Analog Output Module

ST-4xxx

User Manual

Version 1.01

2012 CREVIS Co.,Ltd

DOCUMENT CHANGE SUMMARY				
REV	PAGE	REMARKS	DATE	EDITOR
1.0	New Document		2011/10/07	JE KANG
1.01	5	Add your experience	2012/1/13	JE KANG

Table of Contents

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 50℃ 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.

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

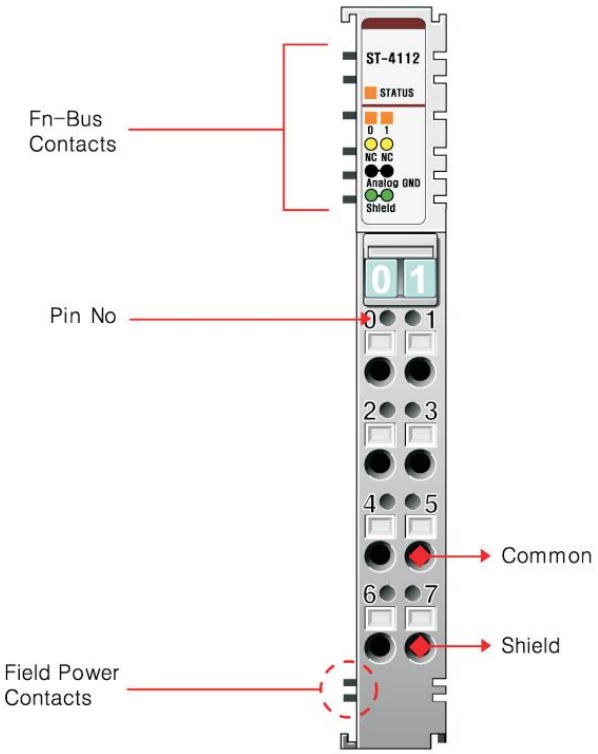
2. ANALOG OUTPUT MODULE LIST

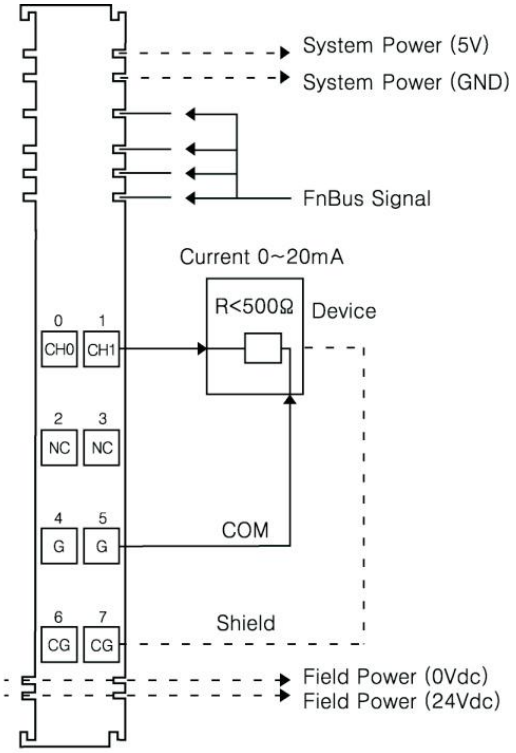
ST-Number	Description	ID(hex)	Production Status
ST-4112	2 Channels, Current, 0~20mA, 12bit	81 41 2C	Active
ST-4114	4 Channels, Current, 0~20mA, 12bit	81 43 6D	Active
ST-4212	2 Channels, Current, 4~20mA, 12bit	81 41 2D	Active
ST-4214	4 Channels, Current, 4~20mA, 12bit	81 43 6E	Active
ST-4274	4 Channels, Current, 4~20mA, 12bit, Sensor Connector	81 43 B3	Active
ST-4422	2 Channels, Voltage, 0~10Vdc, 12bit	81 41 2E	Active
ST-4424	4 Channels, Voltage, 0~10Vdc, 12bit	81 43 6A	Active
ST-4474	4 Channels, Voltage, 0~10Vdc, 12bit, Sensor Connector	81 43 B0	Active
ST-4491	1 Channel, Voltage, 0~10Vdc, 12bit, Manual Type	C1 40 41 BF	Active
ST-4522	2 Channels, Voltage, -10~10Vdc, 12bit	81 41 2F	Active
ST-4622	2 Channels, Voltage, 0~5Vdc, 12bit	81 41 30	Active
ST-4911	1 Channel, Current, 0~1A, 12bit	81 40 31	Active

3. Specification

3.1. The Interface and data

3.1.1. ST-4112

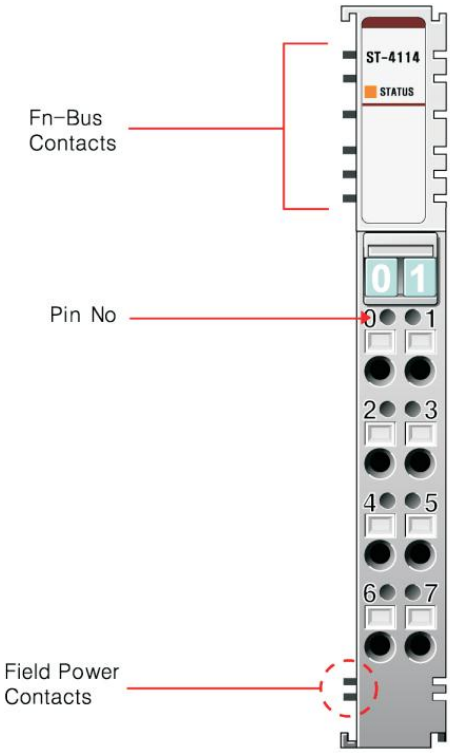


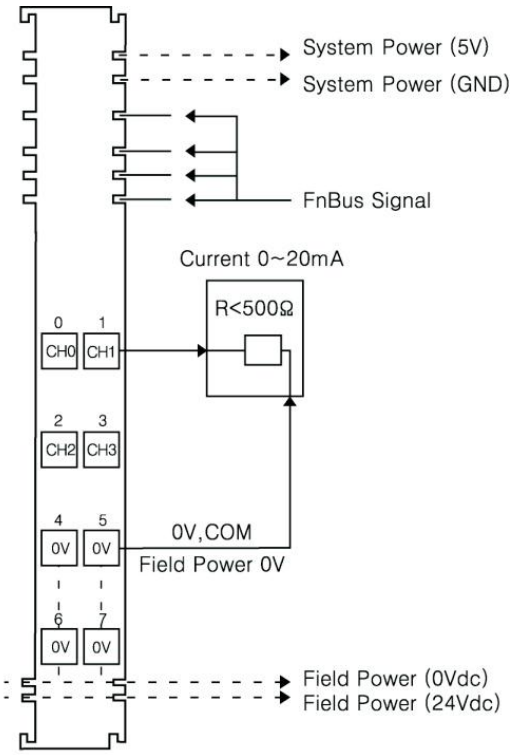


Pin No.	Description	Pin No.	Description
0	Output Channel 0	1	Output Channel 1
2	No Connection	3	No Connection
4	Output Channel Common (0V)	5	Output Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

