

FAREX SR Mini HG SYSTEM H-PCP-J Module

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Mapman Function enables PLCs and RKC temperature controllers to act as one.



General Description

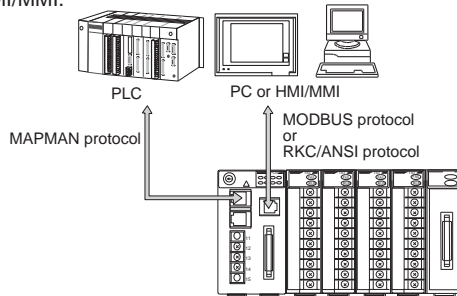
A temperature controller (FAREX SR Mini HG) becomes a Master Unit to PLC, and automatically stores temperature data into registers in a PLC. This enables easy handling of temperature control system to the exiting PLC system is available..

Features

- ☆ Control/monitor from one location
- ☆ Maximum of 80 control loops
- ☆ DIN rail mounting
- ☆ MODBUS/ANSI protocols

Simultaneous Use of Two Protocols

Communication ports (COM. PORT3) has been added. MODBUS protocol or RKC/ANSI protocol can be assigned. During MAPMAN command protocol communication, maintenance and increase of display devices are now available using a PLC or a HMI/MMI.



Selectable a Type of PLC and Protocol

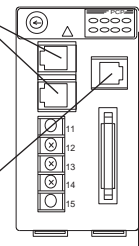
You can select a type of PLC (SLC500/MELSEC/SYMAC/JW) to connect and a protocol (MAPMAN/RKC/MODBUS) to use with a DIP switch.

<COM.PORT1 and COM.PORT2>

- (Selectable options)
- MAPMAN protocol
 - Allen-Bradley SLC500 command
 - Mithubishi MELSEC command
 - Omron SYMAC command
 - Sharp JW command
- MODBUS protocol
- RKC/ANSI protocol

<COM.PORT3>

- (Selectable options)
- MODBUS protocol
- RKC/ANSI protocol



Increased Communication Speed

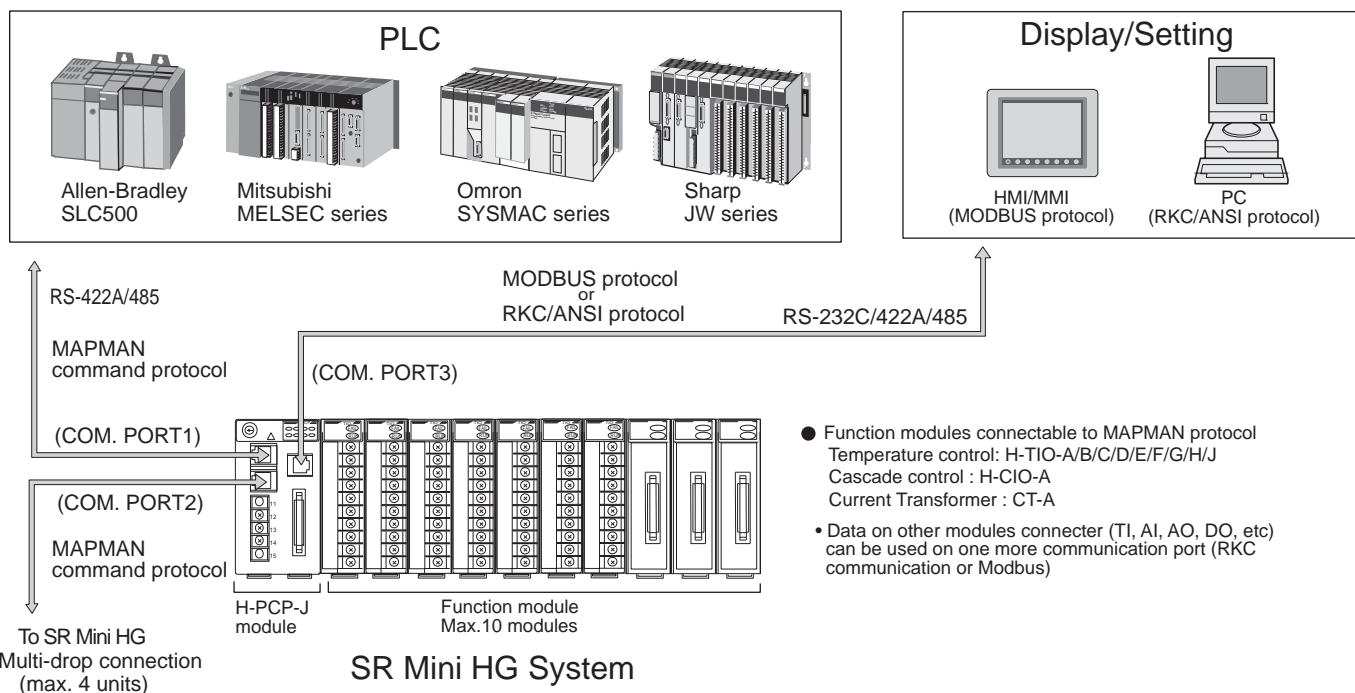
Communication speed at all ports has been increased to 38.4K from 19.2Kbps.

