

Digital Input Module

ST-1xxx User Manual



Version 1.03

2013 CREVIS Co.,Ltd

DOCUMENT CHANGE SUMMARY				
REV	PAGE	REMARKS	DATE	EDITOR
1.0	New Document		2011/10/07	JE KANG
1.01	6 40-41, 24-25	Add your experience Change : ST-1804, ST-1904 Off voltage ST-1804, ST-1904 Image	2012/1/13	JE KANG
		Add the certificate RoHS	2012/3/21	JE KANG
1.02		Changed Crevis TEL	2013/4/4	JE KANG
1.03		Environment Spec. 50°C→55°C (UL Temp)	2013/7/3	JE KANG

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1. Important Notes

Solid state equipment has operational characteristics differing from those of electromechanical equipment.

Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls describes some important differences between solid state equipment and hard-wired electromechanical devices.

Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will CREVIS be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, CREVIS cannot assume responsibility or liability for actual use based on the examples and diagrams.



Warning!

- ✓ **If you don't follow the directions, it could cause a personal injury, damage to the equipment or explosion**
- Do not assemble the products and wire with power applied to the system. Else it may cause an electric arc, which can result into unexpected and potentially dangerous action by field devices. Arching is explosion risk in hazardous locations. Be sure that the area is non-hazardous or remove system power appropriately before assembling or wiring the modules.
- Do not touch any terminal blocks or IO modules when system is running. Else it may cause the unit to an electric shock or malfunction.
- Keep away from the strange metallic materials not related to the unit and wiring works should be controlled by the electric expert engineer. Else it may cause the unit to a fire, electric shock or malfunction.


Caution!

- ✓ **If you disobey the instructions, there may be possibility of personal injury, damage to equipment or explosion. Please follow below Instructions.**
- Check the rated voltage and terminal array before wiring. Avoid the circumstances over 55 °C of temperature. Avoid placing it directly in the sunlight.
- Avoid the place under circumstances over 85% of humidity.
- Do not place Modules near by the inflammable material. Else it may cause a fire.
- Do not permit any vibration approaching it directly.
- Go through module specification carefully, ensure inputs, output connections are made with the specifications. Use standard cables for wiring.
- Use Product under pollution degree 2 environment..

1.1. Safety Instruction**1.1.1. Symbols**

DANGER 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death property damage, or economic loss
IMPORTANT	Identifies information that is critical for successful application and understanding of the product
ATTENTION 	Identifies information about practices or circumstances that can lead to personal injury, property damage, or economic loss. Attentions help you to identity a hazard, avoid a hazard, and recognize the consequences

1.1.2. Safety Notes

DANGER 	The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, e.g. FnBUS Pin.
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1.1.3. Certification

c-UL-us UL Listed Industrial Control Equipment, certified for U.S. and Canada

See UL File E235505

DNV CERTIFICATE No. A-10666

CE Certificate

EN 61000-6-2; Industrial Immunity

EN 61000-6-4; Industrial Emissions

RoHS (EU, CHINA)

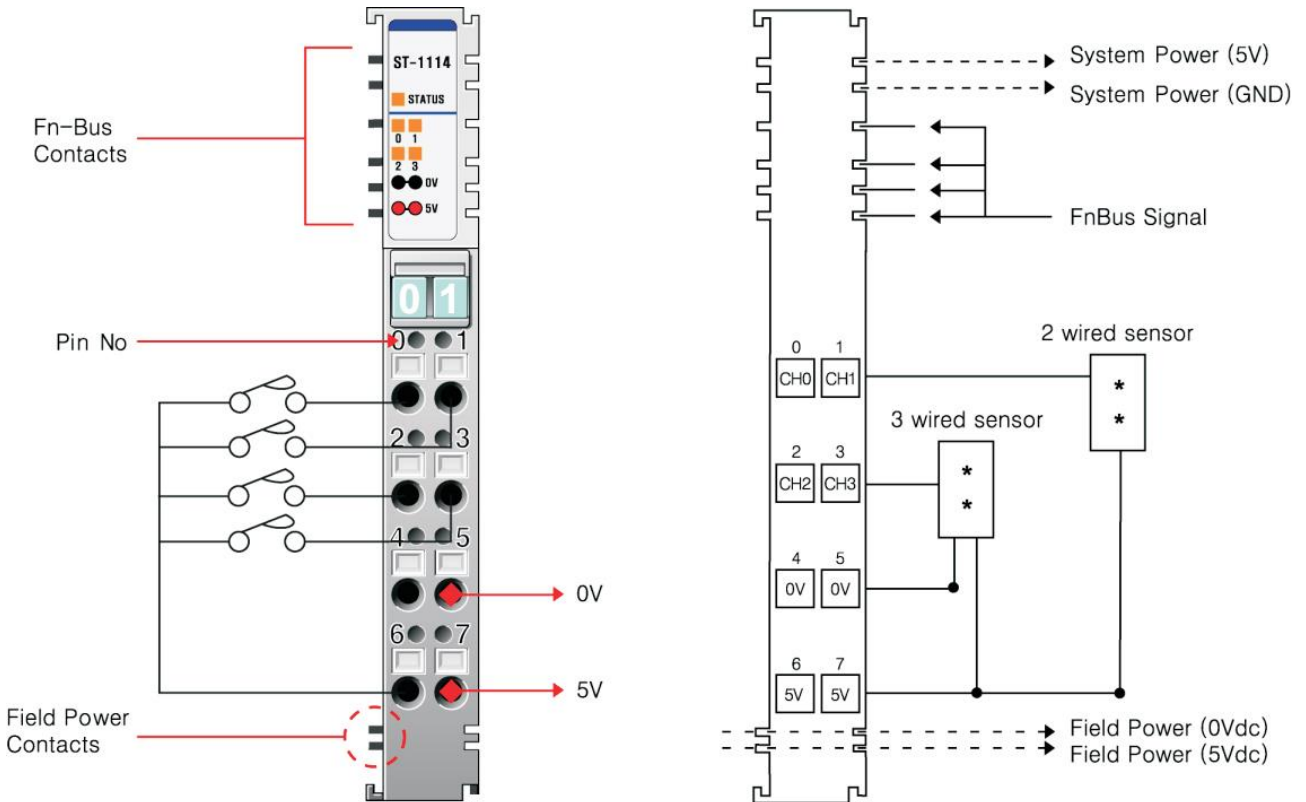
2. DIGITAL INPUT MODULE LIST

ST-Number	Description	ID(hex)	Production Status
ST-1114	4 Points, Sink(Positive), 5Vdc, Terminal	41 00 01	Active
ST-111F	16 Points, Sink(Positive), 5Vdc, 20P Connector	41 01 19	Active
ST-1124	4 Points, Source(Negative), 5Vdc, Terminal	41 00 02	Active
ST-112F	16 Points, Source(Negative), 5Vdc, 20P Connector	41 01 1A	Active
ST-1214	4 Points, Sink(Positive), 12V/24Vdc, Terminal	41 00 03	Active
ST-1218	8 Points, Sink(Positive), 12V/24Vdc, Terminal	41 00 07	Active
ST-121F	16 Points, Sink(Positive), 12V/24Vdc, 20P Connector	41 01 13	Active
ST-1224	4 Points, Source(Negative), 12V/24Vdc, Terminal	41 00 04	Active
ST-1228	8 Points, Source(Negative), 12V/24Vdc, Terminal	41 00 08	Active
ST-122F	16 Points, Source(Negative), 12V/24Vdc, 20P Connector	41 01 14	Active
ST-1314	4 Points, Sink(Positive), 48Vdc, Terminal	41 00 05	Active
ST-131F	16 Points, Sink(Positive), 48Vdc, 20P Connector	41 01 17	Active
ST-1324	4 Points, Source(Negative), 48Vdc, Terminal	41 00 06	Active
ST-132F	16 Points, Source(Negative), 48Vdc, 20P Connector	41 01 18	Active
ST-1804	4 Points, 110Vac, Terminal	41 00 09	Active
ST-1904	4 Points, 220Vac, Terminal	41 00 0A	Active