Current	0.0mA	5.0mA	10.0mA	20.0mA
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

3.1.2. ST-4114

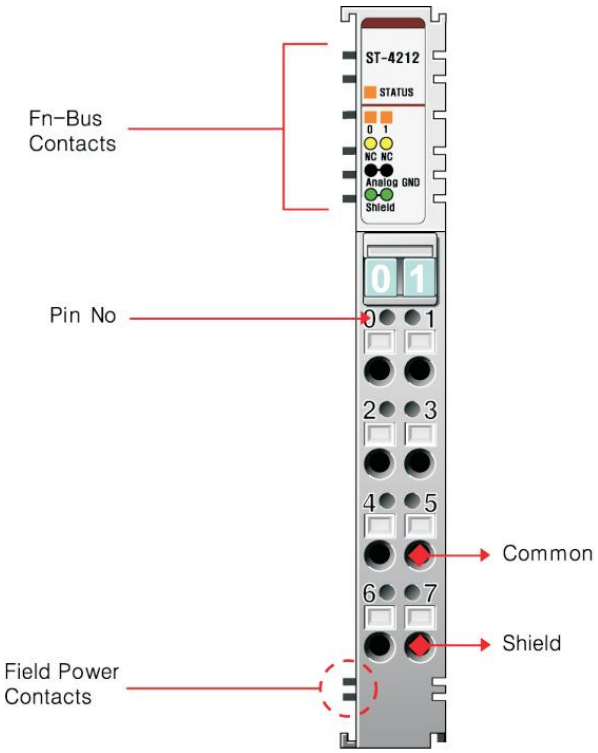


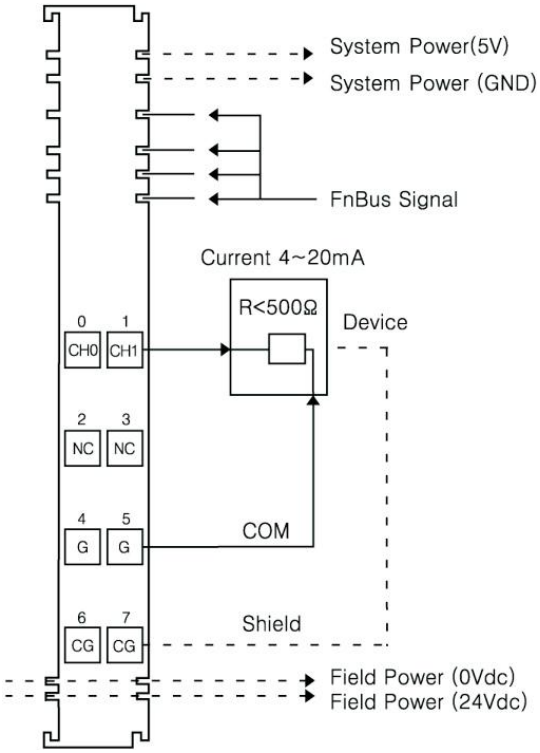


Pin No.	Description	Pin No.	Description
0	Output Channel 0	1	Output Channel 1
2	Output Channel 2	3	Output Channel 3
4	Field Ground 0V(AGND), Common	5	Field Ground 0V(AGND), Common
6	Field Ground 0V(AGND), Common	7	Field Ground 0V(AGND), Common

Current	0.0mA	5.0mA	10.0mA	20.0mA
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

3.1.3. ST-4212

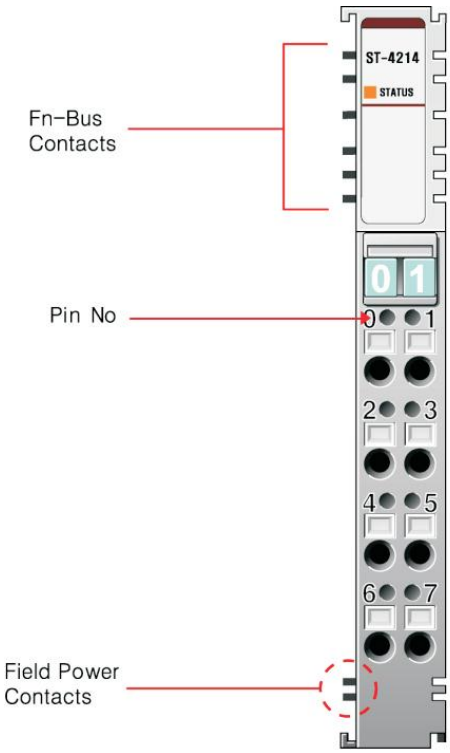


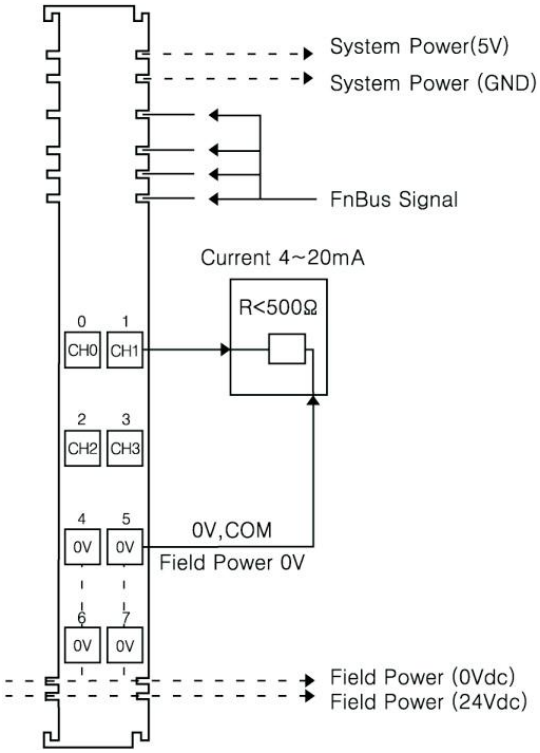


Pin No.	Description	Pin No.	Description
0	Output Channel 0	1	Output Channel 1
2	No Connection	3	No Connection
4	Output Channel Common (0V)	5	Output Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

