

NA-9122 Specification

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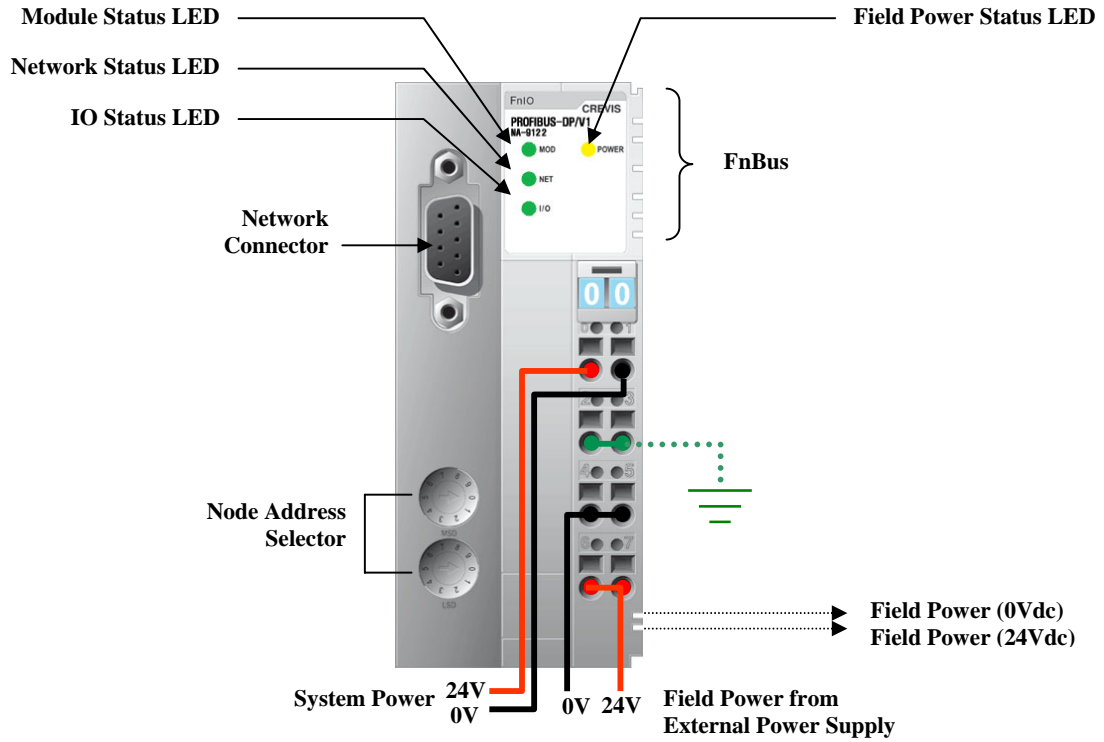
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1. GENERAL DESCRIPTION

1.1. Specification

Items	PROFIBUS Adapter Module
Communication Interface Specifications	
Redundancy	Not supported
Repeater Control Signal	RS-485 Signal
Freeze mode	Support
Sync mode	Support
Auto baudrate	Support
Fail safe mode	Support
Station type	Slave
FMS support	Not supported
Number of Nodes	100 Node/Max (Rotary switch# 0~99).
Number of Expansion I/O slots	Max. 32 slots
I/O Data Size	Total: Input 128bytes / Output 128bytes . Max. Discrete I/O: Input 1024points/Output 1024points . Max. Analog I/O: Input 64channels/Output 64channels
Indicators	1 green/red Module Status Indicator 1 green Network Status Indicator 1 green/red Expansion Module Status indicator 1 green Field Power Status indicator
Communication Rate	9.6K~12M(1.2Km~100m)
Communication Speed	9.6 to 12000 Kbps (Auto baudrate selection)
Module Location	Starter module - left side of FnIO system
Field Power detection	Detect Field Power @11Vdc
General Specification	
System Power	Supply voltage : 24Vdc nominal Voltage range : 11~28.8Vdc, Protection : Output Current Limit (Min. 1.5A) Reverse Polarity protection
Power dissipation	60mA typical @24Vdc
Current for I/O module	1.5A @ 5Vdc maximum
Isolation	System power : Non- isolation System to Logic : Isolation
Field Power	Supply voltage : 24Vdc nominal Voltage range : 11~28.8Vdc
Current in jumper contacts	DC 10A maximum
Weight	150g
Module Size	42mm x 99mm x 70mm
Environment Condition	Refer to '2. Environment Specification'

1.2. Shape



1.3. Status Indicator LED

1.3.1. Module Status LED

State	LED is:	To indicate:
No Power	Off	No power is supplied to the unit.
Device Operational	Green	The unit is operating in normal condition.
Device in Standby	Flashing Green	The device needs commissioning due to configuration missing, incomplete or incorrect..
Minor Fault	Flashing Red	Recoverable Fault
Unrecoverable Fault	Red	The device has an unrecoverable fault.

