

Programmable Logic Controllers **MICRO-EHV+**

Full compliance with
the IEC61131-3 International Standard



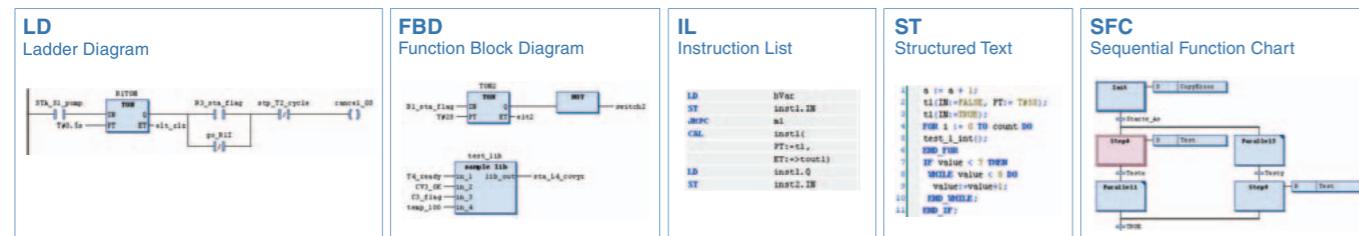
Hitachi compact PLC MICRO-EHV+

"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)



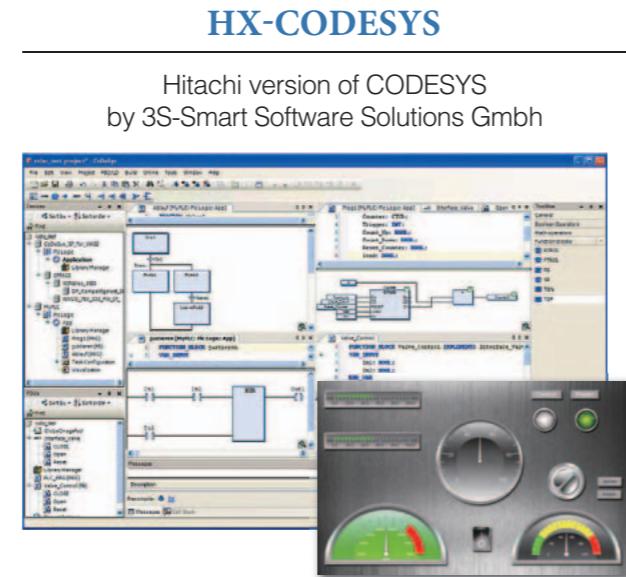
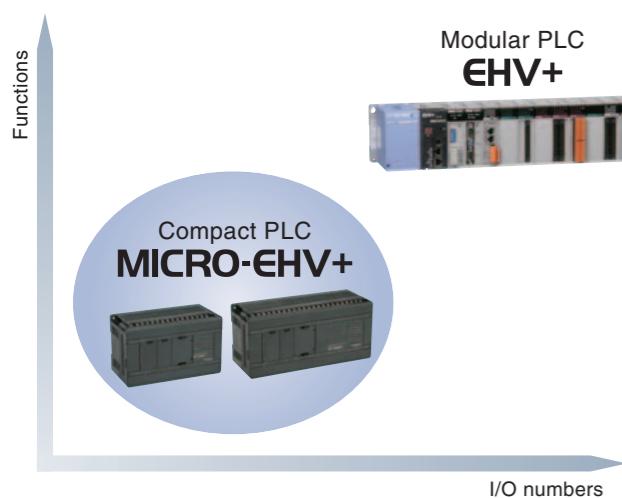
- No proprietary programming languages
- Easy start-up for users with;
 - no PLC experience or
 - experience of other manufacturer's programming language or
 - experience of high level programming languages
- Variable names for PLC, HMI, SCADA, and other I/O devices can be consolidated.
- Features Offline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



MICRO-EHV+ Basic unit

User program memory
Data memory (non-retain)
Data memory (retain)