Current	4.0mA	5.0mA	10.0mA	20.0mA
Data(Hex)	H 0000	H 00FF	H 05FF	H 0FFF

3.1.4. ST-4214

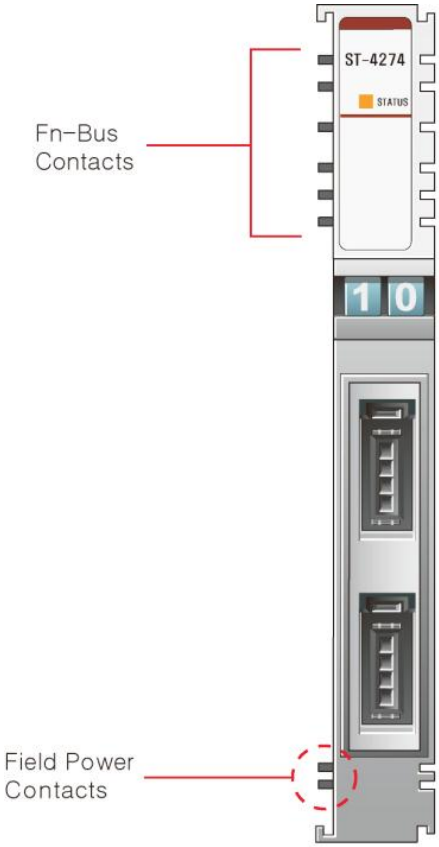


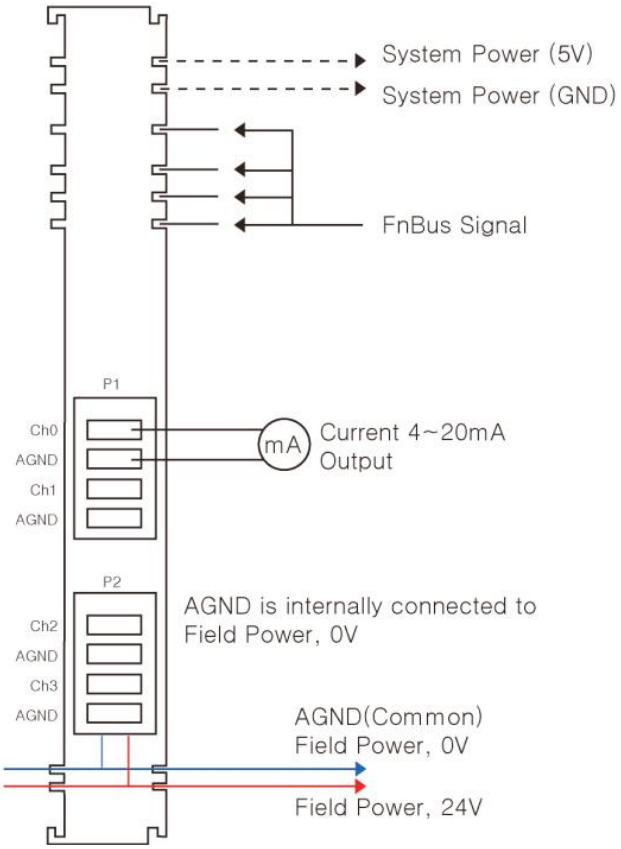


Pin No.	Description	Pin No.	Description
0	Output Channel 0	1	Output Channel 1
2	Output Channel 2	3	Output Channel 3
4	Field Ground 0V(AGND), Common	5	Field Ground 0V(AGND), Common
6	Field Ground 0V(AGND), Common	7	Field Ground 0V(AGND), Common

Current	4.0mA	8.0mA	12.0mA	20.0mA
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

3.1.5. ST-4274



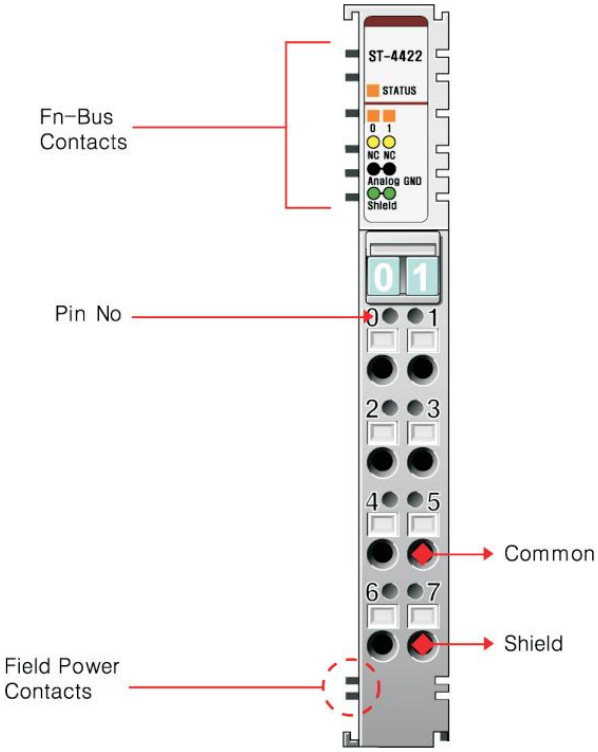


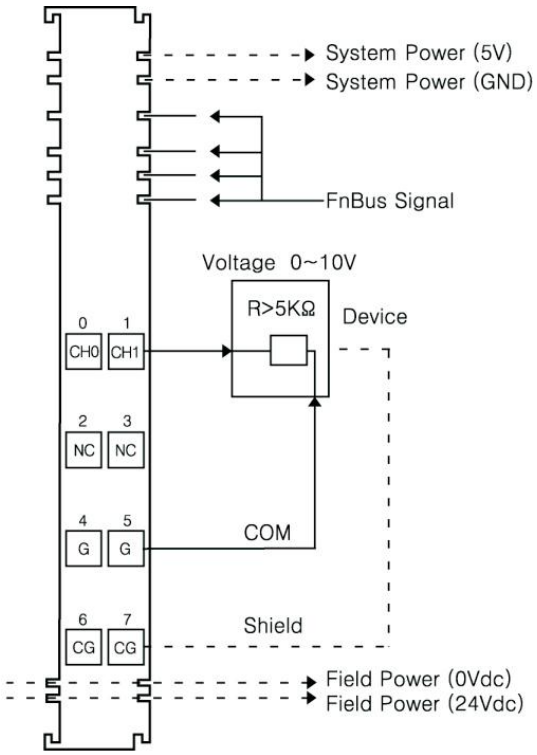
P1 Connector (Upper Connector) P2 Connector (Lower Connector)

Pin No.	Description	Pin No.	Description
1	Output Channel 0	1	Output Channel 2
2	Field Ground 0V(AGND), Common	2	Field Ground 0V(AGND), Common
3	Output Channel 1	3	Output Channel 3
4	Field Ground 0V(AGND), Common	4	Field Ground 0V(AGND), Common

Current	4.0mA	8.0mA	12.0mA	20.0mA
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