1.3.2. Network Status LED

State	LED is :	To indicate :
Not Powered Not On-line	Off	Device is not on-line or may not be powered
On-line, Not connected	Flashing Green	Device is on-line but has no connections in the established state. - Not allocated to a master
On-line, Connected	Green	Device is on-line and allocated to a master
Connection Time-out	Flashing Red	One or more I/O connections are in the time-out state.
Critical Communication Failure	Red	Failed communication

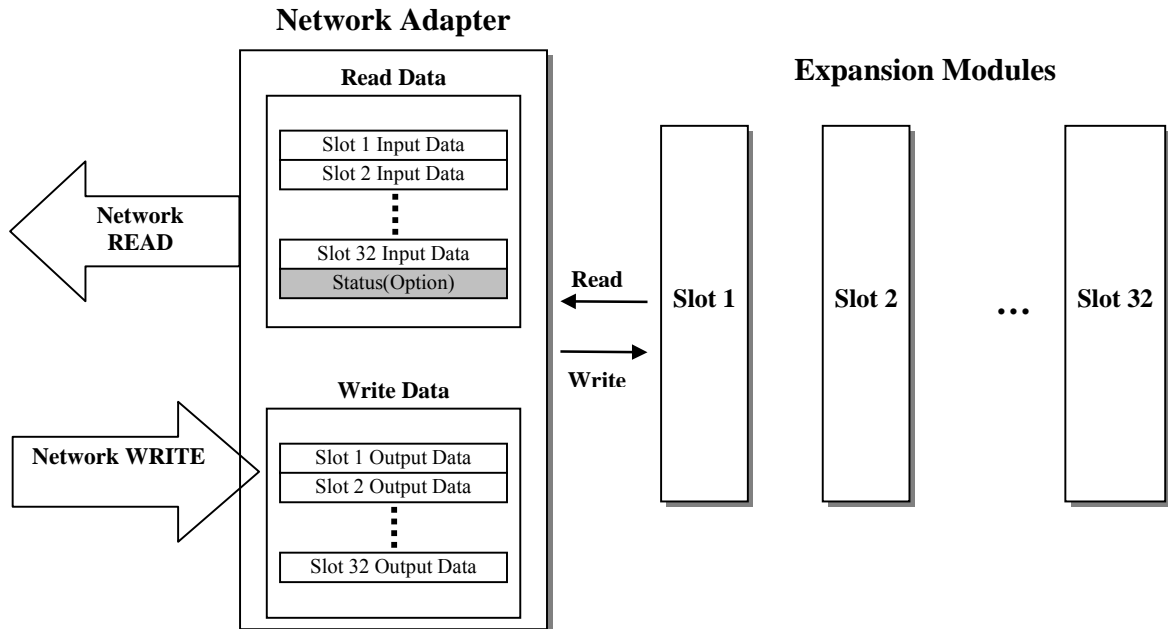
1.3.3. Expansion Module Status LED

State	LED is :	To indicate :
Not Powered No Expansion Module	Off	Device has no expansion module or may not be powered
Fn-Bus On-line, Do not Exchanging I/O	Flashing Green	Fn-Bus is on-line but does not exchanging I/O data (Passed the expansion module configuration).
Fn-Bus Connection, Run Exchanging IO	Green	Exchanging I/O data
FnBus connection fault during exchanging IO	Flashing Red	One or more expansion module occurred in fault state. - changed expansion module configuration. - Fn-Bus communication failure.
Expansion Configuration Failed	Red	Failed to initialize expansion module - detected invalid expansion module ID. - overflowed Input/Output Size - too many expansion module - initial protocol failure

1.3.4. Field Power Status LED

State	LED is :	To indicate :
Not Supplied Field Power	Off	Not supplied 24V dc field power
Supplied Field Power	Green	Supplied 24V dc field power

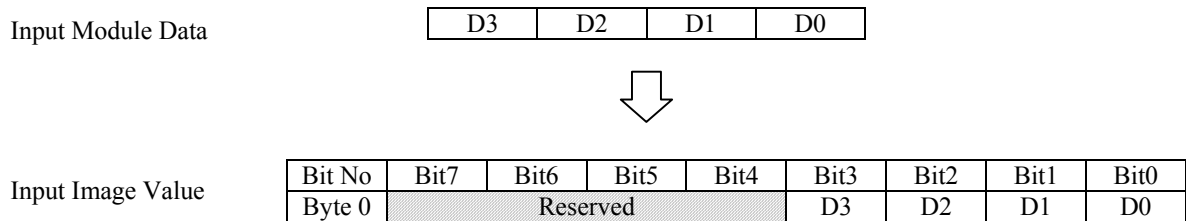
2. I/O PROCESS IMAGE MAP



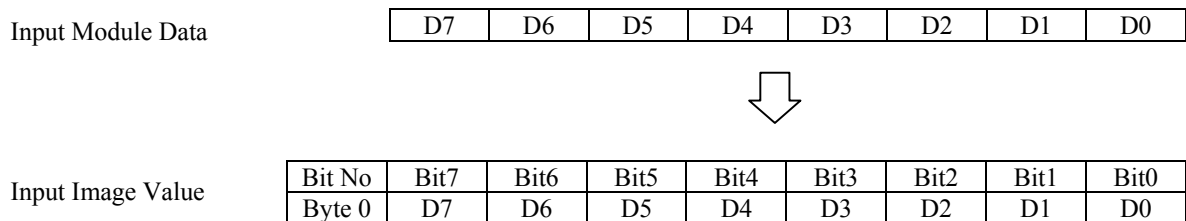
2.1. Mapping Data into the Image Table

2.1.1. Discrete Input Module

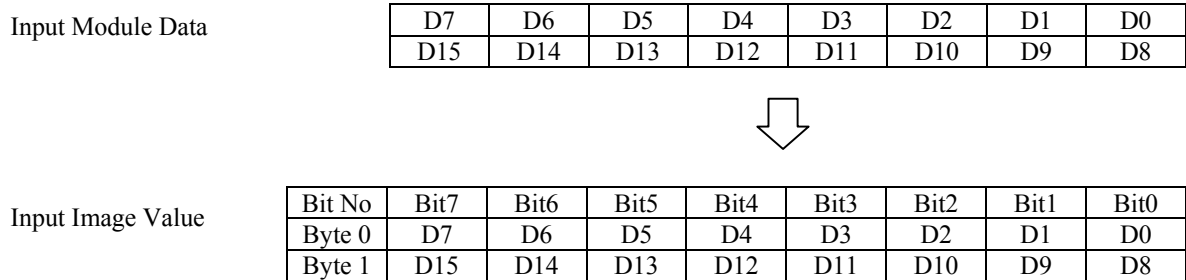
■ 4 Point Input Module(ST-1214, ST-1224, ST-1314, ST-1324, ST-1804, ST-1904)



