PACSystems RSTi Solution Guide

Compact Distributed Slice I/O

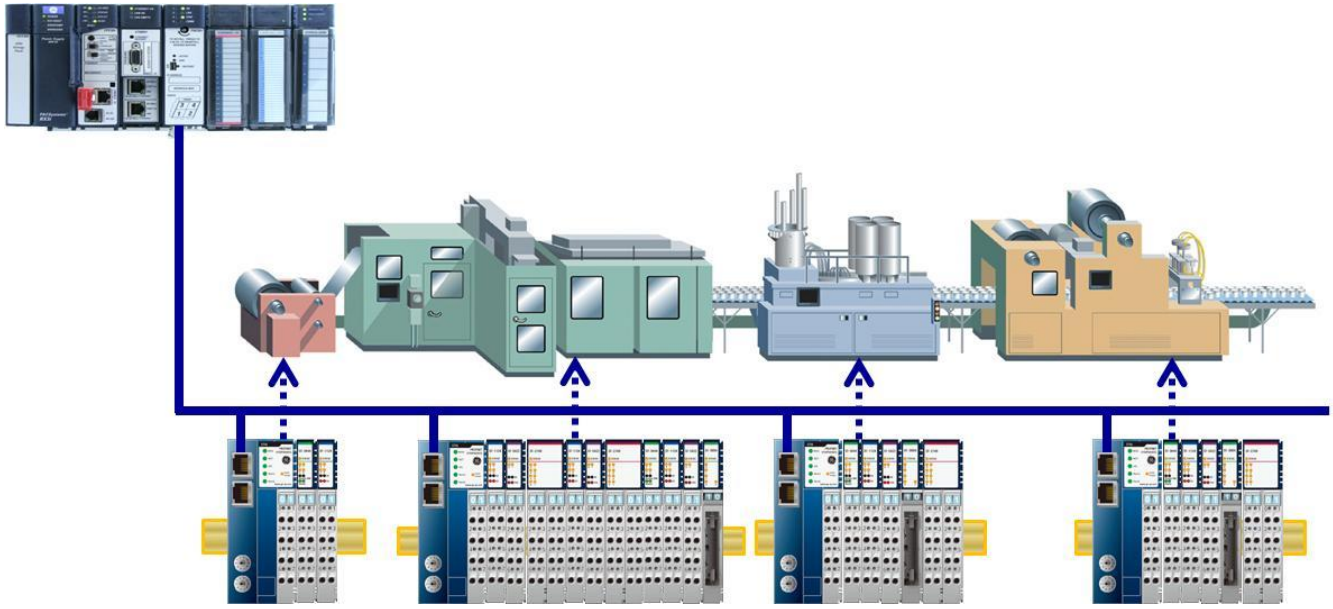
March 2012

Table of Content

Introduction to RSTi	Page 3
Configuration Tools	Page 8
Specifications and Reference Manuals	Page 10
RSTi Part Numbers	Page 11
Sample RSTi Configuration	Page 13
PROFINET Network Interface Specifications and Drawing	Page 14
Profibus DP Network Interface Specifications and Drawing	Page 15
DeviceNet Network Interface Specifications and Drawing	Page 16
Modbus TCP Network Interface Specifications and Drawing	Page 17
Modbus Serial RS-232 Network Interface Specifications and Drawing	Page 18
Modbus Serial RS-485 Network Interface Specifications and Drawing	Page 19
Ethernet IP Network Interface Specifications and Drawing	Page 20
EtherCAT Network Interface Specifications and Drawing	Page 21
CANOpen Network Interface Specifications and Drawing	Page 22
CC-Link Network Interface Specifications and Drawing	Page 23
Discrete Inputs Specifications and Drawings	Page 24
Discrete Outputs Specifications and Drawings	Page 27
Analog Inputs Specifications and Drawings	Page 30
Analog Outputs Specifications and Drawings	Page 33
Serial Communications Module Specifications and Drawings	Page 36
Motion Modules – High Speed Counting Specifications and Drawings	Page 38
Motion Modules – PWM and Pulse Train Specifications and Drawings	Page 40
System Modules – Power Distribution, Bus Power Booster	Page 42

RSTi Distributed Slice I/O

RSTi Distributed I/O Reduces Panel Size, Provides High Performance and Lowers Installation Cost



The RSTi family of PROFINET based granular I/O is part of GE Intelligent Platforms High Performance Platform strategy, that leverages industry standards along with our experience in embedded technology and automation to deliver long-life, higher performance solutions, that are easy to configure, manage and upgrade.

Equipment builders are continuously looking for ways to improve the performance of their equipment while augmenting usability and reducing size and complexity. These requirements extend to the control system. With PACSystems GE provides high performance control solutions with best-in-class integration of distributed (networked) I/O ideally suited for demanding applications. The RSTi line of I/O extends the capabilities of the PROFINET enabled GE solution with the addition of a comprehensive line of granular slice I/O that allows customers to simplify panel design and reduce the overall size of the control panel while benefiting from the performance, maintainability & upgradeability of the PACSystems platform.

By choosing GE, customers gain access to a highly versatile, extremely robust and complete line of slice I/O modules with seamless integration into the PAC Systems control family, with its industry leading innovation, performance & reliability characteristics.

Centralized I/O Challenges verses Decentralized I/O Advantages

- **Cost:** Traditional control architectures require potentially hundreds of field device wires back to a centralized control cabinet which results in both high material and labor cost.
- **Complexity:** Running hundreds of device wires back to a central control cabinet makes assembly, disassembly, re-assembly, and commissioning of machine sections very complex and labor intensive. Adding additional devices to a commissioned system is also both labor and time consuming.
- **Signal Integrity:** There is an added risk of noise interference with centralized control systems. By mixing high voltage and low voltage signals in one conduit increase the risk of noise in low level devices causing unnecessary delays in debugging the root cause.
- **Lack of Granularity:** With hundreds of I/O wires coming back to a central cabinet, I/O card density is as high as possible to minimize control cabinet space. This often forces customers to buy I/O cards with I/O points that are unused in the application.

The Decentralization of the RSTi addresses all of these concerns with a distributed high performance network to meet the OEMs needs and reducing the high cost of field wiring. The distributed nature of the RSTi enables an OEM to build machines in sections with local I/O drops which can easily be assembled at the customer site, connected to the controller by a high performance network, one standard Ethernet cable verses hundreds of wires.

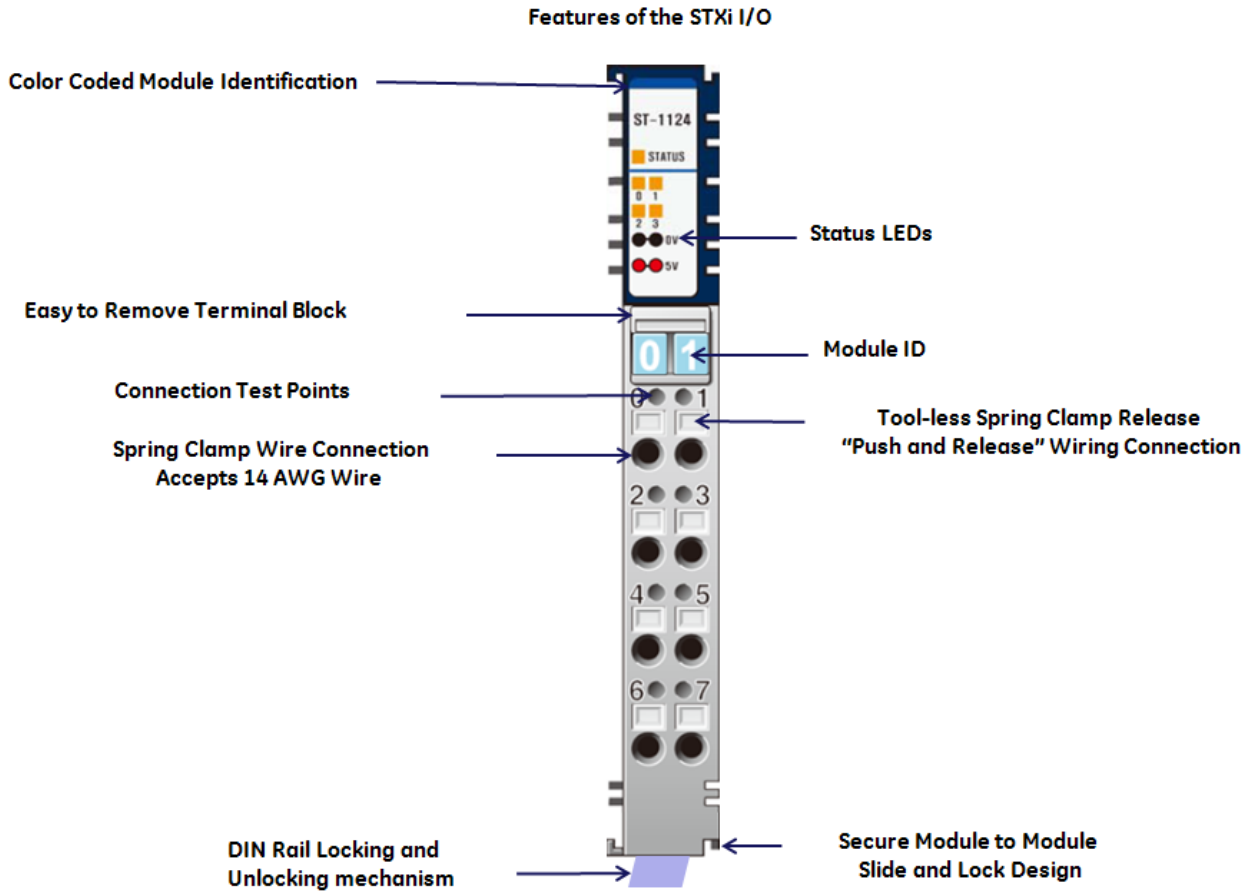
Distributed I/O minimizes the risk of mixing of high and low voltage signals and reduces the added cost of running a separate conduit for voltages.

The low density modules available in the RSTi line allow the OEM to more closely match what they purchase with the exact I/O requirements of each drop. An added benefit is the ease of adding additional devices for future expansion without impacting existing wiring.

Key Benefits of RSTi

- **HIGHER PERFORMANCE:** We combined the best of our embedded computing & controls knowledge & experience to deliver innovative CPU's, linked them to the #1 open industrial network and connected a full I/O line
- **Increased UPTIME:** We engineered a high performance redundant solution for controllers & I/O with integrated safety that is extremely easy to setup and scale
- **Reduced Development Time:** Panels can be fabricated in advance, independent of the control system, by simply changing out the network/bus interface without impacting wiring.
- **Reduced Installation Cost:** Distributed I/O networks reduce installation and wiring cost.
- **Lower Cost Per Point:** The RSTi can be configured to meet the applications needs. The granular design reduces panel space and module cost.
- **"Build as You Go":** Expansion is simple, just slide in a RSTi I/O module without impacting the wiring back to the main control panel.
- **System Simplification:** The distributed nature of the RSTi greatly reduces the time to dis-assemble and re-assemble a machine and therefore reducing machine commissioning.
- **Network Independence:** OEMs and System Integrators can standardize on their I/O layout without worrying about the controller it's connected to.

RSTI Features



Key Features of the RSTi

- PROFINET Network Interface is tightly integrated into Proficy Machine Edition
- Simple push spring clamp terminal, no special tool required for wiring
- Unique module locking mechanism secures modules on the DIN rail
- Removable terminal blocks for easy installation and maintenance
- Integrated slide and locking design secures module to module connection
- Built-in test points on terminal block for easy troubleshooting
- RSTi network interface supports up to 32 slice I/O modules (512 I/O)
- Low density (4 points) to high density (16 points) in 12mm width (0.47 inches)
- Advanced diagnostics

Wiring Connections, Backplane Communications and Power Distribution

The RSTi innovative design enables module power, communications and field power to be passed from one module to the next. Power Distribution, Power Booster and Field Power Isolation modules are available as "dumb" modules and do not require a slot address. Smart module versions have module ID and they occupy an address on the bus. In addition the smart modules provide additional diagnostic and status information.

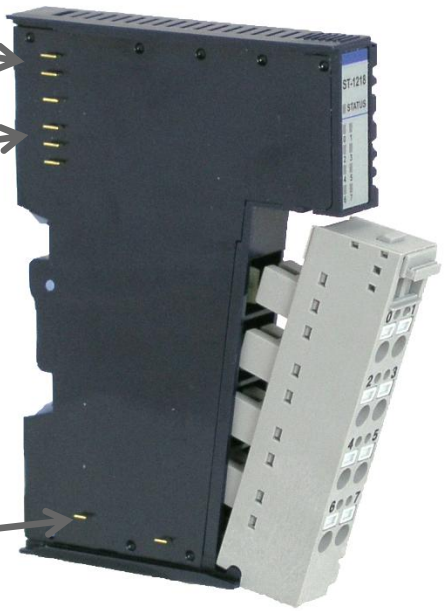
Module Power and System Power
Pin 0 (24VDC) and Pin 1 (0VDC)

Field Ground
Pin 2 and Pin 3

Field Power (Field Power Supply should be independent of Module System Power
Pin 4 and Pin 5 (0VDC)
Pin 6 and Pin 7 (24VDC)

5VDC Bus pins passes power from one module to the next.

Communications passed from one module to the next.



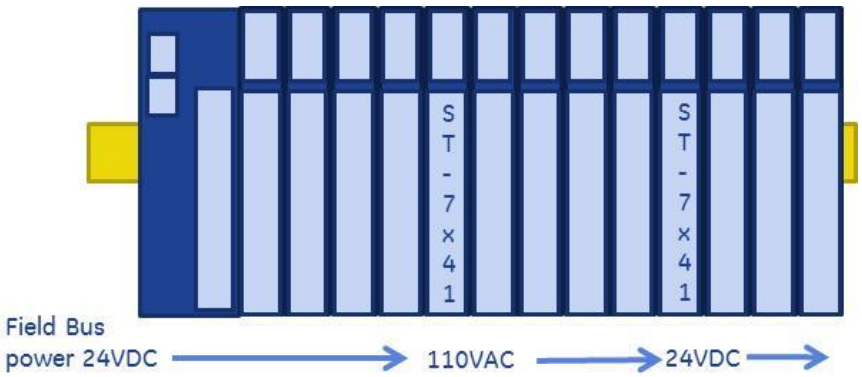
Field Bus power passed from one module to the next.