3. Specification

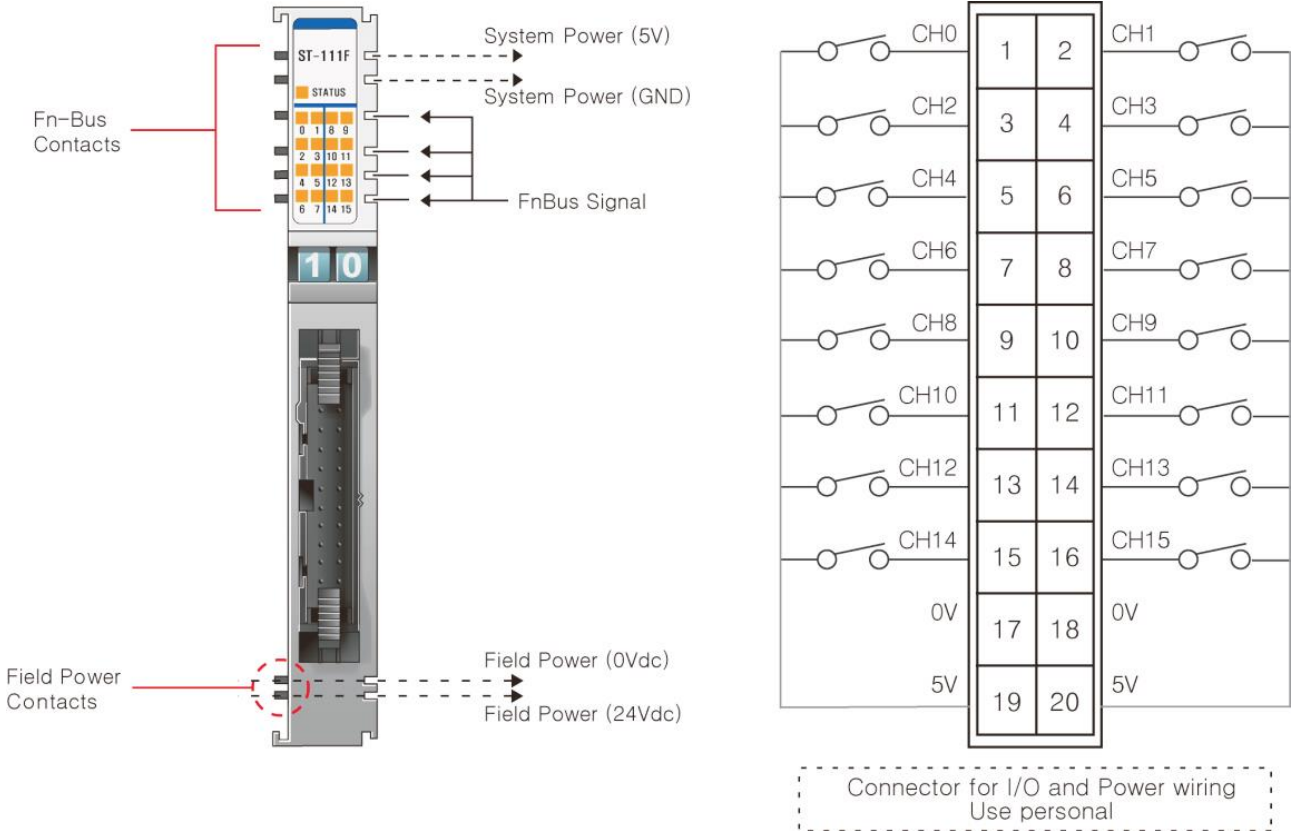
3.1. The Interface

3.1.1. ST-1114



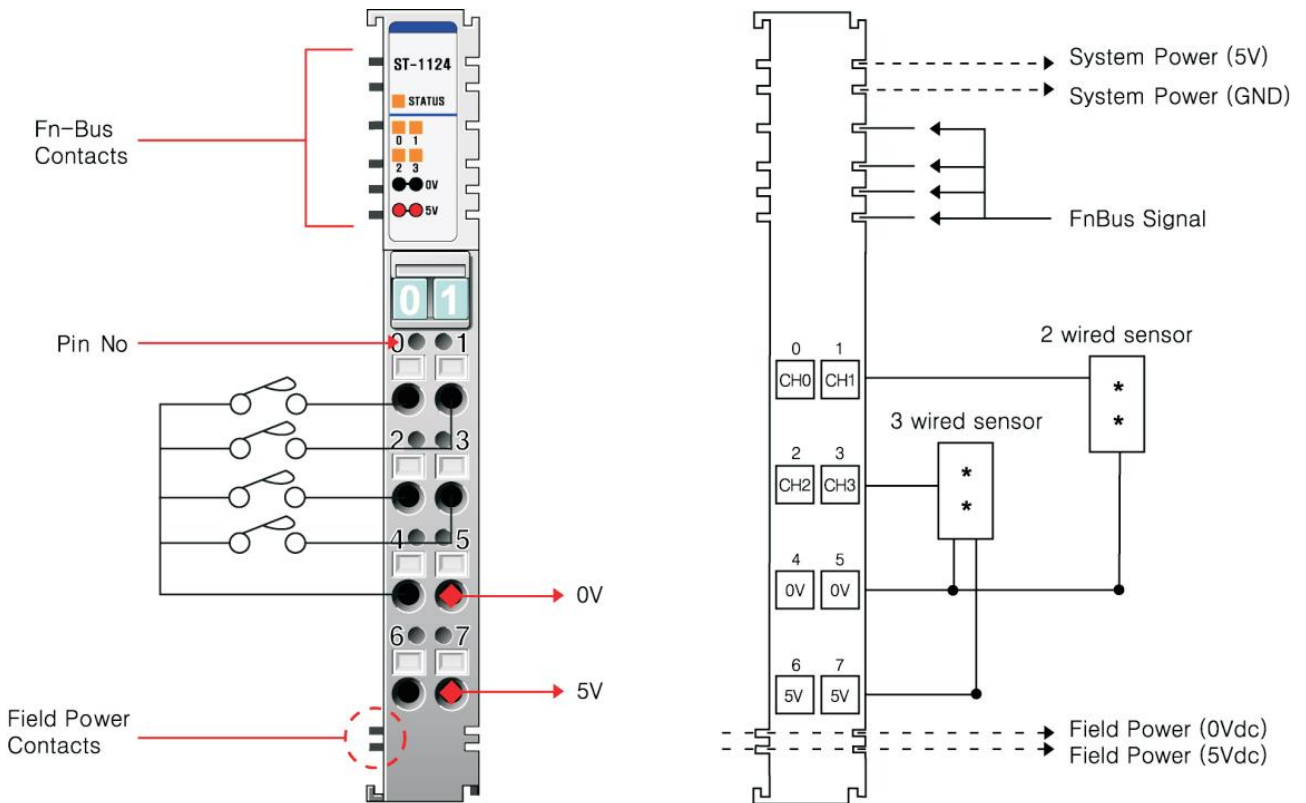
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Field Ground (0V)	5	Field Ground (0V)
6	Field Power (+5Vdc)	7	Field Power (+5Vdc)

3.1.2. ST-111F



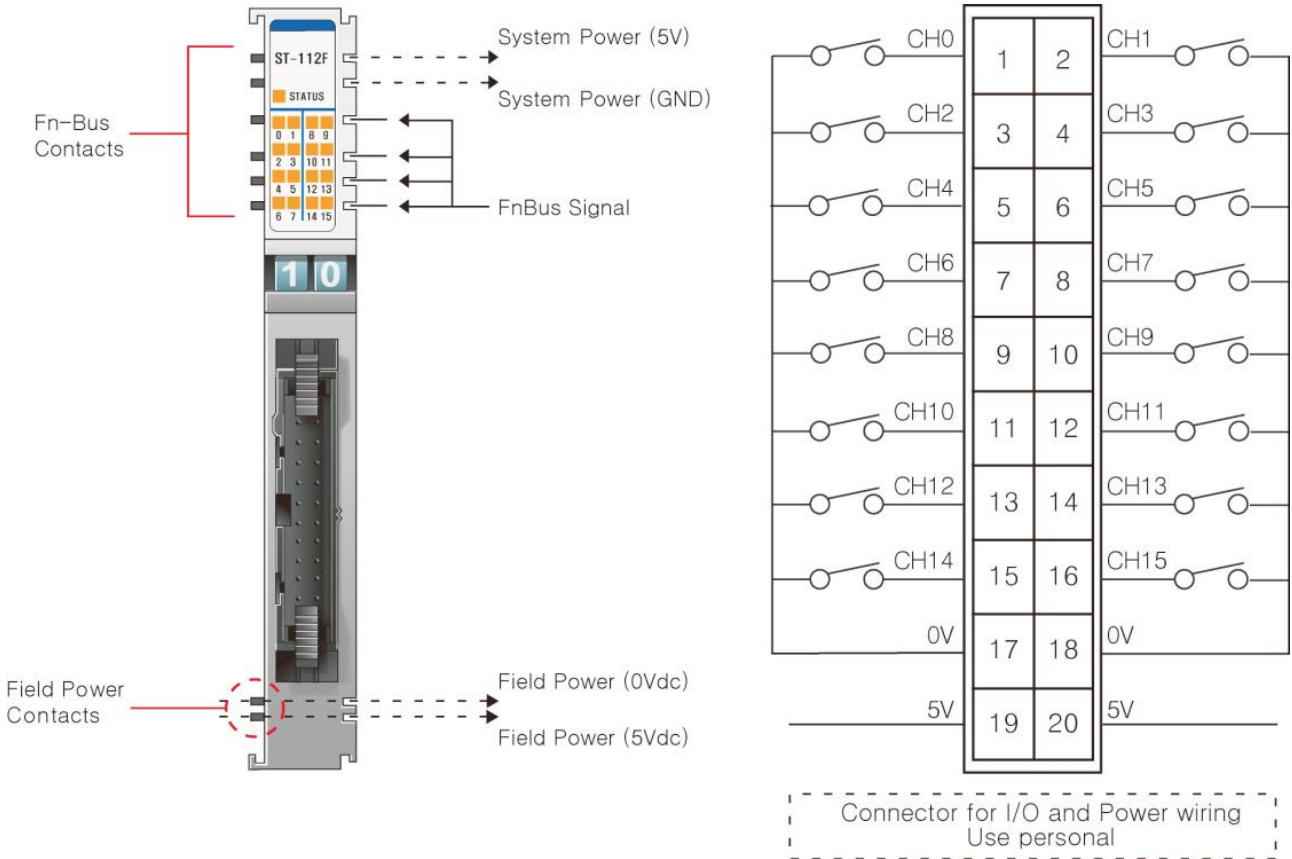
Pin No.	Description	Pin No.	Description
1	Input Channel 0	2	Input Channel 1
3	Input Channel 2	4	Input Channel 3
5	Input Channel 4	6	Input Channel 5
7	Input Channel 6	8	Input Channel 7
9	Input Channel 8	10	Input Channel 9
11	Input Channel 10	12	Input Channel 11
13	Input Channel 12	14	Input Channel 13
15	Input Channel 14	16	Input Channel 15
17	Field Ground(0V)	18	Field Ground(0V)
19	Field Power (+5Vdc)	20	Field Power (+5Vdc)

