+ into the ideal controller for the Hitachi NE-S1 series inverter. Communication is achieved using a standard Cat. 5 LAN cable.

OBV-NES



Straight cable



NE-S1

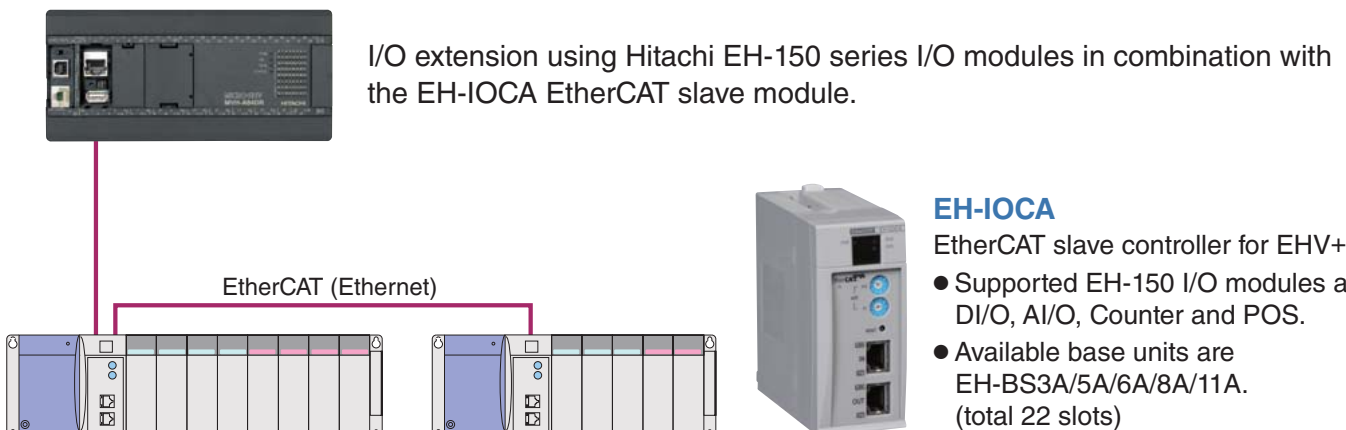
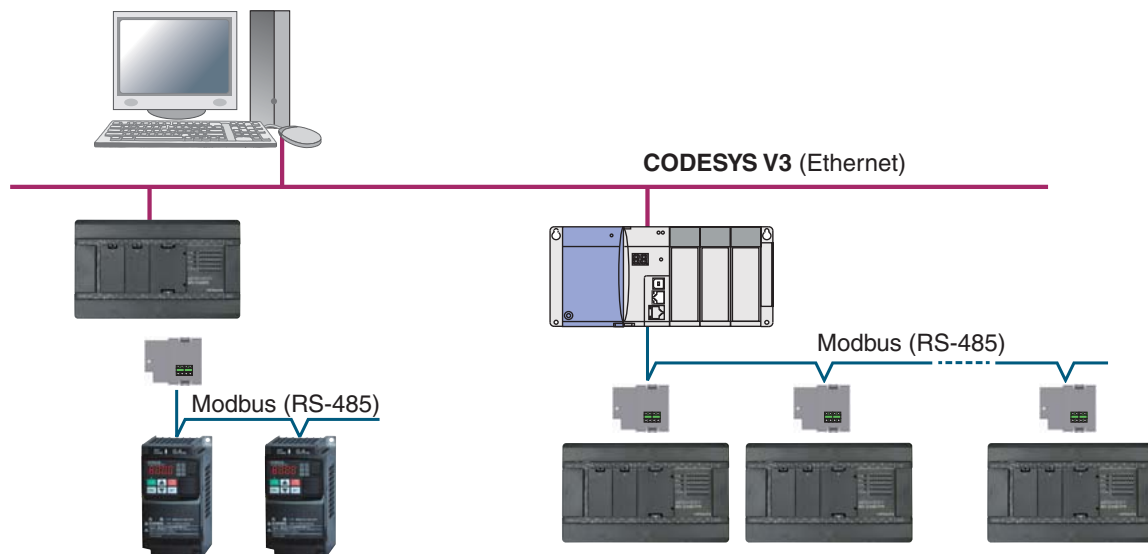
By using RJ-45 splitter, multi-drop connection will be achieved easily.



Compliance with Fieldbus Standards



MICRO-EHV+ supports Modbus / TCP, Modbus / RTU and EtherCAT.
(EtherCAT under preparation).



Overview of products lineup

Basic units

40 points type

DC power supply (24V),
DC input 24pts,
TR output 16pts (source)
with short circuit protection

MV-D40DTPS



DC power supply (24V),
DC input 24pts,
TR output 16pts (sink)

MV-D40DT



DC power supply (24V),
DC input 24pts,
RY output 16pts

MV-D40DR



AC power supply (100/200V),
DC input 24pts,
RY output 16pts

MV-A40DR



64 points type

DC power supply (24V),
DC24V input 40pts,
TR output 24pts (source)
with short circuit protection

MV-D64DTPS



DC power supply (24V),
DC24V input 40pts,
TR output 24pts (sink)

MV-D64DT



DC power supply (24V),
DC24V input 40pts,
RY output 24pts

MV-D64DR



AC power supply (100/200V),
DC24V input 40pts,
RY output 24pts

MV-A64DR



Expansion units (Digital I/O)

8 points type



- EH-D8ED** : DC power supply (24V), DC input 8pts
- EH-D8ER** : DC power supply (24V), RY output 8pts
- EH-D8ETPS** : DC power supply (24V),
TR output 8pts (source) with short circuit protection
- EH-D8ET** : DC power supply (24V), TR output 8pts (sink)
- EH-D8EDR** : DC power supply (24V), DC input 4pts, RY output 4pts
- EH-D8EDTTPS** : DC power supply (24V), DC input 4pts,
TR output 4pts (source) with short circuit protection
- EH-D8EDT** : DC power supply (24V), DC input 4pts, TR output 4pts (sink)

14 points type



- EH-D14EDT** : DC power supply (24V), DC input 8pts, TR output 6pts (sink)
- EH-D14EDTP** : DC power supply (24V), DC input 8pts, TR output 6pts (source)
- EH-D14EDTTPS** : DC power supply (24V), DC input 8pts,
TR output 6pts (source) with short circuit protection
- EH-D14EDR** : DC power supply (24V), DC input 8pts, RY output 6pts
- EH-A14EDR** : AC power supply (100/200V), DC input 8pts, RY output 6pts

16 points type



- EH-D16ED** : DC power supply (24V), DC input 16pts
- EH-D16ER** : DC power supply (24V), RY output 16pts
- EH-D16ETPS** : DC power supply (24V),
TR output 16pts (source) with short circuit protection
- EH-D16ET** : DC power supply (24V), TR output 16pts (sink)