System Power: It is recommended that the 24VDC System Power be from an independent power source than the Field Bus Power. The separation allows the field power to be turned off without impacting the Network Interface. The network interface provides 5VDC to the corresponding I/O modules and each module passes the 5VDC to the next module.

5VDC Booster Module: The ST-7111 (No bus ID type support, does not occupy an address on the bus) or ST-7511 (Uses a bus ID and occupies an address on the bus) are available to boost the 5VDC signal in the event that modules power consumption exceed network interface. The booster module will provide 5VDC at 1 amp to modules to the right of the booster module. The module requires 24VDC System Power. 24VDC Field Power is also required and is supplied to all modules to the right.

Field Power: Field Power on the Network Interface is 24VDC and the Field Power is passed from one module to the next. The maximum current available on the Field Power Bus is 10 amps.

Isolated Field Distribution Module: The ST-7241 (No bus ID type support, does not occupy an address on the bus) or ST-7641 (Uses a bus ID and occupies an address on the bus) are available to change field voltages such as 5VDC, 24VDC, 48VDC or AC with a maximum of 10 amps available on the Field Power Bus to the right of the module. The module can also be used when additional current and isolation. The Field Bus on the I/O modules to the right of the Isolated Field Distribution Module will carry the voltage of the Isolated Field Distribution Module.



Shield Termination Modules: The ST-7008 (No bus ID type support, does not occupy an address on the bus) or ST-7408 (Uses a bus ID and occupies an address on the bus) is available to group all shields to the RSTi bus ground. Modules such as analog and motion could use the module to reduce noise impact on the RSTi system. Field Bus power is passed through the module to the module on the right.

0VDC Distribution Modules 8 points, 10 amps: The ST-7108 (No bus ID type support, does not occupy an address on the bus) or ST-7508 (Uses a bus ID and occupies an address on the bus) is available to group commons from field devices to simplify wiring. The module commons group is connected to the Field Power 0VDC bus. Field Bus power is passed through the module to the module on the right.

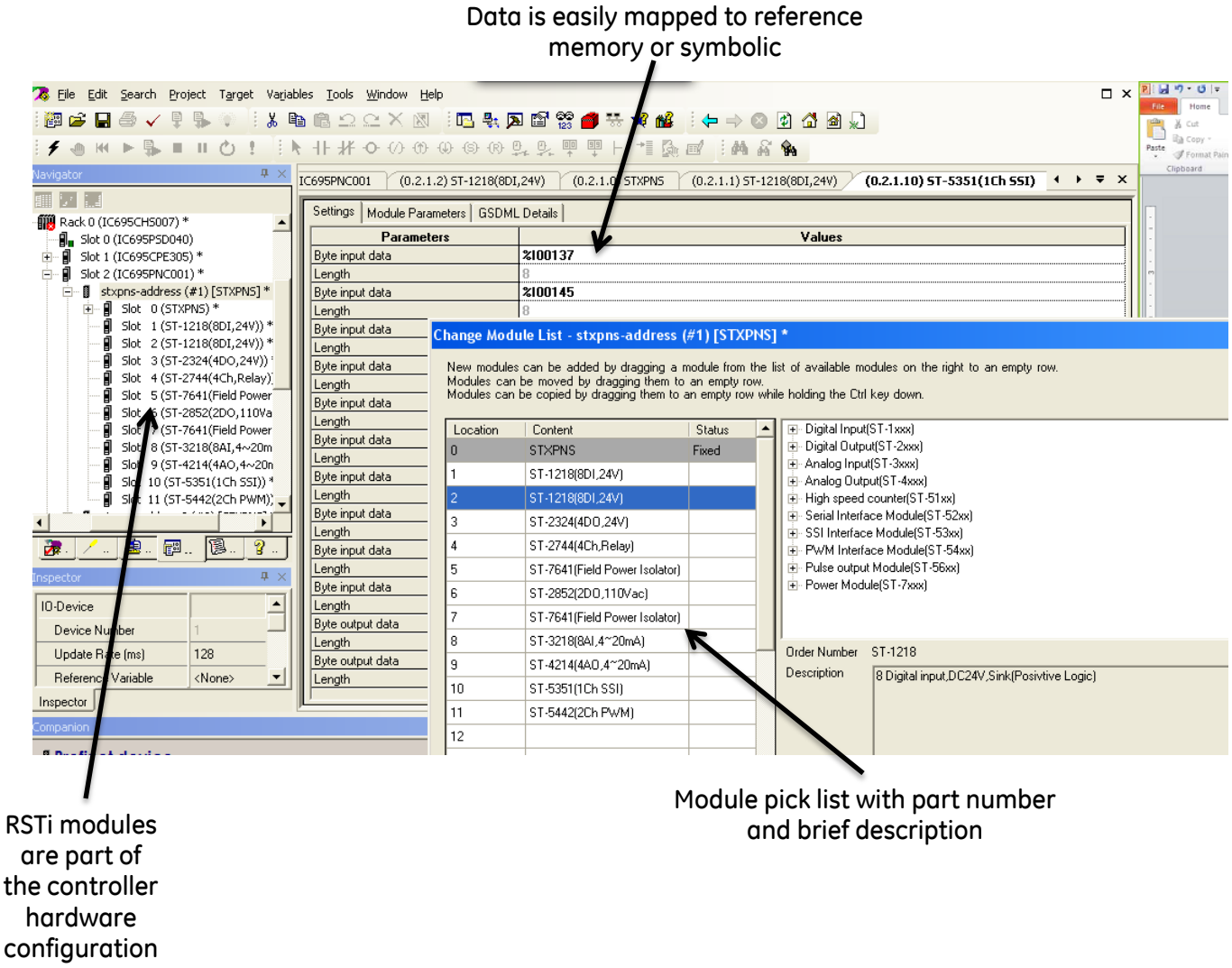
24VDC Distribution Modules 8 points, 10 amps: The ST-7118 (No bus ID type support, does not occupy an address on the bus) or ST-7518 (Uses a bus ID and occupies an address on the bus) is available to group 24VDC from field devices to simplify wiring. The module 24VDC group is

connected to the Field Power 24VDC bus. Field Bus power is passed through the module to the module on the right.

0VDC and 24VDC Distribution Modules 4 points each, 10 amps: The ST-7188 (No bus ID type support, does not occupy an address on the bus) or ST-7588 (Uses a bus ID and occupies an address on the bus) is available to group four 0VDC and four 24VDC from field devices to simplify wiring. The module 0VDC is connected to the Field Power 0VDC and the 24VDC group is connected to the Field Power 24VDC bus. Field Bus power is passed through the module to the module on the right.

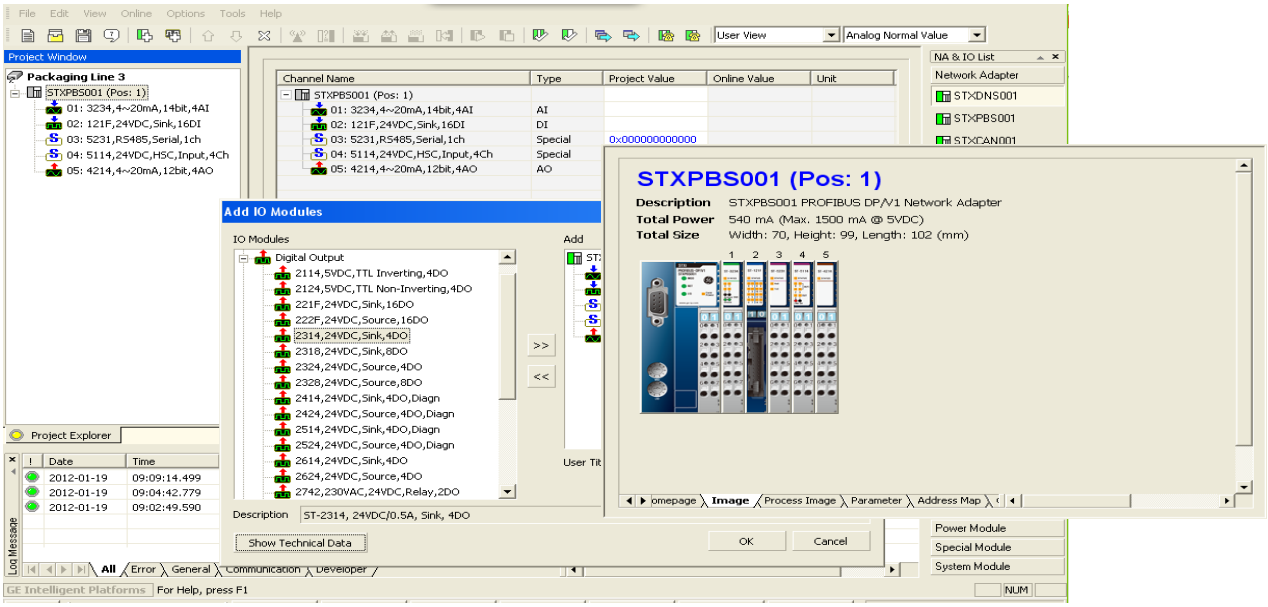
Powerful Configuration Tools

The RSTi is tightly integrated with the GE Intelligent Platforms Proficy Machine Edition. The user can easily select an I/O module and configure parameters. The configuration is stored in the folder and once download to the controller it is automatically loaded to the RSTi with a single point of connect.



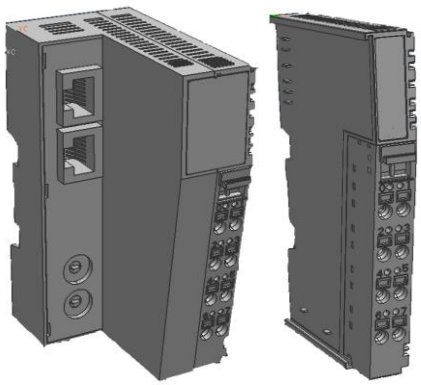
IO Guide Pro - Third Party Configuration Tool

The IO Guide Pro enables integrators network independence. I/O systems can be easily configured using the various RSTi network interfaces. Changing from Ethernet IP to Profibus is as simple as a mouse click without impacting the rest of the I/O configuration. The tool provides technical data, address mapping, product image and bus loading.



Network Interface	Configuration Tool
PROFINET	Integrated into Proficy Machine Edition and also a GSDML file is available for other platforms
Profibus DP/V1	IO Guide Pro software tool and GSD file
DeviceNet	IO Guide Pro software tool and EDS file
Modbus TCP	IO Guide Pro software tool
Modbus Serial	IO Guide Pro software tool
EtherCAT	IO Guide Pro software tool
Ethernet IP	IO Guide Pro software tool and EDS file
CANOpen	IO Guide Pro software tool and EDS file
CC-Link	CSP file

Additional tools: 2D and 3D CAD drawings.



Specifications:

Environmental	Specification
Operating Temperature	Discrete I/O: -20C to 60C Analog I/O: 0 to 60C Network Interfaces: -20 to 50C for UL applications. GE is currently working to increase the temperature range to 55C by mid 2012. For non-UL application 0 to 60C. PROFINET Network Interface (STXPNS001) 0 to 55C for non-UL applications.
Non-Operating Temperature	-40 to 85C
Relative Humidity	5 to 90% Non-condensing
Operating Altitude	2,000 meters
Mounting	DIN rail. Supports vertical and horizontal mounting

Product Design	Specifications
Wiring I/O Cable	Maximum wire size is 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 Sweeps Per Axis : 10
EMC	Conforms to EN-61000-6-2
EMI	Conforms to EN-61000-6-4
Installation Pos. / Protect. Class	Variable / IP20
Product Certifications	UL/cUL , CE
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
Marine Certifications	DNV – DeviceNet, Modbus Ethernet, Modbus Serial and a subset of the I/O. DNV document TE-08-0094 Lloyds Register – Profibus Slave, Modbus TCP, Modbus Serial and a subset of the I/O. LR document SGS-R10-0476

Manuals

Document Number	Description
GFK-2745	RSTi I/O User Manual
GFK-2746	RSTi Network Adapter Manual

Part Numbers:

Network Interface Units (*Check release date)

STXPNS001	PROFINET RT Network Adapter	STXMBE001*	MODBUS/TCP network adapter
STXPBS001	PROFIBUS DP/V1 network adapter	STXECT001*	EtherCAT Network Adapter
STXDNS001*	DeviceNet network adapter	STXEIP001*	EtherNet/IP Network Adapter
STXMBS001*	MODBUS RS-232C network adapter	STXCAN001*	CANopen network adapter
STXMBS002*	MODBUS RS-485 network adapter	STXCCL001*	CC-link network adapter

Discrete Inputs

ST-1124	4 points, Negative Logic 5VDC	ST-1218	8 points, Positive Logic, 12V/ 24VDC
ST-1114	4 points, Positive Logic 5VDC	ST-1228	8 points, Negative Logic, 12V/ 24VDC
ST-1214	4 points, Positive Logic, 12V/ 24VDC	ST-121F	16 points, Positive Logic, 12V/ 24VDC (Requires connector Type Hirose , HIF3BA-20D-2.54C)
ST-1224	4 points, Negative Logic, 12V/ 24V DC	ST-122F	16 points, Negative Logic, 12V/ 24VDC (Requires connector Type Hirose , HIF3BA-20D-2.54C)
ST-1314	4 points, Positive Logic, 48V DC	ST-1804	4 points, 110V AC (AC 85V ~ 132V)
ST-1324	4 points, Negative Logic, 48VDC	ST-1904	4 points, 220V AC (AC 170V ~ 264V)
ST-131F	16 points, Positive Logic, 48VDC (Requires connector Type Hirose , HIF3BA-20D-2.54C)		