■ 8 Point Input Module(ST-1218, ST-1228)

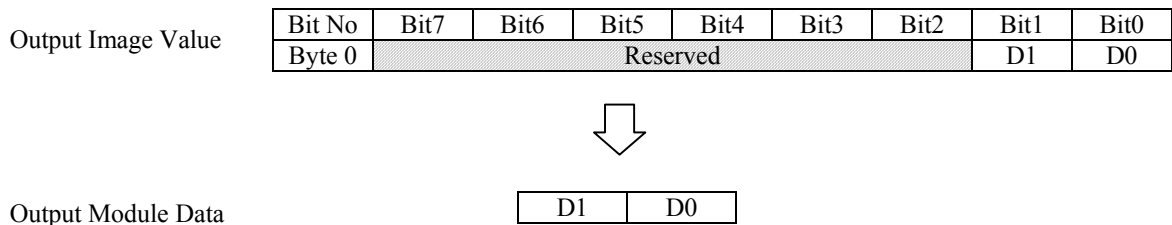


■ **16 Point Input Module(ST-121F, ST-122F)**

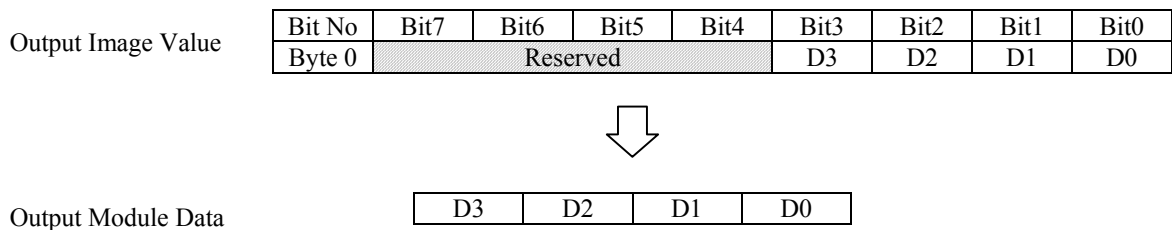


2.1.2. Discrete Output Module

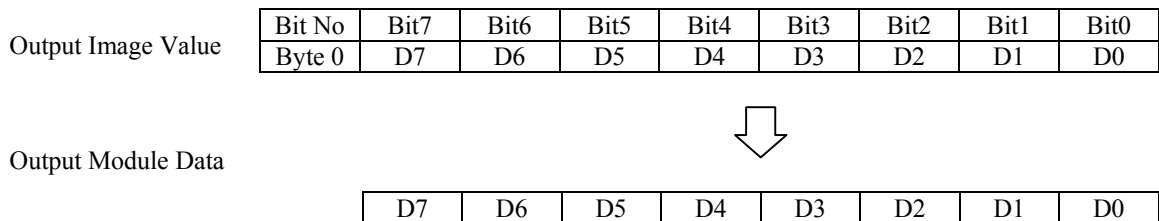
■ **2 Point Output Module(ST-2742, ST-2852)**



■ **4 Point Output Module(ST-2314, ST-2324)**



■ **8 Point Output Module(ST-2318, ST-2328)**



■ **16 Point Output Module(ST-221F, ST-222F)**

Output Image Value	Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
	Byte 0	D7	D6	D5	D4	D3	D2	D1	D0
	Byte 1	D15	D14	D13	D12	D11	D10	D9	D8



Output Module Data	D7	D6	D5	D4	D3	D2	D1	D0
	D15	D14	D13	D12	D11	D10	D9	D8

■ **4 Point Output Module/Diagnostic(ST-2414, ST-2424, ST-2514, ST-2524)**

Output Image Value	Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
	Byte 0	Reserved				D3	D2	D1	D0



Output Module Data	D3	D2	D1	D0
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Output Diagnostic Status

Input Image Value	Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
	Byte 0	Reserved				S3	S2	S1	S0

2.1.3. Analog Input Module

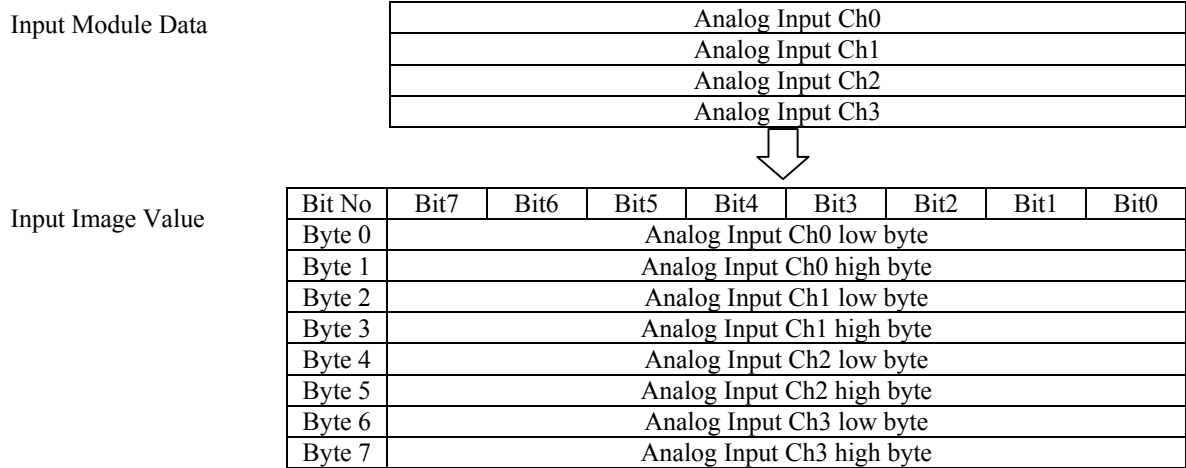
■ **2 Channel Analog Input Module(ST-3702, ST-3802)**