28 points type



- EH-D28EDT** : DC power supply (24V), DC input 16pts,
TR output 12pts (sink)
- EH-D28EDTP** : DC power supply (24V), DC input 16pts,
TR output 12pts (source)
- EH-D28EDTTPS** : DC power supply (24V), DC input 16pts,
TR output 12pts (source) with short circuit protection
- EH-D28EDR** : DC power supply (24V), DC input 16pts,
RY output 12pts
- EH-A28EDR** : AC power supply (100/200V), DC input 16pts,
RY output 12pts

64 points type



- EH-D64EDT** : DC power supply (24V), DC input 40pts,
TR output 24pts (sink)
- EH-D64EDTTPS** : DC power supply (24V), DC input 40pts,
TR output 24pts (source) with short circuit protection
- EH-D64EDR** : DC power supply (24V), DC input 40pts,
RY output 24pts
- EH-A64EDR** : AC power supply (100/200V), DC input 40pts,
RY output 24pts

Expansion units (Analog I/O)

Analog



- EH-D6EAN** : DC power supply (24V), Analog input 4pts, Analog output 2pts
EH-A6EAN : AC power supply (100/200V), Analog input 4pts, Analog output 2pts

RTD



- EH-D6ERTD** : DC power supply (24V), RTD input 4pts, Analog output 2pts
EH-D4ERTD : DC power supply (24V), RTD input 4pts
EH-A6ERTD : AC power supply (100/200V), RTD input 4pts, Analog output 2pts
EH-A4ERTD : AC power supply (100/200V), RTD input 4pts

Thermocouple



- EH-D6ETC** : DC power supply (24V), Thermocouple input 4pts, Analog output 2pts
EH-D4ETC : DC power supply (24V), Thermocouple input 4pts

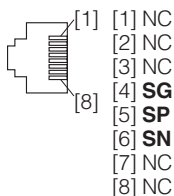
Options

Communication board

OBV-NES



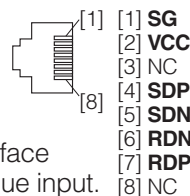
RS-485 2-wires interface option.



OBV-485A



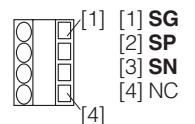
RS-485 4-wires interface option with 2-analogue input. compatible with EH-OB485.



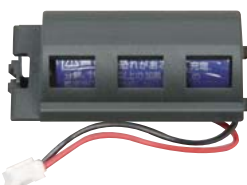
OBV-485T



RS-485 2-wires interface option. Terminal connection. (Under planning)



Battery



MV-BAT
 For data memory retention. 1750mAh.

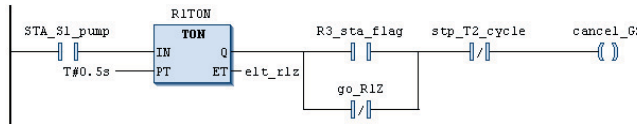
Programming software “EHV-CODESYS”

● 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.

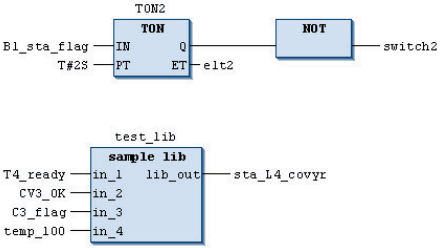
LD

Ladder Diagram



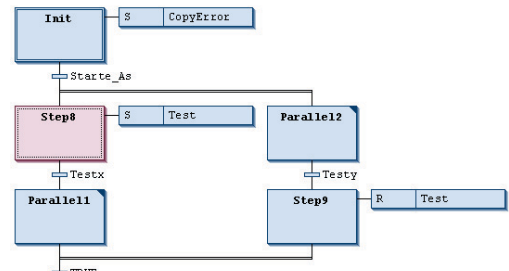
FBD

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  tl(IN:=FALSE, PT:= T#5S);
3  tl(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;
                    
```

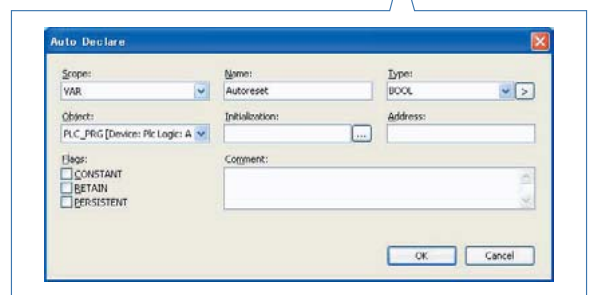
● Easy and efficient programming

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.



● Debugging and commissioning features

Many of user-friendly debugging and commissioning features are supported.

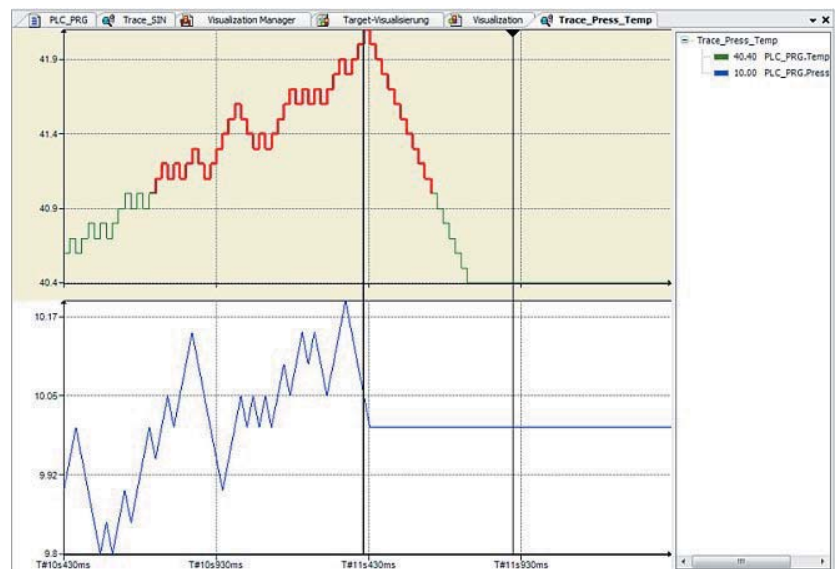
- Monitoring
- Forcing of variables
- Break points
- Single step execution
- Single cycle execution
- Flow control
- Online change
- Incremental compile
- Incremental download
- Sampling trace
- Simulation
- and much more.

Expression	Type	Value	Prepared value
StartTime	TIME	T#0ms	
S3	GEN		
MODE	GEN_MODE	GEN_MODE.SAWTOO...	
BASE	BOOL	FALSE	TRUE
PERIOD	TIME	T#1s	
CYCLES	INT	100	45
AMPLITUDE	INT	1000	
RESET	BOOL	FALSE	
OUT	INT	-280	

```

13 D (IN:=INT_TO_REAL(S6.Out 440) , TM:=10 , RESET:=FALSE );
14 B (ENABLE:=TRUE, TIMELOW:=t#4s , TIMEHIGH:=t#8s);
15 iSpecialSinus -833 := S12.Out 639 - S11.OUT 1472;
16 RETURN
    
```

Forcing of variables



Sampling trace

● Library

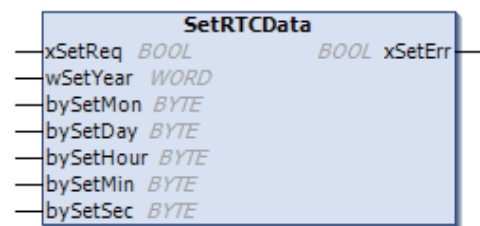
For efficient programming, libraries are a convenient tool. Through the use of libraries, overall programming time can be shortened.

EHV-CODESYS already contains many built-in libraries for various purposes.

The user can create their own library from a collection of commonly used sub-routines. Re-use of such objects can save time in programming and testing.