3.1.6. ST-4422

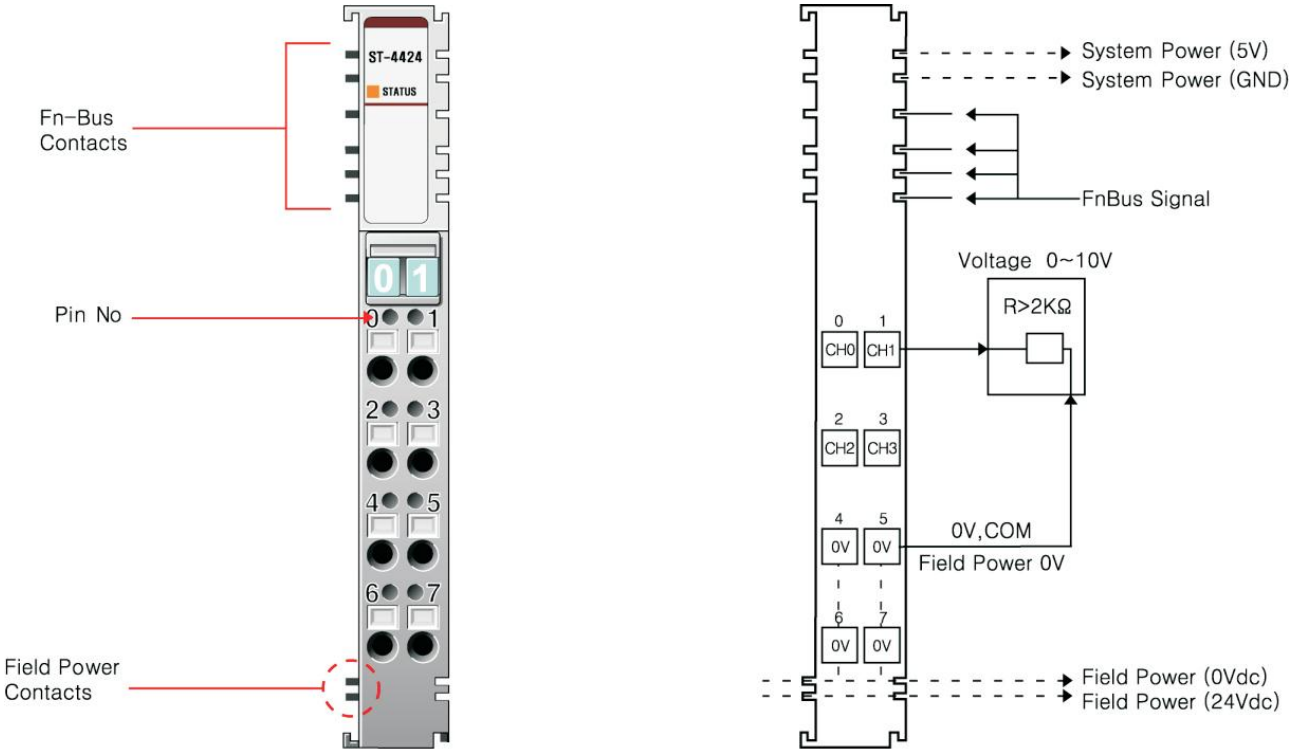




Pin No.	Description	Pin No.	Description
0	Output Channel 0	1	Output Channel 1
2	No Connection	3	No Connection
4	Output Channel Common (0V)	5	Output Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

Voltage	0V	2.5V	5V	10V
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

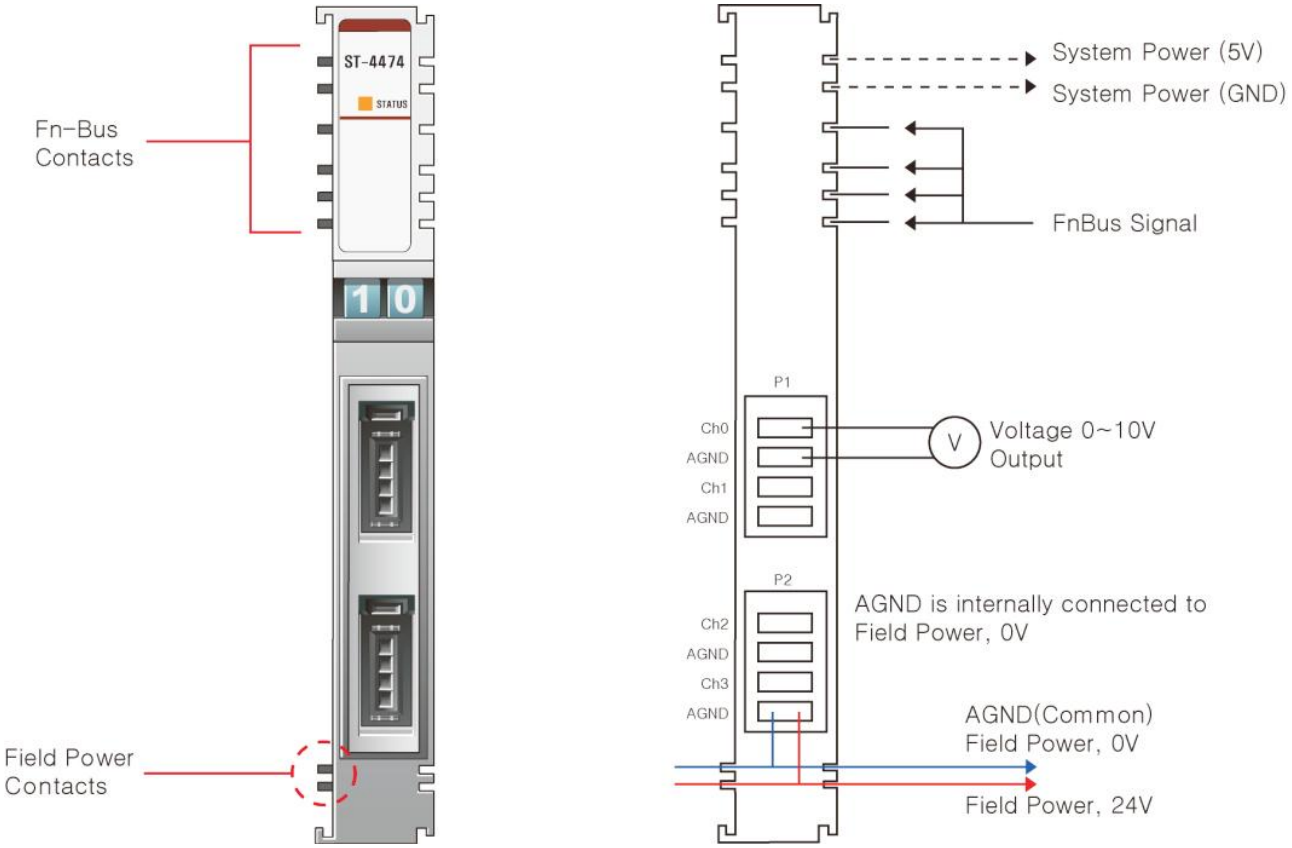
3.1.7. ST-4424



Pin No.	Description	Pin No.	Description
1	Output Channel 0	1	Output Channel 1
2	Output Channel 2	2	Output Channel 3
3	Field Ground 0V(AGND), Common	3	Field Ground 0V(AGND), Common
4	Field Ground 0V(AGND), Common	4	Field Ground 0V(AGND), Common