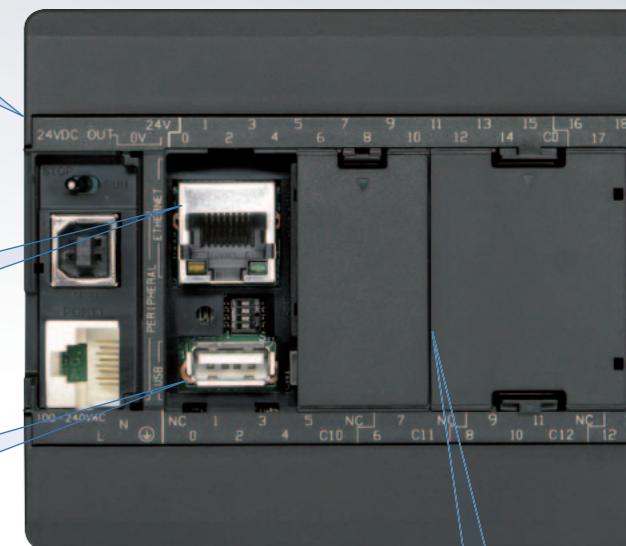
1,024kB

640kB

256kB

3 communication ports

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

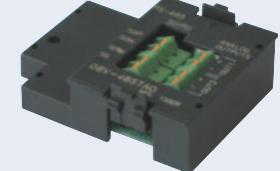


USB host function

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

Option board

- RS-485 port can be added as option



User program is stored in non-volatile FLASH memory

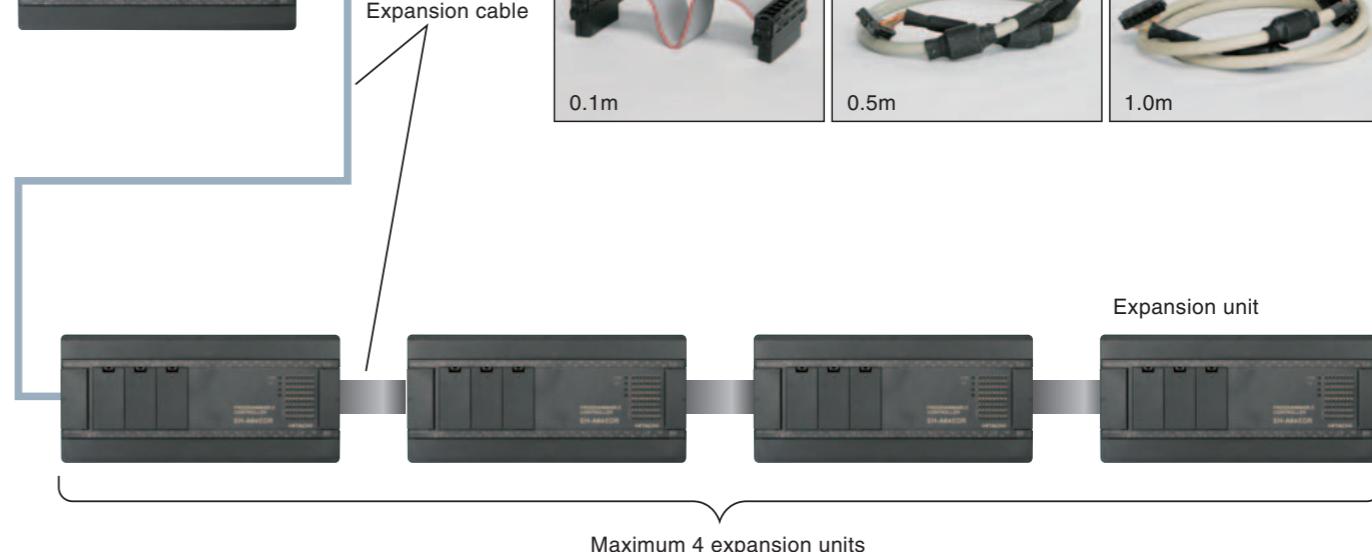
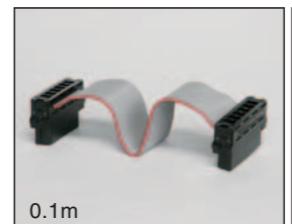
Data is stored in volatile RAM memory Retained by battery.

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

Basic unit



Expansion cables are prepared in 3 different lengths



Maximum 4 expansion units

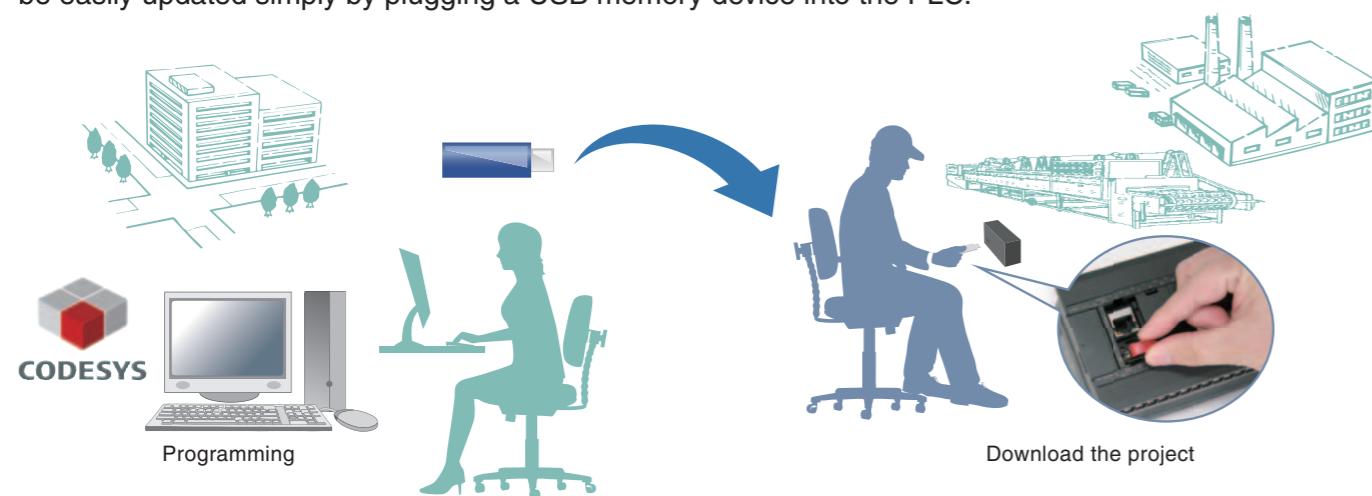
Advantage in your application

USB storage



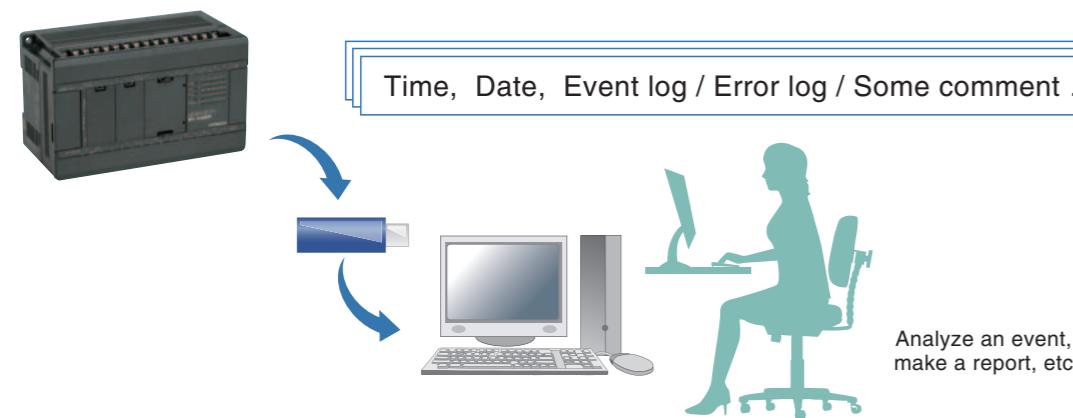
Program Download/Upload without a PC connection

If end users don't have HX-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.