Comparison of Programming

Connection Method	Ladder communication	Field network	Programless (MAPMAN protocol)
Connection example			
PLC/Temp. controllers Comm. software	Required	Pareitically necessary (When instrument is started)	Not required
PLC/Temp.controllers Temp. control S/W	Required	Required	Not required (R/W possible by flag handling)

FAREX SR Mini HG SYSTEM H-PCP-J Module

Typical Configuration



Specifications

Basic Functions

Data supervision

Operating and system data

Control unit diagnosis

Function modules configuration check

Self-diagnostic

Check item : ROM/RAM check, Watchdog timer, Power supply monitoring
 • If error occurs in self-diagnosis, the hardware will automatically return the module outputs to the OFF position.

Memory backup

RAM is backed up by a lithium battery.
 Data retaining period : Approx. 10 years
 (depends on storage and operating conditions.)

Power Supply

Supply Voltage

- 90 to 132V AC (Including supply voltage variation)
 [Rating : 100 to 120V AC] (50/60Hz common use)
- 180 to 264V AC (Including supply voltage variation)
 [Rating : 200 to 240V AC] (50/60Hz common use)
- 21.6 to 26.4V DC (Ripple rate 10% p-p or less)
 [Rating : 24V DC]

Power Consumption

- 100 to 120V AC type : Less than 40VA
- 200 to 240V AC type : Less than 50VA
- 24V DC type : Less than 21W, 1A

Output voltage/current

5V DC, 1.7A max.
 12V DC, 1.0A max.

Over current protection

Fold-back limiting method : 5V

Digital Output

Number of output

8 points

Output type

Temperature alarm (Alarm 1, Alarm 2), Heater break alarm, Burnout Temperature input (TI) alarm, Analog input (AI) alarm, Control loop break alarm (LBAA), Temperature rise completion, FAIL, PLC communication status, Unused, (Selectable)

Output method

Open collector output, Sink type
 8 points/common, DC12/24V
 Max. load current : 0.1A/points, 0.8A/common

Communications

Communication Method

RS-422A (4-wire), RS-485 (2-wire), RS-232C (3-wire, Only COM.PORT3)
 (Specify when ordering)

Communication Protocol

- ANSI X3.28 subcategory 2.5B1
- MODBUS
- PLC special protocol

Communication Speed : 9600, 19200, 38400 BPS

Synchronous method : Start/stop synchronous type

Bit Format

- Start bit : 1
- Data bit : 7 or 8
- Parity bit : Without, Odd or Even
- Stop bit : 1 or 2

General Specifications

Insulation Resistance

More than 20MΩ (500V DC) between power terminals and ground
 More than 20MΩ (500V DC) between output terminals and ground

Dielectric Strength

1500V AC for one minute between power terminals and ground
 1500V AC for one minute between output terminals and ground

