

A photograph of an industrial facility with several large white storage tanks and smokestacks emitting smoke against a blue sky.

User Manual
FnIO S-Series
Analog Input Module

**List of Revisions**

No.	Date	Version	Revision
1	2007.12.15	1.00	created



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1. Product Specifications

1) Environment Specifications

Item		Specifications	Remarks
Temperature	Operating	0°C to +60°C (32°F to 140°F)	
	Storage	-40°C to +85°C (-40°F to 185°F)	
Humidity	Operating	5 to 90% RH (Non-condensing)	
	Storage	5 to 90% RH (Non-condensing)	
Operating Altitude		2,000m	
Mounting		DIN Rail	

2) General Specifications

Item		Specifications	Remarks
Wiring I/O Cable		Max. 2.0m ² , AWG 14	
Shock Operating		10G	
Shock Non-Operating		30G	
Vibration/Shock Resistance	Displacement	0.012 Inch p-p from 10~57Hz	
	Acceleration	2G's from 57~500Hz	
	Sweep Rate	1 octave per Minute	
	Axes to test	X, Y, Z	
	Frequency Sweep per Axis	10	
EMC		Confirms to EN-61000-6-2	
EMI		Confirms to EN-61000-6-4	
Installation Pos. / Protect. Class		Variable / IP20	
Certifications		UL, cUL, CE	

2. Current Input Module

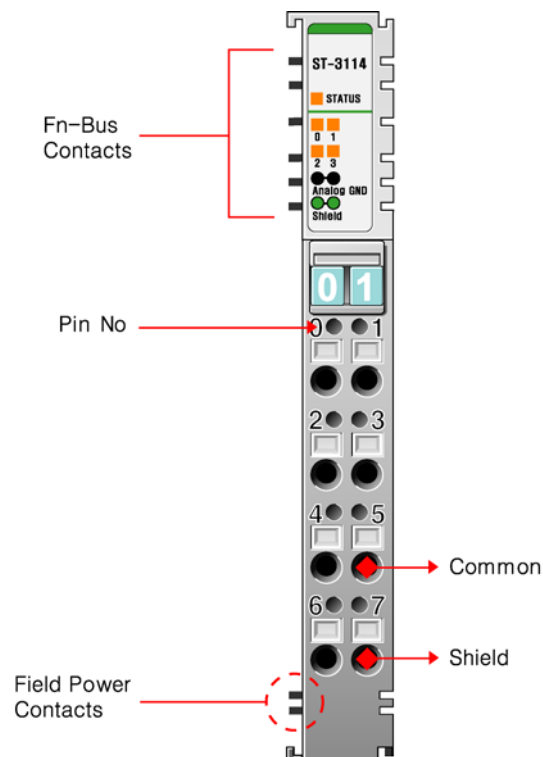
Description

- ST-31xx and ST-32xx series receive the standardized 0~20mA or 4~20mA of current value as a signal input .
- It has 5 LEDs for status. One is for FnBus, the other are for Field Device status.
- Each input channel is electrically isolated and has distribution capability of 12bit or 14bit.
- The conversion time of Analog Signal transferred from Field Device is 4ms each for all channel.
- It is isolated between Field I/O and FnBus by using Photo-coupler.
- It is operated regardless of Field Power supply. When the supplied Field Power has changed, absolutely the Expansion Field Power Supply (ST-7241) must be used.

1) ST-3114

- 0~20mA 4 channels Current Input Terminal Type, 12bits

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3

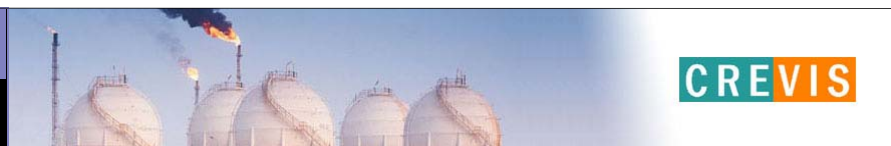


Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	12Bits : 4.88 μ A/bit
Input Current Range	0 ~ 20mA
Data Format	16bit Integer (2's compliment)
Module Error	$\pm 0.1\%$ Full Scale @ 25 ° C
	$\pm 0.3\%$ Full Scale @ 0 ° C, 60 ° C
Input Impedance	120ohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 165mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm x 99mm x 70mm



◆ Status LED Description

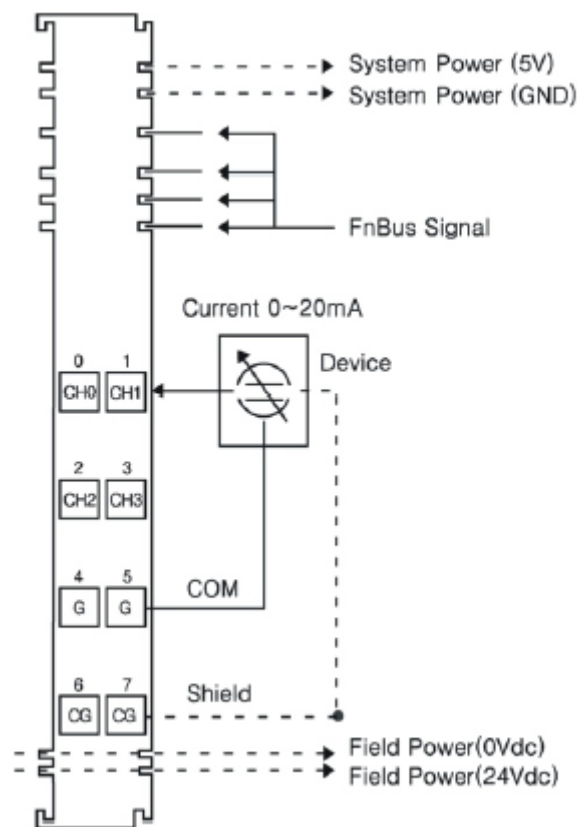
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram



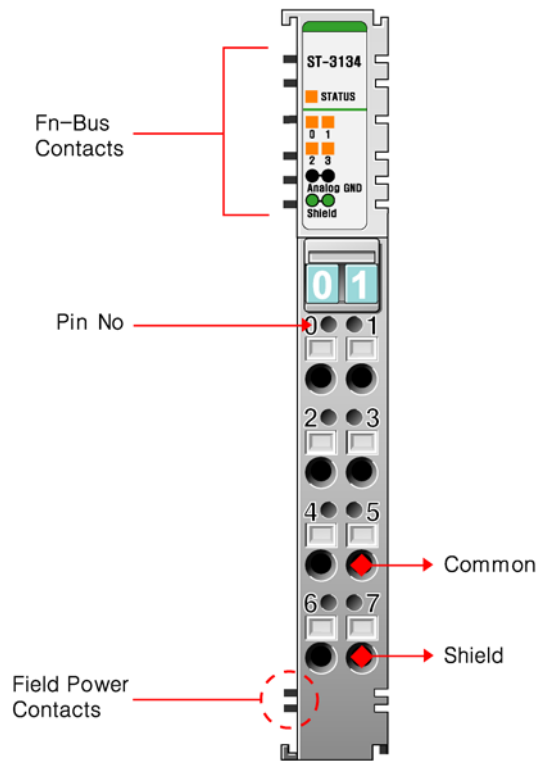
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

2) ST-3134

- 0~20mA 4 channels Current Input Terminal Type, 14bits

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	14Bits : 1.22 μ A/bit
Input Current Range	0 ~ 20mA
Data Format	16bit Integer (2's compliment)
Module Error	\pm 0.1% Full Scale @ 25 ° C
	\pm 0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	120ohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 165mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm x 99mm x 70mm

◆ Status LED Description

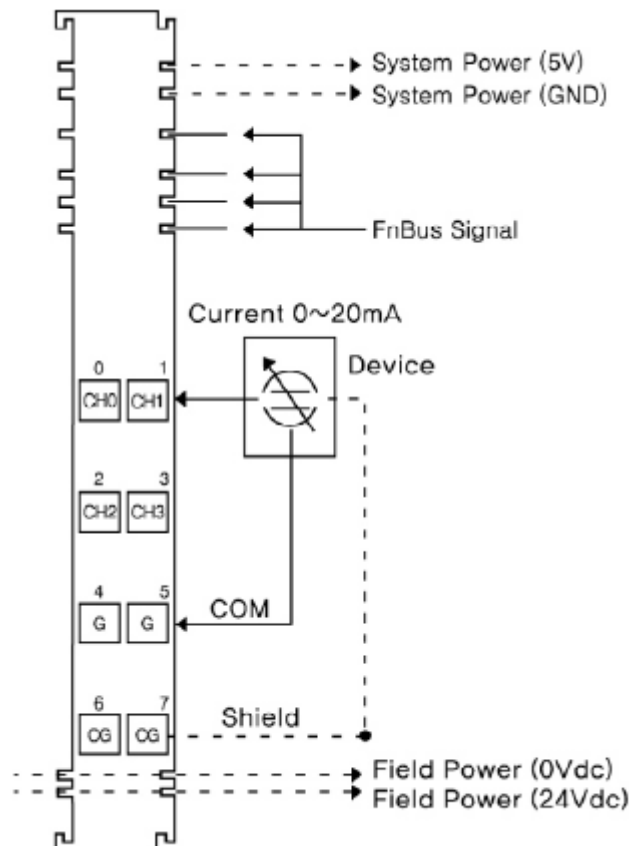
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram



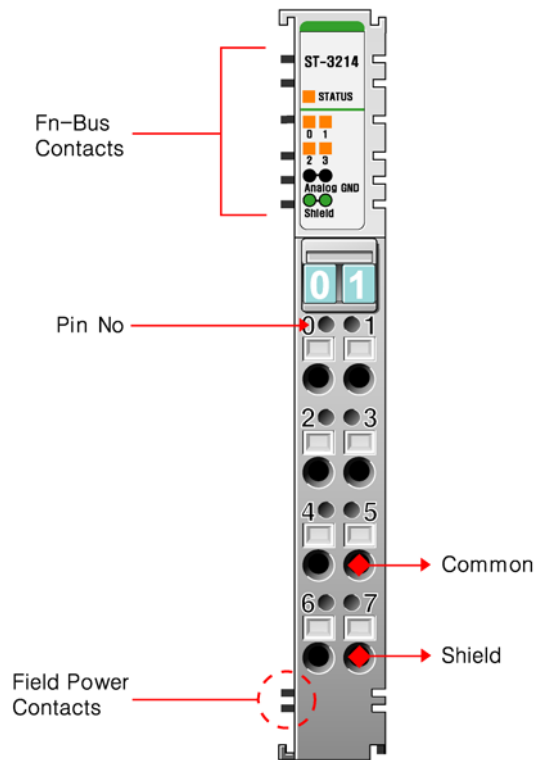
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

3) ST-3214

- 4~20mA 4 channels Current Input Terminal Type, 12bits

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	12Bits : 3.9 μ A/bit
Input Current Range	4 ~ 20mA
Data Format	16bit Integer (2's compliment)
Module Error	\pm 0.1% Full Scale @ 25 ° C
	\pm 0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	120ohm
Conversion Time	4msec/All channel
Calibration	Not Required
Dagnostic	Channel Open (if < 3mA, Data=0x8000)
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 165mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm x 99mm x 70mm

◆ Status LED Description

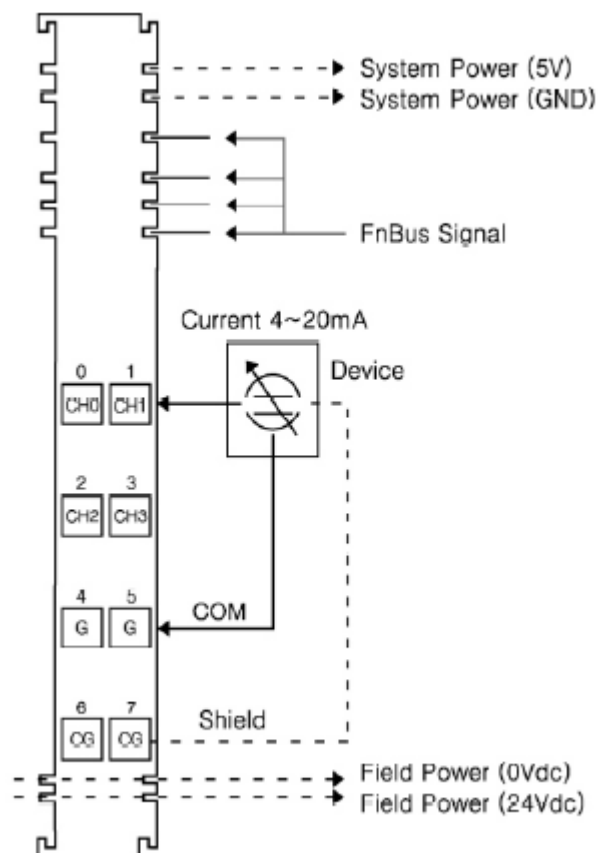
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram