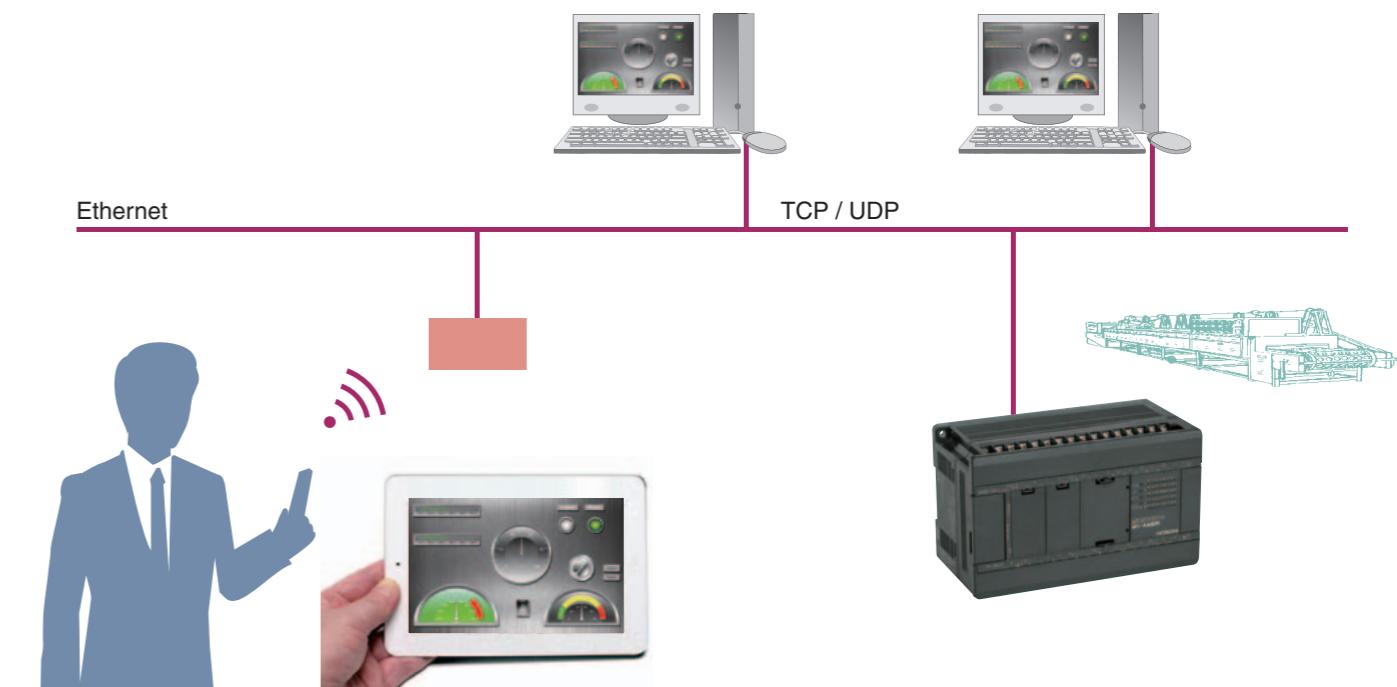
Note : Using USB memory does not mean to expand MICRO-EHV+ CPU memory .

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

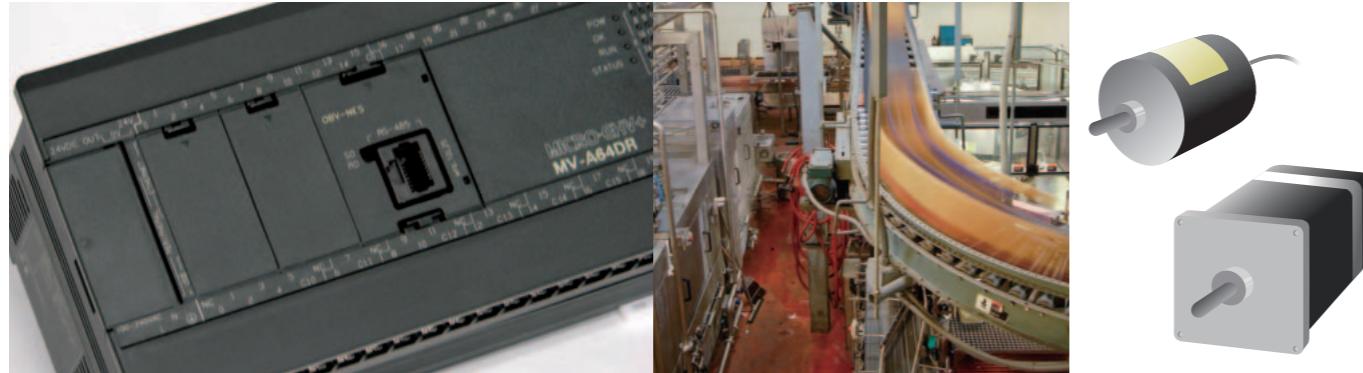
- Visualization over Internet / Intranet
- Web Server is adopted as standard
- JavaScript Execution