Operating Environments : 0 to 50°C [32 to 122°F] , 45 to 85%

Net Weight : Approx. 300g

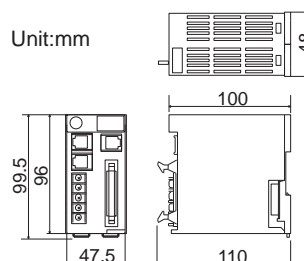
Compliance with Standards

- CE Mark
- UL/cUL Recognized



External Dimensions

Unit:mm



FAREX SR Mini HG SYSTEM H-PCP-J Module

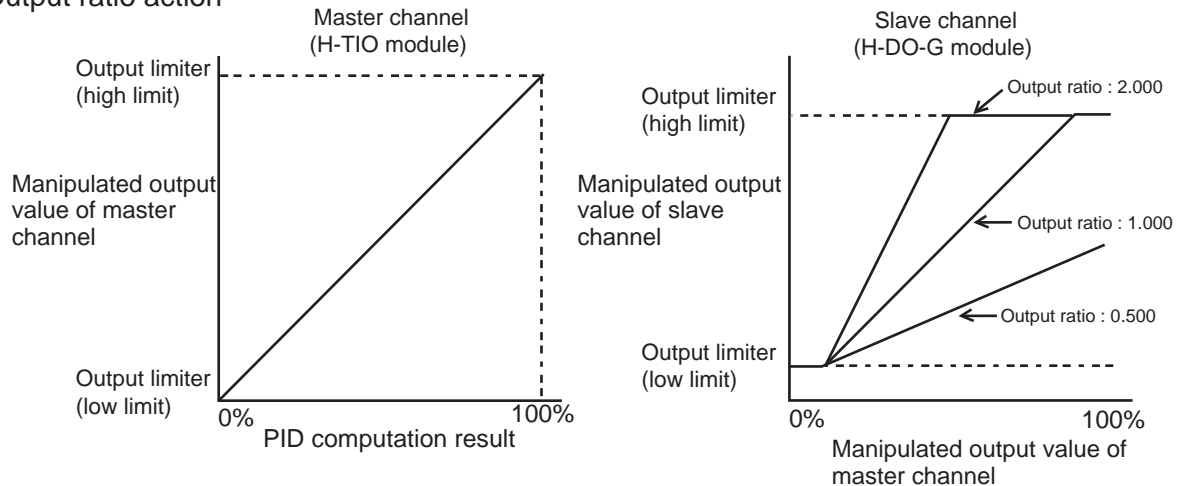


Digital Output Module with Output Ratio (H-DO-G-D)

Output ratio function multiplies value (gradient) set with output ratio in manipulated output value of master channel (Temperature control module H-TIO-[]), and it is function to output the consequence as manipulated output value from slave channel (Digital output module H-DO-G).

Other than H-PCP-J module, H-TIO-[] module and H-DO-G module are requirement to do output ratio function.