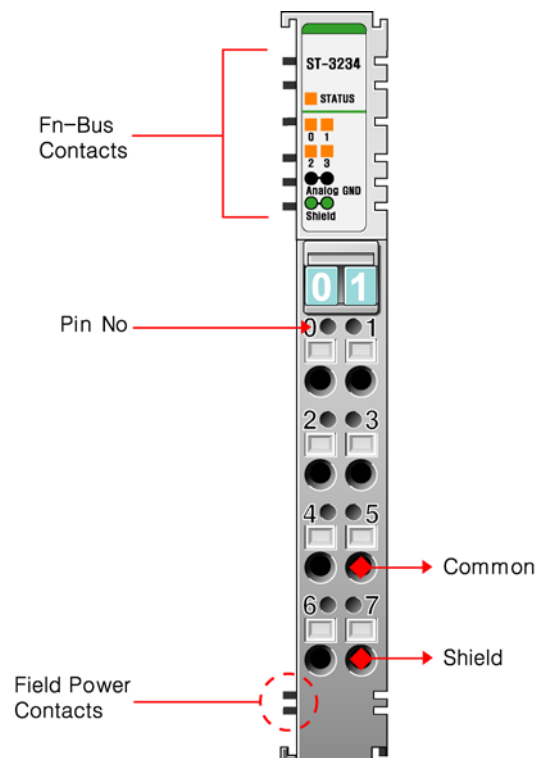
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

4) ST-3234

- 4~20mA 4 channels Current Input Terminal Type, 14bits

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification

Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	14Bits : 0.97 μ A/bit
Input Current Range	4 ~ 20mA
Data Format	16bit Integer (2's compliment)
Module Error	\pm 0.1% Full Scale @ 25 ° C
	\pm 0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	120ohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	Channel Open (if < 3mA, Data=0x8000)
Common Type	4 Channel / 1 COM

Module Specification

Power Supply	From System Power DC/DC
Power Dissipation	Max. 165mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm x 99mm x 70mm

◆ Status LED Description

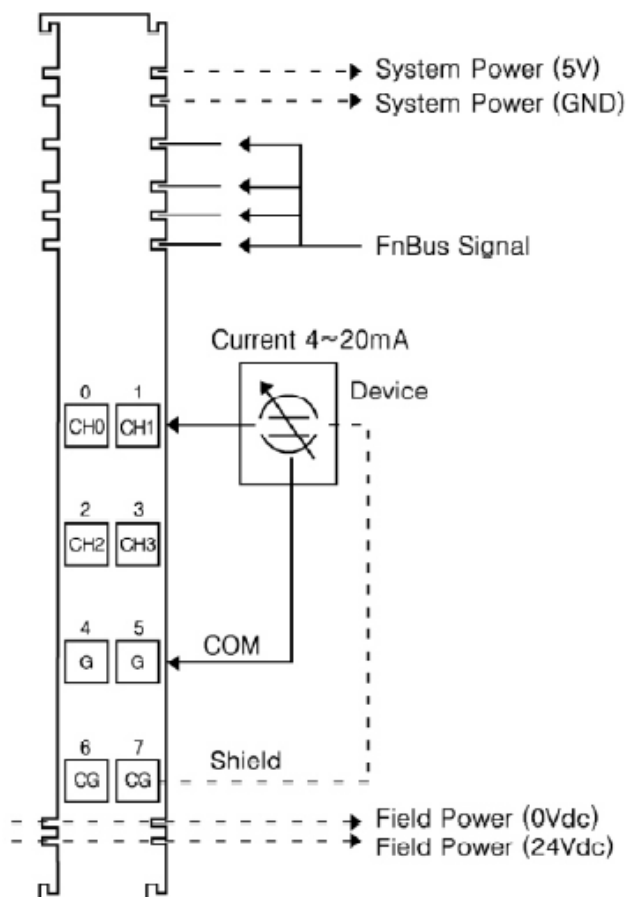
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram



**- Wiring Description**

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

3. Voltage Input Module

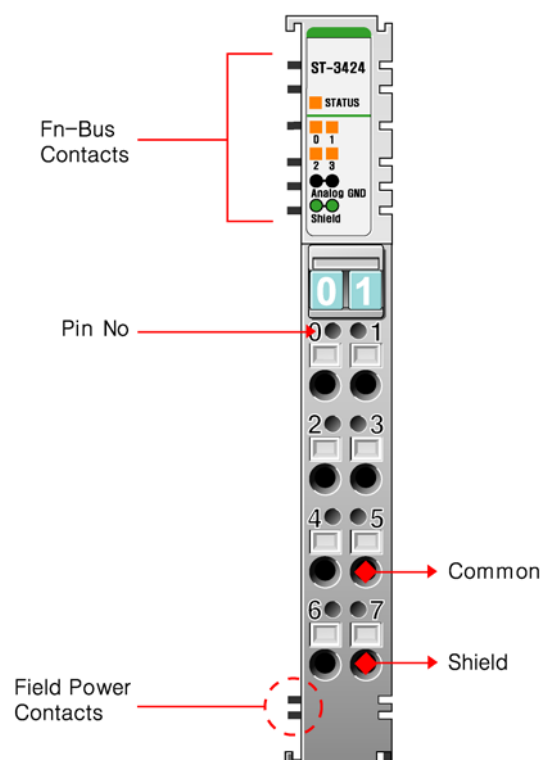
Description

- The ST-34xx, ST-35xx and ST-36xx series receive the standardized voltage value 0~10V, $\pm 10V$ or 0~5V as Signal.
- It has all 5 LEDs to indicate Status, one for FnBus and the others for Field Device.
- Each Channel is electrically isolated and has has distribution capability of 12bit or 14bit .
- The conversion time of Analog Signal transferred from Field Device is 4 ms each for all channel.
- It is isolated between Field I/O and FnBus by using Photo-coupler.
- It is operated regardless of Field Power supply. When the supplied Field Power has changed, absolutely the Expansion Field Power Supply(ST-7241) must be used.