Purpose

- Remote maintenance
- Diagnostics
- Remote control

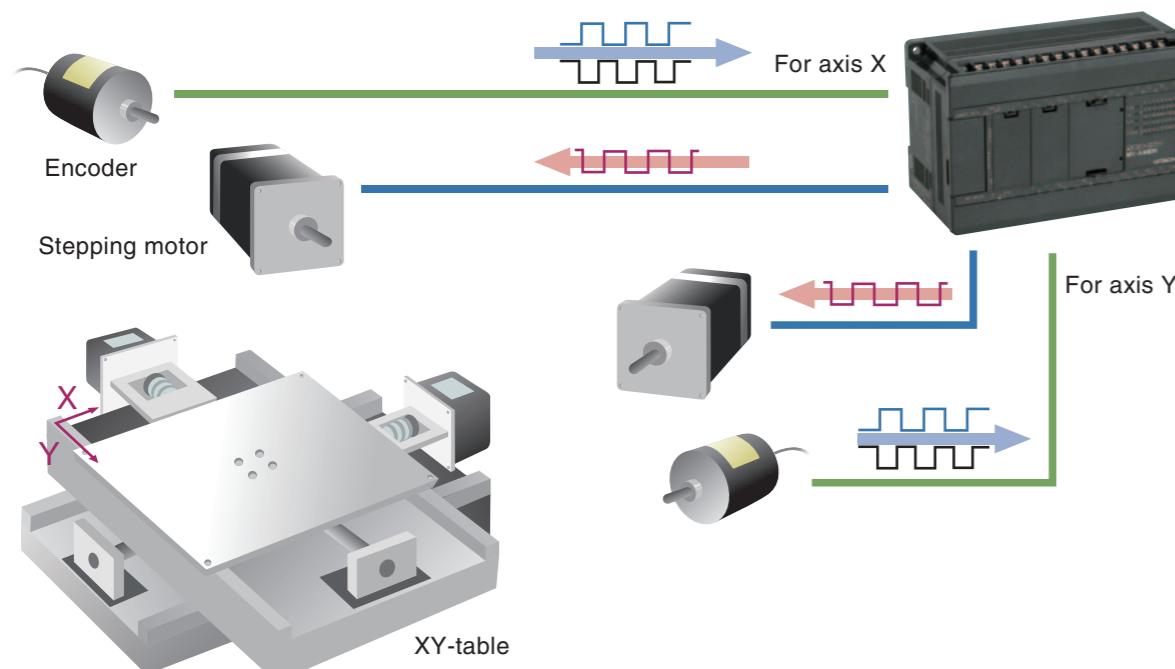


Simple automation system



Application Example – Position control

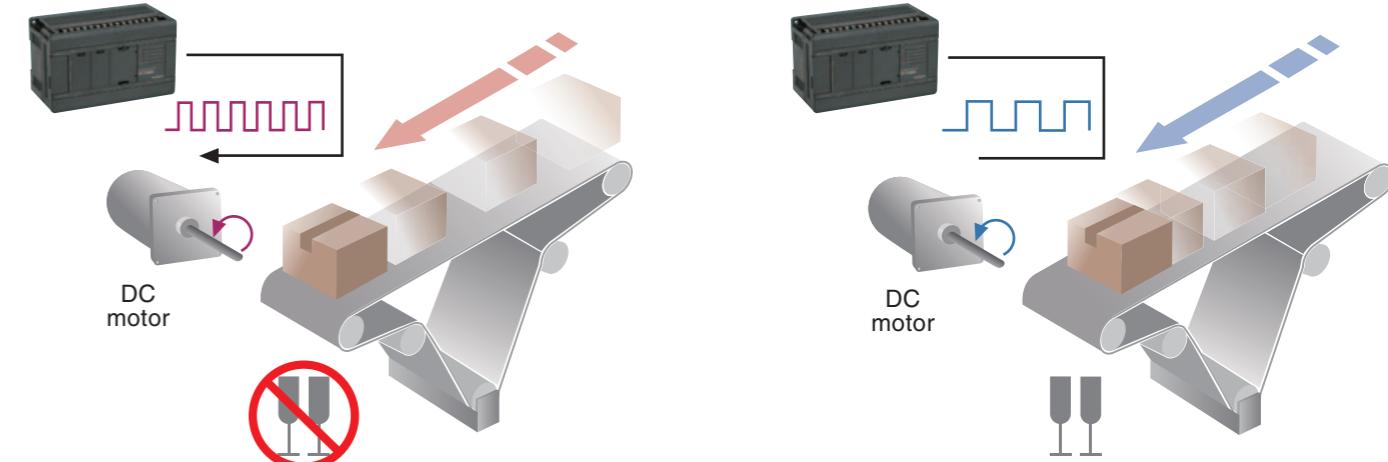
Using the built in High-speed counter and pulse train output a simple position control system can be achieved without the need for a dedicated motion controller.