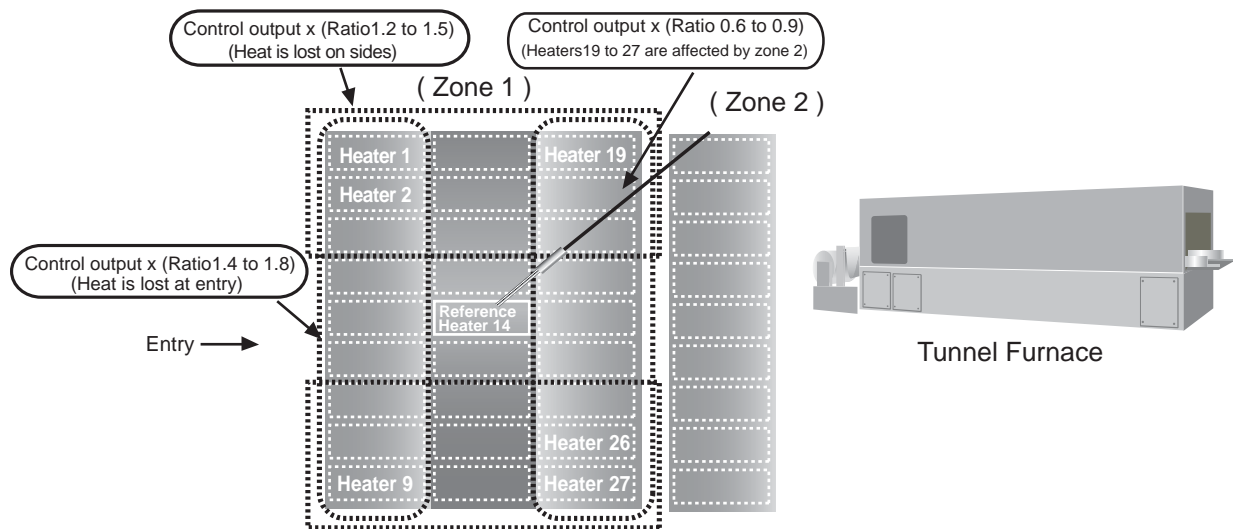
● Output ratio action



● Application

To obtain uniform temperature with a single sensor, temperature distribution of heaters is analyzed and the control output at a reference point is multiplied by ratio which is then sent to each heater for temperature control.

This type of output ratio distribution was formerly available with a thyristor unit, but now it can be achieved with an SSR and a magnetic contactor, and a compact and low cost multi-zone temperature control system can be built up.



● Output Specifications

Number of output

16 points

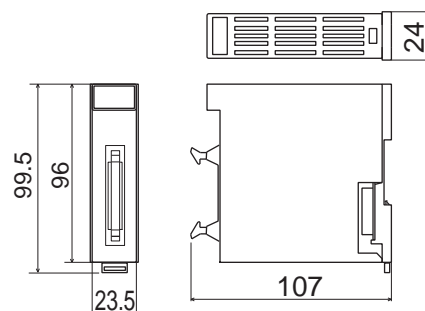
Output method

Open collector output, Sink type, 12 to 24V DC
Max. load current : 50mA, 1common, 400mA

Output type

Control output of master channel (TIO module)
Output limiter
Output ratio
Control output cycle : 1 to 100sec

● External Dimensions Unit:mm

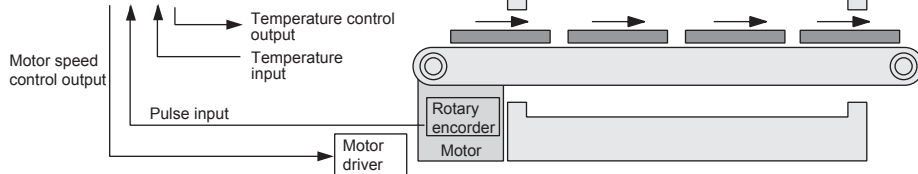
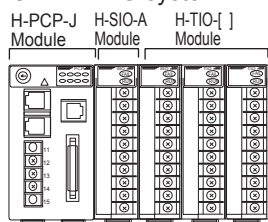


FAREX SR Mini HG SYSTEM H-PCP-J Module

Speed Control Module (H-SIO-A)

Speed control function inputs pulse from rotary encoder, and motor speed is controlled. Other than H-PCP-J module, H-SIO-A module are requirement to do speed control functions.

SR Mini HG system



Specifications

Input

Number of input : 1 point

Input type

- Voltage pulse input
 - High level voltage : 7 to 15V DC
 - Low level voltage : 0 to 2V DC
 - Rise/fall time : Less than 5µsec
- Dry contact

Power supply for sensor

12V DC ±10%, Less than 70mA

Input response frequency : 2Hz to 50kHz

Measuring method

Periodic computation method and Pulse count method (Selectable)

Divide ratio : 1 to 1000 (Effective only for periodic computation method)

Gate time : 0.1 to 4.0sec (Effective only for pulse count method)

Digital Filter

First order lag digital filter : 0.1 to 100.0 sec (No filter when 0.0 is set)

Action at input break : Indicates display scale low value

Display scale range

-1999 to +10000

However, scaling is possible within a span of 10000 maximum.

Decimal point position can be varied down to 3 digit.

Control

Control Method

- Open loop control
- Close loop control (Brilliant PID control with autotuning)
 - Available PI control (Selectable)

Setting Range

- Set value : Same as display scale range
- Proportional band : 0.1 to 1000.0% of span (Zero is not settable)
- Integral time : 1 to 3600 sec. (Zero is not settable)
- Derivative time : 0 to 3600 sec. (PI action when D=0)
- Control response : Slow, Medium, Fast

Control Output

- Voltage output : 0 to 1V DC, 0 to 5V DC, 0 to 10V DC
1 to 5V DC
- Current output : (Load resistance : More than 1kΩ)
0 to 20mA DC, 4 to 20mA DC
(Load resistance : Less than 500Ω)

Output Scale Range

-9999 to 10000 (However, scaling is possible within a span of 10000 maximum. Decimal point position is common with display scale.)

