

CPU & Power Module for Zone 1 / Div. 1

Series 9440/22, 9490



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10065E00

- > Intrinsically safe fieldbus and ServiceBus acc. RS 485-IS (PNO-Standard)
- > Integrated Ex i power supply for up to 8 I/O modules
- > Profibus DP V0 and V1 HART; Modbus RTU
- > System redundancy (Profibus standard) and media redundancy
- > DTM and ServiceBus interface for fault diagnostics and Asset Management System
- > LCD for local display of diagnostic data, input and output values
- > Module can be replaced in Zone 1 / Div. 1 in operation (hot swap)

A4



The CPU & Power Module (CPM) contains the power supply unit for intrinsically safe supply of power to the I/O modules and field circuits.

The CPM has the function of a gateway between the internal bus in an IS1 field station and the Ex i fieldbus that connects the field station to the automation system.

System redundancy is supported for Profibus conformable masters and also other masters (so called flying masters). As an alternative media redundancy can be used.

The interface of the CPU & Power Module with the internal data bus and the I/O modules is designed with redundancy.

The CPM can be separated from the socket during operation (hot swap) even in Zone 1 / Division 1 installations. The auxiliary power connection is made via Ex e terminals or a pre-wired sealed cable in rigid conduit.



	ATEX / IECEx						NEC 505						NEC 506						NEC 500					
	0	1	2	20	21	22	Class I						Class II						Class III					
Zone	0	1	2	20	21	22	Zone	0	1	2	20	21	22	Division	1	2	1	2	1	2				
Ex interface		x	x		x	x	Ex interface		x	x		x	x	Ex interface	x	x	x	x	x	x	x			
Installation in		x	x		x ^{*)}	x ^{*)}	Installation in		x	x		x ^{*)}	x ^{*)}	Installation in	x	x	x	x ^{*)}	x ^{*)}	x ^{*)}				

^{*)} Restrictions see table explosion protection

WebCode 9440A

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Selection Table

Version	Installation in	Fieldbus	Power supply	Order number	Weight kg
CPU & Power Modules (without sockets)	Zone 1 / Division 1	Profibus DP V0	24 V DC	9440/22-01-11**)	2.963
			120 / 230 V AC	9440/22-01-21**)	2.963
		Profibus DP V1 HART	24 V DC	9440/22-01-11-C1243	2.963
		Profibus DP V0	120 / 230 V AC	9440/22-01-21-C1243	2.963
		Profibus DP V1 HART + PNO-redundancy	24 V DC	9440/22-01-11-C1455	2.963
		Modbus RTU	120 / 230 V AC	9440/22-01-21-C1455	2.963
			24 V DC	9440/22-01-11-C1202	2.963
Sockets for CPU & power module	Zone 1, connection by means of Ex e terminals		24 V DC,	9490/11-12	0.482
			120 / 230 V AC		
	Division 1, connection via conduit ^{*)}		24 V DC,	9490/12-12	0.900
			120 / 230 V AC		
Zone 1, connection via pig tail		24 V DC,	9490/13-12	0.900	
		120 / 230 V AC			

^{*)} For orders inside the USA, please use
9490/12-12-dc for DC, pre-wired
9490/12-12-ac for AC, pre-wired
plus conduit hub 9491/00-13-70 as accessory

****)** not recommended for new installations!

Explosion Protection

Global (IECEX)

Gas

KEM 08.0038X

9440/22-01-.1: Ex d [ia] [ib] IIC T4 Gb

9490/11-12: Ex d e [ia] [ib] IIC T4 Gb

9490/13-12: Ex d mb [ia] [ib] IIC T4 Gb

Europe (ATEX)

Gas

KEMA 02 ATEX 1333 X

9440/22-01-.1: II 2 G Ex d [ia] [ib] IIC T4 Gb

9490/11-12: II 2 G Ex d e [ia] [ib] IIC T4 Gb

9490/13-12: II 2 G Ex d mb [ia] [ib] IIC T4 Gb

Certifications and certificates

Certificates

IECEX, ATEX, Brazil (INMETRO), India (PESO), Canada (CSA), Kazakhstan (GOST-K), Russia (GOST-R), Serbia (SRPS), Belarus (operating licence), USA (FM)