Input Module Data	Analog Input Ch0							
	Analog Input Ch1							



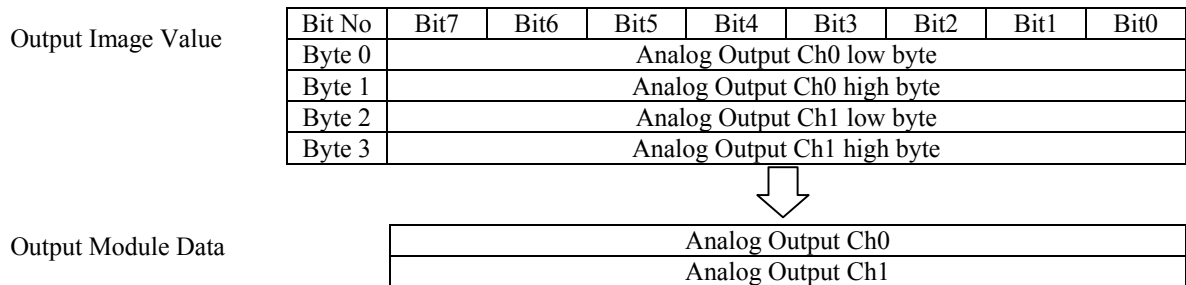
Input Image Value	Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
	Byte 0	Analog Input Ch0 low byte							
	Byte 1	Analog Input Ch0 high byte							
	Byte 2	Analog Input Ch1 low byte							
	Byte 3	Analog Input Ch1 high byte							

■ 4 Channel Analog Input Module(ST-3114, ST-3134, ST-3214, ST-3234, ST-3424, ST-3444, ST-3524, ST-3544)



2.1.4. Analog Output Module

■ 2 Channel Analog Output Module(ST-4112, ST-4212, ST-4422, ST-4522)



2.2. Example of Input Process Image Map

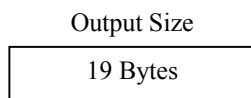
2.2.1. Example of Output Process Image Map

■ Module Configuration

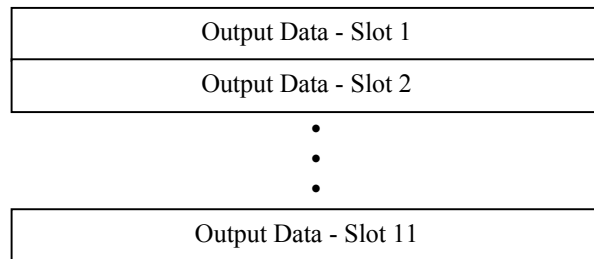


Slot Address	Module Description
0	Network Adapter
1	4-discrete output
2	8-discrete output
3	2-analog output
4	16-discrete output
5	4-discrete output
6	8-discrete output
7	2-realy output
8	2-realy output
9	2-analog output
10	16-discrete output
11	4-discrete output

Output Image



Module Image



■ Output Process Image Map

Byte	Slot #	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Write Byte 0	Slot 1	Not used				Discrete Output 4 points				
Write Byte 1	Slot 2	Discrete Output 8 points								
Write Byte 2	Slot 3	Analog Output Ch0 low byte								
Write Byte 3		Analog Output Ch0 high byte								
Write Byte 4		Analog Output Ch1 low byte								
Write Byte 5	Slot 4	Analog Output Ch1 high byte								
Write Byte 6		Discrete Output low 8 points								
Write Byte 7		Discrete Output high 8 points								
Write Byte 8	Slot 5	Not used				Discrete Output 4 points				
Write Byte 9	Slot 6	Discrete Input 8 points								
Write Byte 10	Slot 7	Not used							Discrete Output 2 pts	
Write Byte 11	Slot 8	Not used							Discrete Output 2 pts	
Write Byte 12	Slot 9	Analog Output Ch0 low byte								
Write Byte 13		Analog Output Ch0 high byte								
Write Byte 14		Analog Output Ch1 low byte								
Write Byte 15	Slot 10	Analog Output Ch1 high byte								
Write Byte 16		Discrete Output low 8 points								
Write Byte 17		Discrete Output high 8 points								
Write Byte 18	Slot 11	Reserved				Discrete Output 4 points				

3. PARAMETER

3.1. Discrete Input Module

ST-1214 (4-sinking input, 24Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-1224 (4-sourcing input, 24Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-1218 (8-sinking input, 24Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-1228 (8-sourcing input, 24Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-121F (16-sinking input, 24Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-122F (16-sourcing input, 24Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-1314 (4-sinking input, 48Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-1324 (4-sourcing input, 48Vdc)

- Parameter length: 0 bytes
- Parameter Data: none

ST-1804 (4-ac input, 110Vac)

- Parameter length: 0 bytes
- Parameter Data: none

ST-1904 (4-ac input, 220Vac)

- Parameter length: 0 bytes
- Parameter Data: none

3.1.1. Discrete Output Module

ST-2314 (4-sinking output, 24Vdc 0.5A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-03	Fault Action (ch0~ch3) 0: Fault Value 1: Hold last state	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-03	Fault Value (ch0~ch3) 0: off 1: on	0 (off)
		04-07	Reserved	0