Digital Outputs

ST-2114	4 points, TTL, 5VDC/20mA Inverting	ST-2318	8 points, Negative Logic, 24VDC/ 0.5A
ST-2124	4 points, TTL, 5VDC/20mA Non inverting	ST-2328	8 points, Positive Logic, 24VDC/ 0.5A
ST-2314	4 points, Negative Logic, 24VDC/ 0.5A	ST-221F	16 points, Negative Logic, 24VDC/ 0.3A (Requires connector Type Hirose , HIF3BA-20D-2.54C)
ST-2324	4 points, Positive Logic, 24VDC/ 0.5A	ST-222F	16 points, Positive Logic, 24VDC/ 0.3A (Requires connector Type Hirose , HIF3BA-20D-2.54C)
ST-2414	4 points, Negative Logic, Diagnostics, 24VDC/ 0.5A	ST-2742	Isolated Relay Output 2 points, 230V AC/ 2A
ST-2424	4 points, Positive Logic, Diagnostics, 24VDC/ 0.5A	ST-2744	Isolated Relay Output 4 Points, 230V AC/ 2A
ST-2514	4 points, Negative Logic, Diagnostics, 24VDC/ 2A	ST-2748	Isolated Relay Output 8 Points, 230V AC/ 2A
ST-2524	4 points, Positive Logic, Diagnostics, 24VDC/ 2A	ST-2792	Relay Output 2 points, 230V AC/ 2A, Manual
ST-2614	4 points, Negative Logic, 24VDC/ 2A	ST-2852	Triac Output 2 points, 12V ~ 125VAC/ 0.5A
ST-2624	4 points, Positive Logic, 24VDC/ 2A		

Analog Inputs

ST-3114	4 Channels, 0~20mA, 12-bit	ST-3524	4 Channels, -10~+10Vdc, 12-bit
ST-3118	8 Channels, 0~20mA, 12bit	ST-3544	4 Channels, -10~+10Vdc, 14-bit
ST-3134	4 Channels, 0~20mA, 14-bit	ST-3624	4 Channels, 0~5Vdc, 12-bit
ST-3214	4 Channels, 4~20mA, 12-bit	ST-3644	4 Channels, 0~5Vdc, 14-bit
ST-3218	8 Channels, 4~20mA, 12bit	ST-3702	2 Channels, RTD
ST-3234	4 Channels, 4~20mA, 14-bit	ST-3704	4 Channels, RTD (Requires connector Type Hirose , HIF3BA-20D-2.54C)
ST-3274	4 Channels, 4~20mA, 12-bit, (Requires Sensor Connect 3M Mini-Clamp Plug, 37104 Series)	ST-3708	8 Channels, RTD Connector Type (Requires connector Type Hirose , HIF3BA-20D-2.54C)
ST-3424	4 Channels, 0~10Vdc, 12-bit	ST-3802	2 Channels, Thermocouple
ST-3428	8 Channels, 0~10V, 12bit	ST-3804	4 Channels, Thermocouple Connector Type (Requires connector Type Hirose , HIF3BA-20D-2.54C)
ST-3444	4 Channels, 0~10Vdc, 14-bit	ST-3808	8 Channels, Thermocouple Connector Type (Requires connector Type Hirose , HIF3BA-20D-2.54C)

Analog Output

ST-4112	2 Channels, 0~20mA, 12-bit	ST-4424	4 Channels, 0~10Vdc, 12bit
ST-4114	4 Channels, 0~20mA,, 12bit	ST-4474	4 Channels, 0~10Vdc, 12bit, (Requires Sensor Connect 3M Mini-Clamp Plug, 37104 Series)
ST-4212	2 Channels, 4~20mA, 12-bit	ST-4491	1 Channel, 0~10V, 12bit, Manual type
ST-4214	4 Channels, 4~20mA, 12bit	ST-4522	2 Channels, -10~+10Vdc, 12-bit
ST-4274	4 Channels, 4-20mA, 12bit, (Requires Sensor Connect 3M Mini-Clamp Plug, 37104 Series)	ST-4622	2 Channels, 0~5Vdc, 12-bit
ST-4422	2 Channels, 0~10Vdc, 12-bit	ST-4911	1 Channel, 0~1 A, 12bit

PID Loop Controllers (*Check release date)

ST-3814*	1 Loop PID Controller 4 Channels, TC, Temp. Controller, SSR out (DeviceNet only)	ST-3714*	1 Loop PID Controller 4 Channels, RTD, Temp. Control, SSR Out (DeviceNet only)

ST-3834*	1 Loop PID Controller 4 Ch. TC, Temp. Controller, Current out (DeviceNet only)	ST-3734*	1 Loop PID Controller 4 Ch, RTD, Temp. Control, Current Out (DeviceNet only)

Serial Interface Modules (ASCII)

ST-5211	Serial Interface RS-232C, 1 Channel	ST-5232	Serial Interface RS-485, 2 Channels
ST-5212	Serial Interface RS-232C, 2 Channels	ST-5252	Serial Interface RS-232 , 2 Channels,32 Bytes
ST-5221	Serial Interface RS-422, 1 Channel	ST-5272	Serial Interface RS-485, 2 Channels,32 Bytes
ST-5231	Serial Interface RS-485, 1 Channel		

Motion Modules

ST-5101	High Speed Counter, 1 Channel, 5VDC 1.5MHz	ST-5442	2 Channel, PWM Out, 0.5A/24V, Positive Logic, 2.5Khz
ST-5111	High Speed Counter, 1 Channel, 24VDC 1.5MHz	ST-5444	PWM Out, 0.5A/24V, Positive Logic, 4 Channels, 2.5Khz
ST-5112	High Speed Counter, 2 Channel, 24VDC,100Khz	ST-5641	1 Channel, Pulse Out, 0.5A/24V, Positive Logic, 20Khz
ST-5114	High Speed Counter, 4 Channel, 24VDC, 50Khz	ST-5642	2 Channel, Pulse Out, 0.5A/24V, Positive Logic, 20Khz
ST-5351	SSI Interface 1 CH; 62.5K, 100K, 125K, 250K, 500K, 1M, 2Mbps	ST-5651	1 Channel, Pulse Out, 0.5A/5V (RS422), 20Khz
ST-5422	PWM Out, 2A/24V, Positive Logic, 2 Channels 2.5Khz		

System Modules

(Modules with ID type occupy 1 of the 32 available module ID addresses and will appear in the hardware configuration. The modules without ID support will not occupy a module address and will not appear in the hardware configuration.)

ST-7008	Shield termination module, 8 points, 10A No LED	ST-7588	0VDC and 24VDC 4 points distribution module for field devices ID type with status LEDs (ID type uses module address)
ST-7408	Shield termination module, 8 points, 10A, ID type with LED (ID type uses module address)	ST-7111	5VDC bus booster, 24VDC in
ST-7108	0VDC distribution module for field devices, 8 points, 10A	ST-7511	5VDC bus booster, 24VDC in with LED ID type (ID type uses module address)
ST-7508	0VDC distribution module for field devices, 8 points, 10A with LED (ID type uses module address)	ST-7241	Isolated Field Power Distribution, 5 VDC, 24VDC, 48VDC, 120/240VAC 10 Amp no LED status
ST-7118	24VDC distribution module for field devices, 8 points, 10A	ST-7641	Isolated Field Distributor 5 VDC, 24VDC, 48VDC, 120/240VAC, 10 amp with LED status ID type (ID type uses module address)
ST-7518	24VDC distribution module for field devices, 8 points, 10A ID type with status LEDs (ID type uses module address)	ST-5725	Extension IO, Master (Tx). Up to 3 master/slave combinations supported. Maximum 300 meters. Only one slave supported per master module.
ST-7188	0VDC and 24VDC 4 points distribution module for field devices	ST-5726	Extension IO, Slave (Rx). Each Slave requires a Master module.

Profibus Network Interface with built-in I/O (Up to 8 expansion modules supported) (* Check release date)

STXPBS032	24VDC Positive Logic input, 32 points	STXPBS432	16 24VDC Positive Logic input and 16 24VDC Positive Logic output
STXPBS132	24VDC Negative Logic input, 32 points	STXPBS532	16 24VDC Negative Logic input and 16 24VDC Negative Logic output
STXPBS232	24VDC Negative Logic output, 32 points	STXPBS824	16 24VDC Positive Logic input and 16 relay output
STXPBS332	24VDC Positive Logic output, 32 points	STXPBS924	16 24VDC Negative Logic input and 16 relay output
STXPBS016	Relay output, 16 points	STXPBS825	16 24VDC Positive Logic input and 16 isolated relay output
STXPBS116	Relay output, 16 points, isolated	STXPBS925*	16 24VDC Negative Logic input and 16 isolated relay output

DeviceNet Network Interface with built-in I/O (Up to 10 expansion modules supported) (* Check release date)

STXDNS032*	24VDC Positive Logic input, 32 points	STXDNS532*	16 24VDC Negative Logic input and 16 24VDC Negative Logic output
STXDNS132*	24VDC Negative Logic input, 32 points	STXDNS824*	16 24VDC Positive Logic input and 16 relay output
STXDNS232*	24VDC Negative Logic output, 32 points	STXDNS924*	16 24VDC Negative Logic input and 16 relay output
STXDNS332*	24VDC Positive Logic output, 32 points	STXDNS825*	16 24VDC Positive Logic input and 16 isolated relay output

STXDNS016*	Relay output, 16 points	STXDNS925*	16 24VDC Negative Logic input and 16 isolated relay output
STXDNS116*	Relay output, 16 points, isolated	STXDNS032*	24VDC Positive Logic input, 32 points
STXDNS432*	16 24VDC Positive Logic input and 16 24VDC Positive Logic output	STXDNS132*	24VDC Negative Logic input, 32 points

DeviceNet Network Interface with built-in I/O (No expansion modules supported) (* Check release date)

STXDNC032*	24VDC Positive Logic input, connector, 32 points	STXDNC432*	16 24VDC Positive Logic input and 16 24VDC Positive Logic output connector type
STXDNC132*	24VDC Negative Logic input, connector, 32 points	STXDNC532*	16 24VDC Negative Logic input and 16 24VDC Negative Logic output connector type
STXDNC232*	24VDC Negative Logic output, connector type, 32 points	STXDNC632*	16 24VDC Positive Logic input and 16 24VDC Negative Logic output connector type
STXDNC332*	24VDC Positive Logic, connector type, 32 points	STXDNC732*	16 24VDC Negative Logic input and 16 24VDC Positive Logic output connector type

Accessories

STXACC004	End Module, 7pcs (End module ships with Network Interface)	STXACC001	Marker with numbers 100pcs
STXRTB009	Removable Terminal Block, 9pcs (Modules ship with terminal block except connector style.)	STXACC002	Blank markers 100pcs

Typical Configuration Example:

Requirement: PROFINET network connection, (24) 24VDC positive logic inputs, (12) 24VDC Positive Logic, 0.5 amp outputs, (4) analog inputs 4-20mA, (2) analog outputs 4-20mA, (6) 120VAC inputs

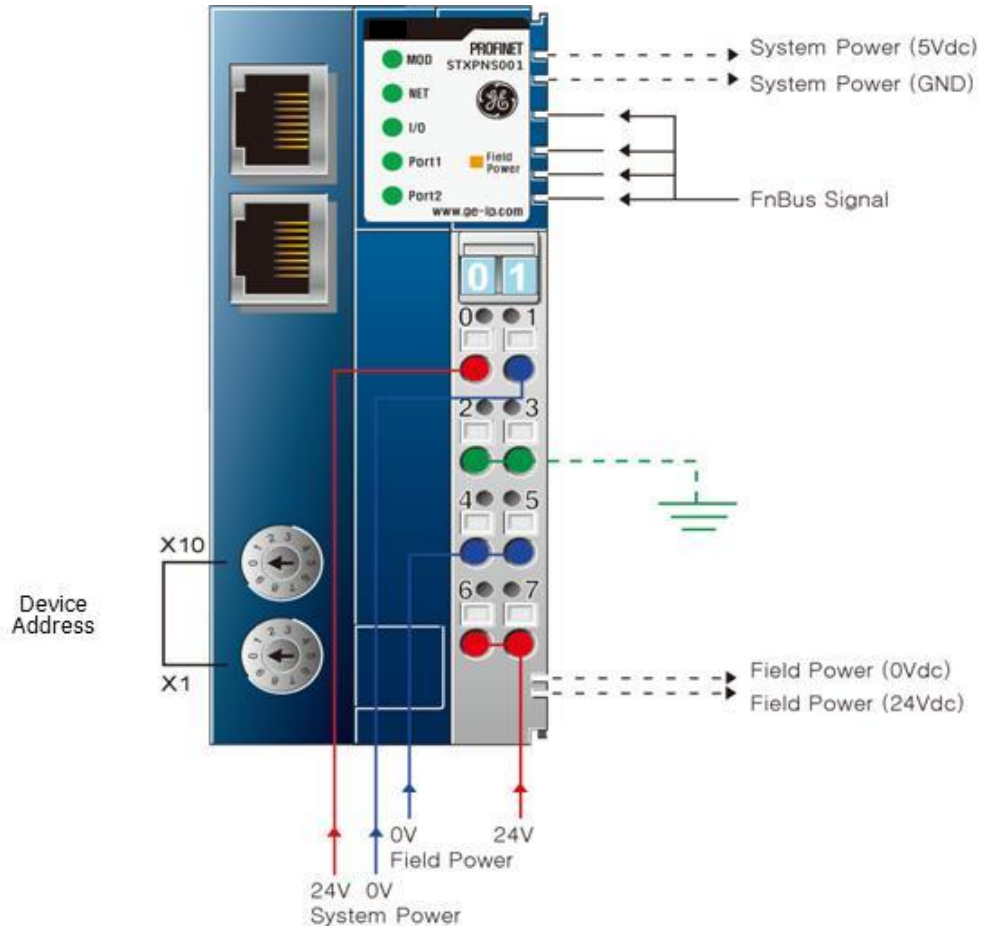
QTY	Part Number	Description	Comments
1	STXPNS001	PROFINET RT Network Adapter	Supports up to 32 modules with built-in Ethernet switch (ring topology not supported)
3	ST-1218	8 points, Positive Logic 12V/ 24VDC inputs	Includes terminal block
1	ST-2328	8 points, Positive Logic, 24VDC/ 0.5A outputs	Includes terminal block
1	ST-2324	4 points, Positive Logic, 24VDC/ 0.5A outputs	Includes terminal block
1	ST-3214	4 Channels, 4~20mA, 12-bit in	Includes terminal block
1	ST-4212	2 Channels, 4~20mA, 12-bit out	Includes terminal block
1	ST-7408	Shield module, ID type with LED (ID type uses module address)	Optional Shield module for analog modules.
1	ST-7641	Power distribution module 5, 24, 48, AC , 10 amp with LED status ID type (ID type uses module address)	The ST-7641 is needed to support the 120VAC input module ST-1804. All modules to the right of the ST-7641 will be 120VAC unless a ST-7641 is installed to switch the bus voltage.
2	ST-1804	4 points, 110V AC (AC 85V ~ 132V) inputs	Includes terminal block