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

Application Example – Speed control using PWM output

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

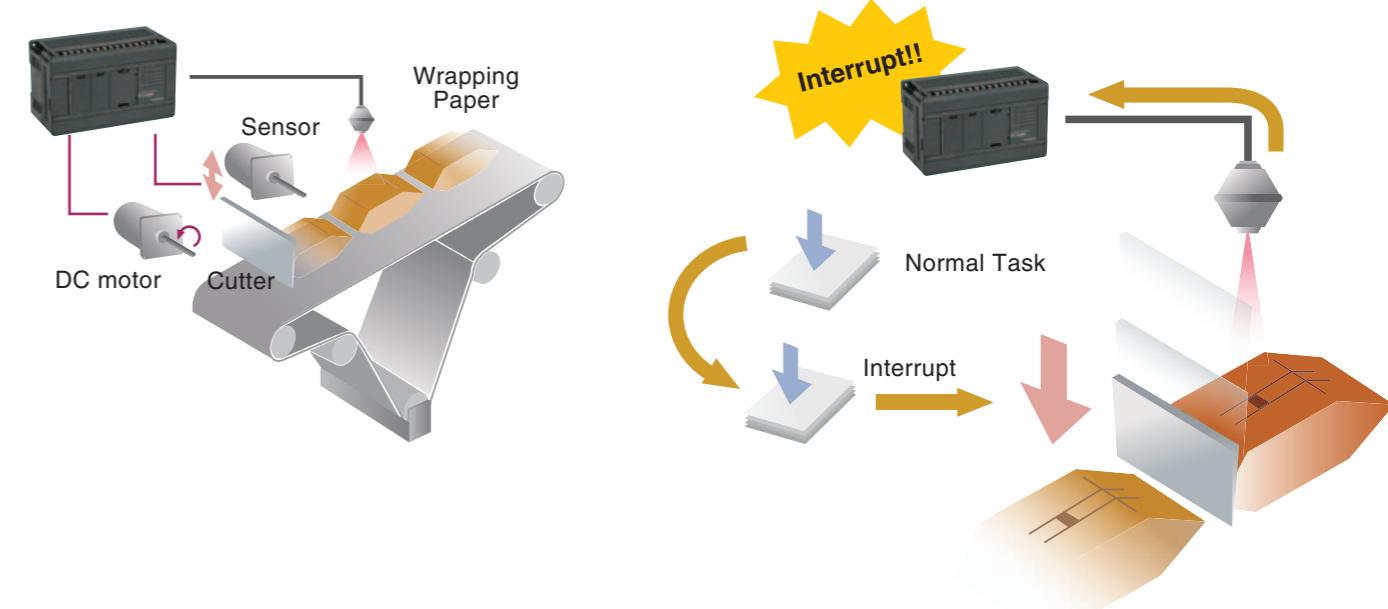


Conveyor speed can be changed depending on the contents of packages.

- PWM output Max. 3ch, 65kHz

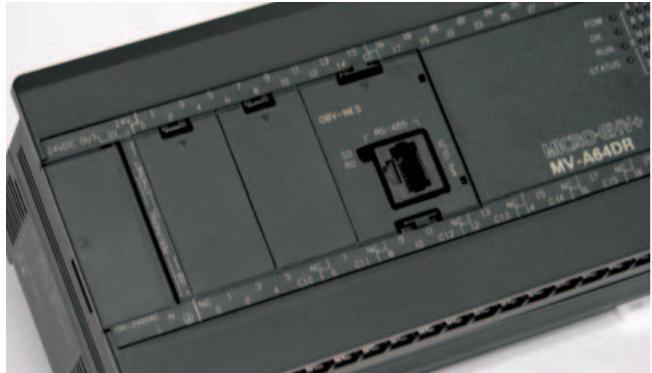
Application Example – Interrupt input

Specific processing can be executed without jitter.



- Interrupt input Max. 5ch

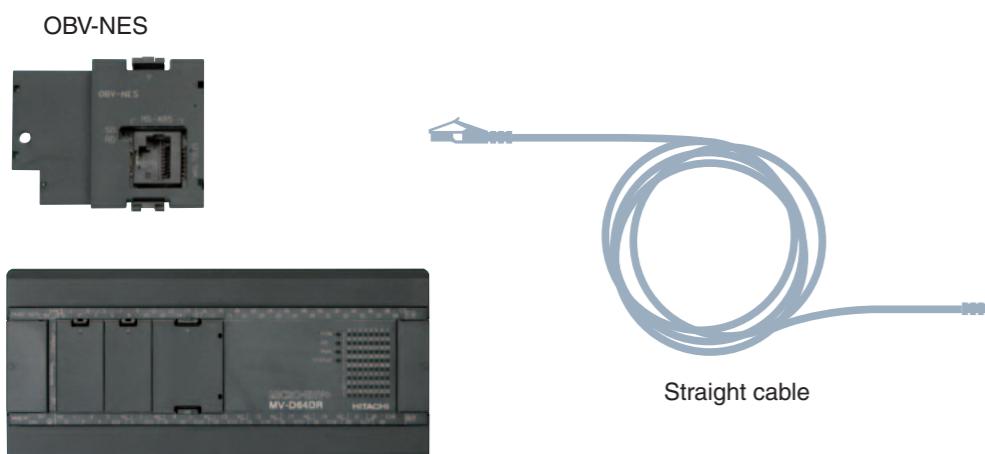
Easy communication with Hitachi Inverter