3.1.3. ST-1124



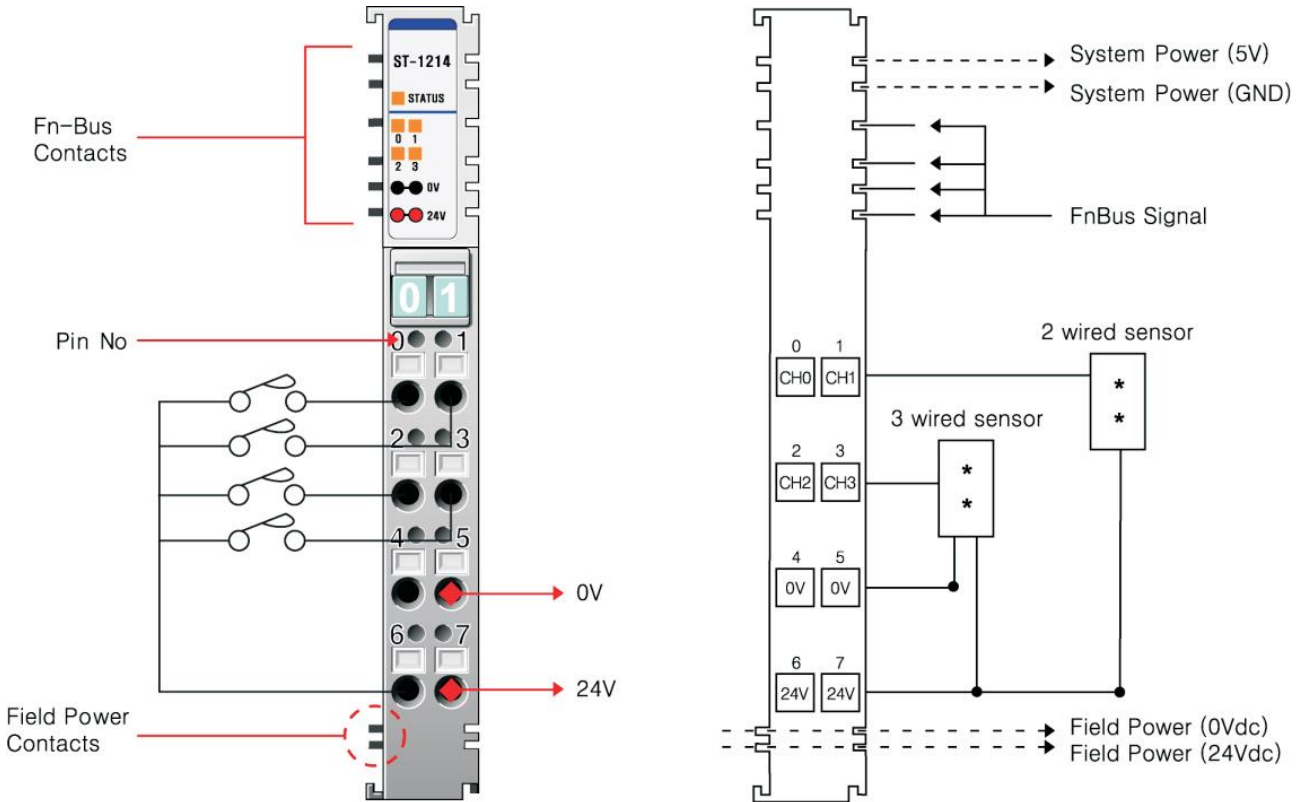
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Field Ground (0V)	5	Field Ground (0V)
6	Field Power (+5Vdc)	7	Field Power (+5Vdc)

3.1.4. ST-112F



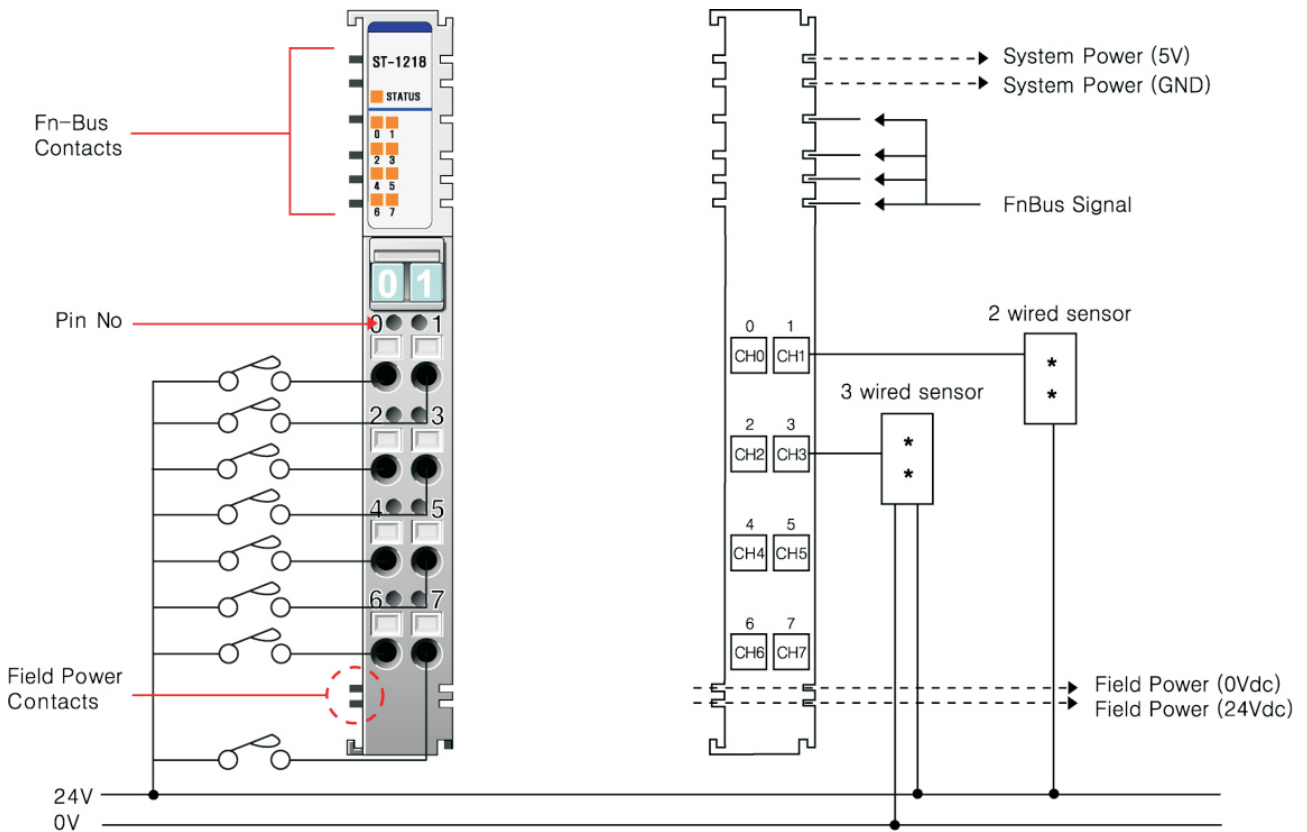
Pin No.	Description	Pin No.	Description
1	Input Channel 0	2	Input Channel 1
3	Input Channel 2	4	Input Channel 3
5	Input Channel 4	6	Input Channel 5
7	Input Channel 6	8	Input Channel 7
9	Input Channel 8	10	Input Channel 9
11	Input Channel 10	12	Input Channel 11
13	Input Channel 12	14	Input Channel 13
15	Input Channel 14	16	Input Channel 15
17	Field Ground(0V)	18	Field Ground(0V)
19	Field Power (+5Vdc)	20	Field Power (+5Vdc)

3.1.5. ST-1214



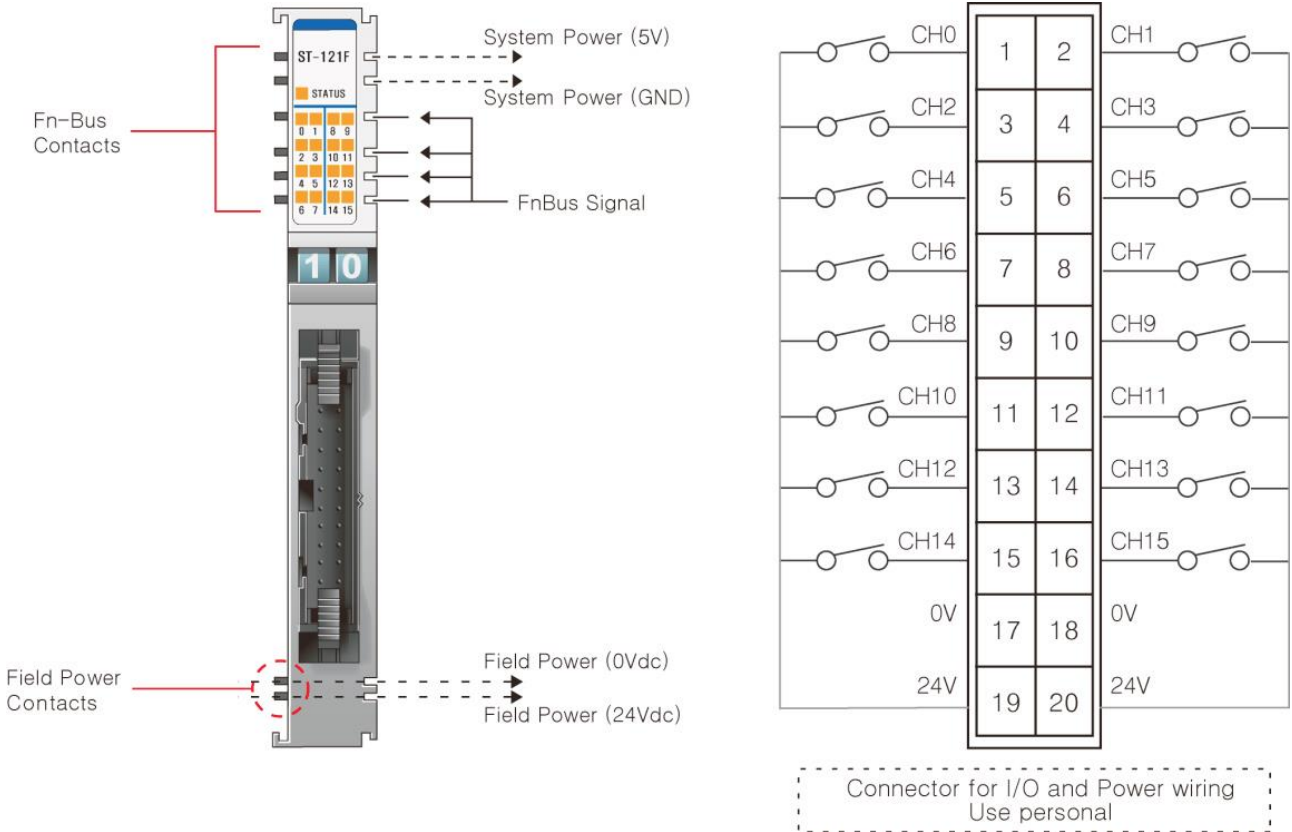
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Field Ground (0V)	5	Field Ground (0V)
6	Field Power (+24Vdc)	7	Field Power (+24Vdc)