1) ST-3424

- 0~10V 4 channels Voltage Input Terminal Type, 12bits

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	12Bits : 2.44mV/bit
Input Voltage Range	0Vdc to 10Vdc
Data Format	16bit Integer (2's compliment)
Module Error	±0.1% Full Scale @ 25 ° C
	±0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	500Kohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 165mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ Status LED Description

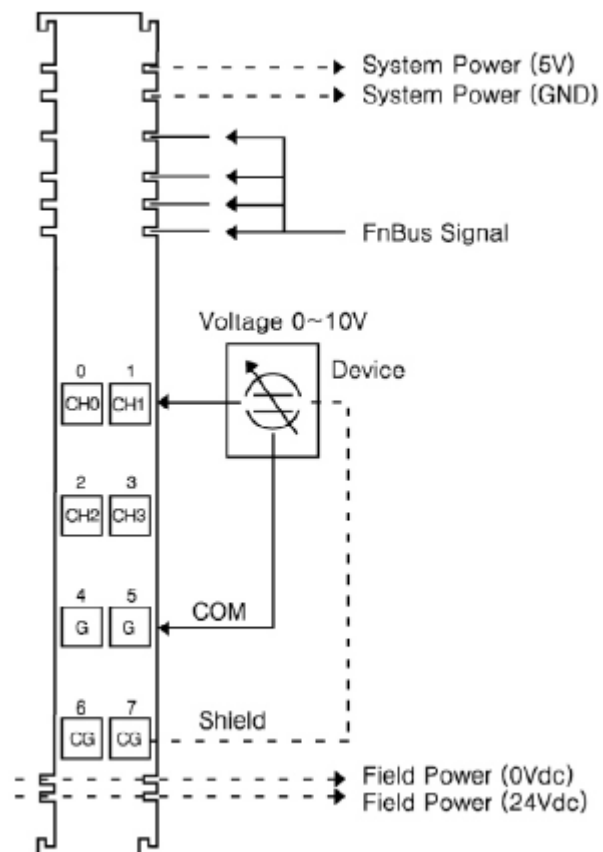
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram





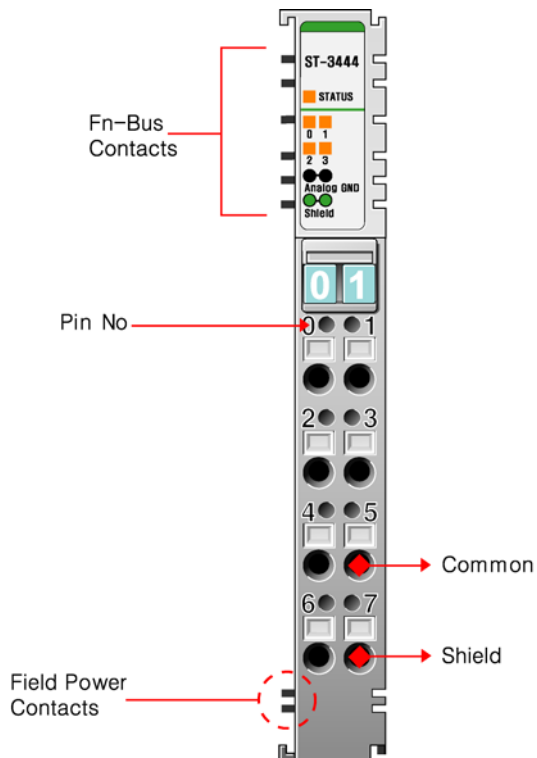
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

2) ST-3444

- 0~10V 4 channels Voltage Input Terminal Type, 14bits

◆ **Module View**



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	14Bits : 0.6mV/bit
Input Voltage Range	0Vdc to 10Vdc
Data Format	16bit Integer (2's compliment)
Module Error	±0.1% Full Scale @ 25 ° C
	±0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	500Kohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 170mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ Status LED Description

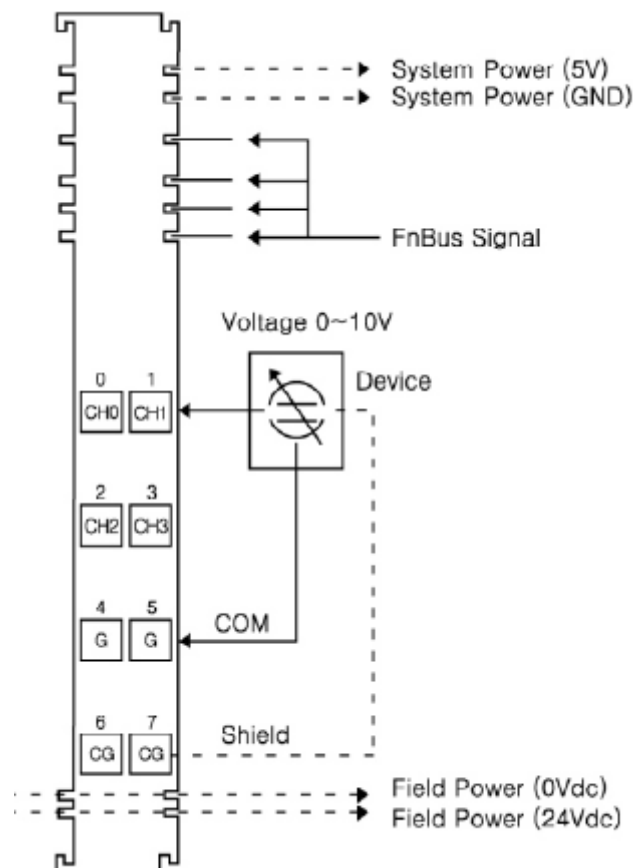
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram





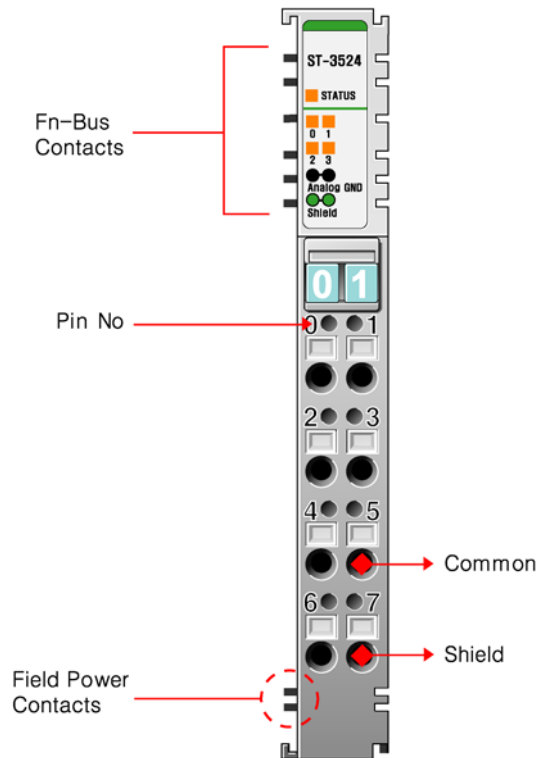
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

3) ST-3524

-10~+10V 4 channels Voltage Input Terminal Type, 12bits

◆ **Module View**



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	12Bits : 4.8mV/bit
Input Voltage Range	-10Vdc to 10Vdc
Data Format	16bit Integer (2's compliment)
Module Error	±0.1% Full Scale @ 25 ° C
	±0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	500Kohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 170mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ Status LED Description

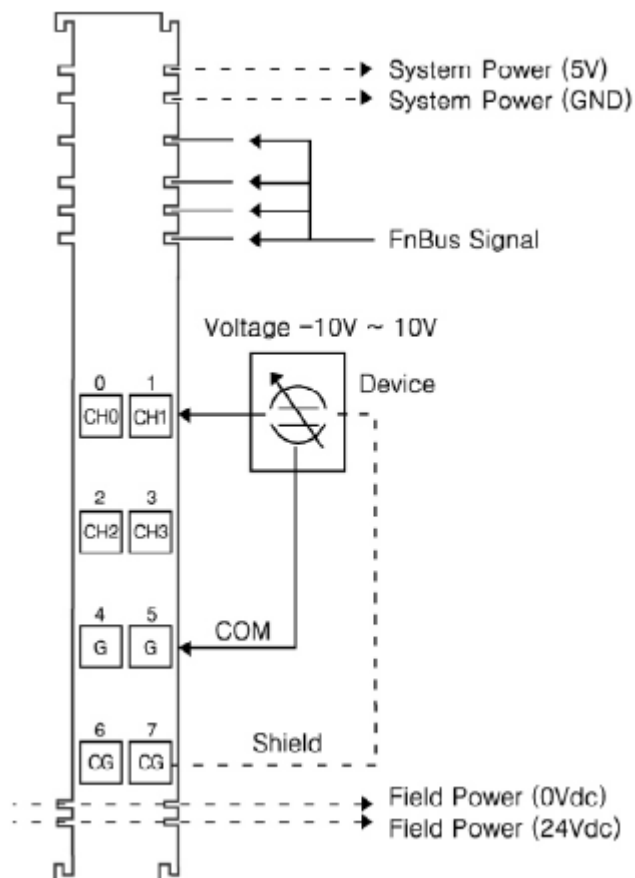
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram



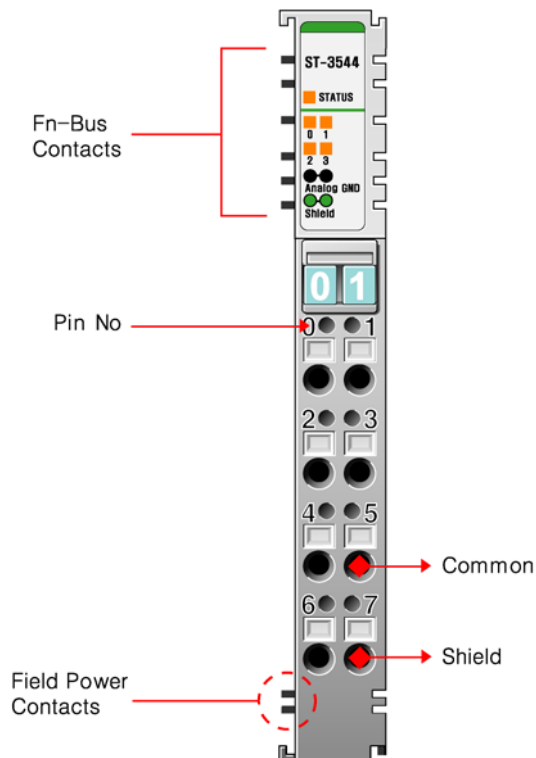
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

4) ST-3544

- -10~+10V 4 channels Voltage Input Terminal Type, 14bits

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	14Bits : 1.2mV/bit
Input Voltage Range	-10Vdc to 10Vdc
Data Format	16bit Integer (2's compliment)
Module Error	±0.1% Full Scale @ 25 ° C
	±0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	500Kohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 170mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ Status LED Description

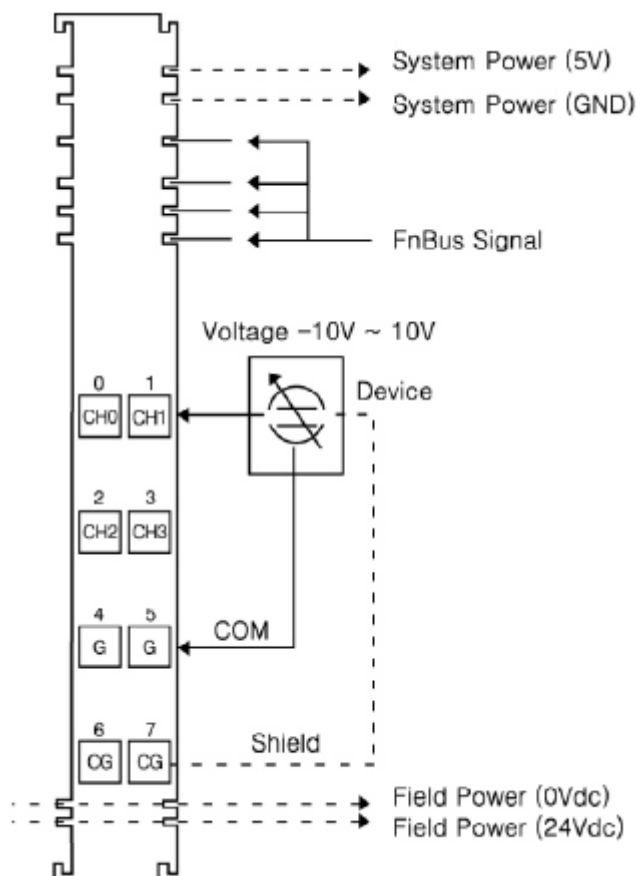
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram





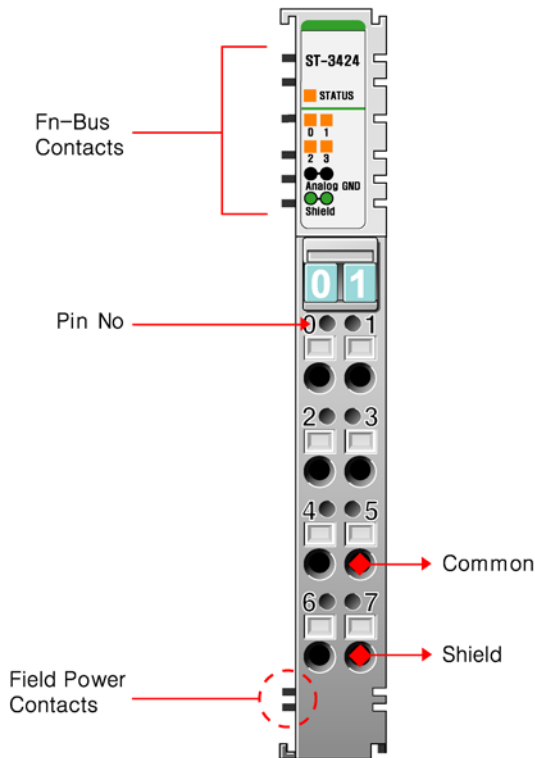
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

5) ST-3624

- 0~5V 4 channels Voltage Input Terminal Type, 12bits

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	12Bits : 1.22mV/bit
Input Voltage Range	0Vdc to 5Vdc
Data Format	16bit Integer (2's compliment)
Module Error	±0.1% Full Scale @ 25 ° C
	±0.3% Full Scale @ 0 ° C, 60 ° C
Input Impedance	500Kohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 170mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ Status LED Description

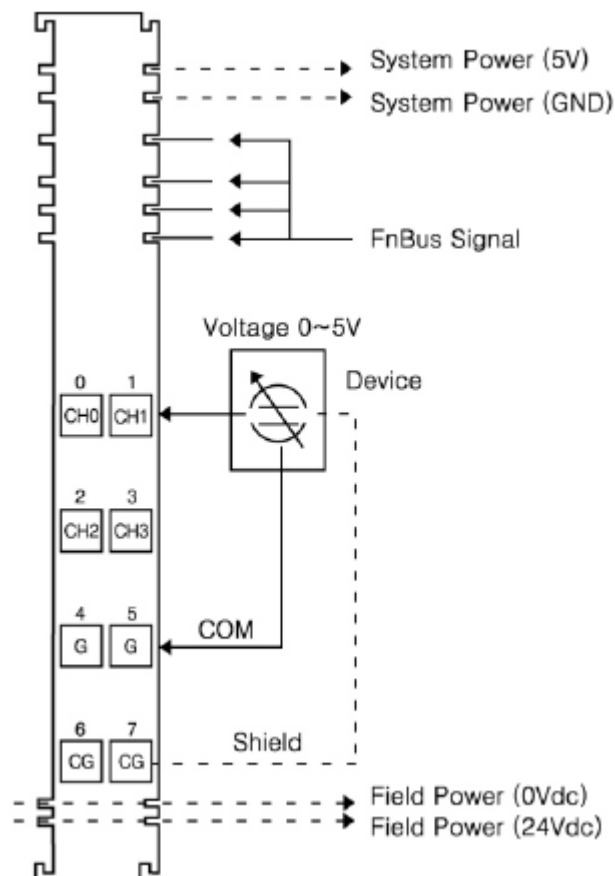
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram



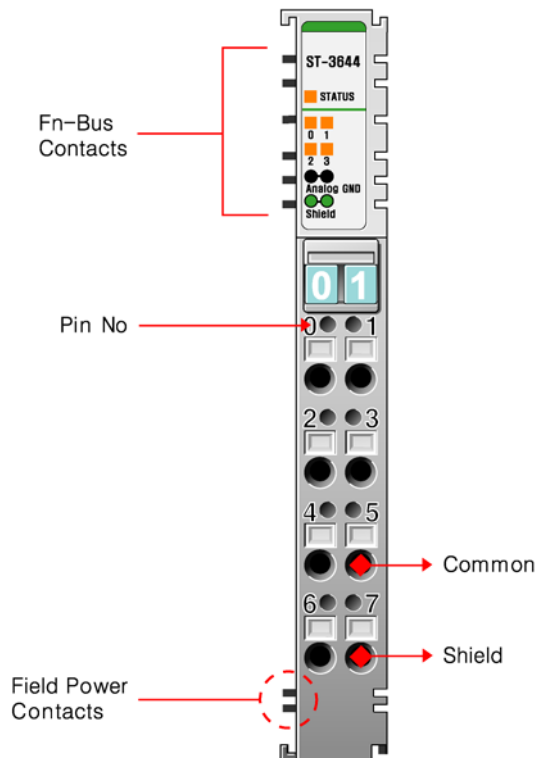
- Wiring Description

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

6) ST-3644

- 0~5V 4 channels Voltage Input Terminal Type, 14bits

◆ **Module View**



◆ Mapping Data into the image table

Input Module Data
- 4 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1
Analog Input Channel 2
Analog Input Channel 3



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							
Byte4	Analog Input Channel 2 Low Byte							
Byte5	Analog Input Channel 2 High Byte							
Byte6	Analog Input Channel 3 Low Byte							
Byte7	Analog Input Channel 3 High Byte							

◆ Specification

Input Specification	
Inputs per Module	4 Channel Single Ended
Indicators	4 Green/Red Input State, 1 Green/Red FnBus State
Resolution	14Bits : 0.3mV/bit
Input Voltage Range	0Vdc to 5Vdc
Data Format	16bit Integer (2's compliment)
Module Error	$\pm 0.1\%$ Full Scale @ 25 ° C
	$\pm 0.3\%$ Full Scale @ 0 ° C, 60 ° C
Input Impedance	500Kohm
Conversion Time	4msec/All channel
Calibration	Not Required
Diagnostic	No
Common Type	4 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 170mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ Status LED Description