```

1 FUNCTION_BLOCK SetRTCData
2   VAR_INPUT
3     xSetReq: BOOL;
4     wSetYear: WORD := 2011;
5     bySetMon: BYTE := 1;
6     bySetDay: BYTE := 1;
7     bySetHour: BYTE := 0;
8     bySetMin: BYTE := 0;
9     bySetSec: BYTE := 0;
10  END_VAR
11 VAR_OUTPUT
12   xSetErr: BOOL;
13 END_VAR
14 VAR
15   atYear: STRING;
16   atMonth: STRING;
17   atDay: STRING;
18   atHour: STRING;
19   atMinute: STRING;
20
21 // Year
22 atYear := WORD_TO_STRING(wSetYear);
23 // Month
24 atMonth := BYTE_TO_STRING(bySetMon);
25 // Day
26 atDay := BYTE_TO_STRING(bySetDay);
27 // Hour
28 atHour := BYTE_TO_STRING(bySetHour);
29 // Minute
    
```



Specifications

Basic units

40 points type



64 points type



I/O external connection : Removable type screw terminal block (M3)

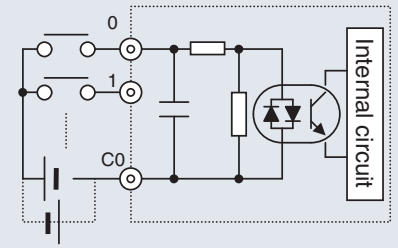
[CPU specification]

Item		40 points type	64 points type
Platform		CODESYS Runtime V3.5 SP3 Patch4	
Boolean execution speed		0.54µs/instruction	
User Program memory		1MB	
Source file memory		1MB	
Data memory (non retain)		640KB	
Data memory (retain)		256KB	
Programming languages		IEC61131-3 compliant 5 languages (LD, FBD, SFC, IL, ST)	
No. of expansion unit		4	
No. of I/O (using 64pts exp. units)		296 (In 184 / Out 112)	320 (In 200 / Out 120)
Special I/O	Single phase counter	Max. 5ch, 100kHz	
	2 phase counter	Max. 2ch, 60kHz	
	Pulse train output	Max. 3ch, 65kHz	
	PWM output	Max. 3ch, 65kHz	
	Interrupt	Max. 5 ch	
I/O updating cycle		Refresh processing (depends on each task cycle)	
USB	Device function	For programming. Built-in USB 2.0 Full speed	
	Host function	USB stick can be used for a copy of project and data logging (under preparation)	
Ethernet	UDP/IP, TCP/IP	Programming, General purpose, Modbus/TCP server, EtherCAT master (under preparation)	
	RS-232C (Built-in)	General purpose, Modbus/RTU master and slave	
Serial	RS-485 (Option)	General purpose, Modbus/RTU master and slave	
	Web visualization function	(under preparation)	
RTC		Built-in	
Battery		Optional	

[I/O specification]

DC input

MV-A64DR / MV-D64DR : 24 pts, MV-A40DR / MV-D40DR : 16 pts

Item	Specification		Circuit diagram	
	bit 0, 2, 4, 6, 8	The other inputs		
Input voltage	24 V DC			
Allowable input voltage range	0 to 30 V DC			
Input impedance	Approx. 2.7kΩ	Approx. 4.7 kΩ		
Input current	Approx. 8 mA	Approx. 4.8 mA		
Operating voltage	On voltage	15 V DC (min.) / 4.5 mA (max.)		15 V DC (min.) / 3.3 mA (max.)
	OFF voltage	5 V DC (min.) / 1.8 mA (max.)		5 V DC (max.) / 1.6 mA (max.)
Input lag	OFF → ON	0.5 to 20ms (configurable)		
	ON → OFF	0.5 to 20ms (configurable)		
Polarity	None			
Insulation system	Photocopler insulation			
Input display	LED (green)			

Relay output

MV-A64DR / MV-D64DR : 24 pts, MV-A40DR / MV-D40DR : 16 pts

Item	Specification	Circuit diagram	
Rated load voltage	5 – 250 V AC, 5 – 30V DC		
Minimum switching current	10 mA (5V DC)		
Maximum load current	1 circuit		2A (24V DC, 20V AC)
	1 common		5A
Output response time	OFF → ON		15 ms (max.)
	ON → OFF		15 ms (max.)
Surge removal circuit	None		
Fuse	None		
Insulation system	Relay insulation		
Output display	LED (green)		
Externally supplied power (for driving relays)	Not need		
Contact life	20,000,000 times (mechanical)		
	200,000 times (electrical : 1.5 A)		
Insulation	1,500V or more (external – internal)		
	500V or more (external – external)		

DC Transistor output

MV-D64DT, MV-D40DT : bit 0-2 (3 pts) , MV-D64DTPS, MV-D40DTPS : bit 0-3 (4 pts)

Item	Specification	Circuit diagram	
Rated load voltage	24/12 V DC (+10 %, –15 %)		
Minimum switching current	10 mA		
Leak current	0.1 mA		
Maximum load current	1 circuit		0.5 A / 24V DC, 0.3 A / 12V DC
	1 common		2A
Output response time	OFF → ON		bit 0-2: 5μs (max.) / 24V DC 0.2A bit 3: 0.5ms (max.) / 24V DC
	ON → OFF		bit 0-2: 5μs (max.) / 24V DC 0.2A bit 3: 0.5ms (max.) / 24V DC
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocoupler insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal)		
	500V or more (external – external)		
Output voltage	0.3 V DC (max.)		

DC Transistor output

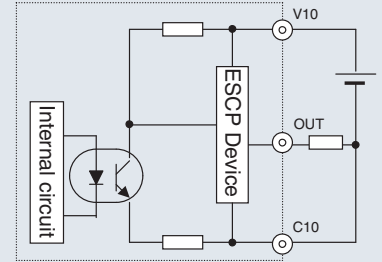
MV-D64DT : 21 pts from bit 3, MV-D40DT : 13 pts from bit 3

Item	Specification	Circuit diagram	
Rated load voltage	24/12 V DC (+10 %, –15 %)		
Minimum switching current	10 mA		
Leak current	0.1mA		
Maximum load current	1 circuit		0.5A
	1 common		2A
Output response time	OFF → ON		0.1 ms (max.) / 24V DC
	ON → OFF		0.1 ms (max.) / 24V DC