3.1.6. ST-1218



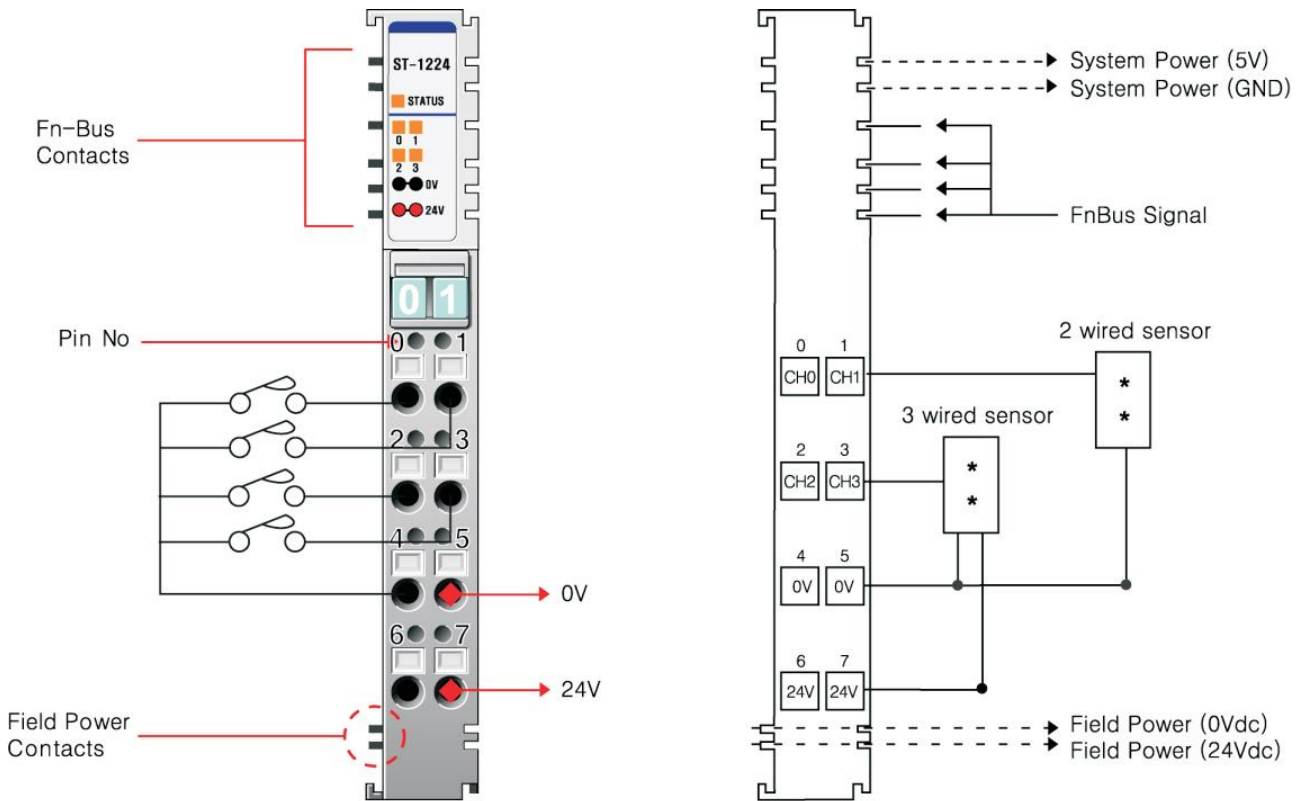
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Input Channel 4	5	Input Channel 5
6	Input Channel 6	7	Input Channel 7

3.1.7. ST-121F



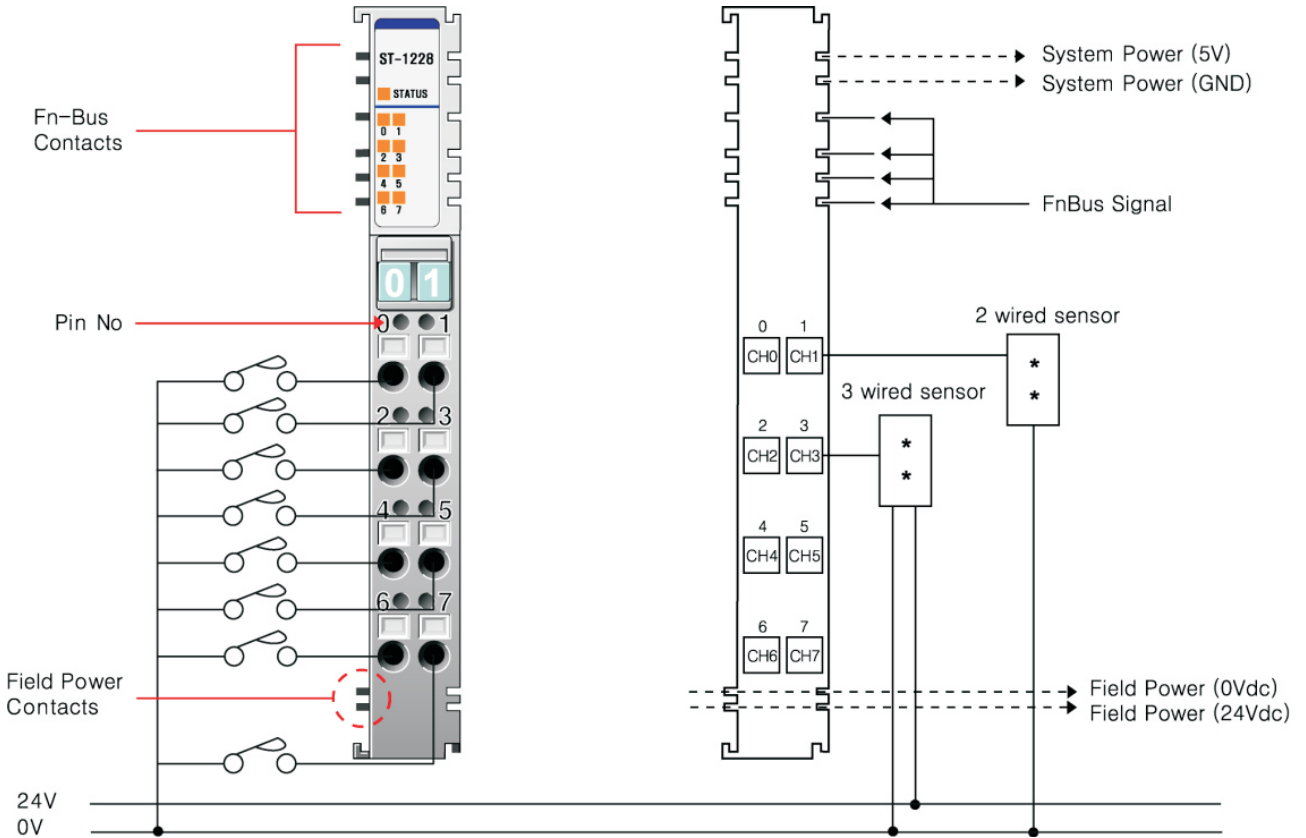
Pin No.	Description	Pin No.	Description
1	Input Channel 0	2	Input Channel 1
3	Input Channel 2	4	Input Channel 3
5	Input Channel 4	6	Input Channel 5
7	Input Channel 6	8	Input Channel 7
9	Input Channel 8	10	Input Channel 9
11	Input Channel 10	12	Input Channel 11
13	Input Channel 12	14	Input Channel 13
15	Input Channel 14	16	Input Channel 15
17	Field Ground(0V)	18	Field Ground(0V)
19	Field Power (+24Vdc)	20	Field Power (+24Vdc)

3.1.8. ST-1224



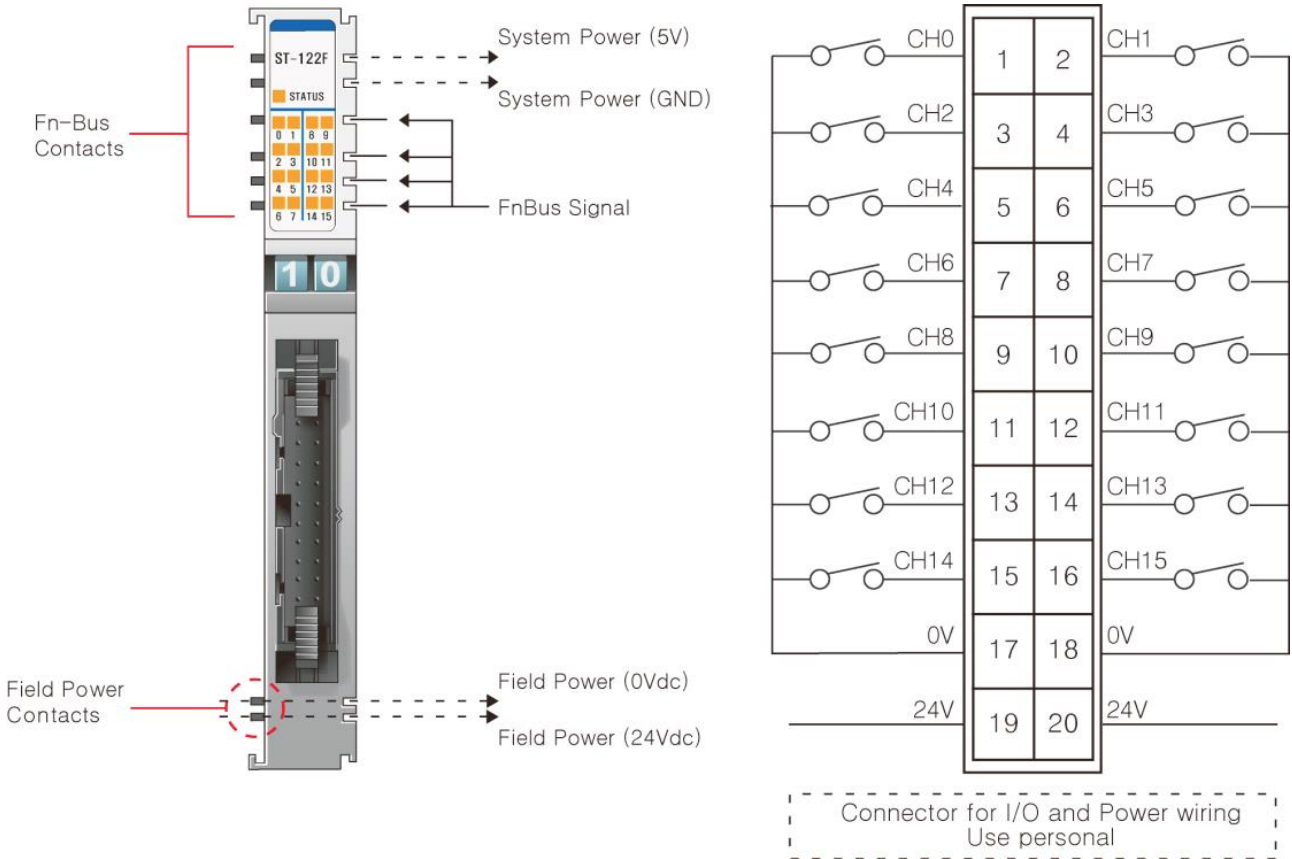
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Field Ground (0V)	5	Field Ground (0V)
6	Field Power (+24Vdc)	7	Field Power (+24Vdc)