Ship approval

ABS, BV, ClassNK, DNV, GL, LR

Safety data

Max. output voltage

U_{out} = 26.2 V to supply the I/O modules

Connection to intrinsically safe RS 485-IS fieldbus

Global (IECEX): PTB 11.0027, Ex ib IIC T4

Europe (ATEX): PTB 04 ATEX 2089, II 2 G Ex ib IIC T4

Maximum values for fieldbus and ServiceBus (RS485-IS)

Max. voltage U_o

3.7 V

Max. voltage U_i

+/- 4.2 V

Max. current I_o

134 mA

Max. power P_o

124 mW

Max. capacitance C_o for IIC

1000 µF

Max. inductance L_o for IIC

1.9 mH

Further parameters

Further information

see respective certificate and operating instructions

Technical Data

Electrical data

Types	9440/22-01-11 (24 V DC)	9440/22-01-21 (90 ... 253 V AC)
Auxiliary power		
Nominal voltage	24 V DC	120 V / 230 V AC
Voltage range	20 ... 35 V DC	90 ... 253 V AC
Mains frequency	--	50 / 60 Hz
Frequency range	--	45 ... 66 Hz
Current consumption		
without I/O modules	approx. 0.21 A at 24 V DC	approx. 25 mA at 230 V AC, approx. 48 mA at 120 V AC
with 8 I/O modules	approx. 2.5 A at 24 V DC	approx. 0.4 A at 230 V AC, approx. 0.8 A at 120 V AC
Power dissipation		
without I/O modules	5 W	8.4 W
per I/O module	approx. 1.4 W	approx. 1 W
Polarity reversal protection	yes	not applicable
Undervoltage monitoring	yes	yes
Interfaces for fieldbus, redundant fieldbus and ServiceBus		
Interface	RS 485-IS acc. to Profibus specification	
Cable length / Transfer rate		
Copper cable	1200 m with 9.6 ... 93.75 kbit/s 1000 m with 187.5 kbit/s 400 m with 500 kbit/s 200 m with 1.5 Mbit/s	
Fibre optic cable	approx. 2000 m with 1.5 Mbit/s	
ServiceBus	1200 m with 9.6 kbit/s	
Note	For further information see operating instructions.	
Line termination	powered resistor (termination resistor is installed in the Sub-D plug, see accessories)	
Address range	0 ... 127	
Redundancy	Full redundancy and line redundancy	
Profibus		
Versions	DP V0, DP V1, DP V1 HART	
Transfer rate	9.6 kbit/s ... 1.5 Mbit/s	
Data transmission	approx. 40 16-bit words / ms (cyclic, net at 1.5 Mbit/s)	
Modbus RTU		
Transfer rate	9.6 ... 38.4 kbit/s	
Data transmission	approx. 1000 16-bit-registers / s (at 38.4 kbit/s)	
Functions	Read, Write; see Modbus RTU coupling instructions	
Characteristic values		
Max. internal signal delay for 8 I/O modules (without I/O module delay)		
for Digital Modules	7 ms	
for Analog Modules	10 ms	
Operator interface		
Software	IS1 devices DTM or IS Wizard	
Operation	LED green "RUN"	
Fault	LED red "ERR"	
LCD indication	2 x 16 characters	
Settings	bus address	
Indications	Bus addresses, alarms / faults, information (type, revision, etc.) for the levels: field station, modules and signals, values of the inputs and outputs	

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Technical Data

Electrical data

Diagnostic and parameterisation Functions

- Load or read back configuration data and parameters in the IS1 field stations
- Read inputs
- Read and write outputs
- Transfer diagnosis data (e.g. config-errors, hardware-errors, signal-errors)
- Transfer HART commands to/from HART field devices.

Connectable software packages

- IS Wizard (via R. STAHL ServiceBus)
- R. STAHL DTM
- AMS by Emerson Process Management
- PDM by Siemens
- PRM and Fieldmate by Yokogawa
- FieldCare by Endress + Hauser
- FDM by Honeywell
- etc.