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocoupler insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal)		
	500V or more (external – external)		
Output voltage	0.3 V DC (max.)		

DC Transistor output (ESCP type)

MV-D64DTPS : 20 pts from bit 4, MV-D40DTPS : 12 pts from bit 4

Item		Specification	Circuit diagram
Rated load voltage		24/12 V DC (+10 %, -15 %)	
Minimum switching current		10 mA	
Leak current		0.1mA	
Maximum load current	1 circuit	0.7A	
	1 common	2A	
Output response time	OFF → ON	0.5 ms (max.) / 24V DC	
	ON → OFF	0.5 ms (max.) / 24V DC	
Surge removal circuit		None	
Fuse		None	
Insulation system		Photocoupler insulation	
Output display		LED (green)	
Externally supplied power		12 to 30 V DC	
Insulation		1,500V or more (external – internal) 500V or more (external – external)	
Output voltage		0.3 V DC (max.)	



High-speed counter

Item		Single phase	2-phase
Available input		bit 0, 2, 4, 6, 8	bit 0/2/3, bit 4/6/7
Input voltage	ON	18V	
	OFF	5V	
Count pulse width		10 μs	17 μs
Maximum count frequency		100 kHz at each channel	60 kHz at each channel
Counter register			
Coincidence output			32 bits
ON/OFF-preset			Allowed
Upper/lower limit setting			Not Allowed

PWM output / Pulse Train Output

Item	Specification
Available output	Bit 0-2
Load voltage	12 / 24 V
Minimum load current	1 mA
PWM max. output frequency	65,535 Hz at each channel
Pulse train max. output frequency	65,535 Hz at each channel

Interrupt input

Item	Specification	
Input that can be used	bit 1, 3, 5, 7, 9	
Input voltage	ON	18 V
	OFF	5 V

Expansion units



I/O external connection : Removable type screw terminal block (M3)

DC input (14 / 28 points expansion unit)

EH-D14EDT / EH-D14EDTP / EH-D14EDTPS / EH-D14EDR / EH-A14EDR : 8 pts
EH-D28EDT / EH-D28EDTP / EH-D28EDTPS / EH-D28EDR / EH-A28EDR : 16 pts

Item	Specification	Circuit diagram	
Input voltage	24 V DC		
Allowable input voltage range	0 to 30 V DC		
Input impedance	Approx. 2.8 kΩ		
Input current	Approx. 7.5 mA		
Operating voltage	On voltage		15 V DC (min.) / 4.5 mA (max.)
	OFF voltage		5 V DC (min.) / 1.5 mA (max.)
Input lag	OFF → ON		0.5 ms or less
	ON → OFF		0.5 ms or less
Polarity	None		
Insulation system	Photocopler insulation		
Input display	LED (green)		

DC input (8 / 16 points expansion unit)

EH-D8ED : 8 pts , EH-D8EDR / EH-D8EDTPS / EH-D8EDT : 4 pts, EH-D16ED : 16 pts

Item	Specification		Circuit diagram
	EH-D8EDR EH-D8EDTPS EH-D8EDT	EH-D8ED EH-D16ED	
Input voltage	24 V DC		
Allowable input voltage range	0 to 30 V DC		
Input impedance	Approx. 2.8 kΩ	Approx. 4.8 kΩ	
Input current	Approx. 7.5 mA	Approx. 4.8 mA	
Operating voltage	On voltage	15 V DC (min.) / 4.5 mA (max.)	
	OFF voltage	5 V DC (min.) / 1.5 mA (max.)	
Input lag	OFF → ON	4 ms (TYP)	
	ON → OFF	4 ms (TYP)	
Polarity	None		
Insulation system	Photocopler insulation		
Input display	LED (green)		

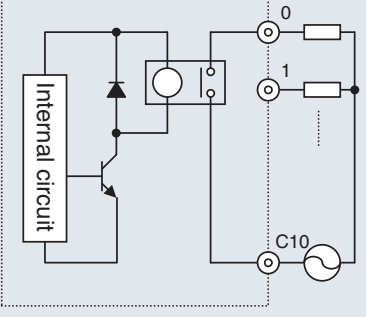
DC input (64 points expansion unit)

EH-A64EDR / EH-D64EDR / EH-D64EDT / EH-D64EDTPS : 40 pts

Item	Specification		Circuit diagram
	bit 0, 2, 4, 6	The other inputs	
Input voltage	24 V DC		
Allowable input voltage range	0 to 30 V DC		
Input impedance	Approx. 2.7 kΩ	Approx. 4.7 kΩ	
Input current	Approx. 8 mA	Approx. 4.8 mA	
Operating voltage	On voltage	18 V DC (min.) / 4.5 mA (max.)	
	OFF voltage	5 V DC (min.) / 1.8 mA (max.)	
Input lag	OFF → ON	2 ms or less	
	ON → OFF	2 ms or less	
Polarity	None		
Insulation system	Photocopler insulation		
Input display	LED (green)		

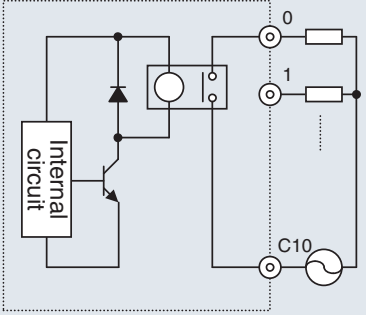
Relay output (14 points / 28 points expansion unit)

EH-D14EDR / EH-A14EDR : 6 pts , EH-D28EDR / EH-A28EDR : 12 pts

Item	Specification	Circuit diagram	
Rated load voltage	5 – 250 V AC, 5 – 30V DC		
Maximum load current	1 circuit		2A (24V DC, 240V AC)
	1 common		5A
Output response time	OFF → ON		15 ms (max.)
	ON → OFF		15 ms (max.)
Surge removal circuit	None		
Fuse	None		
Insulation system	Relay insulation		
Output display	LED (green)		
Externally supplied power (for driving relays)	Not necessary		
Contact life	20,000,000 times (mechanical) 200,000 times (electrical : 2 A)		
Insulation	1,500V or more (external – internal) 500V or more (external – external)		

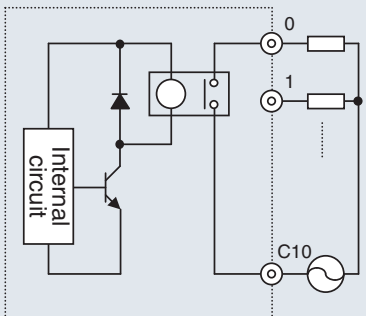
Relay output (8 points / 16 points expansion unit)

EH-D8ER : 8 pts , EH-D8EDR : 4 pts, EH-D16ER : 16 pts

Item	Specification	Circuit diagram	
Rated load voltage	5 – 250 V AC, 5 – 30V DC		