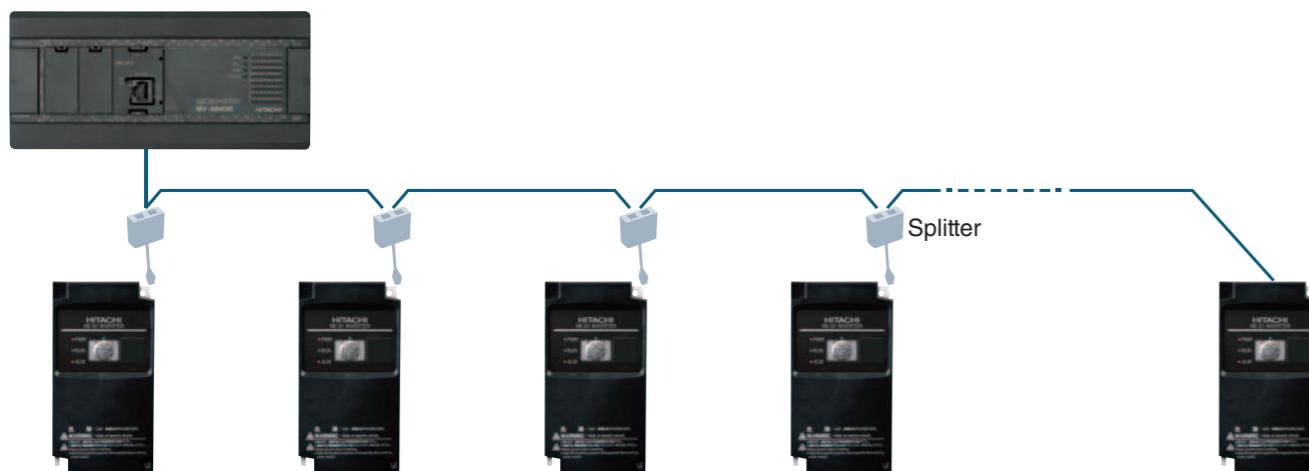
Economical Inverter
NE-S1

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.



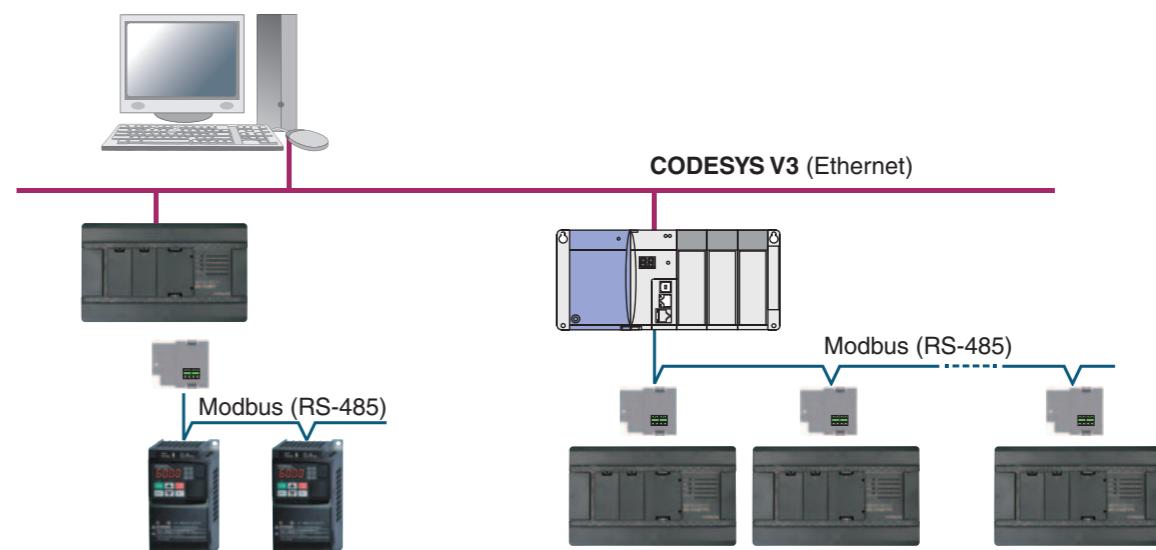
By using RJ-45 splitter, multi-drop connection will be achieved easily.



Compliance with Fieldbus Standards



MICRO-EHV+ supports Modbus-TCP (master / slave), Modbus-RTU (master / slave) and EtherCAT® master.



I/O extension using Hitachi EH-150 series I/O modules in combination with the EH-IOCA EtherCAT® slave module.



- Supported EH-150 I/O modules are DI/O, AI/O, Counter and POS.
- Available base units are EH-BS3A/5A/6A/8A/11A. (total 22 slots)

EtherCAT is registered trade mark and patented technology, licenced by Beckhoff Automation GmbH, Germany.



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



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



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

MV-A64DR



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



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



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-D8EDTPS** : 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-D14EDTPS** : 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-D28EDTPS** : 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-D64EDTPS** : 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

Programming software “HX-CODESYS”

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

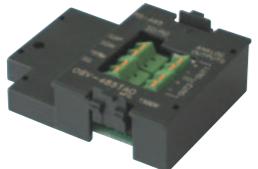
Thermocouple



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, 1 port
OBV-485A : RS-485, 1 port and Analog input, 2ch.
OBV-AIO : Analog Input, 2ch. and Analog Output, 2ch.
OBV-485TAI : RS-485, 1 port and Analog Input, 2ch.
OBV-485TAO : RS-485, 1 port and Analog Output, 2ch.