Power supply for the I/O modules via the BusRail

Voltage range

22.5 ... 26.2 V DC

Max. current

2 A

Max. number I/O modules

8

Redundant supply of the I/O modules

yes (decoupled with diodes)

Undervoltage monitoring

yes

Galvanic separation

between power supply and system components

1500 V AC

between Fieldbus/ServiceBus interface and system components

500 V AC

between two bus interfaces

500 V AC

Ambient conditions

Ambient temperature

-20 ... +65 °C

Storage temperature

-40 ... +70 °C

Maximum relative humidity

95 % (no condensation)

Sinusoidal vibration (IEC EN 60068-2-6)

1 g in frequency range between 10 ... 500 Hz
2 g in frequency range 45 ... 100 Hz

Semi-sinusoidal shock (IEC EN 60068-2-27)

15 g (3 shocks per axis and direction)

Electromagnetic compatibility

Tested according to the following standards and regulations:
EN 61326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21

Mechanical data

Connection

Fieldbus RS 485

Sub-D socket 9-pin

ServiceBus RS 485

Sub-D socket 9-pin

Power supply

Socket 9492/11-12

Ex e terminals 4.0 mm²

Socket 9492/13-12

pig tail, 5 m, 1 mm² per conductor

Socket 9492/12-12

Conduit

Module enclosure

Polyamide 6GF

Fire resistance (UL 94)

HB

Degree of protection (IEC 60529)

Modules

IP30

Connections

IP20

Mounting / installation

Installation conditions

on 35 mm DIN rail NS 35/15

Mounting type

horizontal and vertical








Mounting orientation

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Accessories and spare parts

Designation	Figure	Description	Order number
SUB-D socket	 09868E00	9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/22 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For RS 485 IS to PNOstandard.	162693
Optical fieldbus-isolating repeater, Zone 1 / Div. 1	 11131E00	<ul style="list-style-type: none"> • Isolating repeater for installation in Zone 1 and Zone 2 / Class I Division 2 and Class I Zone 1 • For fieldbus via fibre optic intrinsically safe cables „ex op is“ into Zone 1 / Class I, II, III Division 1 and Class I, II, III Zone 0 • Redundant construction possible using optical ring • Extensive diagnostic function and fault-contact • Suitable for Profibus DP up to 1.5 MBit/s • Further versions and information see data sheet of Series 9186 optical fieldbus-isolating repeater 	9186 / 12-11-11
Optical fieldbus-isolating repeater, Zone 2 / Div. 2	 11550E00	<ul style="list-style-type: none"> • Isolating repeater for installation in Zone 2 / Div. 2 • For fieldbus via fibre optic intrinsically safe cables „ex op is“ into Zone 1 / Div. 1 • Optical ring possible • Extensive diagnostic function and fault-contact • Suitable for Profibus DP up to 1.5 MBit/s • Further versions and information see data sheet of Series 9186 optical fieldbus-isolating repeater 	9186 / 15-12-11
	 11550E00	<ul style="list-style-type: none"> • Isolating repeater for installation in Zone 2 / Div. 2 • For fieldbus via fibre optic intrinsically safe cables „ex op is“ into Zone 1 / Div. 1 • Point-to-point or line structure • Extensive diagnostic function and fault-contact • Suitable for Profibus DP up to 1.5 MBit/s • Further versions and information see data sheet of Series 9186 optical fieldbus-isolating repeater 	9186 / 25-12-11
Fieldbus-isolating repeater, up to 1.5 MBit/s, for application in safe areas (non-Ex) or Zone 2 / Div. 2	 09867E00	<ul style="list-style-type: none"> • Equipment for installation in safe areas or Zone 2 / Div. 2 • For fieldbusses with RS 485 interface - Zone 1 / Class I, II, III Division 1 and Class I, II, III Zone 1 • Suitable for Profibus DP, Modbus, R. STAHL ServiceBus • Interface to automation system RS 232, RS 422, RS 485 • Automatic setting of transfer rate for Profibus DP • Adjustable transfer rate (1.2 kBit/s to 1.5 MBit/s) • Power supply 24 V AC/DC • Further information see data sheet Series 9185/11 	9185 / 11-35-10s
Device DTM IS1+ for PROFIBUS DP	 12564E00	<ul style="list-style-type: none"> • Parameterization and configuration of the IS1+ system • Communicating with HART-compatible field devices via Profibus DP V1 • Supports all common FDT frame applications (e.g. FieldCare, PactWare™) • Condition Monitoring • Scan function for automatic topology generation 	on request
IS1 PCS7 APL field device library	 15667E00	<p>Easy connection of IS1+ modules to the SIEMENS control system PCS7 via PROFIBUS DP. The library contains CFC driver modules created in conformance with PCS7 modules, and documentation in English. HOTLINE support inclusive. Order, processing and support are carried out directly via SIEMENS: function.blocks.industry@siemens.com</p> <p>Hardware/software requirements: SIEMENS PCS7 V7.1 to 8.0 SP1 and IS1+ CPM 9440/...C1455 from V03.45 and GSD from V03.05</p>	9AE4110-1AA20 (SIEMENS)