Notes:

A. The total number of modules used is 11 (ST-7408 and ST-7641 occupy a module address)
B. The above configuration only requires 177mm width by 70mm deep and 99mm high. (6.97 in. W x 2.76 in. D x 3.9 in. H)

PROFINET Network Interface Specifications – STXPNS001

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Surrounding Air Temp./ Storage Temp.	-20°C~50°C / -25°C~85°C	**Network Type**	PROFINET I/O RT
Relative Humidity	5% ~ 90% without condensation	**Cable**	EtherNet Cable
Durable-vibration.	IEC68-2-6(2G) / 10G	**Cable Length(m)**	Up to 100m from Ethernet Hub
EMC/ESD	EN50082 / EN50081	**Comm. Speed (Kbps)**	10/100Mbps
Mount Position	On the left of ST-xxx I/O series	**Expansion No.**	Max. 32 module
Atmosphere	Not so dusty without corrosive gas	**Max. node**	Limited by the IP address
Field Supply Voltage	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	Input : 1024point / Output : 1024point
Field Support Current	Max. 10A	**Max. Analog I/O**	Input : 64Ch / Output : 64Ch
I/O Bus Supplied Current	Max. 1.5A@5Vdc	**Max. Byte size**	Input : 128Bytes / Output : 128Bytes
Isolation	System power to internal logic : Non-isolation System power to I/O driver : Isolation	**Topology**	Line or Star topology
Size	45mm × 99mm × 70mm	**Node No. Setting**	Rotary Switch 2ea(x10, x1)
Weight	150g	**Power Dissipation**	115mA typical @24Vdc
Certification	UL / cUL / CE		

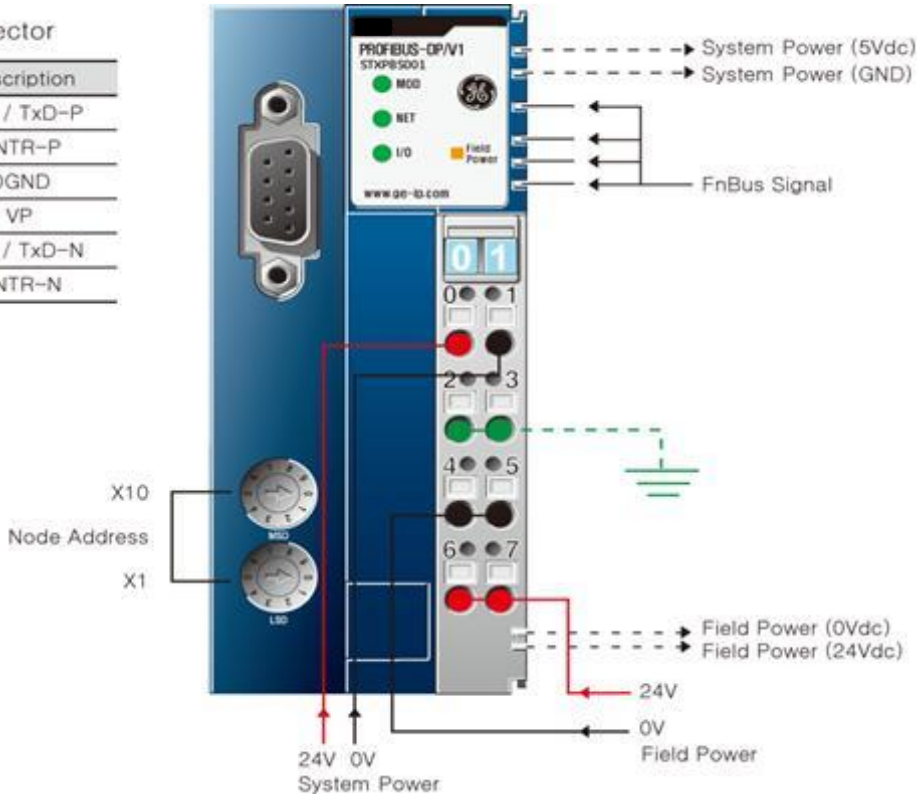


Profibus DP Interface Specifications – STXPBS001

Item	Specification	Item	Specification
Surrounding Air Temp./ Ambient Temp.	-20°C~50°C / -20°C~85°C	**Network Type**	PROFIBUS-DP/V1
Relative Humidity	5% ~ 90%, without condensation	**Network Cable**	PROFIBUS-DP Special Cable
Durable-vibration	IEC68-2-6(2G) / 10G at non-driving	**Cable Length**	1.2Km ~ 100m
EMC / ESD	EN50082 / EN50081	**Comm. Speed**	9.6kBaud ~ 12MBaud
Mount Position	On the left of ST-xxx I/O series	**Max. Station No.**	101 Station(Include Master Scanner)
Atmosphere	Not so dusty without corrosive gas	**Station Type**	PROFIBUS-DP Slave
Field Supply Voltage	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Expansion No.**	Max. 32 Module
Field Supply Current	Max. 10A	**Max. Digital I/O**	Input : 1024point / Output : 1024point
ST-xxxx Supply Current	Max. 1.5A/5VDC	**Max. Analog I/O**	Input : 64Ch / Output : 64Ch
Mount	DIN-Rail	**I/O Data Size**	Input : 128Bytes / Output : 128Bytes
Size	42mm x 99mm x 70mm	**Baudrate Setting**	Support Auto-baudrate
Weight	155g	**Station No. Sett.**	Rotary S/W #1, #2 (x10, x1)
Certification	UL / cUL / CE / PROFIBUS(PNO)	**Power Dissipation**	60mA

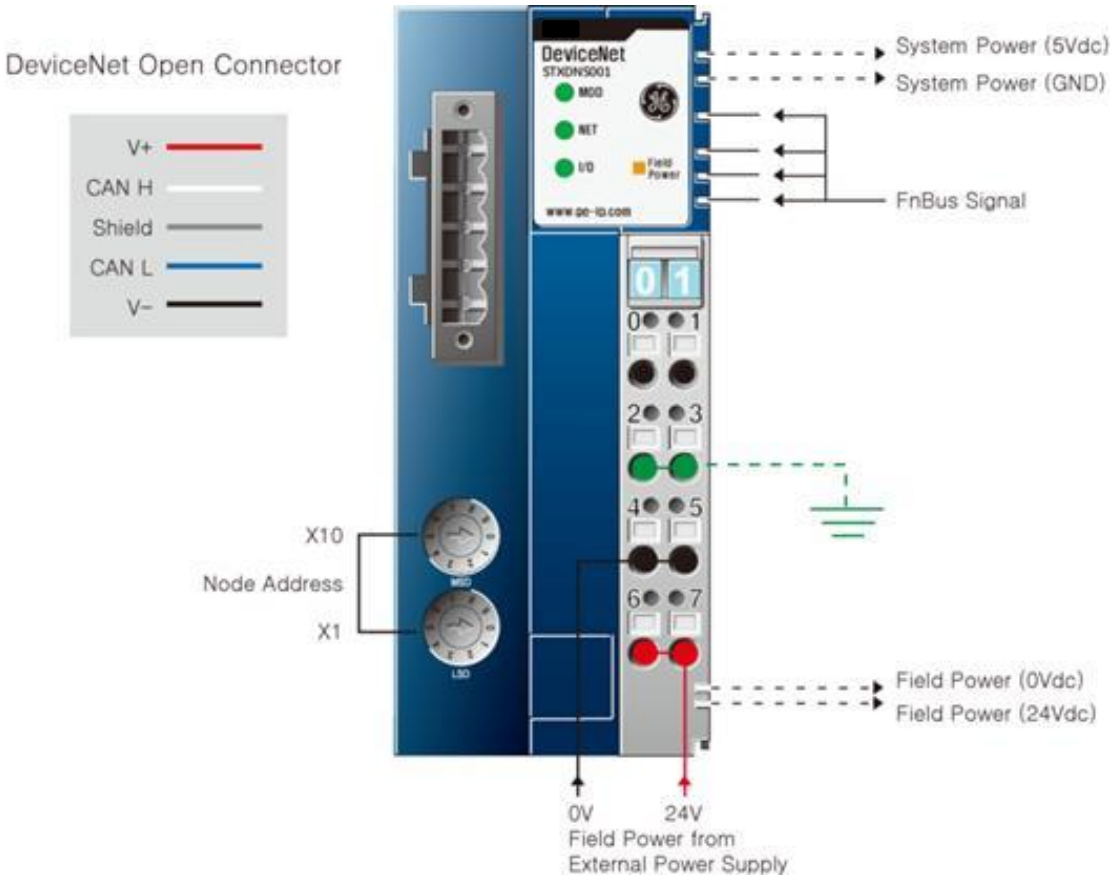
PROFIBUS Connector

Pin No.	Description
3	RxD / TxD-P
4	CNTR-P
5	DGND
6	VP
8	RxD / TxD-N
9	CNTR-N



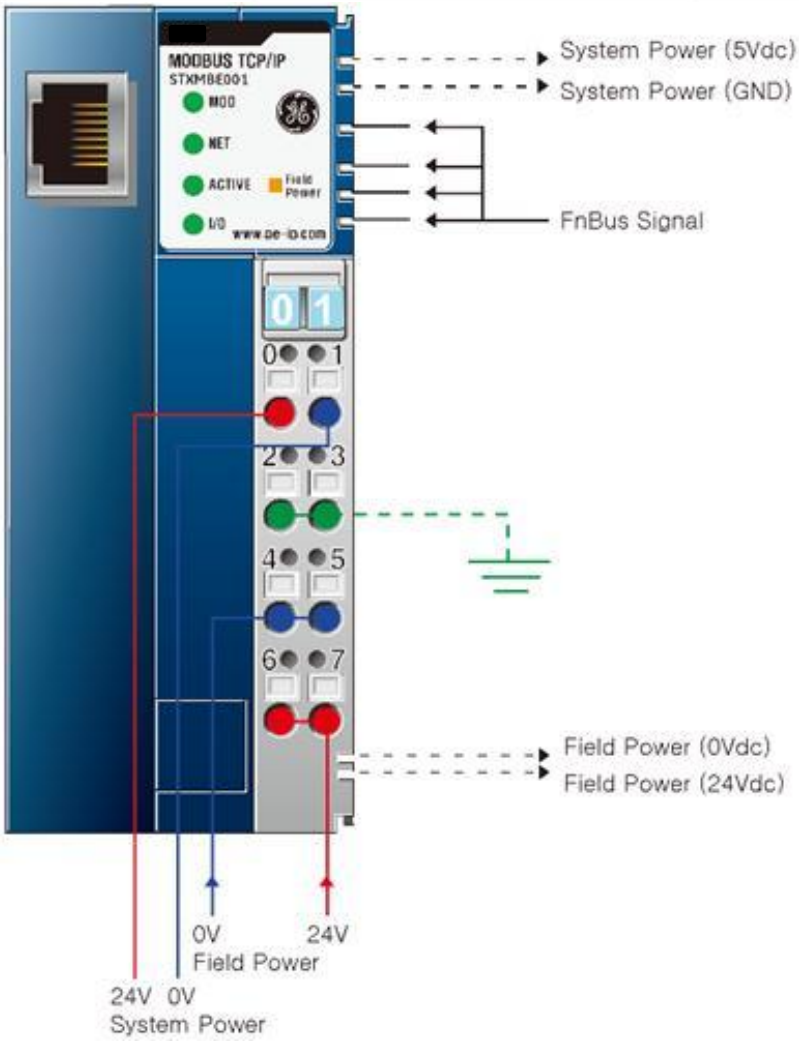
DeviceNet Interface Specifications – STXDNS001 (Target April 2012 release)

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Surrounding Air Temp./ Ambient Temp.	-20°C~50°C / -40°C~85°C	**Network Type**	DeviceNet
Relative Humidity	5% ~ 90% without condensation	**Cable**	Dedicated DeviceNet Cable 5pin
Durable-vib./impact	IEC68-2-6(2G) / 10G	**Cable Length(m)**	100m~500m (depends on the baud rate)
EMC/ESD	EN50082 / EN50081	**Comm. Sp(Kbps)**	125Kbps, 250Kbps, 500Kbps
Mount Position	On the left of ST-xxx I/O series	**Expansion No.**	Max. 32 module
Atmosphere	Not so dusty without corrosive gas	**Max. node**	64 Nodes
Field Supp. Volt.	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	In/Out : 2,016 points
		Max. Analog I/O	In/Out : 126Ch
Field Supp. Cur.	Max. 10A	**Max. Byte size**	In/Out : 252Byte
FnBus Sup. Cur	Max. 1.2A@5Vdc	**Operationg Mode**	Bit Strobe, Polling, Cyclic, COS
Baud rate set	Auto-negotiation	**Station No.**	Rotary Switch 2ea(x10, x1)
Size	42mm × 99mm × 70mm	**Power Dissipation**	30mA typical @24Vdc
Weight	155g	**Certification**	UL / cUL / CE / DeviceNet (ODVA)