ST-2324 (4-sourcing output, 24Vdc 0.5A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-03	Fault Action (ch0~ch3) 0: Fault Value 1: Hold last state	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-03	Fault Value (ch0~ch3) 0: off 1: on	0 (off)
		04-07	Reserved	0

ST-2318 (8-sinking output, 24Vdc 0.5A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-07	Fault Action (ch0~ch7) 0: Fault Value 1: Hold last state	0 (Fault Value)
1	R/W	00-07	Fault Value (ch0~ch7) 0: off 1: on	0 (off)

ST-2328 (8-sourcing output, 24Vdc 0.5A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-07	Fault Action (ch0~ch7) 0: Fault Value 1: Hold last state	0 (Fault Value)
1	R/W	00-07	Fault Value (ch0~ch7) 0: off 1: on	0 (off)

ST-221F (16-sinking output, 24Vdc 0.1A)

- Parameter length: 4 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-07	Fault Action (ch0~ch7) 0: Fault Value 1: Hold last state	0 (Fault Value)
1	R/W	00-07	Fault Action (ch8~ch15) 0: Fault Value 1: Hold last state	0 (Fault Value)
2	R/W	00-07	Fault Value (ch0~ch7) 0: off 1: on	0 (off)
3	R/W	00-07	Fault Value (ch8~ch15) 0: off 1: on	0 (off)

ST-222F (16-sourcing output, 24Vdc 0.1A)

- Parameter length: 4 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-07	Fault Action (ch0~ch7) 0: Fault Value 1: Hold last state	0 (Fault Value)
1	R/W	00-07	Fault Action (ch8~ch15) 0: Fault Value Hold last state	0 (Fault Value)
2	R/W	00-07	Fault Value (ch0~ch7) 0: off 1: on	0 (off)
3	R/W	00-07	Fault Value (ch8~ch15) 0: off 1: on	0 (off)

ST-2414 (4-sinking output, Diag, 24Vdc 0.5A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-03	Fault Action (ch0~ch3) 0: Fault Value 1: Hold last state	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-03	Fault Value (ch0~ch3) 0: off 1: on	0 (off)
		04-07	Reserved	0

ST-2424 (4-sourcing output, Diag, 24Vdc 0.5A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-03	Fault Action (ch0~ch3) 0: Fault Value 1: Hold last state	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-03	Fault Value (ch0~ch3) 0: off 1: on	0 (off)
		04-07	Reserved	0

ST-2514 (4-sinking output, Diag, 24Vdc 2A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-03	Fault Action (ch0~ch3) 0: Fault Value 1: Hold last state	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-03	Fault Value (ch0~ch3) 0: off 1: on	0 (off)
		04-07	Reserved	0

ST-2524 (4-sourcing output, Diag, 24Vdc 2A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-03	Fault Action (ch0~ch3) 0: Fault Value 1: Hold last state	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-03	Fault Value (ch0~ch3) 0: off 1: on	0 (off)
		04-07	Reserved	0

ST-2742 (2-relay output, 230Vac 2A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00, 01	Fault Action (ch0, ch1) 0: Fault Value 1: Hold last state	0 (Fault Value)
		02-07	Reserved	0
1	R/W	00, 01	Fault Value (ch0, ch1) 0: off 1: on	0 (off)
		02-07	Reserved	0

ST-2852 (2-triac output, 120Vac 0.5A)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00, 01	Fault Action (ch0, ch1) 0: Fault Value 1: Hold last state	0 (Fault Value)
		02-07	Reserved	0
1	R/W	00, 01	Fault Value (ch0, ch1) 0: off 1: on	0 (off)
		02-07	Reserved	0

3.1.2. Analog Input Module

ST-3702 (2-RTD input)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-07	The selection Sensor Type =00h:PT100, 0.00385, -200~850°C, 0.1°C/count =01h:PT200, 0.00385, -200~850°C, 0.1°C/count =02h:PT500, 0.00385, -200~850°C, 0.1°C/count =03h:PT1000, 0.00385, -200~350°C, 0.1°C/count =04h:PT50, 0.00385, -200~850°C, 0.1°C/count =10h:JPT100, 0.003916, -200~640°C, 0.1°C/count =11h:JPT200, 0.003916, -200~640°C, 0.1°C/count =12h:JPT500, 0.003916, -200~640°C, 0.1°C/count =13h:JPT1000, 0.003916, -200~350°C, 0.1°C/count =20h:NI100, 0.00618, -60~250°C, 0.1°C/count =21h:NI200, 0.00618, -60~250°C, 0.1°C/count =22h:NI500, 0.00618, -60~250°C, 0.1°C/count =23h:NI1000, 0.00618, -60~180°C, 0.1°C/count =30h:NI120, 0.00672, -80~250°C, 0.1°C/count =40h:CU10, 0.00427, -200~260°C, 0.1°C/count =80h:Resistance Input, 1~2000Ω, 100mΩ/1count =81h: Resistance Input, 1~327Ω, 10mΩ/1count =82h: Resistance Input, 1~620Ω, 20mΩ/1count =Others: Reserved	0: PT100
1	R/W	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	0: Celsius(°C)
		01-03	Reserved	0
		04	Filter Type 0: Normal Filter, 1: Enhanced Filter	0: Normal Filter
		05-07	Reserved	0