3.1.9. ST-1228



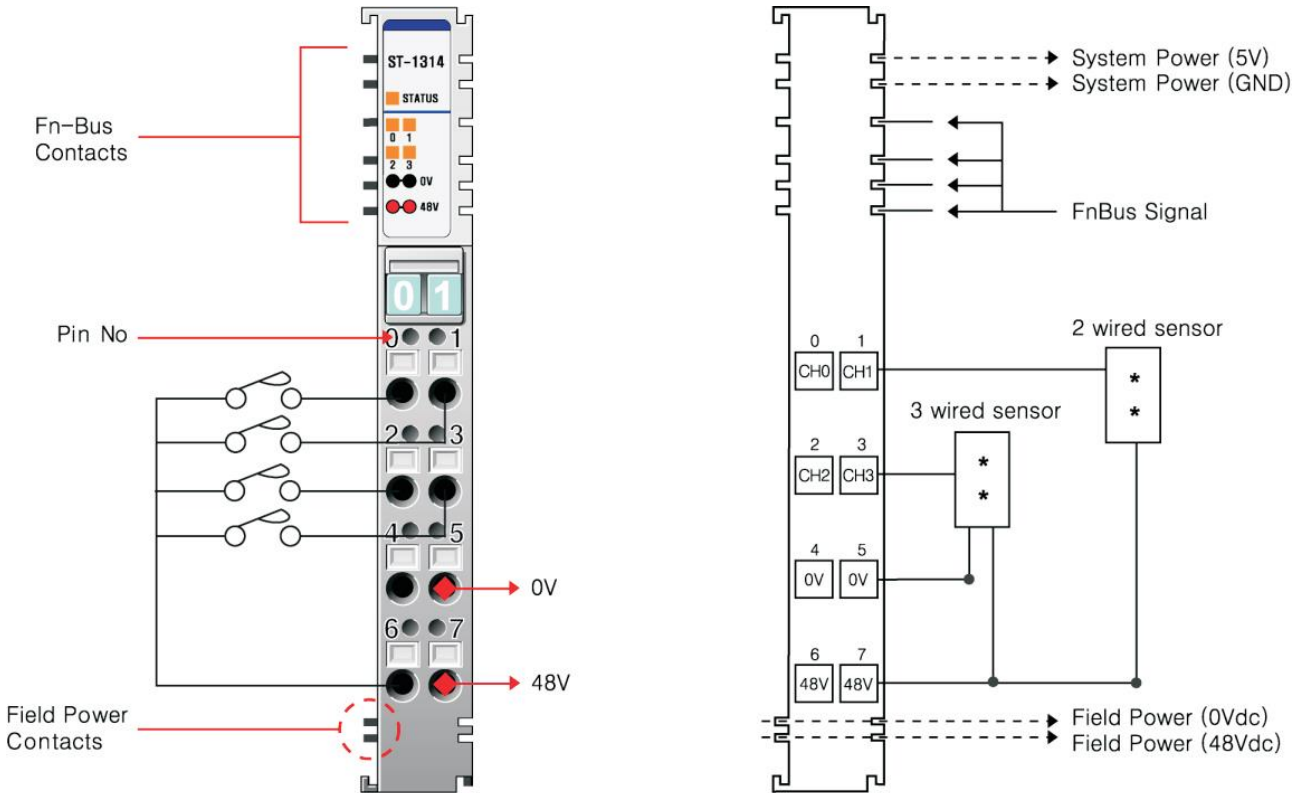
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Input Channel 4	5	Input Channel 5
6	Input Channel 6	7	Input Channel 7

3.1.10. ST-122F



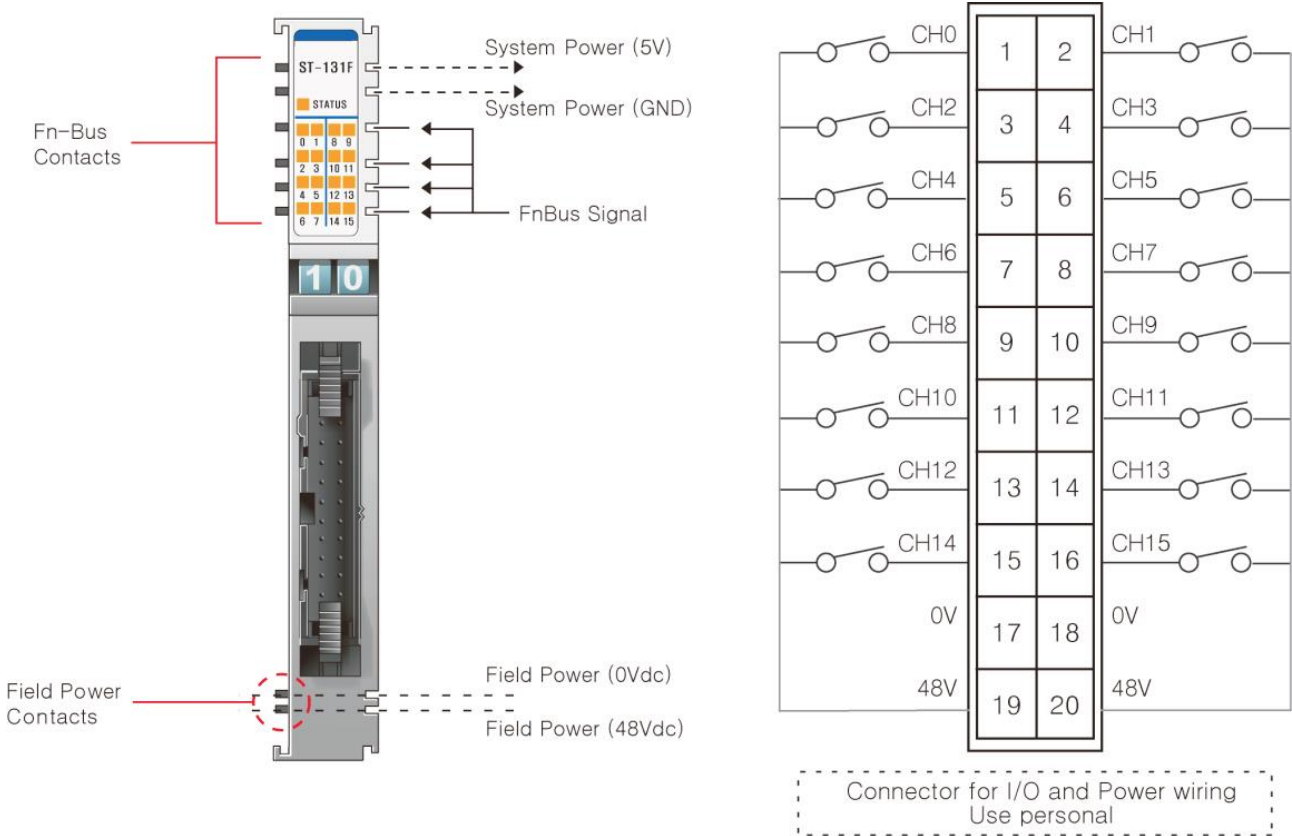
Pin No.	Description	Pin No.	Description
1	Input Channel 0	2	Input Channel 1
3	Input Channel 2	4	Input Channel 3
5	Input Channel 4	6	Input Channel 5
7	Input Channel 6	8	Input Channel 7
9	Input Channel 8	10	Input Channel 9
11	Input Channel 10	12	Input Channel 11
13	Input Channel 12	14	Input Channel 13
15	Input Channel 14	16	Input Channel 15
17	Field Ground(0V)	18	Field Ground(0V)
19	Field Power (+24Vdc)	20	Field Power (+24Vdc)

3.1.11. ST-1314



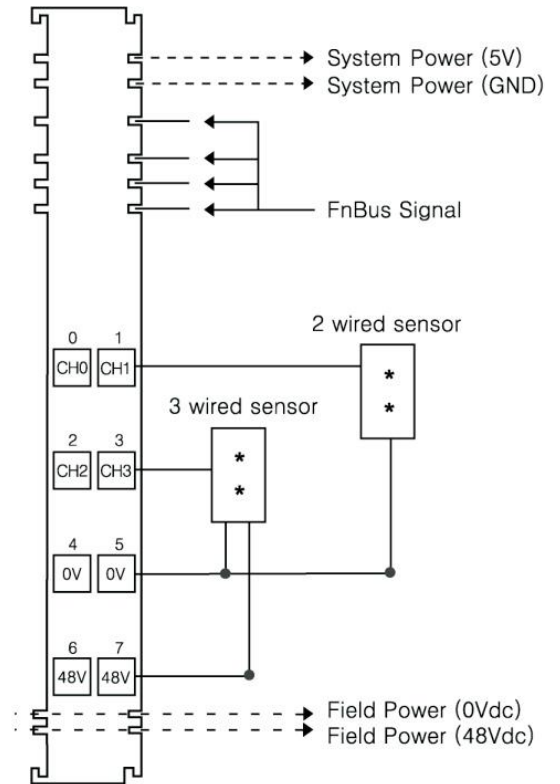
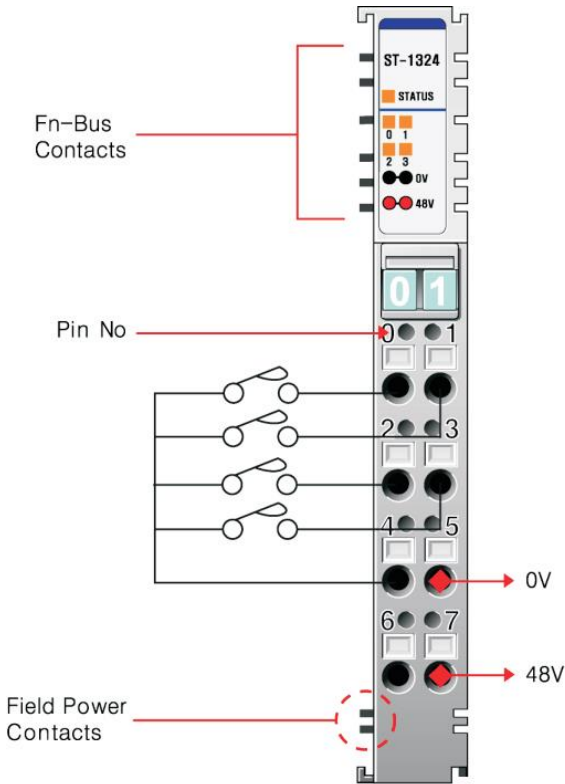
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Field Ground (0V)	5	Field Ground (0V)
6	Field Power (+48Vdc)	7	Field Power (+48Vdc)