Modbus TCP Specifications – STXMBE001 (Target April 2012 release)

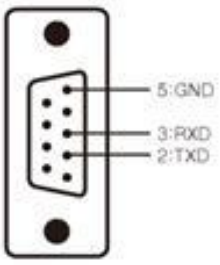
ITEM	SPECIFICATION	ITEM	SPECIFICATION
Surrounding Air Temp./ Ambient Temp.	-20°C~50°C / -40°C~85°C	**Network Type**	Modbus/TCP
Relative Humidity	5% ~ 90% without condensation	**Cable**	EtherNet Cable(Shield Cable)
Durable-vib./impact	IEC68-2-6(2G) / 10G	**Cable Length(m)**	Up to 100m from Ethernet Hub
EMC/ESD	EN50082 / EN50081	**Comm. Sp(Kbps)**	10/100Mbps
Mount Position	On the left of ST-xxx I/O series	**Expansion No.**	Max. 32 module
Atmosphere	Not so dusty without corrosive gas	**Max. node**	Limited by Ethernet Specification
Field Supp.Volt.	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	Input : 2016points/Output:2016points
Field Supp. Cur.	Max. 10A	**Max. Analog I/O**	Input : 126Ch / Output : 126Ch
FnBus Sup. Cur	Max. 1.5A@5Vdc	**Max. Byte size**	Input : 252Bytes / Output : 252Bytes
Baud rate set	Auto-negotiation	**Operationg Mode**	8 MODBUS/TCP, 4 HTTP, BOOTP.
Size	45mm × 99mm × 70mm	**IP Address setting**	Window Command, BOOTP
Weight	150g	**Power Dissipation**	60mA typical @24Vdc
Certification	UL / cUL / CE		



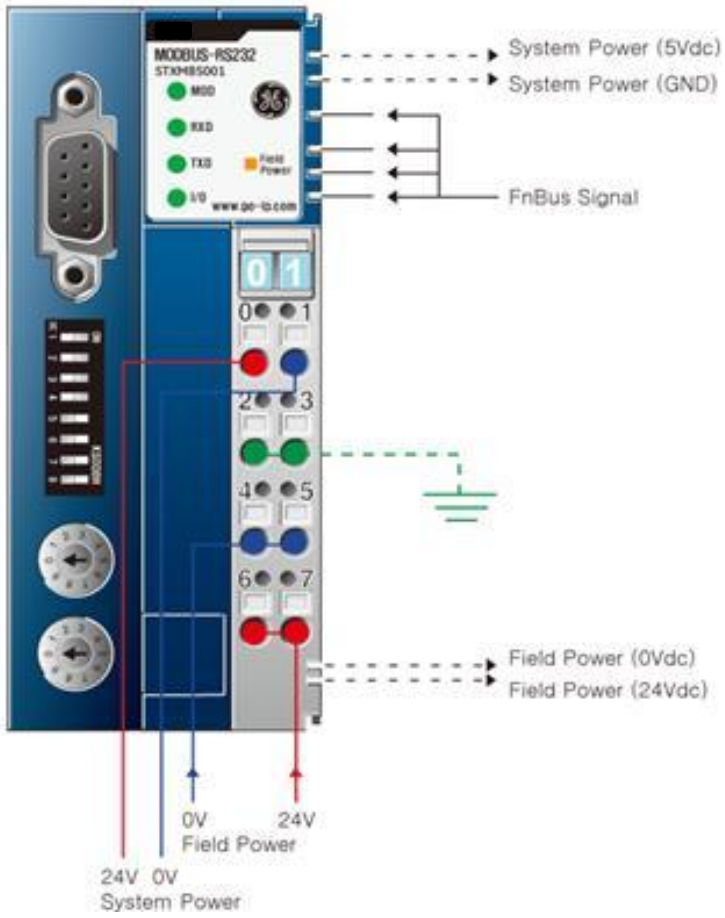
Modbus Serial RS-232 Specifications – STXMBS001 (Target April 2012 release)

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Surrounding Air Temp./ Ambient Temp.	-20°C~50°C / -40°C~85°C	**Network Type**	ModBus-RS232
Relative Humidity	5% ~ 90% without condensation	**Cable**	Serial Twist cable
Durable-vib./impact	IEC68-2-6(2G) / 10G	**Cable Length(m)**	15m
EMC/ESD	EN50082 / EN50081	**Comm. Sp(Kbps)**	1.2k ~ 115.2kbps
Mount Position	On the left of ST-xxx I/O series	**Expansion No.**	Max. 32 module
Atmosphere	Not so dusty without corrosive gas	**Max. node**	1 node(STXMBS001,RS232)
Field Supp.Volt.	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	Input : 2016point / Output : 2016point
Field Supp. Cur.	Max. 10A	**Max. Analog I/O**	Input : 126Ch / Output : 126Ch
FnBus Sup. Cur	Max. 1.5A@5Vdc	**Max. Byte size**	Input : 252Bytes / Output : 252Bytes
Isolation	System power to internal logic : Non-isolation System power to I/O driver : Isolation	**Node No. Setting**	Rotary Switch 2ea(x10, x1)
Size	45mm × 99mm × 70mm	**Power Dissipation**	70mA typical @24Vdc
Weight	150g		
Certification	UL / cUL / CE		

MODBUS Electrical Interface



Dsub 9-Pin (Female)	SignalName	Description
1		
2	TXD	Output, Transmitted Data
3	RXD	Input, Received Data
4		
5	GND	Signal Common
6		
7		
8		
9		

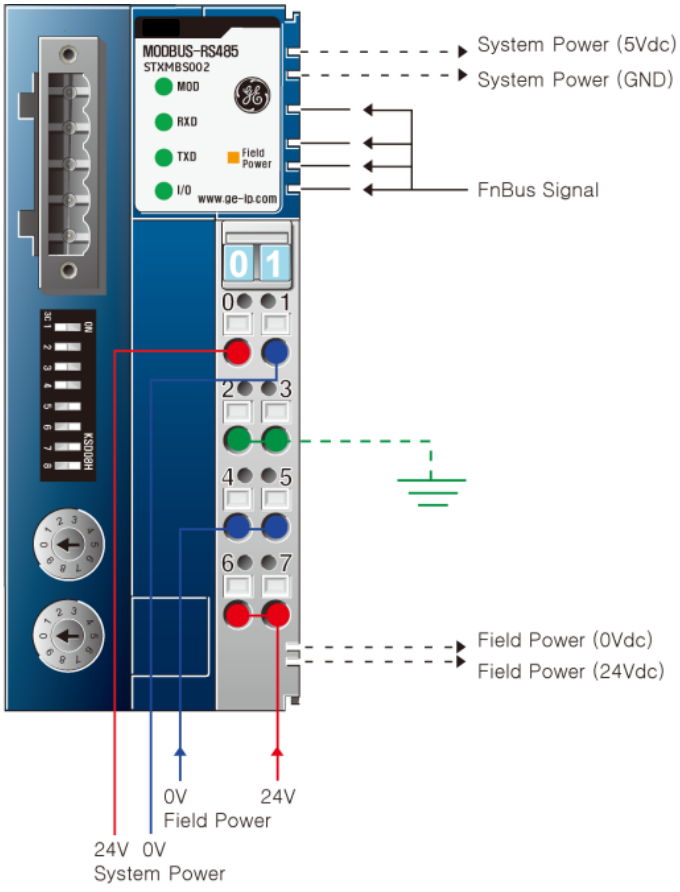


Modbus Serial RS-485 Specifications – STXMBS002 (Target April 2012 release)

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Surrounding Air Temp./ Ambient Temp.	-20°C~50°C / -40°C~85°C	**Network Type**	ModBus-RS485
Relative Humidity	5% ~ 90% without condensation	**Cable**	Serial Twist cable
Durable-vib./impact	IEC68-2-6(2G) / 10G	**Cable Length(m)**	1200m
EMC/ESD	EN50082 / EN50081	**Comm. Sp(Kbps)**	1.2k ~ 115.2kbps
Mount Position	On the left of ST-xxx I/O series	**Expansion No.**	Max. 32 module
Atmosphere	Not so dusty without corrosive gas	**Max. node**	64 nodes
Field Supp.Volt.	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	Input : 2016point / Output : 2016point
Field Supp. Cur.	Max. 10A	**Max. Analog I/O**	Input : 126Ch / Output : 126Ch
FnBus Sup. Cur	Max. 1.5A@5Vdc	**Max. Byte size**	Input : 252Bytes / Output : 252Bytes
Isolation	System power to internal logic : Non-isolation System power to I/O driver : Isolation	**Operating Mode**	RTU and ASCII
Size	45mm × 99mm × 70mm	**Node No. Setting**	Rotary Switch 2ea(x10, x1)
Weight	150g	**Power Dissipation**	70mA typical @24Vdc
Certification	UL / cUL / CE		

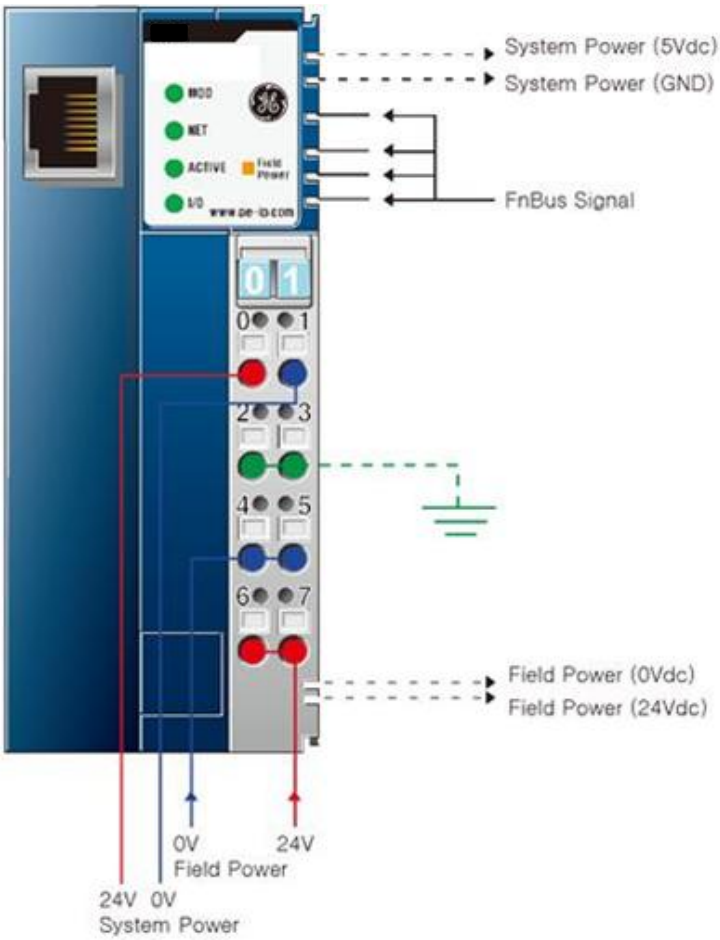
RS485 Connector

Dsub 5-Pin (Female)	SignalName	Description
1	RS485+	In/Out, Transceiver Data High
2	RS485-	In/Out, Transceiver Data Low
3	GND	Signal Common
4	Shield	Shield
5	FG	Frame Ground. Internally shorted with Shield



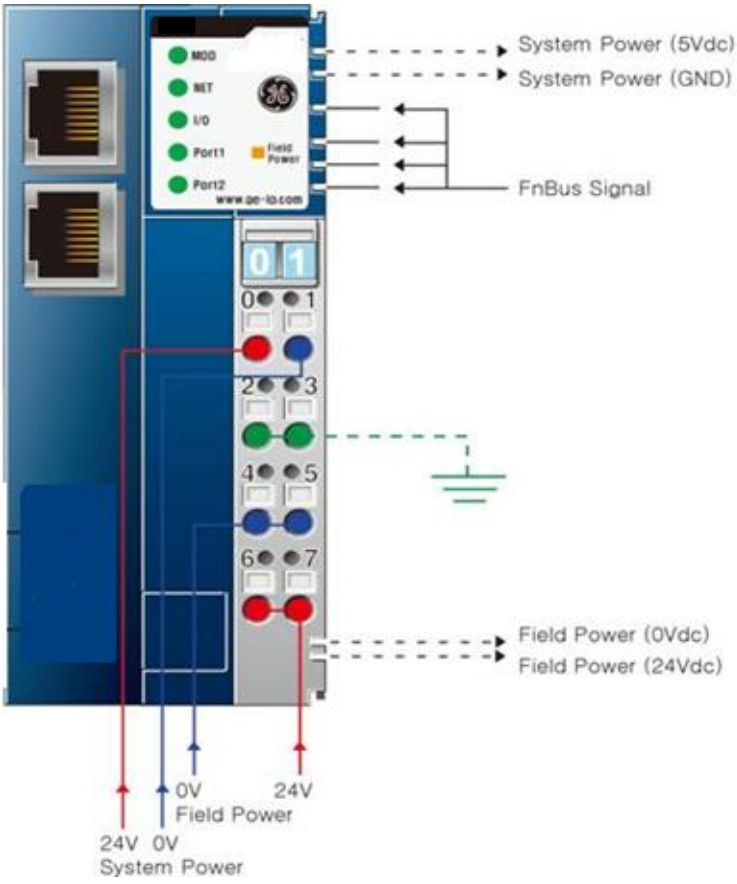
Ethernet IP Specifications – STXEIP001 (Target July 2012 release)