Maximum load current	1 circuit		2A (24V DC, 240V AC)
	1 common		5A
Output response time	OFF → ON		15 ms (max.)
	ON → OFF		15 ms (max.)
Surge removal circuit	None		
Fuse	None		
Insulation system	Relay insulation		
Output display	LED (green)		
Externally supplied power (for driving relays)	Not necessary		
Contact life	20,000,000 times (mechanical) 200,000 times (electrical : 2 A)		
Insulation	1,500V or more (external – internal) 500V or more (external – external)		

Relay output (64 points expansion unit)

EH-A64EDR / EH-D64EDR : 24 pts

Item	Specification	Circuit diagram	
Rated load voltage	5 – 250 V AC, 5 – 30V DC		
Maximum load current	1 circuit		2A (24V DC, 240V AC)
	1 common		-
Output response time	OFF → ON		15 ms (max.)
	ON → OFF		15 ms (max.)
Surge removal circuit	None		
Fuse	None		
Insulation system	Relay insulation		
Output display	LED (green)		
Externally supplied power (for driving relays)	Not necessary		
Contact life	20,000,000 times (mechanical) 200,000 times (electrical : 2 A)		
Insulation	1,500V or more (external – internal) 500V or more (external – external)		

DC Transistor output : LCD- Low Current (8 / 16 points expansion unit)

EH-D8ET : 8 pts, EH-D16ET : 16 pts

Item	Specification	Circuit diagram	
Output specification	Sink output		
Rated load voltage	24 V DC		
Minimum switching current	1 mA		
Leak current	0.1 mA (max)		
Maximum load current	1 circuit		0.5A
	1 common		3A
Output response time	OFF → ON		0.5 ms (max) 24 V DC 0.2A
	ON → OFF		0.5 ms (max) 24 V DC 0.2A
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocopier insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal)		
	500V or more (external – external)		
Output voltage drop	0.3 V DC (max)		

DC Transistor output : LCD- Low Current (8 / 14 / 28 points expansion unit)

EH-D8EDT : 2 pts, EH-D14EDT / EH-D14EDTPS : 4 pts, EH-D28EDT / EH-D28EDTPS : 8 pts

Item	Specification	Circuit diagram	
Rated load voltage	24/12 V DC (+10 %, -15%)		
Minimum switching current	1 mA		
Leak current	0.1 mA (max.)		
Maximum load current	1 circuit		0.75A / 24V DC, 0.5A / 12V DC
	1 common		3A
Output response time	OFF → ON		0.1 ms (max.) 24 V DC 0.2A
	ON → OFF		0.1 ms (max.) 24 V DC 0.2A
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocopier insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal)		
	500V or more (external – external)		
Output voltage drop	0.3 V DC (max.)		

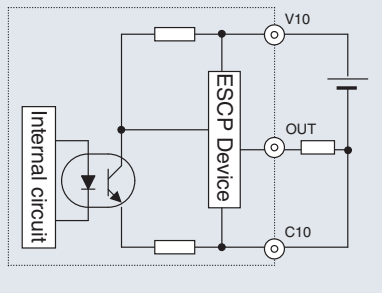
DC Transistor output : HCDC- High Current (8 / 14 / 28 points expansion unit)

EH-D8EDT : 2 pts, EH-D14EDT / EH-D14EDTPS : 2 pts, EH-D28EDT / EH-D28EDTPS : 4 pts

Item	Specification	Circuit diagram	
Rated load voltage	24/12 V DC (+10 %, -15%)		
Minimum switching current	1 mA		
Leak current	0.1 mA (max.)		
Maximum load current	1 circuit		1A / 24V DC
	1 common		3A
Output response time	OFF → ON		0.1 ms (max.) 24 V DC 0.2A
	ON → OFF		0.1 ms (max.) 24 V DC 0.2A
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocopier insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal)		
	500V or more (external – external)		
Output voltage drop	0.3 V DC (max.)		

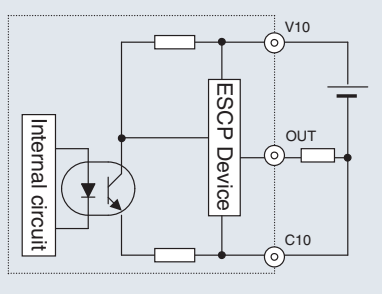
DC Transistor output (ESCP type) LCDC-Low Current (8 / 14 / 16 / 28 points expansion unit)

EH-D8ETPS : 8 pts, EH-D8EDTPS : 2 pts, EH-D14EDTPS : 4 pts, EH-D16EDTPS : 16 pts, EH-D28EDTPS : 8 pts

Item	Specification	Circuit diagram	
Rated load voltage	24/12 V DC (+10 %, -15%)		
Minimum switching current	10 mA		
Leak current	0.1 mA (max.)		
Maximum load current	1 circuit		0.7A / 24V DC
	1 common		3A
Output response time	OFF → ON		0.5 ms (max.) 24 V DC 0.2A
	ON → OFF		0.5 ms (max.) 24 V DC 0.2A
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocoupler insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal) 500V or more (external – external)		
Output voltage drop	0.3 V DC (max.)		

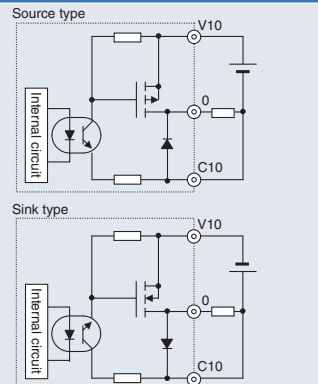
DC Transistor output (ESCP type) HCDC-High Current (8 / 14 / 28 points expansion unit)

EH-D8EDTPS : 2 pts, EH-D14EDTPS : 2 pts, EH-D28EDTPS : 4 pts

Item	Specification	Circuit diagram	
Rated load voltage	24/12 V DC (+10 %, -15%)		
Minimum switching current	10 mA		
Leak current	0.1 mA (max.)		
Maximum load current	1 circuit		1A
	1 common		3A
Output response time	OFF → ON		0.05 ms (max.) 24 V DC
	ON → OFF		0.05 ms (max.) 24 V DC
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocoupler insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal) 500V or more (external – external)		