Voltage	0V	2.5V	5V	10V
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

3.1.8. ST-4474

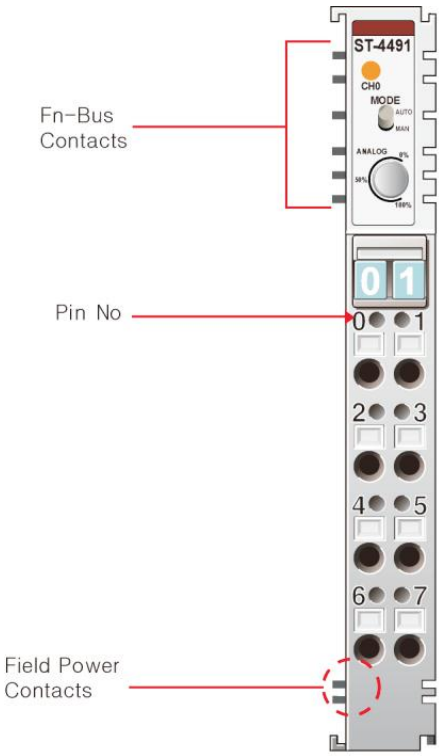


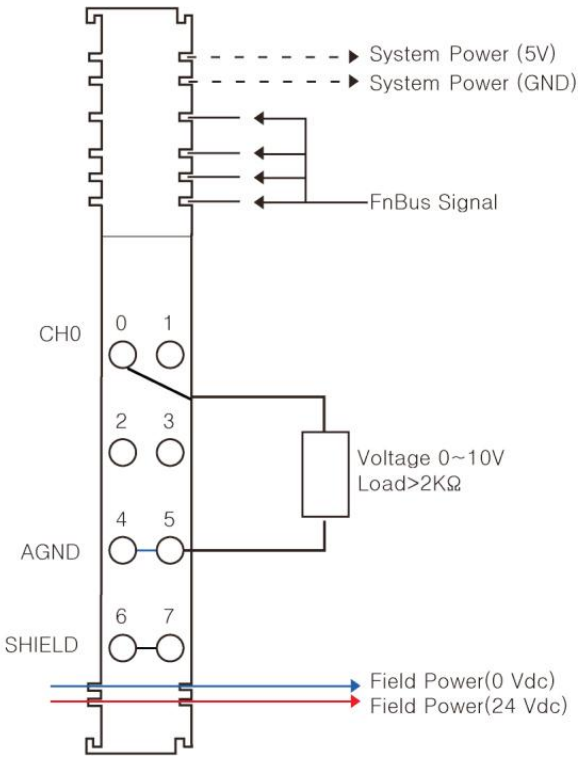
P1 Connector (Upper Connector) P2 Connector (Lower Connector)

Pin No.	Description	Pin No.	Description
1	Output Channel 0	1	Output Channel 2
2	Field Ground 0V(AGND), Common	2	Field Ground 0V(AGND), Common
3	Output Channel 1	3	Output Channel 3
4	Field Ground 0V(AGND), Common	4	Field Ground 0V(AGND), Common

Voltage	0V	2.5V	5V	10V
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

3.1.9. ST-4491



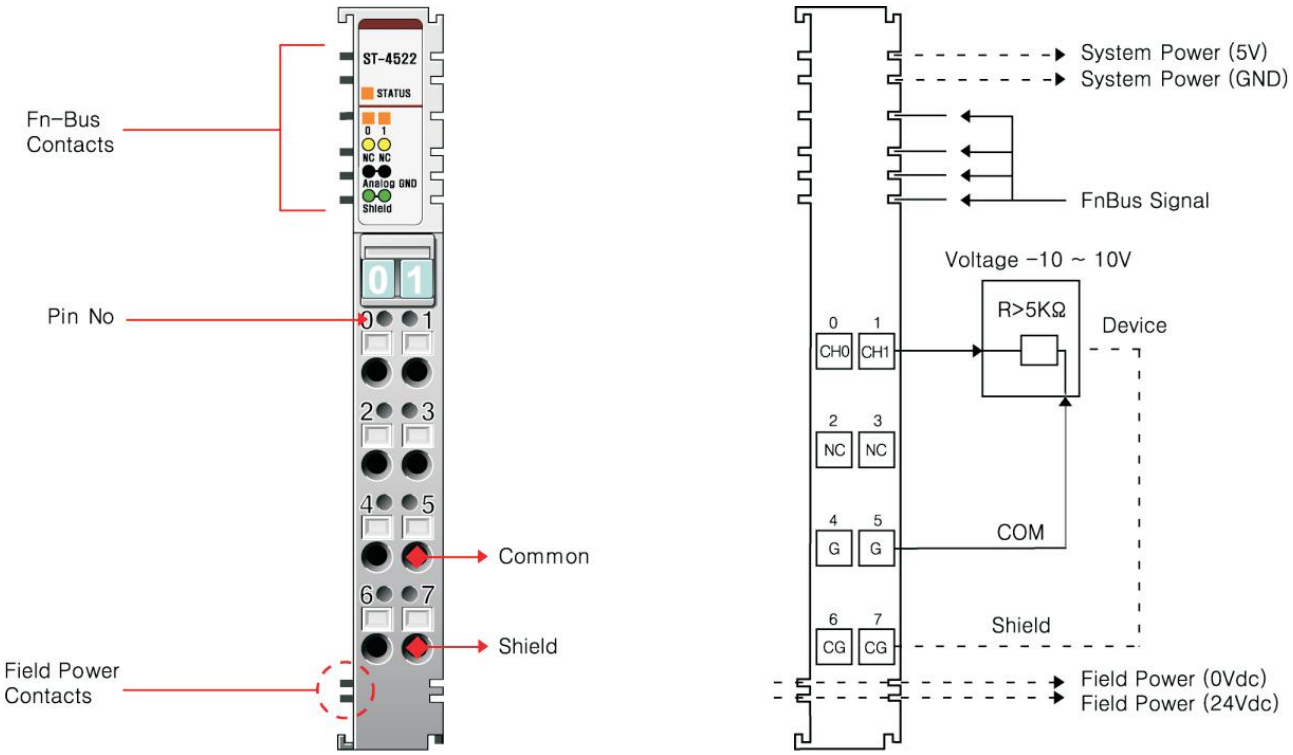


Pin No.	Description	Pin No.	Description
0	**Output Channel 0**	**1**	**-**
2	**-**	**3**	**-**
4	**AGND**	**5**	**AGND**
6	**Shield**	**7**	**Shield**

Voltage	0V	2.5V	5V	10V
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

Switch is	Status	Description
Auto	Auto	
Manual	Manual for Ch0	Ch0 Analog Output vary according to the potentiometer