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Surrounding Air Temp./ Ambient Temp.	-20°C~50°C / -40°C~85°C	**Network Type**	EtherNet/IP, BOOTP
Relative Humidity	5% ~ 90% without condensation	**Cable**	EtherNet Cable
Durable-vib./impact	IEC68-2-6(2G) / 10G	**Cable Length(m)**	Up to 100m from Ethernet Hub
EMC/ESD	EN50082 / EN50081	**Comm. Sp(Kbps)**	10/100Mbps
Mount Position	On the left of ST-xxx I/O series	**Expansion No.**	Max. 32 module
Atmosphere	Not so dusty without corrosive gas	**Max. node**	Limited by Ethernet Specification
Field Supp.Volt.	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	Input : 2016points/Output : 2016points
Field Supp. Cur.	Max. 10A	**Max. Analog I/O**	Input : 126Ch / Output : 126Ch
FnBus Sup. Cur	Max. 1.5A@5Vdc	**Max. Byte size**	Input : 252Bytes / Output : 252Bytes
Isolation	System power to internal logic : Non-isolation System power to I/O driver : Isolation	**Operating Mode**	Ethernet/IP, BOOTP
Size	45mm × 99mm × 70mm	**IP Address Setting**	BOOTP
Weight	150g	**Power Dissipation**	60mA typical @24Vdc
Certification	UL / cUL / CE		



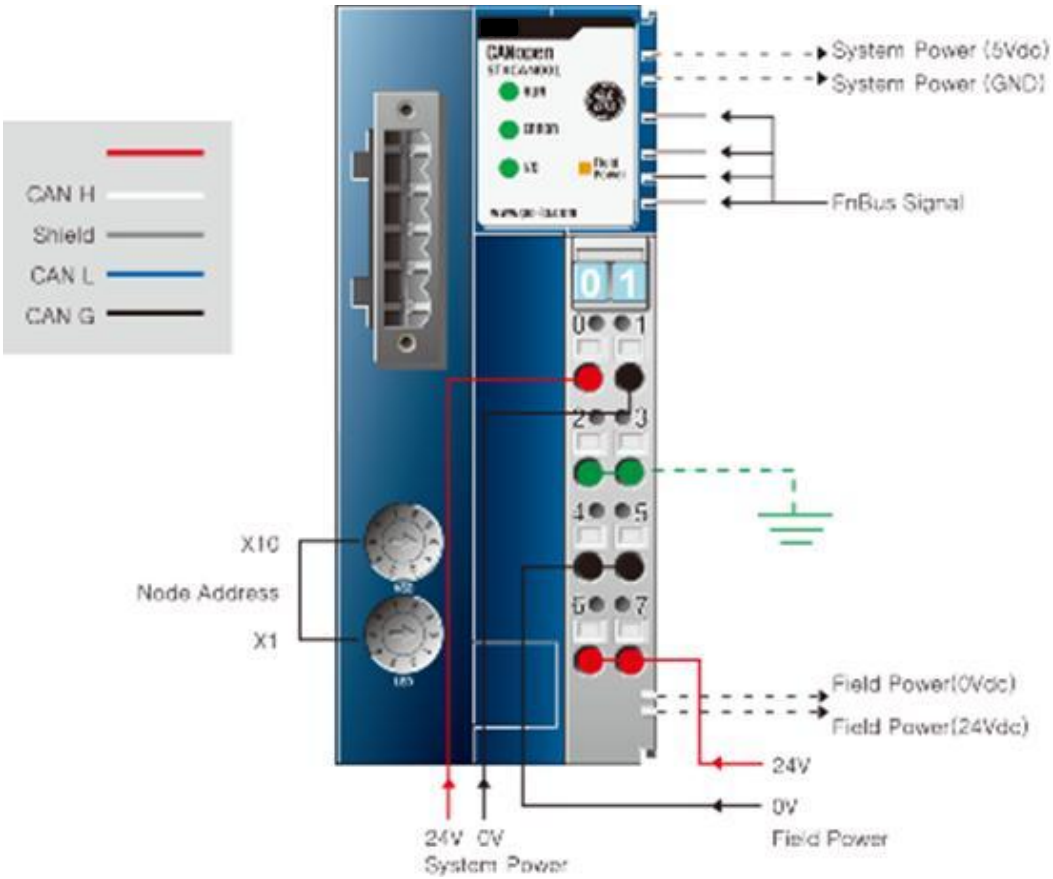
EtherCAT Specifications – STXECT001 (Target July 2012 release)

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Surrounding Air Temp./ Storage Temp.	-20°C~50°C / -25°C~85°C	**Network Type**	EtherCAT Slave Node
Relative Humidity	5% ~ 90% without condensation	**Cable**	Ethernet Cable
Durable-vibration.	IEC68-2-6(2G) / 10G	**Cable Length(m)**	Up to 100m from Ethernet Hub
EMC/ESD	EN50082 / EN50081	**Comm. Speed (Kbps)**	100Mbps
Mount Position	On the left of ST-xxx I/O series	**Expansion No.**	Max. 32 module
Atmosphere	Not so dusty without corrosive gas	**Max. node**	65,635
Field Supply Voltage	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	Input : 2016 point / Output : 2016 point
Field Support Current	Max. 10A	**Max. Analog I/O**	Input : 64Ch / Output : 64Ch
I/O Bus Supplied Current	Max. 1.5A@5Vdc	**Max. Byte size**	Input : 128Bytes / Output : 128Bytes
Isolation	System power to internal logic : Non-isolation System power to I/O driver : Isolation	**Topology**	Line or Star topology
Size	54.2mm × 99mm × 70mm	**Interface Connection**	(2) RJ-45
Weight	150g	**Power Dissipation**	100mA typical @24Vdc
Certification	UL / cUL / CE		



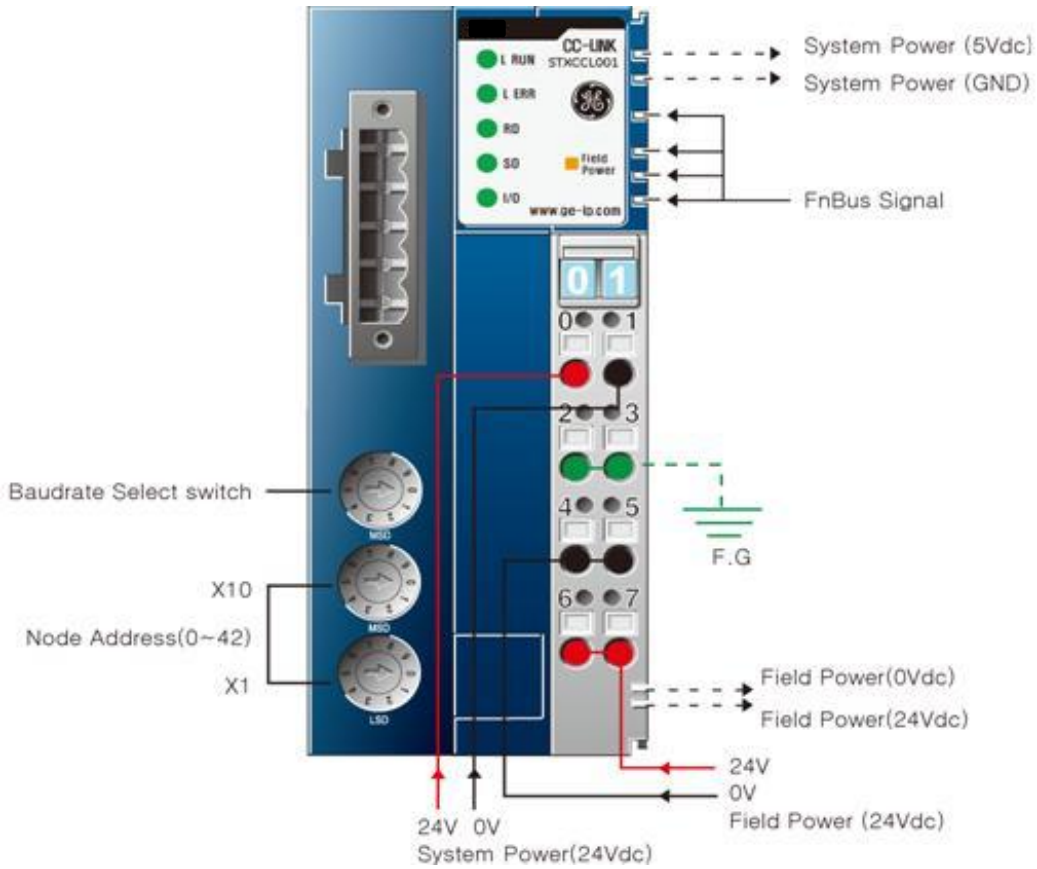
CANOpen Specifications – STXCAN001 (Target October 2012 release)

Item	Specification	Item	Specification
Surrounding Air/ Ambient Temp.	-20°C~50°C / -40°C~85°C	Network Type	CANopen
Relative Humidity	5% ~ 90% ,without condensation	Network Cable	CANopen Special Cable
Durable-vib./impact	IEC68-2-6(2G) / 10G at non-driving	Cable Length	25 m ~ 5km, Depending on Baudrate
EMC / ESD	EN50082 / EN50081	Comm. Speed	10 Kbps ~ 1Mbps
Mount Position	On the left of ST-xxx I/O series	Station Type	CANopen Slave
Atmosphere	Not so dusty without corrosive gas	Max. Station No.	Max. 32 Module
Field Supp. Volt	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	Peripheral signal	Input 64 bytes / Output 64 bytes
Field Supp. Cur.	MAX. 10A	Number of PDOs available	8 Transmit PDOs / 8 Receive PDOs
FnBus Sup. Cur	Max1.5A/5VDC		
Baud rate Setting	Support Auto-baudrate	Number of SDOs available	1 Standard SDOs
Size	42mm x 99mm x 70mm		
Weight	155g	Node address Set.	Rotary S/W #1, #2 (x10, x1)
Certification	UL / cUL / CE	Power Dissipation	100mA



CC-Link Specification – STXCCL001 (Target release October 2012)

ITEM	SPECIFICATION	ITEM	SPECIFICATION				
Surrounding Air Temp./ Ambient Temp.	-20°C~50°C / -40°C~85°C	**Network Type**	CC-Link				
Relative Humidity	5% ~ 90% without condensation	**Cable**	Cable for CC-Link only				
Durable-vib. /impact	IEC68-2-6(2G) / 10G	**Cable Length(m)**	1200	900	400	160	100
EMC/ESD	EN50082 / EN50081	**Comm. Sp(Kbps)**	156	625	2500	5000	10000
Mount Position	On the left of ST-xxx I/O series	**Operating Mode**	Broadcast Polling Method				
Atmosphere	Not so dusty without corrosive gas	**Expansion No.**	Max. 32 Module				
Field Supp.Volt.	Class 2, 24VDC 24VDC (11VDC ~ 28.8VDC)	**Max. Digital I/O**	Input : 112point Output : 112point (4station)				
Field Supp. Cur.	Max. 10A	**Max. Analog I/O**	Input : 16Ch/Output : 16Ch (4station)				
FnBus Sup. Cur	Max. 1.5A@5Vdc	**Available Station**	Max. 4 Station				
Pwr Dissipation	60mA	**Station Type**	Remote Device				
Size	45mm × 99mm × 70mm	**No. of Station**	Max. 42 Station				
Weight	155g	**Baudrate Setting**	Rotary Switch 1개				
Certification	UL / cUL / CE / CC-Link	**Station No. Sett.**	Rotary Switch #2, #3 (x10, x1)				



Discrete Input Specifications

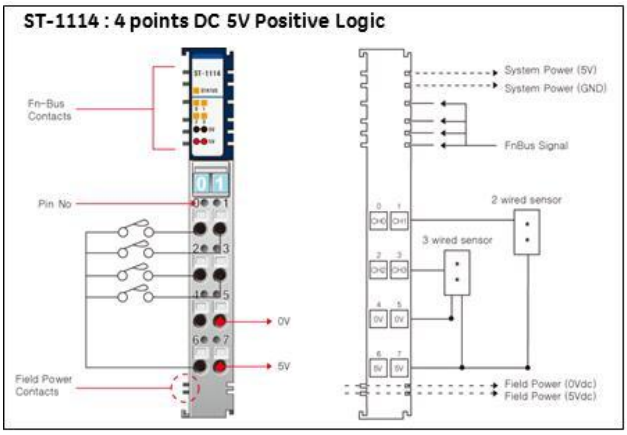
Model	ST-1114	ST-1124	ST-1214	ST-1224	ST-1314	ST-1324	ST-1804	ST-1904
Points	4 Points							
Type	Positive Logic	Negative Logic	Positive Logic	Negative Logic	Positive Logic	Negative Logic	AC	
Normal Voltage	5Vdc		12V/24Vdc		48Vdc		110Vac	220Vac
Allowed Voltage	2.4Vdc ~ 5.5Vdc		10.2Vdc ~ 28.8Vdc		34Vdc ~ 60Vdc		85Vac ~ 132Vac	170Vac ~ 264Vac
On Voltage	Over 2.4Vdc		Over 10.2Vdc		Over 34Vdc		Over 85Vac	Over 170Vac
Off Voltage	Below 0.8Vdc		Below 5Vdc		Below 10Vdc		Below 60Vac	Below 130Vac
Point Consump. Curr.	Below 4.5mA		Below 6mA		Below 4mA		Below 8mA	Below 12mA
Module Consump. Curr.	35mA/5Vdc							
Response Time	OFF->ON: Below 0.5ms, ON->OFF: Below 0.5ms		OFF -> ON : Below 3ms, ON -> OFF : Below 3ms				OFF->ON: Below 10ms, ON->OFF: Below 10ms	
Common Type	4 Points / 2COM (Single Common)							
Isolation	Photocoupler Isolation							
Connection	terminal block							