Alarms

Number of alarms : 2 points

Type

Process High, Process Low, Deviation High, Deviation Low, Deviation High/Low, Band, Set value High, Set value Low

Alarm hold cancel time : 1 to 255 sec

Number of alarm output : 1 point

Alarm output type

Relay output, Form A contact 250V AC, 24V DC 2A (resistive load)

Contact Input

Number of Inputs : 2 points

Type

- Control ON/OFF : OPEN : Open loop control,
CLOSE : Close loop control
- RUN/STOP : OPEN : STOP
CLOSE : RUN

Input Rating

Non-voltage contact input, Photocoupler isolation (Pulse input type is not isolated)

- OPEN : 500kΩ or more
- CLOSE : 10Ω or less
- Allowable contact resistance : 100Ω or less

General Specifications

Self-Diagnostic Function

RAM check, adjustment data check and watchdog timer
Operation at error : FAIL Lamp lights, Control output is OFF.

Operating Environments : 0 to 50°C [32 to 122°F] , 45 to 85%

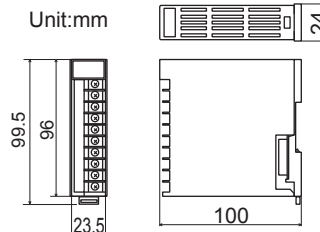
Net Weight : Approx. 300g

Compliance with Standards

- CE Mark
- UL/cUL Recognized



External Dimensions



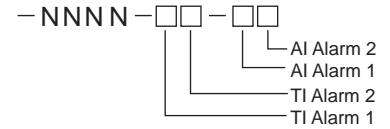
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Model and Suffix Code

Power supply/CPU module within MAPMAN Function (H-PCP-J)

Specifications	Model and Suffix Code	
Model	H-PCP	- J - □ □ □ - D * □ □ □
Type	Within MAPMAN Function	J
Power supply	100 to 120V AC 200 to 240V AC 24V DC	1 2 3
COM.PORT 1,2 Communication	RS-422A RS-485	4 5
COM.PORT 3 Communication	RS-232C RS-422A RS-485	1 4 5
Digital output	Open collector output	D
Alarm 1	See Alarm Code Table	□
Alarm 2	See Alarm Code Table	□

Initial Code Table



TI, AI Alarm Code Table

N : No alarm
 H : Process High
 J : Process Low
 K : Process High (with alarm hold)
 L : Process Low (with alarm hold)

* An analog input module (H-AI) and a temperature input module (H-TI) can be connected to a H-PCP-J module, but MapMan protocol does not support these module.

Alarm Code Table

A	Deviation High	B	Deviation Low	C	Deviation High/Low	D	Deviation band
E	Deviation High (with alarm hold)	F	Deviation Low (with alarm hold)	G	Deviation High/Low (with alarm hold)	H	Process High
J	Process Low	K	Process High (with alarm hold)	L	Process Low (with alarm hold)	Q	Deviation High (with alarm Re-hold)
R	Deviation Low (with alarm re-hold)	T	Deviation High/Low (with alarm re-hold)	N	No alarm		

DO module within output ratio

Model H-DO-G-D

Safety Standards:

When specifying models with CE Mark, CSA Certification and UL recognition add "/CE" to the model code.

Speed control module

Specifications	Model and Suffix Code	
Model	H-SIO	- A - F □ □ - □ * □ □
Type	1 channel type	A
Control method	PID control with AT	F
Input (Pulse input)	Dry contact input (Power supply for sensor, 12V DC) Voltage input (Power supply for sensor, 12V DC)	Z01 Z02
Control output	0 to 1V DC 0 to 5V DC 0 to 10V DC 1 to 5V DC 0 to 20mA DC 4 to 20mA DC	3 4 5 6 7 8
Alarm output	No alarm output Alarm 1 output Alarm 2 output	N 1 2