Output voltage drop	0.3 V DC (max.)		

DC Transistor output (64 points expansion unit)

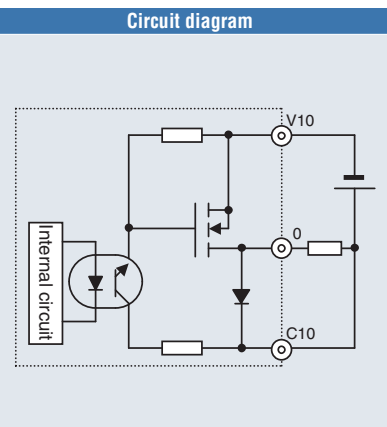
EH-D64EDT / EH-D64EDTPS : bit 0-3 (4 pts)

Item	Specification	Circuit diagram	
Rated load voltage	24/12 V DC (+10 %, -15%)		
Minimum switching current	10 mA		
Leak current	0.1 mA (max.)		
Maximum load current	1 circuit		0.5A 24V DC, 0.3A 12V DC
	1 common		2.0A
Output response time	OFF → ON		5μs (max.) 24 V DC
	ON → OFF		5μs(max.) 24 V DC
Surge removal circuit	None		
Fuse	None		
Insulation system	Photocoupler insulation		
Output display	LED (green)		
Externally supplied power	12 to 30 V DC		
Insulation	1,500V or more (external – internal) 500V or more (external – external)		
Output voltage drop	0.3 V DC (max.)		

DC Transistor output (64 points expansion unit)

EH-D64EDT : bit 4-23 (20 pts)

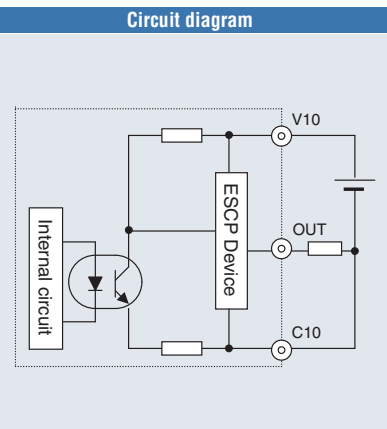
Item	Specification
Rated load voltage	24/12 V DC (+10 %, -15%)
Minimum switching current	10 mA
Leak current	0.1 mA (max.)
Maximum load current	1 circuit
	1 common
Output response time	0.5A
Surge removal circuit	64 pts : 3A, 40 pts : 5A
	0.1ms (max.) 24 V DC
Fuse	0.1ms (max.) 24 V DC
	None
Insulation system	None
Output display	Photocoupler insulation
Externally supplied power	LED (green)
Insulation	12 to 30 V DC
	1,500V or more (external - internal)
Output voltage drop	500V or more (external - external)
	0.3 V DC (max.)



DC Transistor output (ESCP type) LCD-DC-Low Current (64 points expansion unit)

EH-D64EDTPS : bit 4-19 (16 pts)

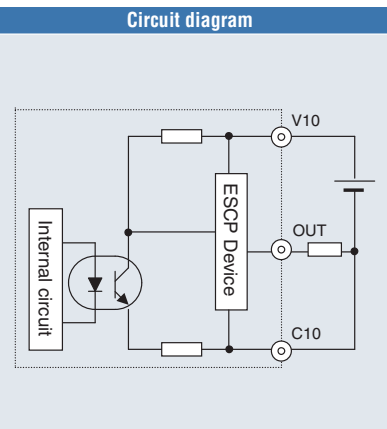
Item	Specification
Rated load voltage	24/12 V DC (+10 %, -15%)
Minimum switching current	10 mA
Leak current	0.1 mA (max.)
Maximum load current	1 circuit
	1 common
Output response time	0.7A
Surge removal circuit	64 pts : 3A, 40 pts : 5A
	0.5 ms (max.) 24 V DC
Fuse	0.5 ms (max.) 24 V DC
	None
Insulation system	None
Output display	Photocoupler insulation
Externally supplied power	LED (green)
Insulation	12 to 30 V DC
	1,500V or more (external - internal)
Output voltage drop	500V or more (external - external)
	0.3 V DC (max.)



DC Transistor output (ESCP type) HCDC-High Current (64 points expansion unit)

EH-D64EDTPS : bit 20-23 (4 pts)

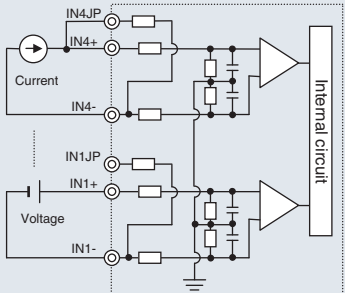
Item	Specification
Rated load voltage	24/12 V DC (+10 %, -15%)
Minimum switching current	10 mA
Leak current	0.1 mA (max.)
Maximum load current	1 circuit
	1 common
Output response time	1.0A
Surge removal circuit	3.0A
	0.5 ms (max.) 24 V DC
Fuse	0.5 ms (max.) 24 V DC
	None
Insulation system	None
Output display	Photocoupler insulation
Externally supplied power	LED (green)
Insulation	12 to 30 V DC
	1,500V or more (external - internal)
Output voltage drop	500V or more (external - external)
	0.3 V DC (max.)



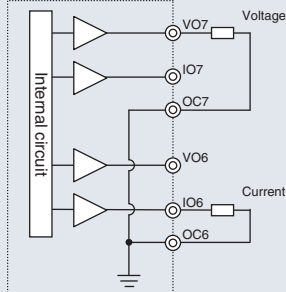
Analog expansion unit

EH-D6EAN / EH-A6EAN

Input specification : All models

Item	Specification	Circuit diagram
No. of input channel	4	
Input range	0–10V (10.24V max.)	
	–10 to +10V (+/- 10.24V max.)	
	0–20mA (20.48mA max.)	
	4–20mA (20.38mA max.)	
Resolution	12 bits	
Accuracy	+/- 1 % of full scale	
Linearity	Max. +/- 3 digits	
Current input impedance	Approx. 249 Ω	
Voltage input impedance	Approx. 200 kΩ	
Input delay time	20 ms	
Channel to internal circuit insulation	Insulated	
Channel-to channel insulation	Not insulated	

Output specification : All models

Item	Specification	Circuit diagram
No. of output channel	2	
Output range	0–10V (10.24V max.)	
	0–20mA (20.48mA max.)	
	4–20mA (20.38mA max.)	
	Resolution	
Accuracy	+/- 1 % of full scale	
Current output		
Allowable load	10 – 500 Ω	
Output allowable capacity	Max. 2,000 pF	
Output allowable inductance	Max. 1H	
Voltage output		
Allowable load	Min. 10 k Ω	
Output allowable impedance	Max. 1μF	
Channel to internal circuit insulation	Insulated	
Channel-to channel insulation	Not insulated	

RTD Expansion Unit

EH-A6ERTD / EH-A4ERTD / EH-D6ERTD / EH-D4ERTD

Input specification : All models

Item	Specification
No. of input channel	4
RTD type supported	Pt100 (2 or 3 wire)
Input resolution	0.1 °C / 0.1 °F
Input ranges	–100.0 °C to +600.0 °C –148.0 °F to +1112.0 °F
Accuracy	+/- 0.5% of full scale over temp.range
Response time	141 / 563ms
Error detection	Data H7FFF and LED blinking at below –100°C (–166 °F) or beyond +610 °C (+1130 °F) (Included wire breaking or cable disconnection)
Cable length (shielded)	100 m (Max.)