Model	ST-1218	ST-1228	ST-121F	ST-122F	ST-131F
Points	8 Points		16 Points		
Type	Positive Logic	Negative Logic	Positive Logic	Negative Logic	Positive Logic
Normal Voltage	12V/24Vdc		12V/24Vdc		48Vdc
Allowed Voltage	10.2Vdc ~ 28.8Vdc		10.2Vdc ~ 28.8Vdc		34Vdc ~ 60Vdc
On Voltage	Over 10.2Vdc		Over 10.2Vdc		Over 34Vdc
Off Voltage	Below 5Vdc		Below 5Vdc		Below 10Vdc
Point Consump. Curr.	Below 6mA		Below 6mA		Below 4mA
Module Consump. Curr.	35mA/5Vdc		45mA/5Vdc		
Response Time	OFF -> ON : Below 3ms, ON -> OFF : Below 3ms				
Common Type	External Common		16 Points / 2COM		
Isolation	Photocoupler Isolation				
Connection	terminal block		20P Connector		

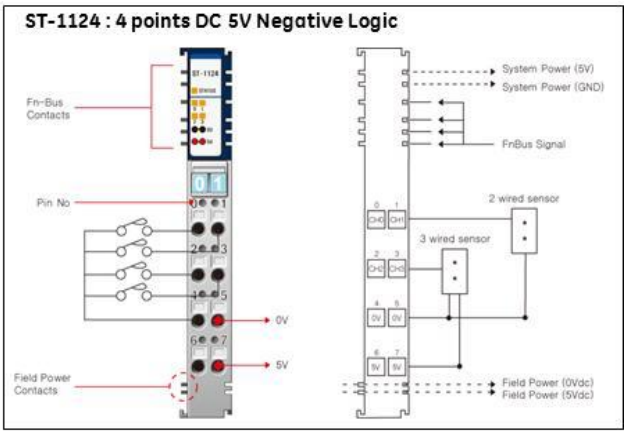
Note: The 20 pin connector for ST-121F, ST-122F and ST-131F require a Hirose , HIF3BA-20D-2.54C connector http://www.hirose.co.jp/cataloge_hp/e61000010.pdf

Discrete Digital Input Wiring Diagrams

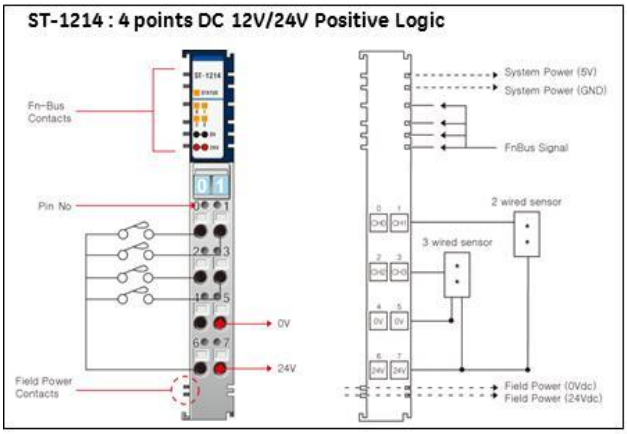
ST-1114 : 4 points DC 5V Positive Logic



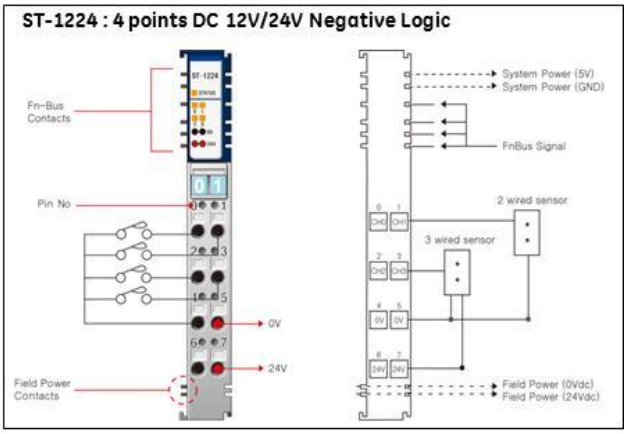
ST-1124 : 4 points DC 5V Negative Logic



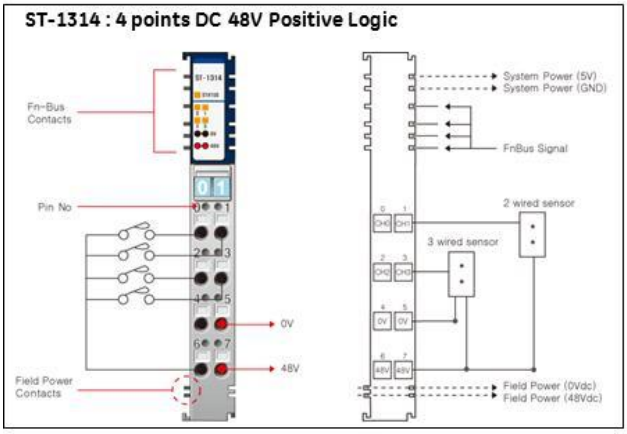
ST-1214 : 4 points DC 12V/24V Positive Logic



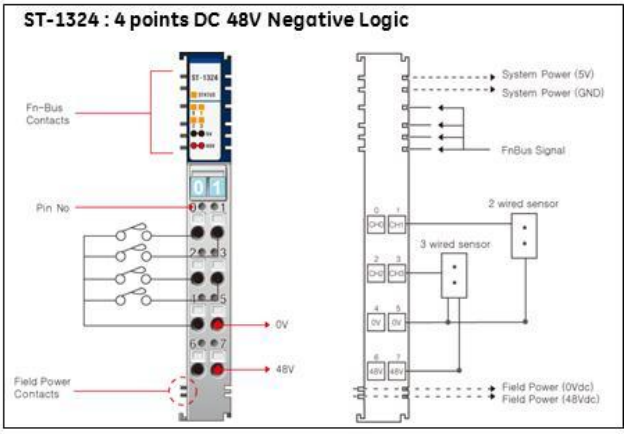
ST-1224 : 4 points DC 12V/24V Negative Logic



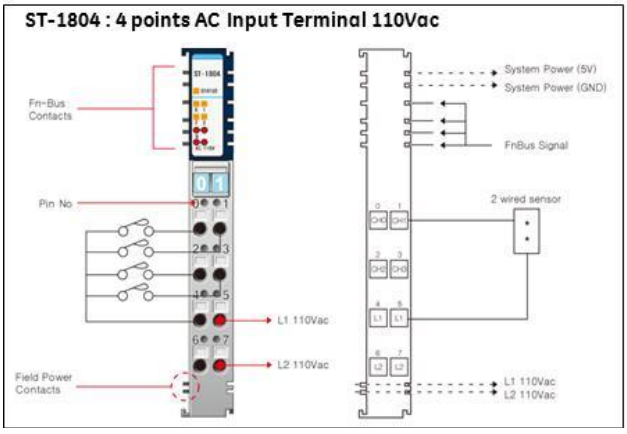
ST-1314 : 4 points DC 48V Positive Logic



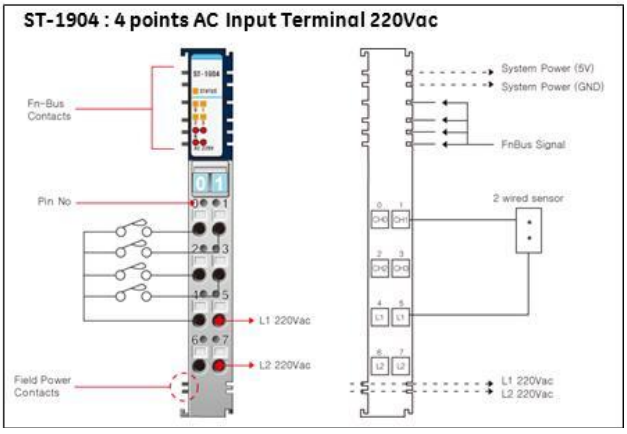
ST-1324 : 4 points DC 48V Negative Logic



ST-1804 : 4 points AC Input Terminal 110Vac

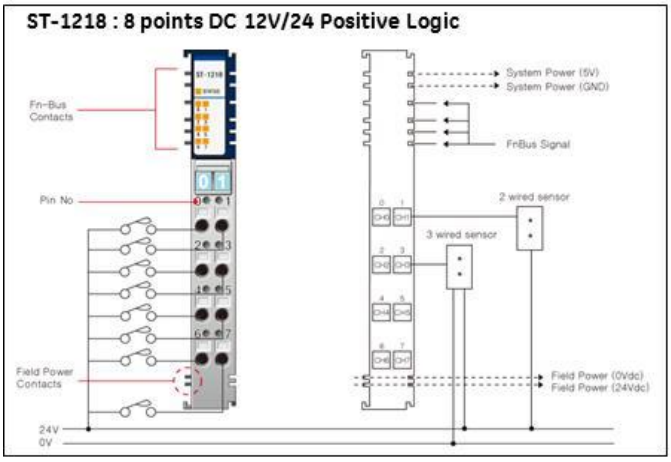


ST-1904 : 4 points AC Input Terminal 220Vac

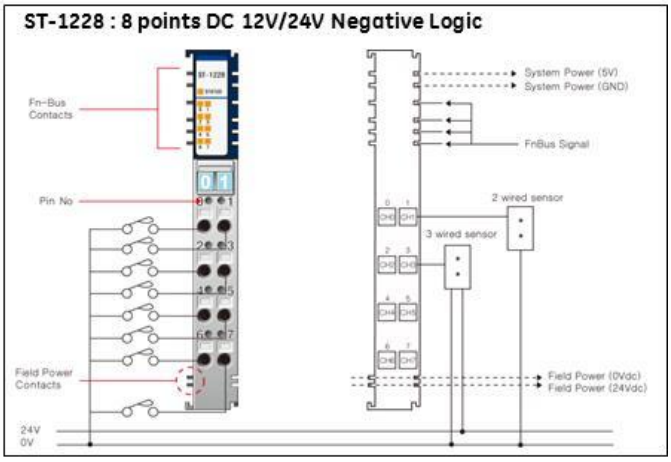


***External Field Power and Field Power are same power.**

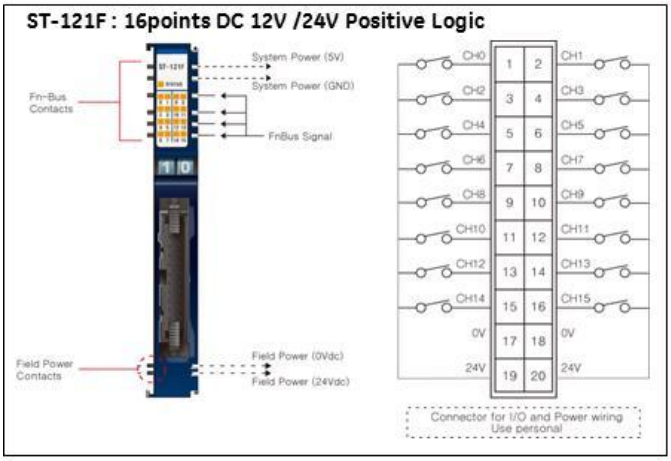
ST-1218 : 8 points DC 12V/24 Positive Logic



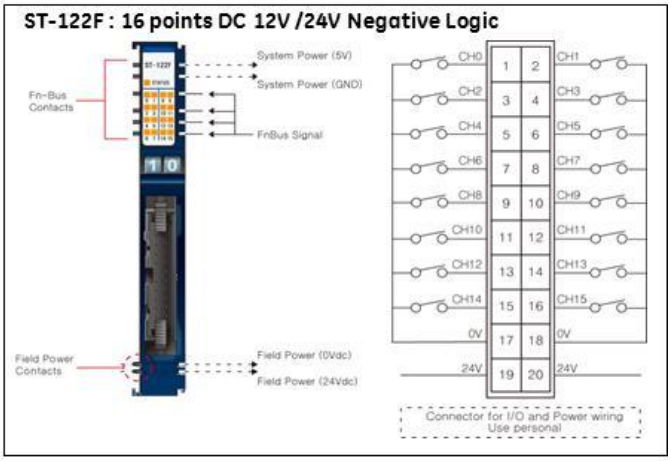
ST-1228 : 8 points DC 12V/24V Negative Logic



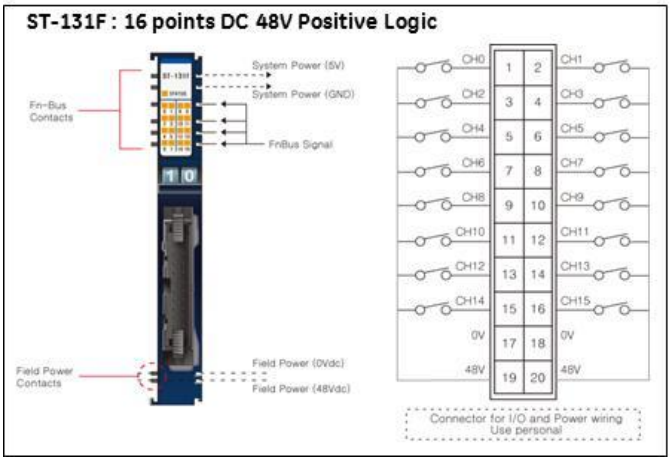
ST-121F : 16points DC 12V /24V Positive Logic