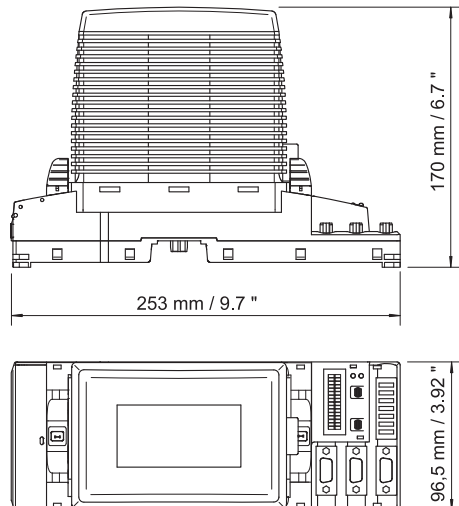
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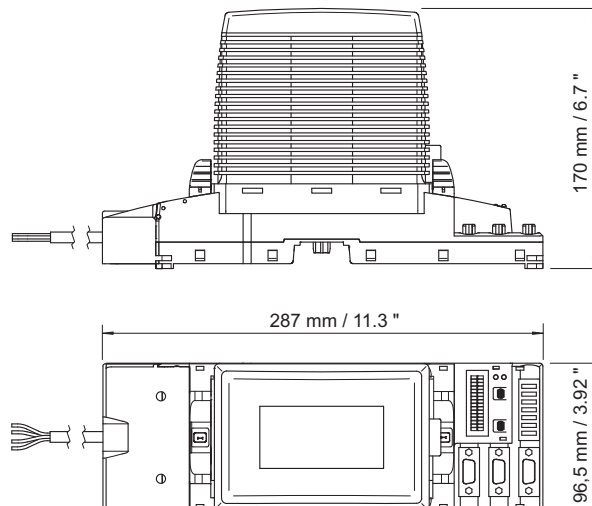


Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alterations



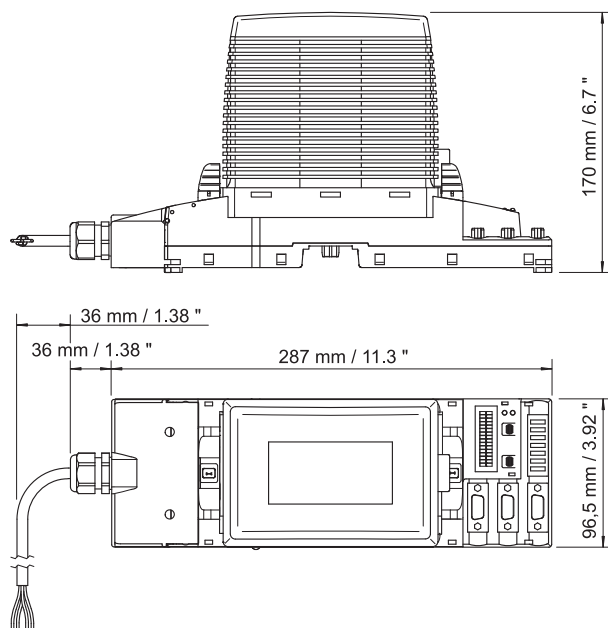
CPU & Power Module for Zone 1
with connection by means of Ex e terminals

09877E00



CPU & Power Module for Division 1
with connection by means of a conduit

07762E00



CPU & Power Module for Zone 1
with connection by means of a pig tail

07760E00

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