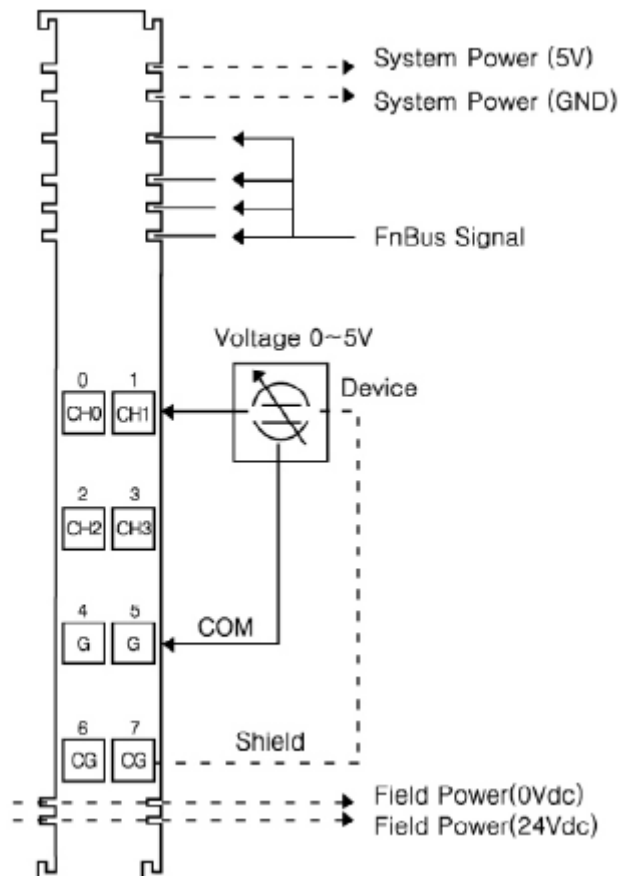
- Expansion Module Status LED

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- Channel Status LED

Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

◆ Module Wire Diagram



**- Wiring Description**

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 Common (0V)	5	Input Channel Common (0V)
6	Chassis Ground / Shield	7	Chassis Ground / Shield

4. Temperature Input Module

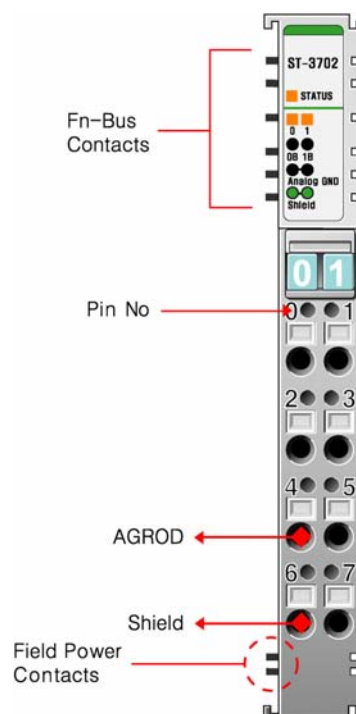
Description

- ST-37xx and ST-38xx series are Temperature Input Module.
- There are 3 LEDs for status. One is for FnBus ,the other are for Field Device status.
- 2 wire or 3 wire system for sensor connection is available, but 3 wire system is recommended.(ST-3702)
- The conversion time of Analog Signal transferred from Field Device is 200ms each for all channel.
- It is isolated between Field I/O and FnBus by using Photo-coupler.
- It is operated regardless of Field Power supply. When the supplied Field Power has changed, absolutely the Expansion Field Power Supply (ST-7241) must be used.

1) ST-3702

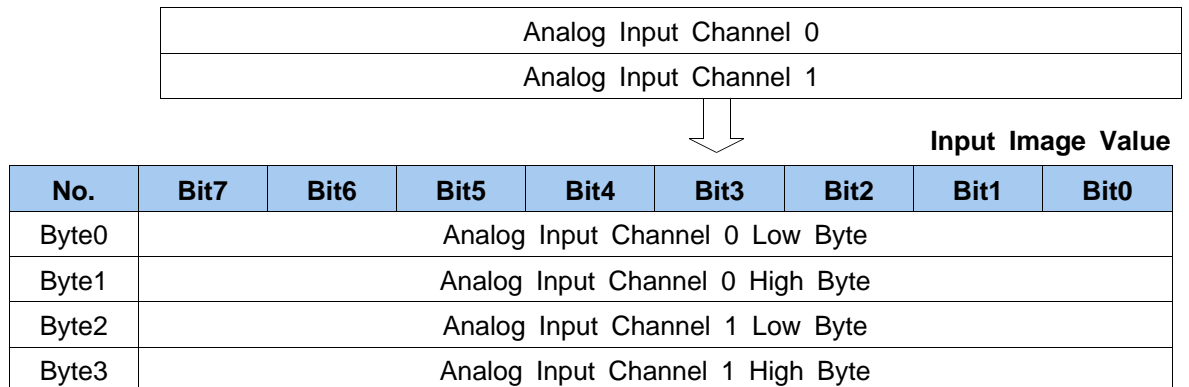
- 2 channels RTD/Resistance Input Terminal Type

◆ Module View



◆ Mapping Data into the image table

Input Module Data
- 2 Channels Analog Input Data



◆ Specification

Input Specification	
Inputs per Module	2 Channel Single Ended
Indicators	2 Green/Red Input State, 1 Green/Red FnBus State
Sensor Types	PT50, PT100, PT200, PT500, PT1000, JPT100, JPT200, JPT500, JPT1000, NI100, NI200, NI500, NI1000, NI120, NI1000LG, CU10, Resistance 100mΩ/bit, Resistance 10mΩ/bit, Resistance 20mΩ/bit
Dissolution ability	0.1 ° C/10mΩ
Data Format	16bit Integer (2's compliment)
Module Error	±0.1% Full Scale @ 25 ° C
	±0.3% Full Scale @ 0 ° C, 60 ° C
Conversion Time	200msec/All channel
Calibration	Not Required
Diagnostic	Range Over (if range over, Data=Dx8000)
Common Type	2 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 70mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ **Status LED Description**