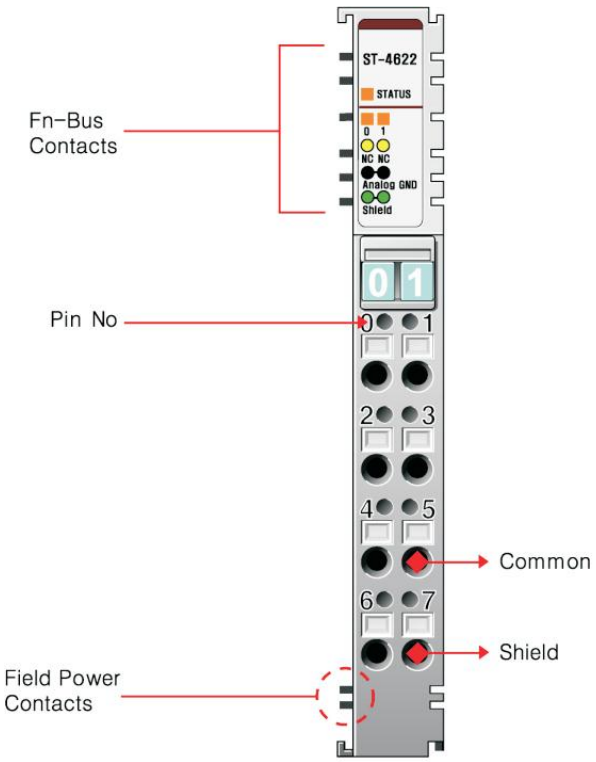
3.1.10. ST-4522

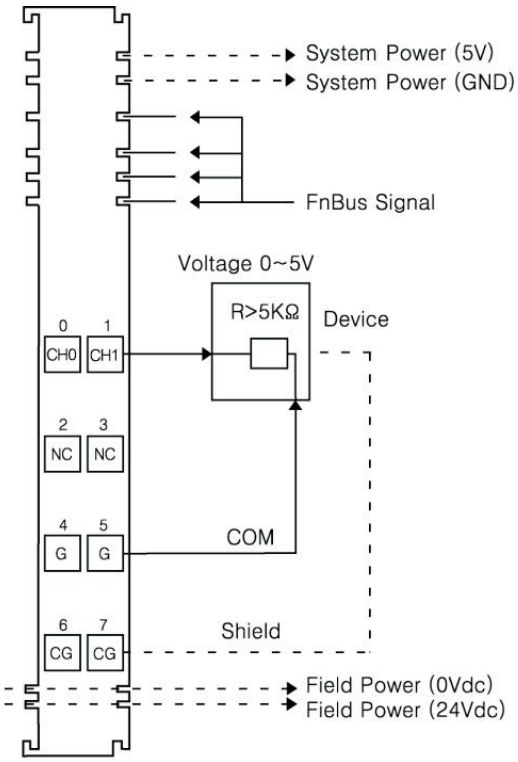


Pin No.	Description	Pin No.	Description
0	Output Channel 0	1	Output Channel 1
2	No Connection	3	No Connection
4	Output Channel Common (0V)	5	Output Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

Voltage	-10V	-5V	0V	5V	10V
Data(Hex)	H F800	H FC00	H 0000	H 03FF	H 7FFF

3.1.11. ST-4622

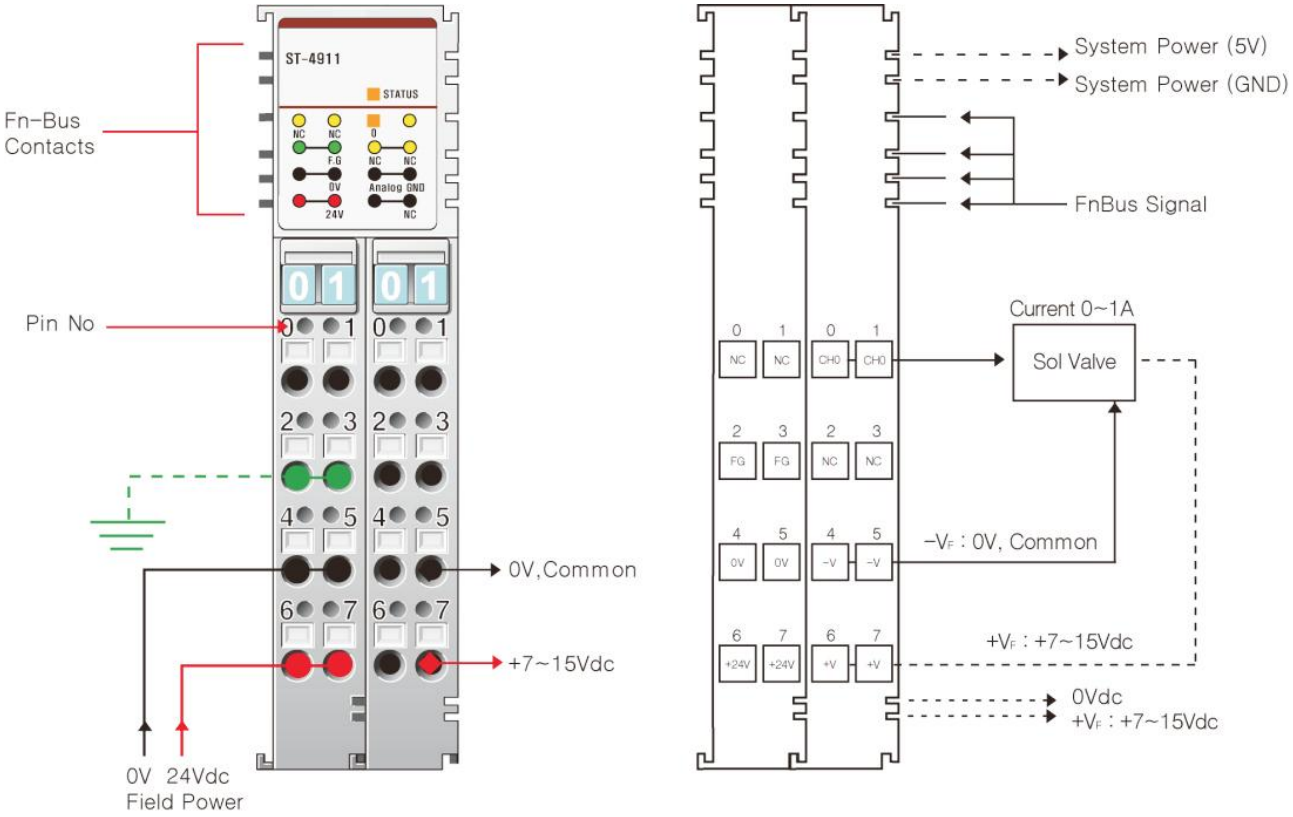




Pin No.	Description	Pin No.	Description
1	Output Channel 0	1	Output Channel 1
2	No Connection	2	No Connection
3	Output Channel Common(0V)	3	Output Channel Common(0V)
4	Chassis Ground / Shield	4	Chassis Ground / Shield

Voltage	0V	2V	4V	5V
Data(Hex)	H 0000	H 0666	H 0CCC	H 0FFF

3.1.12. ST-4911



Signal for Left Terminal

Pin No.	Description	Pin No.	Description
0	No Connector	1	No Connector
2	FG	3	FG
4	Field Ground (0V), Common	5	Field Ground (0V), Common
6	Field Power (+24V)	7	Field Power (+24V)

Signal for Right Terminal

Pin No.	Description	Pin No.	Description
0	Output Channel 0	1	Output Channel 0
2	No Connector	3	No Connector
4	0V, Common	5	0V, Common
6	+7~15V	7	+7~15V

Current	0A	0.25A	0.5A	1A
Data(Hex)	H 0000	H 03FF	H 07FF	H 0FFF

3.2. Environment Specification

Environmental Specifications	
Operating Temperature	-20 to 60℃ (Discrete I/O) 0 to 60℃ (Analog I/O)
Non-Operating Temperature	-40℃ to 85℃
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-4112

Items	Specification
Output Specification	
Outputs Per Module	2Channels single ended, Non-isolated between channels
Indicators	2 Green States, 1 Green/Red FnBUS State
Resolution in Ranges	12 bits : 4.88uA/Bit
Output Current Range	0 ~ 20mA
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @0℃ , 60℃
Load Resistance	Max. 500Ω
Conversion Time	2msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	2Channels / 2COM (Single Channel)
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 15~28.8Vdc Power Dissipation: Max. 60mA @24Vdc
Wiring	I/O Cable Max. 2.0 ㎟
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.2. ST-4114