ST-3802 (2-thermocouple input)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-07	The selection Sensor Type =00h: Type K, 0.1°C/count =01h: Type J, 0.1°C/count =02h: Type T, 0.1°C/count =03h: Type B, 0.1°C/count =04h: Type R, 0.1°C/count =05h: Type S, 0.1°C/count =06h: Type E, 0.1°C/count =07h: Type N, 0.1°C/count =08h: Type L, 0.1°C/count =09h: Type U, 0.1°C/count =0Ah: Type C, 0.1°C/count =0Bh: Type D, 0.1°C/count =80h: 10uV Input, -78.0~78.0mV, 10uV/count =81h: 1uV Input, -32.7~32.7mV, 1uV/count =82h: 2uV Input, -65.5~65.5mV, 2uV/count =Others: Reserved	0: Type K
1	R/W	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	0: Celsius(°C)
		01	0: Cold Junction Compensation 1: Disable Compensation	0
		02, 03	Reserved	0
		04	Filter Type 0: Normal Filter, 1: Enhanced Filter	0: Normal Filter
		05-07	Reserved	0

ST-3114 (4-current analog input, 0~20mA, 12bit)

- Parameter length: 0 bytes
- Parameter Data: none

ST-3134 (4-current analog input, 0~20mA, 14bit)

- Parameter length: 0 bytes
- Parameter Data: none

ST-3214 (4-current analog input, 4~20mA, 12bit)

- Parameter length: 0 bytes
- Parameter Data: none

ST-3234 (4-current analog input, 4~20mA, 14bit)

- Parameter length: 0 bytes
- Parameter Data: none

ST-3424 (4-voltage analog input, 0~10V, 12bit)

- Parameter length: 0 bytes
- Parameter Data: none

ST-3444 (4-voltage analog input, 0~10V, 14bit)

- Parameter length: 0 bytes
- Parameter Data: none

ST-3524 (4-voltage analog input, -10~10V, 12bit)

- Parameter length: 0 bytes
- Parameter Data: none

ST-3544 (4-voltage analog input, -10~10V, 14bit)

- Parameter length: 0 bytes
- Parameter Data: none

3.1.3. Analog Output Module

ST-4112 (2-current analog output, 0~20mA, 12bit)

- Parameter length: 6 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-01	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		02-03	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-07	Reserved	0
2	R/W	00-07	Channel 0 Fault Value Low Byte	0
3	R/W	00-03	Channel 0 Fault Value High Byte	0
		04-07	Reserved	0
4	R/W	00-07	Channel 1 Fault Value Low Byte	0
5	R/W	00-03	Channel 1 Fault Value High Byte	0
		04-07	Reserved	0

ST-4212 (2-current analog output, 4~20mA, 12bit)

- Parameter length: 6 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-01	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		02-03	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-07	Reserved	0
2	R/W	00-07	Channel 0 Fault Value Low Byte	0
3	R/W	00-03	Channel 0 Fault Value High Byte	0
		04-07	Reserved	0
4	R/W	00-07	Channel 1 Fault Value Low Byte	0
5	R/W	00-03	Channel 1 Fault Value High Byte	0
		04-07	Reserved	0

ST-4422 (2-voltage analog output, 0~10Vdc, 12bit)

- Parameter length: 6 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-01	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		02-03	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-07	Reserved	0
2	R/W	00-07	Channel 0 Fault Value Low Byte	0
3	R/W	00-03	Channel 0 Fault Value High Byte	0
		04-07	Reserved	0
4	R/W	00-07	Channel 1 Fault Value Low Byte	0
5	R/W	00-03	Channel 1 Fault Value High Byte	0
		04-07	Reserved	0

ST-4522 (2-voltage analog output, -10~10Vdc, 12bit)

- Parameter length: 6 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description	Default Value
0	R/W	00-01	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		02-03	Fault Action for channel 0 00: Fault Value 01: Hold last state, 10: Low Limit 11:High Limit	0 (Fault Value)
		04-07	Reserved	0
1	R/W	00-07	Reserved	0
2	R/W	00-07	Channel 0 Fault Value Low Byte	0
3	R/W	00-03	Channel 0 Fault Value High Byte	0
		04-07	Reserved	0
4	R/W	00-07	Channel 1 Fault Value Low Byte	0
5	R/W	00-03	Channel 1 Fault Value High Byte	0
		04-07	Reserved	0

3.1.4. Special Module

ST-5101 and ST-5111 (1 Channel, High Speed Counter)

- Parameter length: 2 bytes
- Parameter Data:

Offset	Access	Decimal Bit	Description						
0	R/W	00-03	03	02	01	00	Counter Mode		
			0	0	0	0	Counter Disabled		
			0	0	0	1	1 Pulse Mode(A: Pulse, B: Direction)		
			0	0	1	0	2 Pulse Mode(A: Up Pulse, B: Down Pulse)		
			0	0	1	1	Encoder x1 (A: Aph, B: Bph)		
			0	1	0	0	Encoder x2 (A: Aph, B: Bph)		
			0	1	0	1	Encoder x4 (A: Aph, B: Bph)		
			0	1	1	0	Period/Rate Mode(Gate Function Disabled)		
			0	1	1	1	Reserved		
			1	0	0	0	PWM Output Mode(Gate Function Disabled)		
			1	0	0	1	reserved		
			others				Counter Disabled		
			04-07	07	06	05	04	Gate Function	
		0		0	0	0	Gate Function Disabled		
		0		0	0	1	Store/Continue		
		0		0	1	0	Store/Wait/Resume		
		0		0	1	1	Store-Reset/Wait/Start		
		0		1	0	0	Store-Reset/Start		
		others				reserved			
		1	R/W	00-03	03	02	01	00	Input Filter
					0	0	0	0	Bypass(about 1.5Mhz)
					0	0	0	1	1usec(500Khz ±30%)
					0	0	1	0	5usec(100Khz ±30%)
0	0				1	1	10usec(50Khz ±30%)		
0	1				0	0	50usec(10Khz ±30%)		
0	1				0	1	100usec(5Khz ±30%)		
0	1				1	0	500usec(1000hz ±30%)		
0	1				1	1	1msec(500hz ±30%)		
1	0				0	0	5msec(100hz ±30%)		
1	0				0	1	10msec(50hz ±30%)		
others					Bypass(about 1.5Mhz)				
04-07	07				06	05	04	Gate Sampling Time	
	0			0	0	0	(10/1) Mhz (0.1us)		
	0			0	0	1	(10/2) Mhz (0.2us)		
	0			0	1	0	(10/4) Mhz (0.4us)		
	0			0	1	1	(10/8) Mhz (0.8us)		
	0			1	0	0	(10/16) Mhz (1.6us)		
	0			1	0	1	(10/32) Mhz (3.2us)		
	0			1	1	0	(10/64) Mhz (6.4us)		
	0			1	1	1	(10/128) Mhz (12.8us)		
	others				(10/1) Mhz (0.1us)				