Output specification : EH-D6ERTD / EH-A6ERTD

Item	Specification	
No. of analog output channels	2	
Output ranges	0–10V (10.24V Max.) / 4–20mA (20.38mA max.)*	
Resolution	12 bits	
Accuracy	+/- 1% of full scale over temp. range	
Response time	8.8 ms	
Current outputs	Max. voltage at 20mA	10 V
	User load rage	10 to 500 Ω
	Output load capacitance	2000 pF Max.
	Output inductance	1 Henry Max.
Voltage outputs	Output load range	10 kΩ Minimum at 10 V
	Output load inductance	1 μF Max.

★: Value in brackets is in case of mode 4000.

Thermocouple Expansion Unit

EH-D6ETC / EH-D4ETC

Input specification : All models

Item		Specification			
No. of channels		4 channels			
Supported thermocouple		Type K, J, E, S, T, B, N			
Each type of specification (Ambient temp. 0 to 55°C)	Type	Accuracy guaranteed range	Accuracy (*1)	Resolution	Input range
	K	-200 to 1200°C -328 to 2192°F	0.4%(FS)	0.1 °C 0.2°F	-270 to 1370°C -454 to 2498°F
	J	-40~750°C -40 to 1382°F	0.3%(FS)	0.1 °C 0.2°F	-210 to 1200°C -346 to 2192°F
	E	-200~900°C -328 to 1652°F	0.3%(FS)	0.1 °C 0.2°F	-270 to 1000°C -454 to 1832°F
	S	0~600°C 32 to 2912°F	1.0%(FS)	1.0 °C 1.0°F	-50 to 1760°C -58 to 3200°F
	T	-200~350°C -328 to 662°F	0.8%(FS)	0.1 °C 0.2°F	-270 to 400°C -454 to 752°F
	B	600~1700°C 1112 to 3092°F	1.0%(FS)	1.0 °C 1.0°F	0 to 1820°C 32 to 3308°F
	N	-200~1200°C -328 to 2192°F	0.4%(FS)	0.1 °C 0.2°F	-270 to 1300°C -454 to 2372°F
	50mV	-50 to 50mV	0.5%(FS)	0.01 mV	-50 to 50mV
	100mV	-100 to 100mV	0.5%(FS)	0.02 mV	-100 to 100mV
Conversion data		15 bits + sign (0.1 °C / 0.1 °F / 0.01 mV)			
Isolation	Between channels	Not isolated			
	Between channel and internal circuit	Isolated by photocoupler			
Cold junction temperature input range		-20 to 80 °C			
Cold junction temperature compensation		+/- 2 °C or less (ambient temp. 0 to 55 °C)			
Diagnostic error (Overflow or breaking wire)		Input data : H7FFF (LED blinks at error channel)			
Conversion time (4 channels all)		563 ms (thermocouple) / 141 ms (mV)			
External wiring length *2		Max. 100 m			

★1: Overall error is sum of accuracy for each sensor and accuracy of cold junction compensation. Error of thermocouple is not included in the above accuracy. Above accuracy is guaranteed under the condition of 10 minutes after power ON.

★2: Note : The max. cable length is 100m, however it depends on noisy environment or other conditions.

Output specification : EH-D6ETC

Item		Specification
No. of analog output		2 channels, single output
Output ranges		0-10V (10.24V max.) / 0-20mA (20.48mA max.)
Resolution		12 bits
Accuracy		+/- 1% of full scale over temp. range
Response		8.8 ms
Current outputs	Output load range and max. voltage	10 to 500 Ω , 10V
	Output capacitance and inductance	2000 pF max. 1 Henry max.
Voltage outputs	Output loading	10kΩ Minimum at 10V
	Output load inductance	1 μF Max.

Components list

[Basic units]

40 points type



64 points type



No.	Class	Model Name	Specification				Mass (g)	Power consumption (A)			Certifications		
			Power	Input	Output	Remarks		100V AC	264V AC	24V DC	CE	UL	C-Tick
1	40 points	MV-D40DTPS	24V DC	DC24V x 24	Transistor x 16 (short circuit protection)	Source	460	-	-	0.4	○	-	-
2		MV-D40DT	24V DC	DC24V x 24	Transistor x 16	Sink	460	-	-	0.4	○	-	-
3		MV-D40DR	24V DC	DC24V x 24	Relay x 16		500	-	-	0.4	○	-	-
4		MV-A40DR	100/200V AC	DC24V x 24	Relay x 16		570	0.2	0.1	-	○	-	-
5	64 points	MV-D64DTPS	24V DC	DC24V x 40	Transistor x 24 (short circuit protection)	Source	600	-	-	0.5	○	-	-
6		MV-D64DT	24V DC	DC24V x 40	Transistor x 24	Sink	600	-	-	0.5	○	-	-
7		MV-D64DR	24V DC	DC24V x 40	Relay x 24		655	-	-	0.5	○	-	-
8		MV-A64DR	100/200V AC	DC24V x 40	Relay x 24		710	0.2	0.1	-	○	-	-

[Expansion units]

Expansion units



No.	Class	Model Name	Specification				Mass (g)	Power consumption (A)			Certifications		
			Power	Input	Output	Remarks		100V AC	264V AC	24V DC	CE	UL	C-Tick
1	8 points	EH-D8ED	24V DC	24VDC x 8	-		260	-	-	0.16	○	○	○
2		EH-D8ER	24V DC	-	Relay x 8		280	-	-	0.16	○	○	○
3		EH-D8ETPS	24V DC	-	Transistor x 8 (short circuit protection)	Source	260	-	-	0.16	○	○	○
4		EH-D8ET	24V DC	-	Transistor x 8	Sink	260	-	-	0.16	○	○	○
5		ED-D8EDTPS	24V DC	24VDC x 4	Transistor x 4 (short circuit protection)	Source	260	-	-	0.16	○	○	○
6		EH-D8EDT	24V DC	24VDC x 4	Transistor x 4	Sink	260	-	-	0.16	○	○	○
7		EH-D8EDR	24V DC	24VDC x 4	Relay x 4		300	-	-	0.16	○	○	○
8		EH-D14EDTPS	24V DC	24VDC x 8	Transistor x 6 (short circuit protection)	Source	300	-	-	0.16	○	○	○