3.1.12. ST-131F



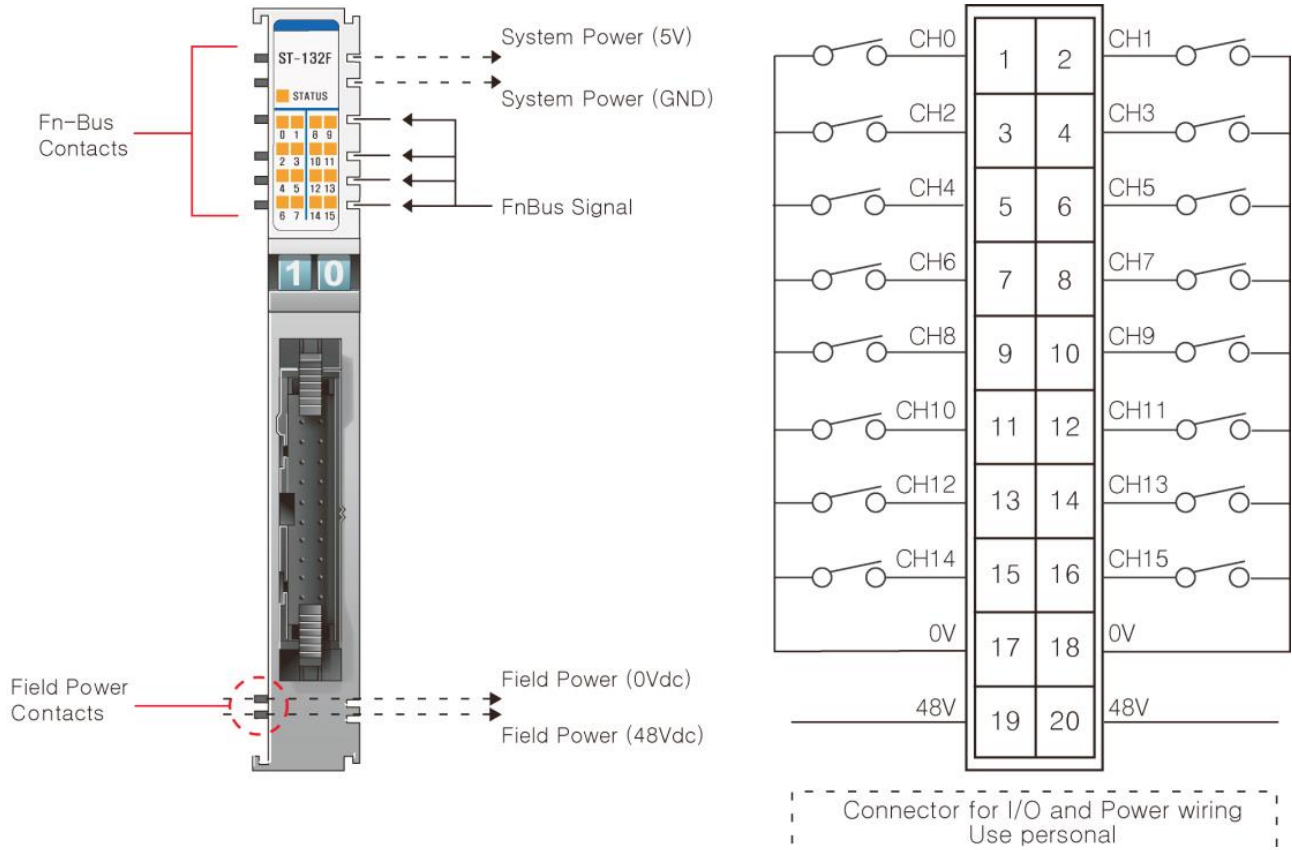
Pin No.	Description	Pin No.	Description
1	Input Channel 0	2	Input Channel 1
3	Input Channel 2	4	Input Channel 3
5	Input Channel 4	6	Input Channel 5
7	Input Channel 6	8	Input Channel 7
9	Input Channel 8	10	Input Channel 9
11	Input Channel 10	12	Input Channel 11
13	Input Channel 12	14	Input Channel 13
15	Input Channel 14	16	Input Channel 15
17	Field Ground(0V)	18	Field Ground(0V)
19	Field Power (+48Vdc)	20	Field Power (+48Vdc)

3.1.13. ST-1324



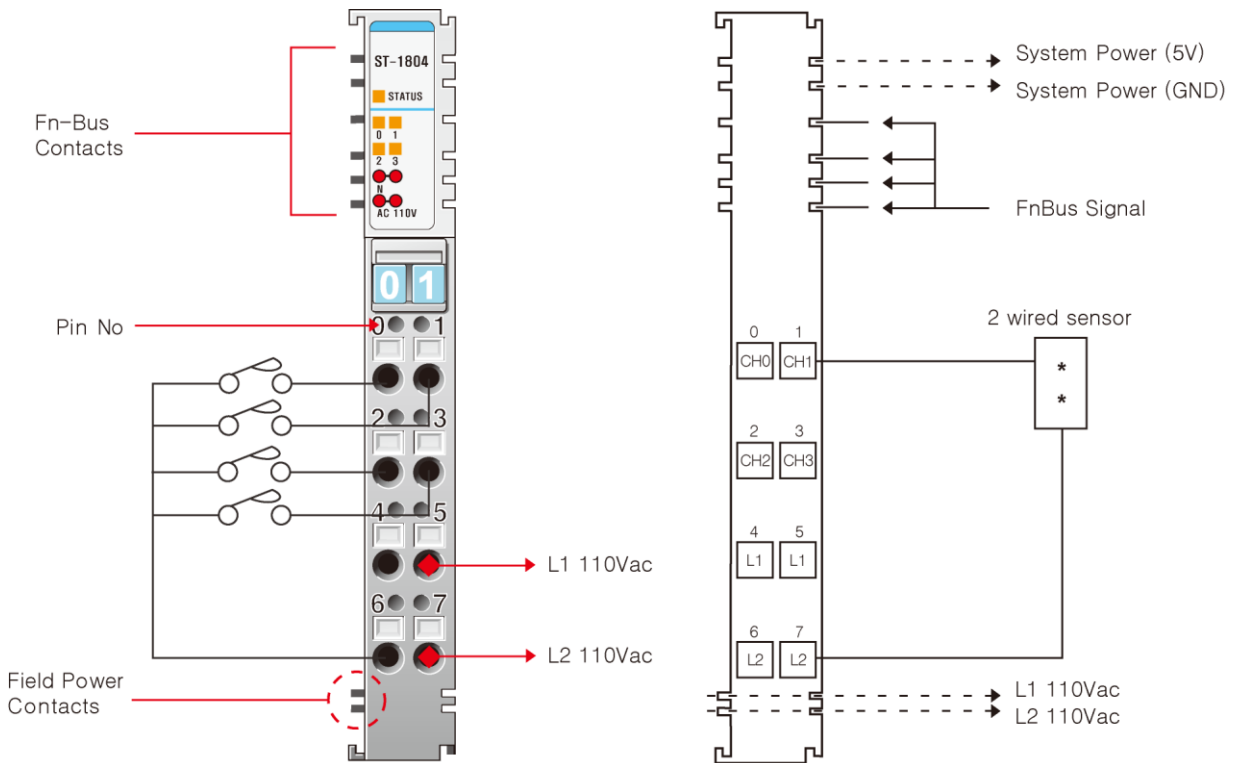
Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	Field Ground (0V)	5	Field Ground (0V)
6	Field Power (+48Vdc)	7	Field Power (+48Vdc)

3.1.14. ST-132F



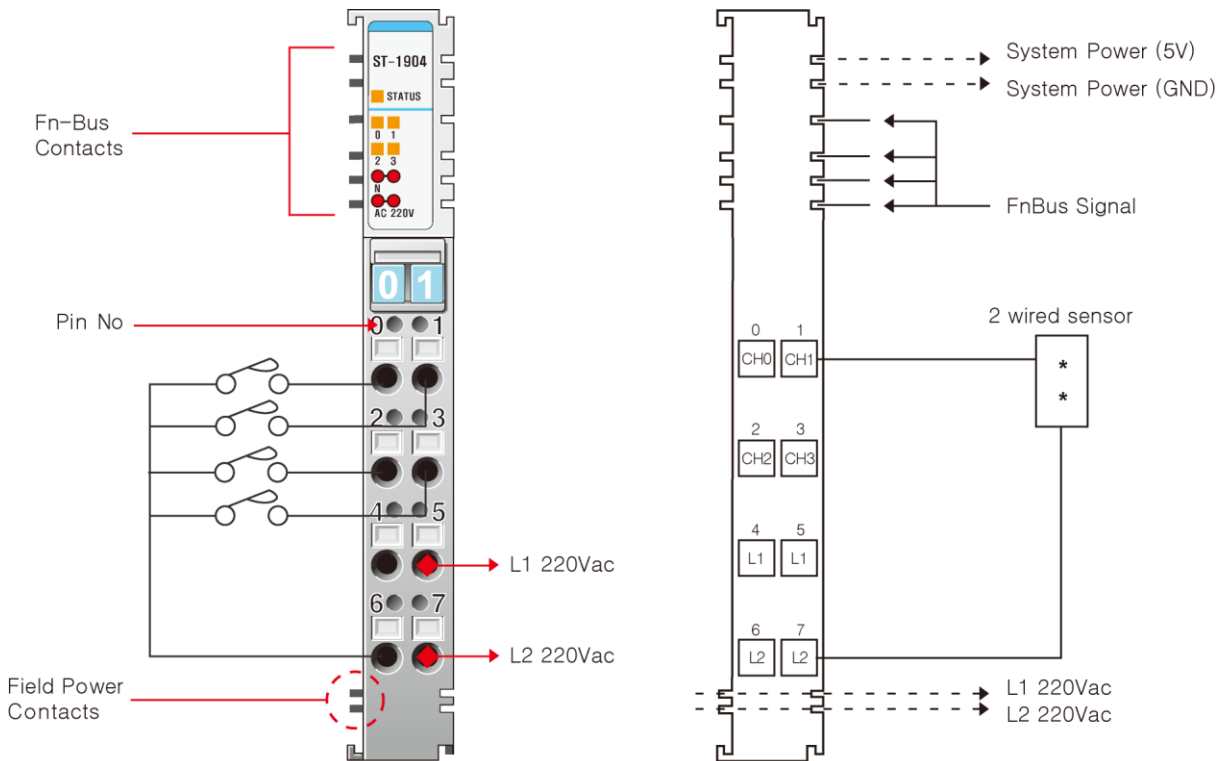
Pin No.	Description	Pin No.	Description
1	Input Channel 0	2	Input Channel 1
3	Input Channel 2	4	Input Channel 3
5	Input Channel 4	6	Input Channel 5
7	Input Channel 6	8	Input Channel 7
9	Input Channel 8	10	Input Channel 9
11	Input Channel 10	12	Input Channel 11
13	Input Channel 12	14	Input Channel 13
15	Input Channel 14	16	Input Channel 15
17	Field Ground(0V)	18	Field Ground(0V)
19	Field Power (+48Vdc)	20	Field Power (+48Vdc)