Items	Specification
Output Specification	
Outputs Per Module	4Channels single ended
Indicators	1 Green/Red FnBus State
Resolution in Ranges	12 bits : 4.88uA/Bit
Output Current Range	0 ~ 20mA
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃(100uA~20mA) ±0.25% Full Scale @25℃(0uA~100uA) ±0.3% Full Scale @0℃, 60℃
Load Resistance	Max. 500Ω
Conversion Time	4msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	4Common, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 18~28.8Vdc Power Dissipation: Max. 60mA @24Vdc
Wiring	I/O Cable Max. 2.0 ㎟
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.3. ST-4212

Items	Specification
Output Specification	
Outputs Per Module	2Channels single ended, Non-isolated between channels
Indicators	2 Green States, 1 Green/Red FnBUS State
Resolution in Ranges	12 bits : 3.9uA/Bit
Output Current Range	4 ~ 20mA
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @0℃ , 60℃
Load Resistance	Max. 500Ω
Conversion Time	2msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	2Channels / 2COM (Single Channel)
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 15~28.8Vdc Power Dissipation: Max. 60mA @24Vdc
Wiring	I/O Cable Max. 2.0 ㎟
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.4. ST-4214

Items	Specification
Output Specification	
Outputs Per Module	4Channels single ended
Indicators	1 Green/Red FnBus State
Resolution in Ranges	12 bits : 3.9uA/Bit
Output Current Range	4 ~ 20mA
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @0℃ , 60℃
Load Resistance	Max. 500Ω
Conversion Time	4msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Common, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 18~28.8Vdc Power Dissipation: Max. 60mA @24Vdc
Wiring	I/O Cable Max. 2.0 ㎟
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.5. ST-4274

Items	Specification
Output Specification	
Outputs Per Module	4Channels single ended
Indicators	1 Green/Red FnBus State
Resolution in Ranges	12 bits : 3.9uA/Bit
Output Current Range	4 ~ 20mA
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @-20℃, 60℃, TBD (If the module operates at temp. 60℃ environment, then the total output is limited to 80%(Hex : 0xCCC)
Load Resistance	Max. 500Ω
Conversion Time	1.2msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	Nothing in the module terminal, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 40mA @ 5.0Vdc, TBD
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 20~26Vdc Power Dissipation: Max. 20mA @24Vdc, TBD
Wiring	3M Mini-Clamp Socket, 4pin, 37204-62A3-004PL Matching Connector : 3M Mini-Clamp Plug, 37104 Series AWG#20~22 available
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.6. ST-4422

Items	Specification
Output Specification	
Outputs Per Module	2Channels single ended, Non-isolated between channel
Indicators	2 Green States, 1 Green/Red FnBUS State
Resolution in Ranges	12 bits : 2.44mV/Bit
Output Current Range	0 ~ 10Vdc
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @0℃ , 60℃
Load Resistance	Min. 5kΩ
Conversion Time	2msec / All Channel
Calibration	Not Required
Diagnostic	No
Common Type	2Channels / 2COM (Single Common)
General Specification	
Power Dissipation	Max.155mA @ 5.0Vdc
Power Supply	From System Power DC/DC
Isolation	I/O to Logic : Photocoupler Isolation Field power : Not Connected
Wiring	I/O Cable Max. 2.0 ㎟
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.7. ST-4424

Items	Specification
Output Specification	
Outputs Per Module	4Channels single ended
Indicators	1 Green/Red FnBus State
Resolution in Ranges	12 bits : 2.44mV/Bit
Output Current Range	0 ~ 10Vdc
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @-20℃, 60℃,
Load Resistance	Min. 2kΩ
Conversion Time	4 msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Common,, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 18~28.8Vdc Power Dissipation: Max. 60mA @24Vdc
Wiring	I/O Cable Max. 2.0 ㎟(AWG#14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.8. ST-4474

Items	Specification
Output Specification	
Outputs Per Module	4Channels single ended
Indicators	1 Green/Red FnBus State
Resolution in Ranges	12 bits : 2.44mV/Bit
Output Current Range	0 ~ 10Vdc
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @-20℃, 60℃,
Load Resistance	Min. 200kΩ
Conversion Time	1.2 msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	Nothing in the module terminal, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 20~26Vdc Power Dissipation: Max. 80mA @24Vdc
Wiring	3M Mini-Clamp Socket, 4pin, 37204-62A3-004PL Matching Connector : 3M Mini-Clamp Plug, 37104 Series AWG#20~22 available
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.9. ST-4491

Items	Specification
Output Specification	
Outputs Per Module	1Channels single ended
Indicators	1 Green/Red FnBus State
Resolution in Ranges	12 bits : 2.44mV/Bit
Output Current Range	0 ~ 10Vdc
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @-20℃, 60℃,
Load Resistance	Min. 2kΩ
Conversion Time	1.2 msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	2 Common / Module
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation
Field Power	Not used, Field Power by pass to next expansion module
Wiring	I/O Cable Max. 2.0 ㎟(AWG#14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.10. ST-4522

Items	Specification
Output Specification	
Outputs Per Module	2Channels single ended, Non-isolated between channel
Indicators	2 Green States, 1 Green/Red FnBUS State
Resolution in Ranges	12 bits : 4.88mV/Bit
Output Current Range	-10 ~ 10Vdc
Data Format	16bits Integer (2‘compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @-20℃, 60℃,
Load Resistance	Min. 5kΩ
Conversion Time	2 msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	2Channels / 2COM(Single common)
General Specification	
Power Dissipation	Max. 155mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation I/O to Field Power : Not Connected
Power Supply	From System Power DC/DC
Wiring	I/O Cable Max. 2.0 ㎟(AWG#14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

3.3.11. ST-4622

Items	Specification
Output Specification	
Outputs Per Module	2Channels single ended, Non-isolated between channel
Indicators	2 Green States, 1 Green/Red FnBUS State
Resolution in Ranges	12 bits : 1.22mV/Bit
Output Current Range	0 ~ 5Vdc
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @-20℃, 60℃,
Load Resistance	Min. 5kΩ
Conversion Time	2 msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	2Channels / 2COM(Single common)
General Specification	
Power Dissipation	Max. 155mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation I/O to Field Power : Not Connected
Power Supply	From System Power DC/DC
Wiring	I/O Cable Max. 2.0 ㎟(AWG#14)
Weight	70g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