9	14 points	EH-D14EDTP	24V DC	24VDC x 8	Transistor x 6	Source	300	-	-	0.16	○	○	○
10		EH-D14EDT	24V DC	24VDC x 8	Transistor x 6	Sink	300	-	-	0.16	○	○	○
11		EH-D14EDR	24V DC	24VDC x 8	Relay x 6		400	-	-	0.16	○	○	○
12		EH-A14EDR	100/200V AC	24VDC x 8	Relay x 6		400	0.2	0.06	-	○	○	○

[Expansion units]

No.	Class	Model Name	Specification				Mass (g)	Power consumption (A)			Certifications		
			Power	Input	Output	Remarks		100V AC	264V AC	24V DC	CE	UL	C-Tick
13	16 Points	EH-D16ED	24V DC	24VDC x 16	–		260	–	–	0.13	○	○	○
14		EH-D16ER	24V DC	–	Relay x 16		300	–	–	0.11	○	○	○
15		EH-D16ETPS	24V DC	–	Transistor x 16 (short circuit protection)	Source	260	–	–	0.04	○	○	○
16		EH-D16ET	24V DC	–	Transistor x 16	Sink	260	–	–	0.03	○	○	○
17	28 Points	EH-D28EDTPS	24V DC	24VDC x 16	Transistor x 12 (short circuit protection)	Source	500	–	–	0.2	○	○	○
18		EH-D28EDTP	24V DC	24VDC x 16	Transistor x 12	Source	500	–	–	0.2	○	○	○
19		EH-D28EDT	24V DC	24VDC x 16	Transistor x 12	Sink	500	–	–	0.2	○	○	○
20		EH-D28EDR	24V DC	24VDC x 16	Relay x 12		500	–	–	0.3	○	○	○
21		EH-A28EDR	100/200 V AC	24VDC x 16	Relay x 12		600	0.2	0.06	–	○	○	○
22	64 Points	EH-D64EDTPS	24V DC	24VDC x 40	Transistor x 24 (short circuit protection)	Source	640	–	–	0.4	○	○	○
23		EH-D64EDT	24V DC	24VDC x 40	Transistor x 24	Sink	640	–	–	0.4	○	○	○
24		EH-D64EDR	24V DC	24VDC x 40	Relay x 24		640	–	–	0.5	○	○	○
25		EH-A64EDR	100/200 V AC	24VDC x 40	Relay x 24		720	0.4	0.2	–	○	○	○
26	Analog	EH-D6EAN	24V DC	Analog x 4	Analog x 2		300	–	–	0.16	○	○	○
27		EH-A6EAN	100/200 V AC	Analog x 4	Analog x 2		400	0.1	0.06	–	○	○	○
28	RTD	EH-D6ERTD	24V DC	RTD x 4	Analog x 2		300	–	–	0.16	○	○	○
29		EH-D4ERTD	24V DC	RTD x 4	–		300	–	–	0.16	○	○	○
30		EH-A6ERTD	100/200 V AC	RTD x 4	Analog x 2		400	0.1	0.06	–	○	○	○
31		EH-A4ERTD	100/200 V AC	RTD x 4	–		400	0.1	0.06	–	○	○	○
32	TC	EH-D6ETC	24V DC	Thermocouple x 4	Analog x 2		300	–	–	0.16	○	○	○
33		EH-D4ETC	24V DC	Thermocouple x 4	–		300	–	–	0.16	○	○	○
34	Expansion cable	EH-MCB10	1.0 m								n/a		
35		EH-MCB05	0.5 m								n/a		
36		EH-MCB01	0.1 m								n/a		
37	Option board	OBV-NES	RS-485 serial com. Port (RJ-45)								n/a		
38	board	OBV-485A	RS-485 serial com. ,4-wire,Port (RJ-45), 10-bit analog input (0-10V) 2ch								n/a		
39	Battery	MV-BAT	For data memory back-up. 3.0V / 1,750mAh								n/a		

[Programming software]

No.	Item	Descriptions	
1	Model name	EHV-CODESYS	
2	Version	V3.5 SP3 Patch 6 or higher	
3	System requirements	RAM	1GB
4		Operating system	Windows® XP / Windows® Vista / Windows® 7 (32-bit / 64-bit)
5		CPU	1GHz Pentium
6		Hard disk	1GB
7		Screen resolution	1024 x 768
8	Communication cables	USB	Standard USB cable (type-B connector)
9		Ethernet	UTP or STP cable (vat 5E)

*Windows is a registered trademark of Microsoft Corp. in the U.S. and other countries.

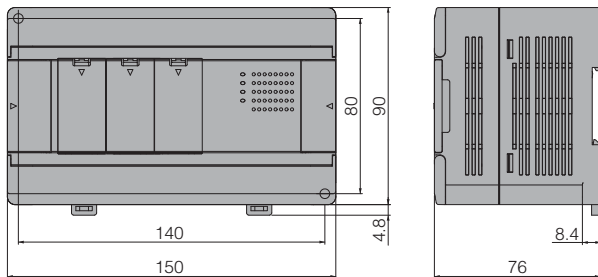
[General specifications]

Item	Specification	
Power supply type	AC	DC
Power voltage	100/110/120 V AC (50/60 Hz), 200/220/240 V AC (50/60 Hz)	24 V DC
Power voltage fluctuation	85 to 264 V AC wide range	19.2 to 30 V DC
Operating ambient temp.	0 to 55 °C	
Storage ambient humidity	5 to 95% RH (no condensation)	
Vibration resistance	Conforming to IEC(EN) 62231-2 (147m/s ² , 3 times in each 3 directions X, Y, Z)	
Noise resistance	<ul style="list-style-type: none"> ○Noise voltage 1,500 Vpp, Noise pulse width 100ns, 1μs (Noise input by a noise simulator across input terminal of a power module according to measuring method of Hitachi-IES.) ○Based on IEC 61131-2 (not applied for input modules) ○Static noise: 3,000V at electrode part 	
Certifications	Conforms with UL, CE marking	
Insulation resistance	20MΩ minimum between AC terminal and frame ground (FE) terminal (based on 500V 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	Attached on an open wall	
Cooling	Natural air cooling	

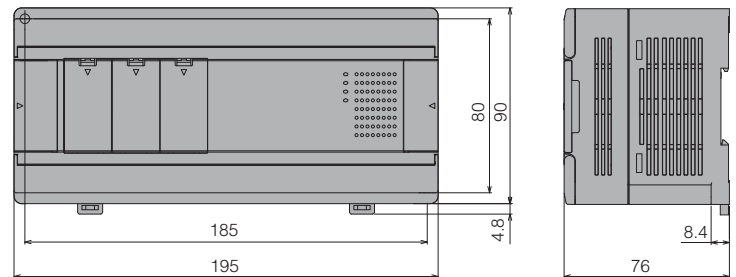
[Dimensions]

[Unit : mm]

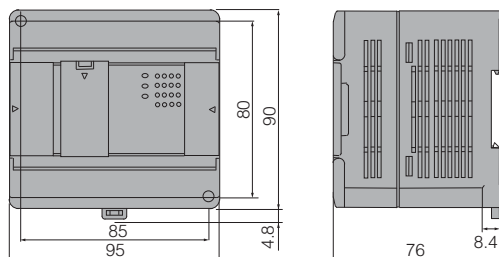
40 points type basic unit



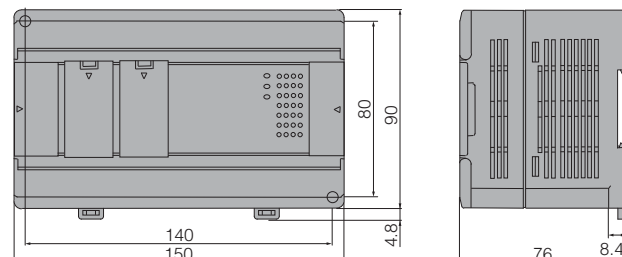
64 points type basic/expansion unit



8/14/16/analog/RTD/TC expansion unit



28 points expansion unit



Network



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Hitachi Industrial Equipment Systems Co., Ltd.

For further information, please contact your nearest sales representative.



ISO 14001
JQA-EM5428



ISO 9001
JQA-1000

The MICRO-EHV+ 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.