4. DPV1 SERVICE

4.1. MSAC1 Read(PROFIBUS-DP Extensions to EN50170)

■ MSAC1 Read request

Parameter	Description
Remote Address	Slave Address(0~99)
Slot Number	Slot Number(0~32),0:NA9122
Index	1 : Parameter 2 : Memory
Length	1~128

■ MSAC1 Read Confirm(+)

Parameter	Description
Remote Address	Slave Address(0~99)
Length	1~128
Data	User Data

■ MSAC1 Read Confirm (-)

Parameter	Description
Remote Address	Slave Address(0~99)
Error Decode	-
Error_code 1	-
Error_code 2	Reserved

4.2. MSAC1 Write(PROFIBUS-DP Extensions to EN50170)

■ MSAC1 Write request

Parameter	Description
Remote Address	Slave Address(0~99)
Slot Number	Slot Number(0~32),0:NA9122
Index	1 : Parameter 2 : Memory
Length	1~128
Data	1.Parameter 2.Memory <ul style="list-style-type: none"> ➤ Data[0] : Offset Low ➤ Data[1] : Offset High ➤ Data[2]... : User Data

■ MSAC1 Write Confirm(+)

Parameter	Description
Remote Address	Slave Address(0~99)
Length	1~128

■ **MSAC1 Write Confirm (-)**

Parameter	Description
Remote Address	Slave Address(0~99)
Error Decode	-
Error_code 1	-
Error_code 2	Reserved

4.3. MSAC2 Initiate(PROFIBUS-DP Extensions to EN50170)

■ **MSAC2 Initiate request**

Parameter	Description
C Ref	PROFIBUS-DP Extensions to EN50170
Rem Add	Slave station address(0~99)
Send Timeout	PROFIBUS-DP Extensions to EN50170
Features Supported 1	0x03
Features Supported 2	Reserved
Profile Features Supported 1	PROFIBUS-DP Extensions to EN50170
Profile Features Supported 2	PROFIBUS-DP Extensions to EN50170
Profile Ident Number	PROFIBUS-DP Extensions to EN50170
Add_Addr_Param	PROFIBUS-DP Extensions to EN50170 (S-Addr=0, D-Addr=0)

■ **MSAC2 Initiate Confirm (+)**

Parameter	Description
C Ref	PROFIBUS-DP Extensions to EN50170
Features Supported 1	PROFIBUS-DP Extensions to EN50170
Features Supported 2	PROFIBUS-DP Extensions to EN50170
Profile Features Supported 1	0
Profile Features Supported 2	0
Profile Ident Number	0
Add_Addr_Param	PROFIBUS-DP Extensions to EN50170 S-Addr=0, D-Addr=0

■ **MSAC2 Initiate Confirm (-)**

Parameter	Description
C Ref	Communication-Reference
Error Decode	-
Error_code 1	-
Error_code 2	Reserved

4.4. MSAC2 Abort(PROFIBUS-DP Extensions to EN50170)

■ MSAC2 Abort request

Parameter	Description
C_Ref	PROFIBUS-DP Extensions to EN50170
Subnet	Slave station address
Instance	PROFIBUS-DP Extensions to EN50170
Reason_code	PROFIBUS-DP Extensions to EN50170 MSAC2_Read,MSAC2_Write

4.5. MSAC2 Read(PROFIBUS-DP Extensions to EN50170)

■ MSAC2 Read request

Parameter	Description
C_Ref	Communication-Reference
Slot Number	Slot Number(0~32),0:NA9122
Index	1 : Parameter 2 : Memory
Length	1~128

■ MSAC2 Read Confirm(+)

Parameter	Description
C_Ref	Communication-Reference
Length	1~128
Data	

■ MSAC2 Read Confirm (-)

Parameter	Description
C_Ref	Communication-Reference
Error Decode	-
Error_code 1	-
Error_code 2	Reserved

4.6. MSAC2 Write(PROFIBUS-DP Extensions to EN50170)

■ MSAC2 Write request

Parameter	Description
C_Ref	Slave Address(0~99)
Slot Number	Slot Number(0~32),0:NA9122
Index	1 : Parameter 2 : Memory
Length	1~128
Data	1.Parameter 2.Memory <ul style="list-style-type: none"> ➤ Data[0] : Offset Low ➤ Data[1] : Offset High ➤ Data[2]... : User Data

■ MSAC2 Write Response(+)

Parameter	Description
C Ref	Communication-Reference
Length	1~128

■ MSAC2 Write Response(-)

Parameter	Description
C Ref	Communication-Reference
Error Decode	-
Error code 1	-
Error code 2	Reserved