3.1.15. ST-1804



Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	L1	5	L1
6	L2	7	L2

3.1.16. ST-1904



Pin No.	Description	Pin No.	Description
0	Input Channel 0	1	Input Channel 1
2	Input Channel 2	3	Input Channel 3
4	L1	5	L1
6	L2	7	L2

3.2. Environment Specification

Environmental Specifications	
Operating Temperature	-20 to 55 °C (Discrete I/O) 0 to 55 °C (Analog I/O)
Non-Operating Temperature	-40 °C to 85 °C
Relative Humidity	5%~90% non-condensing
Operating Altitude	2000m
Mounting	DIN rail
General Specifications	
Shock Operating	10g
Shock Non-Operating	30g
Vibration/Shock resistance	Displacement : 0.012Inch p-p from 10~57Hz Acceleration : 2G's from 57~500Hz Sweep Rate : 1 octave Per Minute Axes to test : x, y, z Frequency Sweeps Per Axis : 10
EMC resistance burst/ESD	Confirms to EN-61000-6-2
EMI	Confirms to EN-61000-6-4
Installation Pos. /Protect. Class	Variable / IP20
Product Certification	UL / cUL, CE
Network Conformance	NA-9111 : ODVA Conformance Test Completion NA-9122 : PTO Conformance Test Completion NA-9131 : CLPA Conformance Test Completion
Isolation	DC Module (Included Analog Module) : Terminal Block to F.G 500Vac/1min AC Module : Terminal Block to F.G 1500Vac/1min Relay Module : Terminal Block to F.G 2500Vac/1min

3.3. Specification

3.3.1. ST-1114

Items	Specification
Input Specification	
Inputs Per Module	4 Points Sink Type
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	5Vdc nominal Min. 2.4Vdc ~ Max. 5.5Vdc
Min. OFF-state Voltage	Max. 0.8Vdc
ON-state Current	Max. 4.5mA / Point @ 5.5Vdc
Input Signal Delay	OFF to ON: Max. 0.5ms ON to OFF: Max. 0.5ms
Nominal Input Impedance	Typ. 1.3K Ω
Filtering Time	Typ. 1.5ms
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 5Vdc nominal Voltage Range : 4.5~5.5Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.2. ST-111F

Items	Specification
Input Specification	
Inputs Per Module	16 Points Sink Type
Indicators	16 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	5Vdc nominal Min. 4.5Vdc ~ Max. 5.5Vdc
Min. OFF-state Voltage	Max. 0.8Vdc
ON-state Current	Max. 4.5mA / Point @ 5.5Vdc
Input Signal Delay	Max. 3.0ms
Input Impedance	Typ. 1K Ω
Filtering Time	Typ. 1.5ms
Common Type	16 Points / 2COM
General Specification	
Power Dissipation	Max. 45mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 5Vdc nominal Voltage Range : 4.5~5.5Vdc Power Dissipation: Max. 70mA@5Vdc
Wiring	Connector Type, up to AWG22 Module Connector : HIF3BA-20D-2.54DSA
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.3. ST-1124

Items	Specification
Input Specification	
Inputs Per Module	4 Points Source Type
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	5Vdc nominal Min. 2.4Vdc ~ Max. 5.5Vdc
Min. OFF-state Voltage	Max. 0.8Vdc
ON-state Current	Max. 4.5mA / Point @ 5.5Vdc
Input Signal Delay	OFF to ON: Max. 0.5ms ON to OFF: Max. 0.5ms
Nominal Input Impedance	Typ. 1.3K Ω
Filtering Time	Typ. 1.5ms
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 5Vdc nominal Voltage Range : 4.5~5.5Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.4. ST-112F

Items	Specification
Input Specification	
Inputs Per Module	16 Points Source Type
Indicators	16 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	5Vdc nominal Min. 4.5Vdc ~ Max. 5.5Vdc
Min. OFF-state Voltage	Max. 0.8Vdc
ON-state Current	Max. 4.5mA / Point @ 5.5Vdc
Input Signal Delay	Max. 3.0ms
Filtering Time	Typ. 1.5ms
Common Type	16 Points / 2COM
General Specification	
Power Dissipation	Max. 45mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 5Vdc nominal Voltage Range : 4.5~5.5Vdc Power Dissipation: Max. 70mA@5Vdc
Wiring	Connector Type, up to AWG22 Module Connector : HIF3BA-20D-2.54DSA
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.5. ST-1214

Items	Specification
Input Specification	
Inputs Per Module	4 Points Sink Type
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	24Vdc nominal Min. 10.2Vdc ~ Max. 28.8Vdc
Min. OFF-state Voltage	Max. 5Vdc
ON-state Current	Max. 6mA / Point @ 28.8Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 5.1K Ω
Filtering Time	Typ. 1.5ms
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 11~28.8Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.6. ST-1218

Items	Specification
Input Specification	
Inputs Per Module	8 Points Sink Type
Indicators	8 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	24Vdc nominal Min. 10.2Vdc ~ Max. 28.8Vdc
Min. OFF-state Voltage	Max. 5Vdc
ON-state Current	Max. 6mA / Point @ 28.8Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 5.1K Ω
Filtering Time	Typ. 1.5ms
Common Type	External Common
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 11~28.8Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.7. ST-121F

Items	Specification
Input Specification	
Inputs Per Module	16 Points Sink Type
Indicators	16 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	24Vdc nominal Min. 10.2Vdc ~ Max. 28.8Vdc
Min. OFF-state Voltage	Max. 5Vdc
ON-state Current	Max. 6mA / Point @ 28.8Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 5.1K Ω
Filtering Time	Typ. 1.5ms
Common Type	16 Points / 2COM
General Specification	
Power Dissipation	Max. 45mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 11~28.8Vdc Power Dissipation : 5mA@28.8Vdc Per Point
Wiring	Module Connector : HIF3BA-20D-2.54DSA
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.8. ST-1224

Items	Specification
Input Specification	
Inputs Per Module	4 Points Source Type
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	24Vdc nominal Min. 10.2Vdc ~ Max. 28.8Vdc
Min. OFF-state Voltage	Max. 5Vdc
ON-state Current	Max. 6mA / Point @ 28.8Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 5.1K Ω
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 11~28.8Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.9. ST-1228

Items	Specification
Input Specification	
Inputs Per Module	8 Points Source Type
Indicators	8 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	24Vdc nominal Min. 10.2Vdc ~ Max. 28.8Vdc
Min. OFF-state Voltage	Max. 5Vdc
ON-state Current	Max. 6mA / Point @ 28.8Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 5.1K Ω
Filtering Time	Typ. 1.5ms
Common Type	External Common
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 11~28.8Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.10. ST-122F

Items	Specification
Input Specification	
Inputs Per Module	16 Points Source Type
Indicators	16 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	24Vdc nominal Min. 10.2Vdc ~ Max. 28.8Vdc
Min. OFF-state Voltage	Max. 5Vdc
ON-state Current	Max. 6mA / Point @ 28.8Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Filtering Time	Typ. 1.5ms
Common Type	16 Points / 2COM
General Specification	
Power Dissipation	Max. 45mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 11~28.8Vdc Power Dissipation : 5mA @28.8Vdc Per Point
Wiring	Module Connector : HIF3BA-20D-2.54DSA
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.11. ST-1314

Items	Specification
Input Specification	
Inputs Per Module	4 Points Sink Type
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	48Vdc nominal Min. 34Vdc ~ Max. 60Vdc
Min. OFF-state Voltage	Max. 10Vdc
ON-state Current	Max. 4mA / Point @ 48Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 12K Ω
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 48Vdc nominal Voltage Range : 34~60Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.12. ST-131F

Items	Specification
Input Specification	
Inputs Per Module	16 Points Sink Type
Indicators	16 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	48Vdc nominal Min. 34Vdc ~ Max. 60Vdc
Min. OFF-state Voltage	Max. 20Vdc
ON-state Current	Max. 2.5mA / Point @ 60Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 27K Ω
Filtering Time	Typ. 1.5ms
Common Type	16 Points / 2COM
General Specification	
Power Dissipation	Max. 45mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 48Vdc nominal Voltage Range : 34~60Vdc Power Dissipation : Max, 45mA@48Vdc
Wiring	Connector Type, up to AWG22 Module Connector : HIF3BA-20D-2.54DSA
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.13. ST-1324

Items	Specification
Input Specification	
Inputs Per Module	4 Points Source Type
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	48Vdc nominal Min. 34Vdc ~ Max. 60Vdc
Min. OFF-state Voltage	Max. 10Vdc
ON-state Current	Max. 4mA / Point @ 48Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 12K Ω
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 48Vdc nominal Voltage Range : 34~60Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.14. ST-132F