- **Expansion Module Status LED**

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- **Channel Status LED**

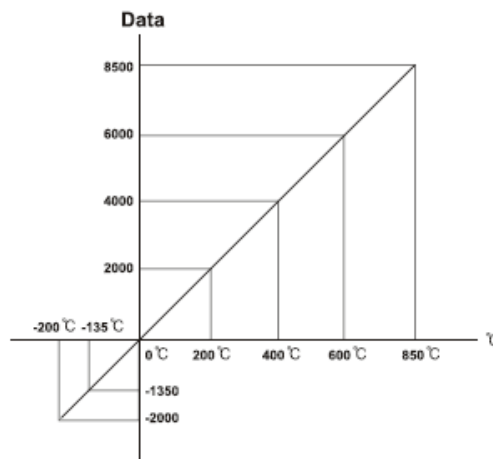
Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

- **Wiring Description**

Pin No.	Description	Pin No.	Description
0	Input Channel 0-A	1	Input Channel 1-A
2	Input Channel 0-B	3	Input Channel 1-B
4	Analog Ground	5	Analog Ground
6	Shield	7	Shield

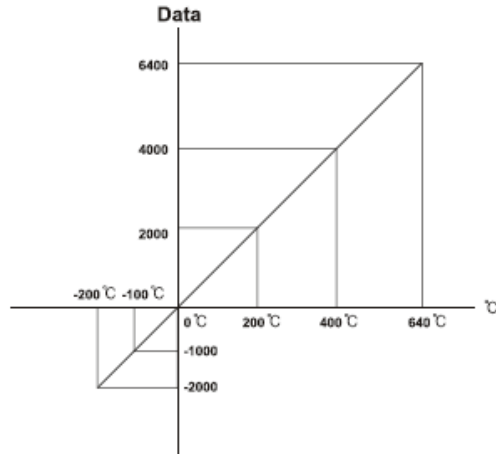
Sensor PT100

℃	-200℃	-100℃	0℃	200℃	400℃	600℃	850℃
Data(Hex)	HF830	HFC18	H0000	H07D0	H0FA0	H1770	H2134



Sensor JPT100

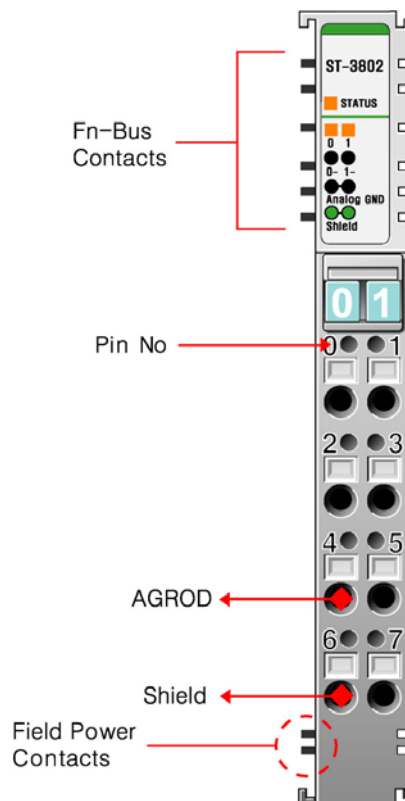
℃	-200℃	-100℃	0℃	200℃	400℃	640℃
Data(Hex)	HF830	HFC18	H0000	H07D0	H0FA0	H1900



2) ST-3802

- 2 channels Thermocouple/mV Input Terminal Type

◆ **Module View**



◆ Mapping Data into the image table

Input Module Data
- 2 Channels Analog Input Data

Analog Input Channel 0
Analog Input Channel 1



Input Image Value

No.	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Analog Input Channel 0 Low Byte							
Byte1	Analog Input Channel 0 High Byte							
Byte2	Analog Input Channel 1 Low Byte							
Byte3	Analog Input Channel 1 High Byte							

◆ Specification

Input Specification	
Inputs per Module	2 Channel Single Ended
Indicators	2 Green/Red Input State, 1 Green/Red FnBus State
Sensor Types	Type K/J/T/B/R/S/E/N/L/U/C/D, mV Input 10uV/Bit, 1uV/Bit, 2uV/Bit
Dissolution ability	0.1 ° C/10mΩ
Data Format	16bit Integer (2's compliment)
Module Error	±0.1% Full Scale @ 25 ° C
	±0.3% Full Scale @ 0 ° C, 60 ° C
Conversion Time	200msec/All channel
Calibration	Not Required
Diagnostic	Range Over (if range over, Data=Dx8000)
Common Type	2 Channel / 1 COM
Module Specification	
Power Supply	From System Power DC/DC
Power Dissipation	Max. 70mA @ 5.0Vdc
Isolation	I/O to Logic : Photo-coupler Isolation
	Field Power : Not Connected
Weight	70g
Size	12mm × 99mm × 70mm

◆ **Status LED Description**

- **Expansion Module Status LED**

State	LED is	To Indicate
Not Powered	Off	Device has no expansion module or may be not powered
No Initialized		The parameter is not initialized yet
FnBus Connection	Green	FnBus normal operation
FnBus Ready	Flashing Green	FnBus ready
FnBus Fault	Flashing Red	FnBus time out
		FnBus failed communication
Device Fault	Red	Device fault

- **Channel Status LED**

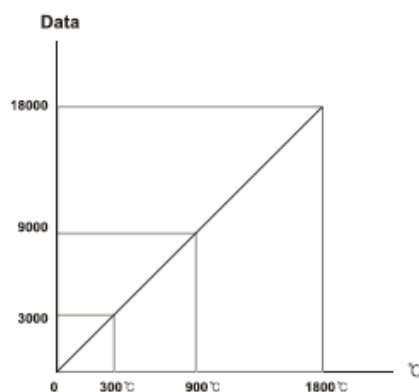
Input Command	LED is	Description
Nominal	Green	Normal operation
Channel Fault	Red	Channel open

- **Wiring Description**

Pin No.	Description	Pin No.	Description
0	Input Channel 0+	1	Input Channel 1+
2	Input Channel 0-	3	Input Channel 1-
4	Analog Ground	5	Analog Ground
6	Shield	7	Shield

Type B

℃	0℃	300℃	900℃	1800℃
Data(Hex)	H0000	H0BB8	H2328	H4650





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