4.7. Error_Decode(PROFIBUS-DP Extensions to EN50170)

- 0~127 : Reserved
- 128 : DPV1
- 129~253 : Reserved
- 254 : FMS
- 255 : HART

4.8. Error Code_1(PROFIBUS-DP Extensions to EN50170)

Bit	7	6	5	4	3	2	1	0
	<ul style="list-style-type: none"> ● Error Class ✓ 0xA : Application class 				<ul style="list-style-type: none"> ● Error code ✓ 0 : Read Error ✓ 1 : Write Error ✓ 2 : Module Failure ✓ 3~7 : Reserved ✓ 8 : Version conflict ✓ 9 : Feature not supported ✓ 10~15 : User specific 			
	<ul style="list-style-type: none"> ● Error Class ✓ 0xB : Access class 				<ul style="list-style-type: none"> ● Error code ✓ 0 : Invalid index ✓ 1 : Write length error ✓ 2 : Invalid slot ✓ 3 : Type conflict ✓ 4 : Invalid area ✓ 5 : state conflict 			

		<ul style="list-style-type: none"> ✓ 6 : access denied ✓ 7 : invalid range ✓ 8 : invalid parameter ✓ 9 : invalid type ✓ 10~15 : User specific
	<ul style="list-style-type: none"> ● Error Class <ul style="list-style-type: none"> ✓ 0xC : Resource class 	<ul style="list-style-type: none"> ● Error code <ul style="list-style-type: none"> ✓ 0 : read constrain conflict ✓ 1 : Write constrain conflict ✓ 2 : Resource busy ✓ 3 : Resource unabailable ✓ 4~7 : Reserved ✓ 8~15 : User specific
	<ul style="list-style-type: none"> ● Error Class <ul style="list-style-type: none"> ✓ 0xD : NA9122 Specific Class 	<ul style="list-style-type: none"> ● Error code <ul style="list-style-type: none"> ✓ 1 : Slot Parameter write error ✓ 2 : Read memory error ✓ 3 : Write memory error

5. DIAGNOSTIC DATA

Byte	Item	Description
0	Station status 0	PROFIBUS Standard Diagnostic
1	Station status 0	
2	Station status 0	
3	Master Address	
4	PNO Ident Number High	
5	PNO Ident Number Low	
6	ID Diagnostic Header	Extended Diagnostic (ID Related Diagnostic)
7	Diagnostic allocation(Slot0~7)	
8	Diagnostic allocation(Slot8~15)	
9	Diagnostic allocation(Slot16~23)	
10	Diagnostic allocation(Slot24~31)	
11	Diagnostic allocation(Slot32~39)	
12		Reserved
13		
14		
15	Device Status Diagnostic Header	Extended Diagnostic (Device Status)
16	Status Type(0xA0:Manufacture-specific)	
17	Slot Number	
18	Status differentiation(0:No differentiation)	
19	Status message	
20		Reserved

■ ID Related Diagnostic

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
6	ID Diagnostic Header(0x45)							
7	Slot 7	Slot 6	Slot 5	Slot 4	Slot 3	Slot 2	Slot 1	NA9122
8	Slot 15	Slot 14	Slot 13	Slot 12	Slot 11	Slot 10	Slot 9	Slot 8
9	Slot 23	Slot 22	Slot 21	Slot 20	Slot 19	Slot 18	Slot 17	Slot 16
10	Slot 31	Slot 30	Slot 29	Slot 28	Slot 27	Slot 26	Slot 25	Slot 24
11	Reserved							

■ Device Related Diagnostic(Status message byte)

- 0x21 : No response from expansion slot
- 0x22 : Response error(Type)
- 0x23 : Response error(Slot Number)
- 0x24 : Response error(Length)
- 0x25 : Response error(Protocol)
- 0x26 : Response error(ID)
- 0x27 : Response error(Function code)
- 0x28 : Response error(CRC)
- 0x29 : Response error(Data)
- 0x2A : Response error(Sequence)
- 0x2B : NA9122 Request error
- 0x2C : NA9122 Broadcasting error
- 0x41 : FnBus Rx Timeout
- 0x42 : Faulty input data(Type)
- 0x43 : Faulty input data(Slot number)
- 0x44 : Faulty input data(Length)
- 0x45 : Faulty input data(CRC)
- 0x46 : Faulty input data(Slot diag)
- 0x47 : Input update timeout
- 0x48 : FnBus token fault
- 0xC1 : Resource error of slot
- 0xC2 : Not supported service from slot
- 0xC3 : Attribute error from slot
- 0xC4 : Slot is already in this mode
- 0xC5 : Object conflict from slot
- 0xC6 : Attribute not settable

- 0xC7 : Insufficient data
- 0xC8 : Not supported attribute
- 0xC9 : Too much data
- 0xCA : Object not exist
- 0xCB : Invalid slot parameter
- 0xCC : Store fail
- 0xCD : Access denied
- 0xCE : FnBus token error
- 0xCF : Object not exist
- 0xD0 : Slot memory size over
- 0xE1 : No expansion slot
- 0xE2 : Too many slots
- 0xE3 : Input data size overflow
- 0xE4 : Output data size overflow
- 0xE5 : Invalid product code
- 0xE6 : Set output-offset error
- 0xE7 : Set slot active-flag error
- 0xE8 : Set slot parameter error
- 0xE9 : Set FnBus parameter error
- 0xEA : Slot warm-start error
- 0xEB : Get slot catalog number error
- 0xEC : Invalid slot request
- 0xED : Firmware fault
- 0xEE : Set word-type error
- 0xF0 : Vendor code fault
- 0xFF : Not ready