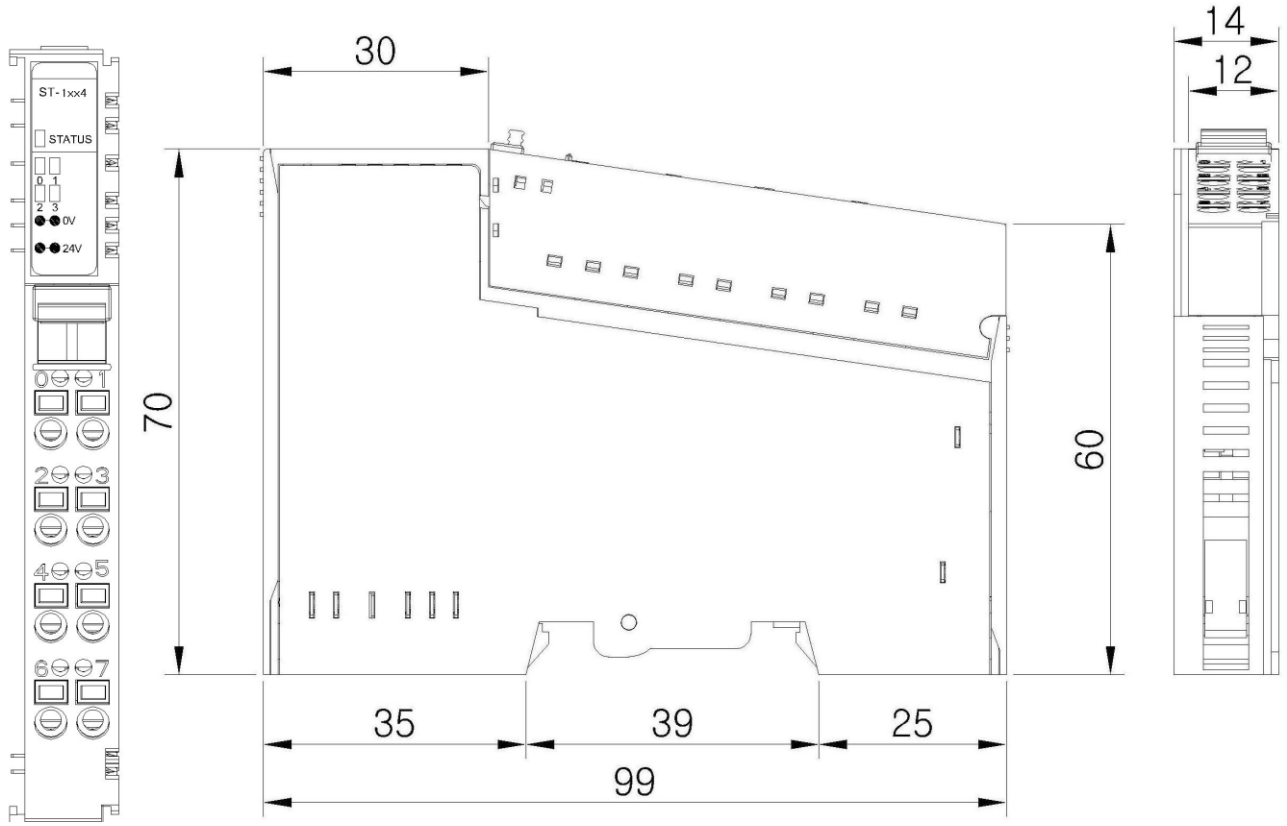
3.3.12. ST-4911

Items	Specification
Output Specification	
Outputs Per Module	1Channel single ended, Non-isolated
Indicators	1 Green FnBUS State, 1 Green/Red Output Channel State
Resolution in Ranges	12 bits : 2.44mV/Bit
Output Current Range	0 ~ 1 A
Data Format	16bits Integer (2'compliment)
Module Error	±0.1% Full Scale @25℃ ±0.3% Full Scale @-20℃, 60℃,
Load Resistance	13Ω, ±5%
Conversion Time	1 msec / All channel
Calibration	Not Required
Diagnostic	No
Common Type	1 Channel / 2Common (Field Power 0V)
General Specification	
Power Dissipation	Max. 60mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation I/O to Field Power : Non-Isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 15~28Vdc Power Dissipation : Max.60mA@24Vdc
Wiring	I/O Cable Max. 2.0 ㎟(AWG#14)
Weight	140g
Module Size	24mm x 99mm x 70mm
Environment Condition	Refer to " Environment Specification"(page : 20)

4. Dimension

4.1. ST-4xx1, ST-4xx2, ST-4xx4

(mm)



5. Mapping Data into the image Table

5.1. ST-4xx2

Output Module Date

-4byte Output Data

Analog Output Ch 0
Analog Output Ch 1

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch 0 Low byte							
Byte 1	Analog Output Ch 0 High byte							
Byte 2	Analog Output Ch 1 Low byte							
Byte 3	Analog Output Ch 1 High byte							

5.2. ST-4xx4

Output Module Date

-8byte Output Data

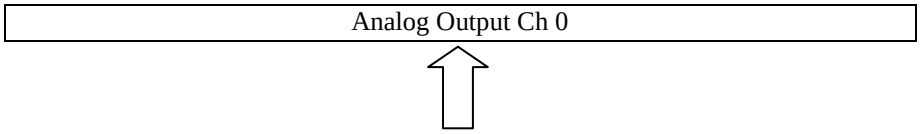
Analog Output Ch 0
Analog Output Ch 1
Analog Output Ch 2
Analog Output Ch 3

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch 0 Low byte							
Byte 1	Analog Output Ch 0 High byte							
Byte 2	Analog Output Ch 1 Low byte							
Byte 3	Analog Output Ch 1 High byte							
Byte 4	Analog Output Ch 2 Low byte							
Byte 5	Analog Output Ch 2 High byte							
Byte 6	Analog Output Ch 3 Low byte							
Byte 7	Analog Output Ch 3 High byte							

5.3. ST-4911

Output Module Data
-2byte Output Data



Output Image Value
Output Module Data

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch 0 Low byte							
Byte 1	Analog Output Ch 0 High byte							

5.4. ST-4274, ST-4474

IO Output
Image Data - 8 byte

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Ch#0 Conversion Data Low byte							
Byte 1	Ch#0 Conversion Data High byte							
Byte 2	Ch#1 Conversion Data Low byte							
Byte 3	Ch#1 Conversion Data High byte							
Byte 4	Ch#2 Conversion Data Low byte							
Byte 5	Ch#2 Conversion Data High byte							
Byte 6	Ch#3 Conversion Data Low byte							
Byte 7	Ch#3 Conversion Data High byte							

Configuration
Parameter Data-4byte

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Ch#3 Fault Action		Ch#2 Fault Action		Ch#1 Fault Action		Ch#0 Fault Action	
	Fault Action 00b : Fault Value (* All Channels use the same fault value) 01b : Hold Last Value 10b : Low Limit 11b : High Limit							
1	Reserved							
2	Ch#0~3 Fault Value Low							
3	Ch#0~3 Fault Value High							

5.5. ST-4491

Input Image Value

-4byte

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	-	-	-	-	-	-	-	Ch#0
	Auto/manual detection 0b : Ch# Auto 1b : Ch#0 Manual							
Byte 1	Reserved							
Byte 2	Ch#0 Manual Low byte							
Byte 3	Ch#0 Manual High byte							

Output Image Value

-2byte

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Ch#0 Conversion Data Low byte							
Byte 1	Ch#0 Conversion Data High byte							

Configuration Parameter

-4byte

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	-	-	-	-	-	-	Ch#0 Fault Action	
	Fault Action 00b : Fault Value 01b : Hold Last Value 10b : Low Limit 11b : High Limit							
Byte 1	Reserved							
Byte 2	Ch#0 Manual Low byte							
Byte 3	Ch#0 Manual High byte							

6. Trouble Shooting

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.

6.1. Normal Module

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