Items	Specification
Input Specification	
Inputs Per Module	16 Points Source Type
Indicators	16 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	48Vdc nominal Min. 34Vdc ~ Max. 60Vdc
Min. OFF-state Voltage	Max. 20Vdc
ON-state Current	Max. 2.5mA / Point @ 60Vdc
Input Signal Delay	OFF to ON: Max. 3ms ON to OFF: Max. 3ms
Nominal Input Impedance	Typ. 27K Ω
Filtering Time	Typ. 1.5ms
Common Type	16 Points / 2COM
General Specification	
Power Dissipation	Max. 45mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 48Vdc nominal Voltage Range : 34~60Vdc Power Dissipation : Max, 45mA@48Vdc
Wiring	Connector Type, up to AWG22 Module Connector : HIF3BA-20D-2.54DSA
Weight	70g
Module Size	12mm × 99mm × 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.15. ST-1804

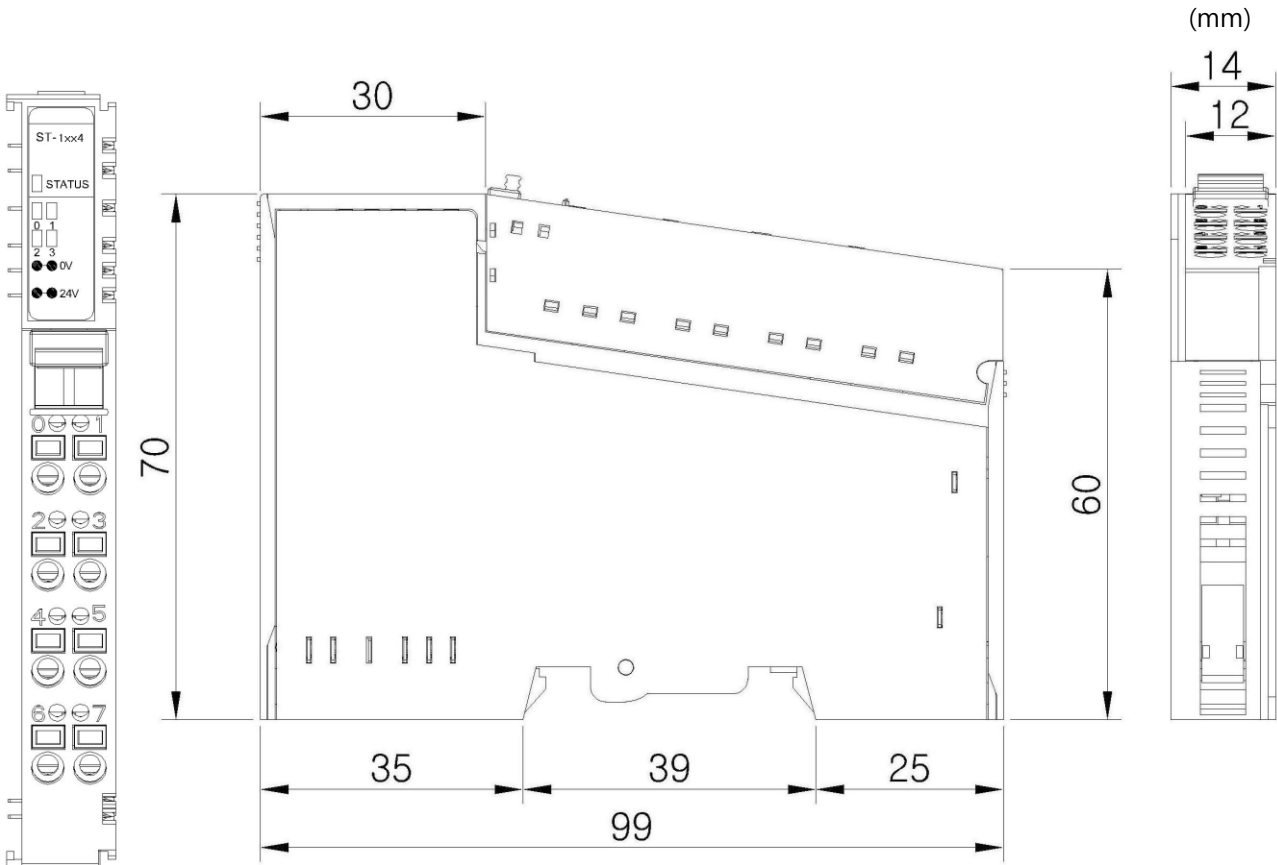
Items	Specification
Input Specification	
Inputs Per Module	4 Points
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	110Vac nominal Min. 85Vac ~ Max. 132Vdc
Min. OFF-state Voltage	Max. 60Vac
ON-state Current	Max. 8mA / Point @ 132Vdc
Input Signal Delay	OFF to ON: Max. 10ms ON to OFF: Max. 10ms
Nominal Input Impedance	Typ. 11K Ω
Frequency Range	47-63Hz
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 120Vac nominal Voltage Range: Min. 85Vac ~ Max. 132Vac
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

3.3.16. ST-1904

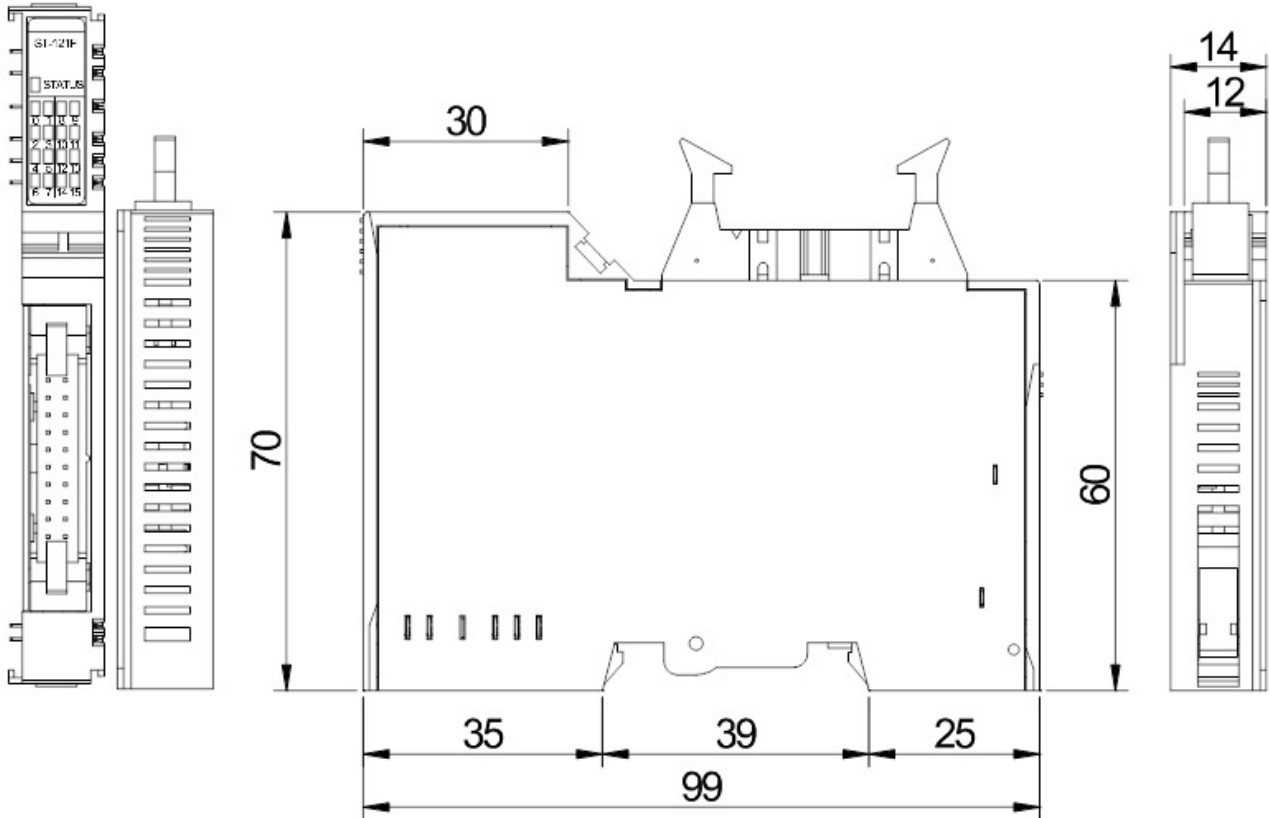
Items	Specification
Input Specification	
Inputs Per Module	4 Points
Indicators	4 Green Input States, 1 Green/Red FnBUS State
ON-state Voltage	220Vac nominal Min. 170Vac ~ Max. 264Vdc
Min. OFF-state Voltage	Max. 130Vac
ON-state Current	Max. 12mA / Point @ 264Vdc
Input Signal Delay	OFF to ON: Max. 10ms ON to OFF: Max. 10ms
Nominal Input Impedance	Typ. 22K Ω
Frequency Range	47-63Hz
Common Type	4 Points / 2COM (Single Common)
General Specification	
Power Dissipation	Max. 35mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
Field Power	Supply Voltage : 240Vac nominal Voltage Range: Min. 170Vac ~ Max. 264Vac
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 25)

4. Dimension

4.1. ST-1xx4, ST-1xx8



4.2. ST-1xxF



5. Mapping Data into the image Table

5.1. ST-1xx4

Input Module Data

D3	D2	D1	D0
----	----	----	----



Input Image Value

Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				D3	D2	D1	D0

5.2. ST-1xx8

Input Module Data

D7	D6	D5	D4	D3	D2	D1	D0
----	----	----	----	----	----	----	----



Input Image Value

Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0

5.3. ST-1xxF

Input Module Data

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



Input Image Value

Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0
Byte 1	D15	D14	D13	D12	D11	D10	D9	D8

6. Trouble Shooting

ATTENTION



In this manual, it couldn't be described all variety case with Network Adapter of several protocols. So if you couldn't find any fault after investigating all below cases refer to NA user manual.

LED Status	Cause	Action
EXPANSION MODULE STATUS LED	Not Power	Device has no expansion Module or may not be powered
	No Initialized	The Parameter is not initialized yet.
	Fn-Bus Connection	FnBus normal Operation
	Fn-Bus Ready	FnBus ready
	Fn-Bus Fault	FnBus Time Out, FnBus Failed Communication
Off		
Green		
Flashing Green		
Flashing Red		
Red	Device Fault	Device fault
CHANNEL STATUS LED		
Off	Not Signal	Normal Operation
Green	On Signal	Normal Operation