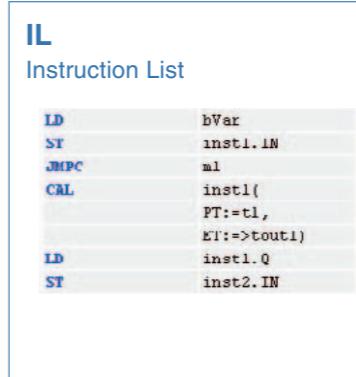
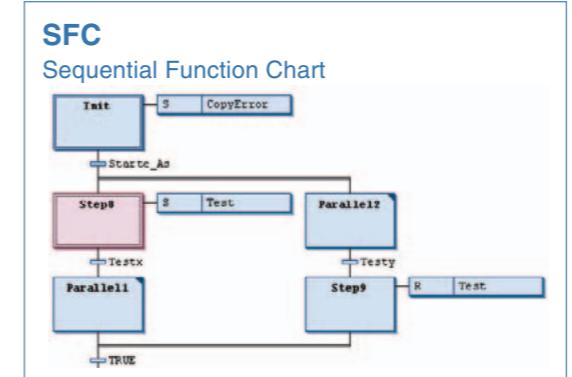
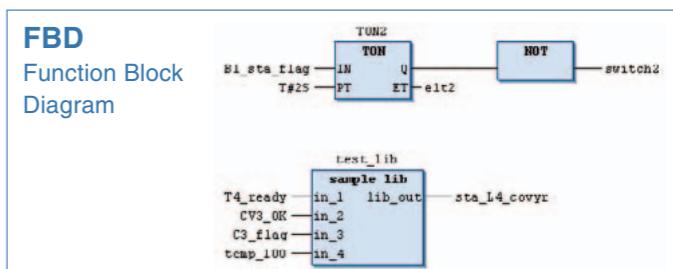
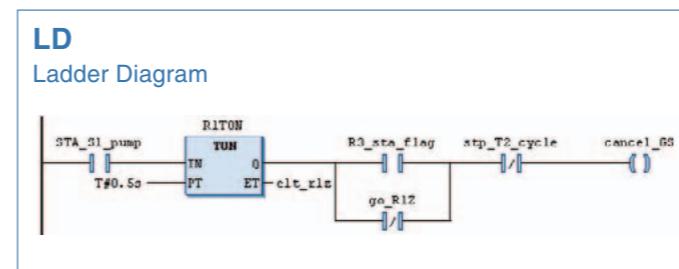
Battery



MV-BAT
For data memory retention. 1750mAh.

● 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.



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 < 6 DO
9 value:=value+1;
10 END WHILE;
11 END_IF;

```

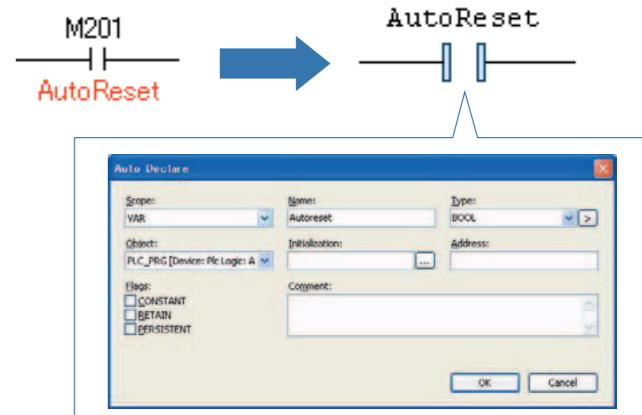
● Easy and efficient programming

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

● 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.

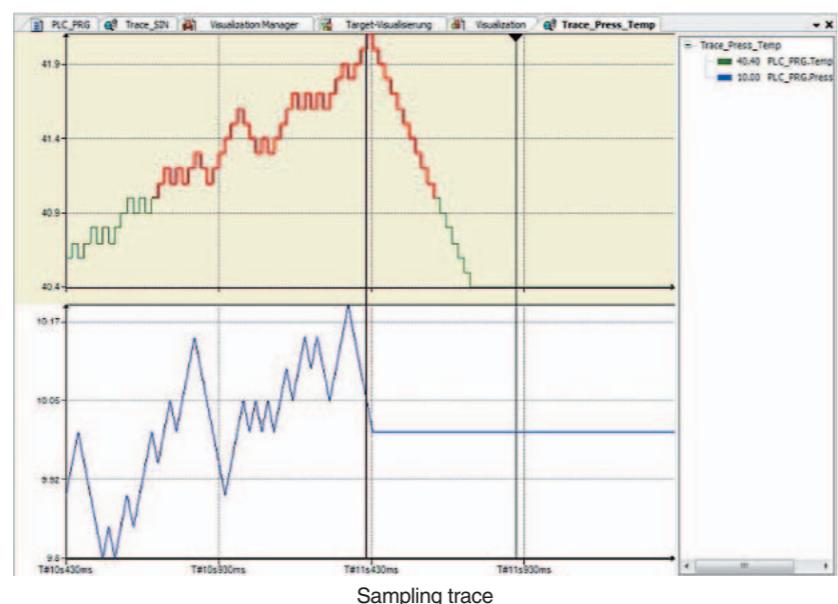
Expression	Type	Value	Prepared value
#StartTime	TIME	T#0ms	
# MODE	GEN_MODE	GEN_MODE_SAWTOO...	
# BASE	BOOL	FALSE	TRUE
# PERIOD	TIME	T#1s	
# CYCLES	INT	100	15
# AMPLITUDE	INT	1000	
# RESET	BOOL	FALSE	
# OUT	INT	-280	

```

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

■ Basic units

40 points type



64 points type



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

[CPU specification]

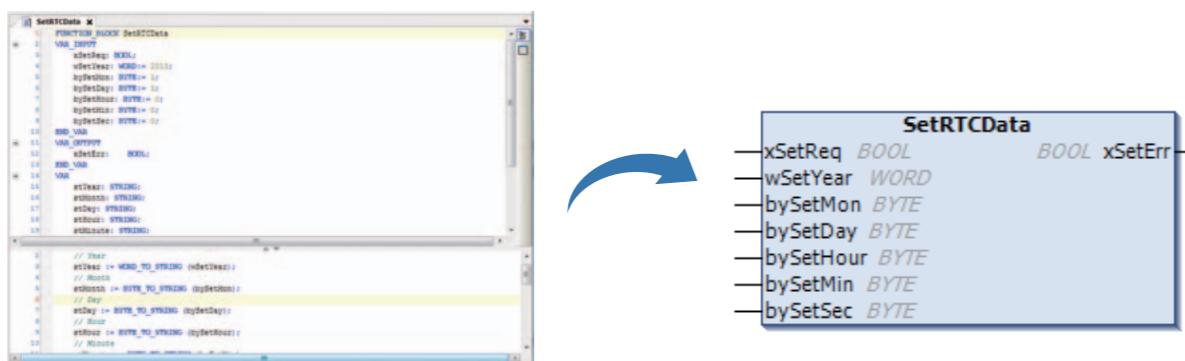
Item	40 points type	64 points type
Platform	CODESYS Runtime V3.5 SP3 Patch4	
Boolean execution speed	0.54µs/instruction	
User Program memory	1MB	
Source file memory	1MB	
Data memory (non retain)	640KB	
Data memory (retain)	256KB	
Programming languages	IEC61131-3 compliant 5 languages (LD, FBD, SFC, IL, 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		
USB	Device function	Refresh processing (depends on each task cycle)
	Host function	For programming. Built-in USB 2.0 Full speed
Ethernet	UDP/IP, TCP/IP	USB stick can be used for a copy of project and data logging
Serial	RS-232C (Built-in)	Programming, General purpose, Modbus-TCP server/client, EtherCAT® master
	RS-485 (Option)	General purpose, Modbus-RTU master and slave
Web visualization function		
RTC		Support
Battery		Built-in
		Optional

● Library

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

HX-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.



Components list

[Basic units]



No.	Class	Model Name	Specification				Mass (g)	Power consumption (A)		
			Power	Input	Output	Remarks		100V AC	264V AC	24V DC
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)		
			Power	Input	Output	Remarks	100V AC	264V AC	24V DC		
13	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		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	100/200V AC	24VDC x 16	Relay x 12		600	0.2	0.06	-	-
22		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	100/200V AC	24VDC x 40	Relay x 24		720	0.4	0.2	-	-
26		EH-D6EAN	24V DC	Analog x 4	Analog x 2		300	-	-	-	0.16
27		EH-A6EAN	100/200V AC	Analog x 4	Analog x 2		400	0.1	0.06	-	-
28		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	100/200V AC	RTD x 4	Analog x 2		400	0.1	0.06	-	-
31		EH-A4ERTD	100/200V AC	RTD x 4	-		400	0.1	0.06	-	-
32		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				
35		EH-MCB05					0.5 m				
36		EH-MCB01					0.1 m				
37		OBV-NES					RS-485 (2wire, RJ-45), 1ch.				
38	Option board	OBV-485A					RS-485 (4wire, RJ-45), 1 port and 10-bit Analog input, 2ch. (terminal block)				
39		OBV-AIO					10-bit Analog Input, 2ch. And 10-bit Analog Output, 2ch. (terminal block)				
40		OBV-485TAI					RS-485 (2wire, terminal block), 1 port and 10-bit Analog Input, 2ch. (terminal block)				
41		OBV-485TAO					RS-485 (2wire, terminal block), 1 port and 10-bit Analog Output, 2ch. (terminal block)				
42	Battery	MV-BAT					For data memory back-up. 3.0V / 1,750mAh				

[Programming software]

Item	Model	Specifications	Remarks
Integrated development environment HX-CODESYS	HX-CDS	Integrated development environment in conformance with IEC61131-3	*1

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

No.	Class	Model Name	Specification				Mass (g)	Power consumption (A)		
			Power	Input	Output	Remarks		100V AC	264V AC	24V DC
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	-



MEMO

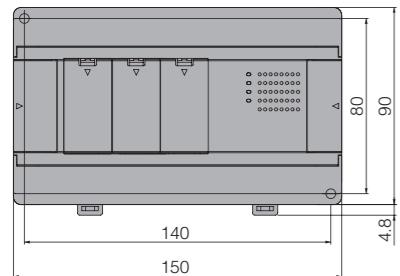
[General specifications]

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	<input type="radio"/> 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.) <input type="radio"/> Based on IEC 61131-2 (not applied for input modules) <input type="radio"/> Static noise: 3,000V at electrode part	
Certifications	CE,RCM	
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]

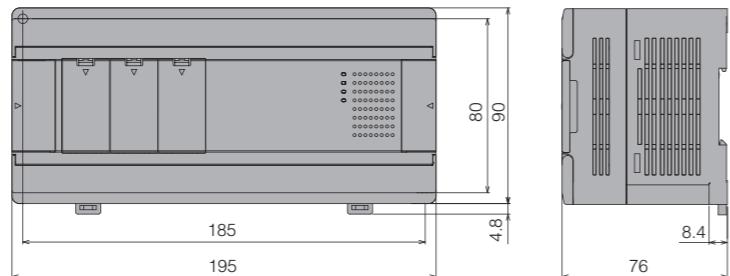
Unit : mm]

40 points type basic unit

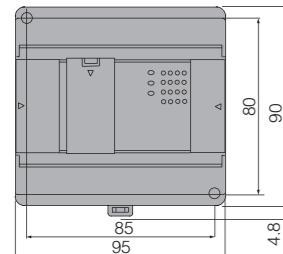


8.4

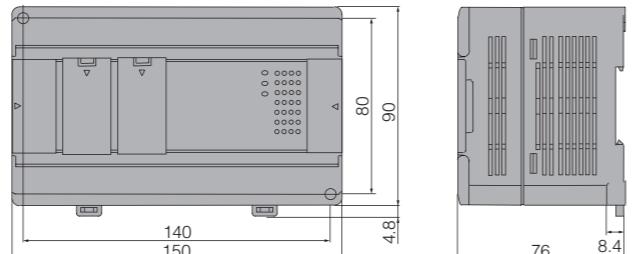
64 points type basic/expansion unit



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



28 points expansion unit



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 Pionner 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/>

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For further information, please contact your nearest sales representative.