ST-122F : 16 points DC 12V /24V Negative Logic



ST-131F : 16 points DC 48V Positive Logic



***External Field Power and Field Power are same power.**

Discrete Output Specifications

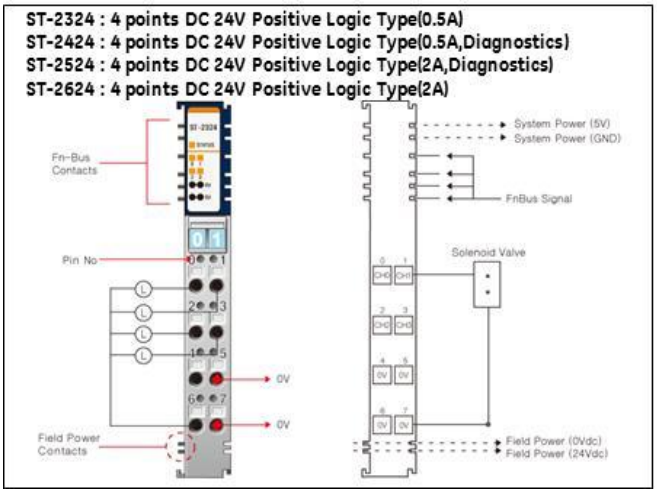
Model	ST-2114	ST-2124	ST-221F	ST-222F	ST-2314	ST-2324	ST-2318	ST-2328
Point NO.	4 Points		16Points		4Points		8Points	
Type	TTL Inverting	TTL Non-Inverting	Negative Logic	Positive Logic	Negative Logic	Positive Logic	Negative Logic	Positive Logic
Special Fun.	-							
Allo. Voltage	5Vdc		24Vdc					
Volt. Range	4.5Vdc~5.5Vdc		11Vdc~28.8Vdc					
Loading Cur	20mA/Point		0.5A/Point					
Consum Cur	50mA/5Vdc		80mA/5Vdc		45mA/5Vdc		60mA/5Vdc	
Fuse	-		3.5A, 40V	3.5A, 36V	3.5A, 40V	3.5A, 36V	3.5A, 40V	3.5A, 36V
Common	4points/4COM (Single Common)		16Points/2COM (Single Common)		4points/4COM (Single Common)		8 Points/Extermal Common	

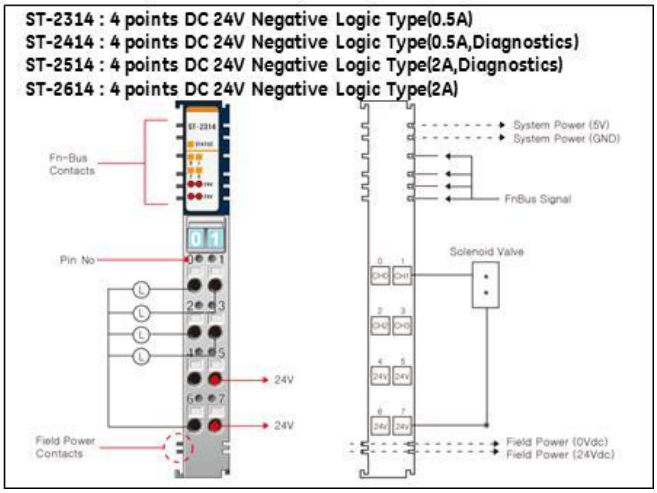
Model	ST-2414	ST-2424	ST-2514	ST-2524	ST-2614	ST-2624
Point NO.	4Points					
Type	Negative Logic	Positive Logic	Negative Logic	Positive Logic	Negative Logic	Positive Logic
Special Fun.	Diagnostics				-	
Allo. Voltage	24Vdc					
Volt. Range	11Vdc~28.8Vdc					
Loading Cur	0.5A/point		2.0A/Point			
Consum Cur	45mA/5Vdc					
Fuse	3.5A, 40V	3.5A, 36V	3.5A, 40V	3.5A, 36V	3.5A, 40V	3.5A, 36V
Common	4 points/4COM(Single Common)					

Model	ST-2742	ST-2744	ST-2748	ST-2792	ST-2852
Point NO.	2Points	4Points	8Points	2Points	
Type	Relay				Triac
Special Fun.	-			Manual Type	-
Allo. Voltage	24Vdc/230Vac				12~125Vac
Volt. Range	5~28.8Vdc/110~250Vac				12~132Vac
Loading Cur	2.0A/Point				0.5A/Point
Consum Cur	65mA/5Vdc	130mA/5Vdc	150mA/5Vdc	70mA/5Vdc	35mA/5Vdc
Common	1 Points/1COM				2Points/2COM

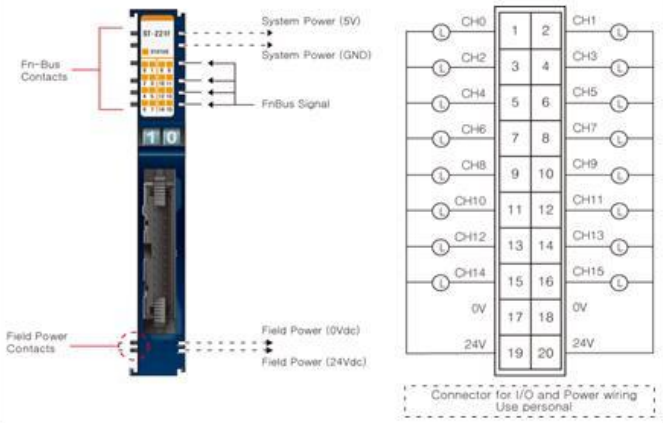
Note: The 20 pin connector for ST-221F and ST-222F require a Hirose , HIF3BA-20D-2.54C connector
http://www.hirose.co.jp/cataloge_hp/e61000010.pdf

Discrete Digital Output Wiring Diagrams

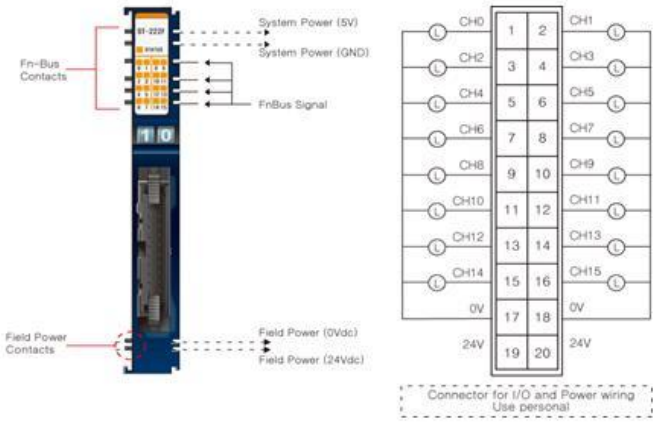




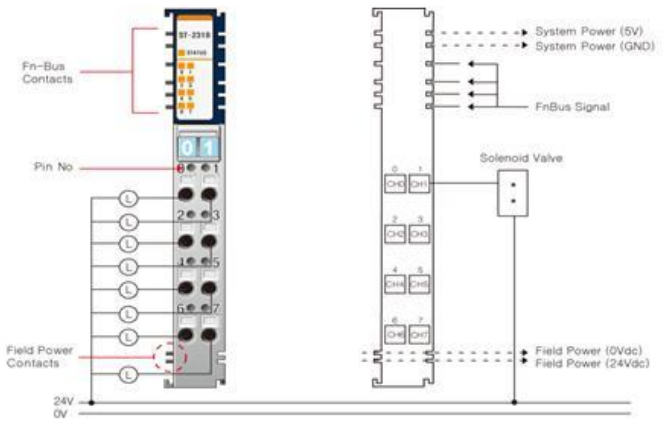
ST-221F : 16 points DC 24V Negative Logic Type



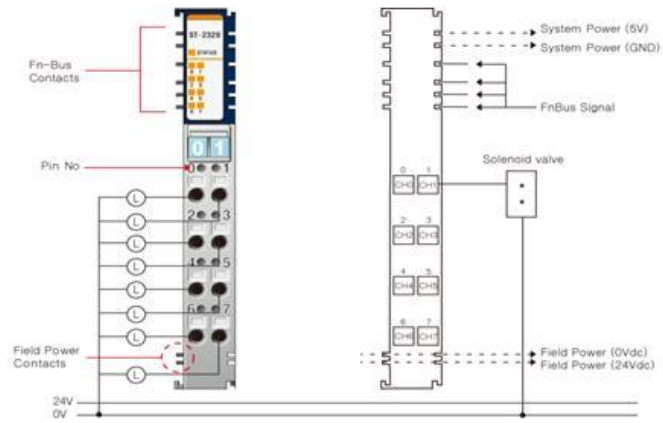
ST-222F : 16 points DC 24V Positive Logic Type



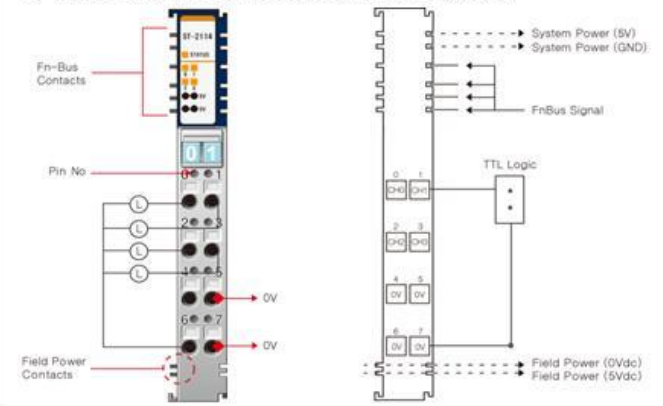
ST-2318 : 8 points DC 24V Negative Logic Type



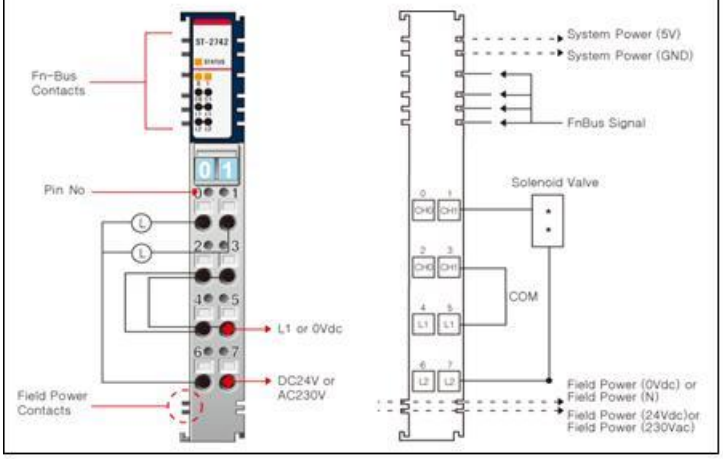
ST-2328 : 8 points DC 24V Positive Logic Type



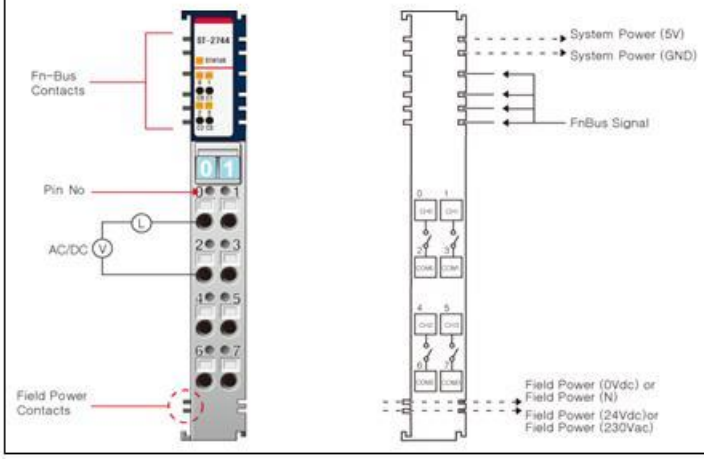
ST-2114 : 4 points DC 5V TTL Inverting Type
ST-2124 : 4 points DC 5V TTL Non-Inverting Type



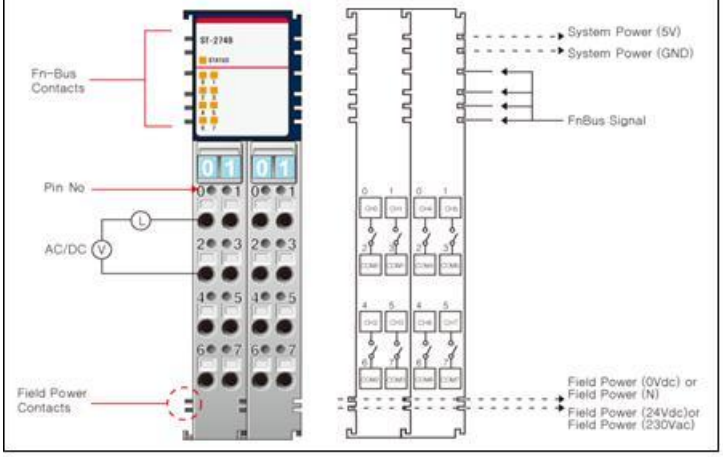
ST-2742 : 2 point Relay Type



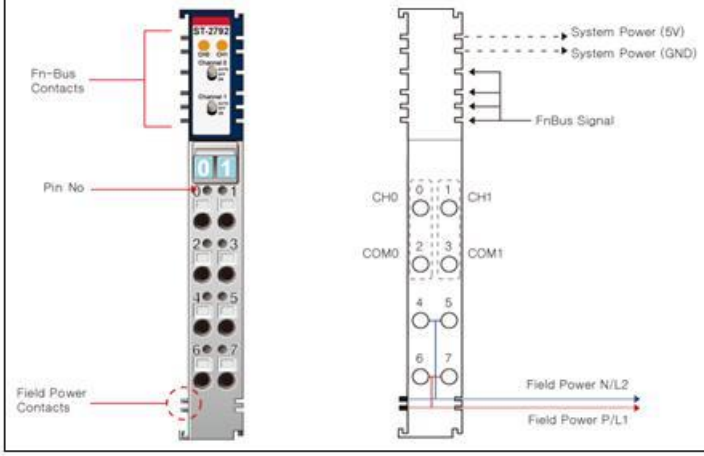
ST-2744 : 4 point Relay Type



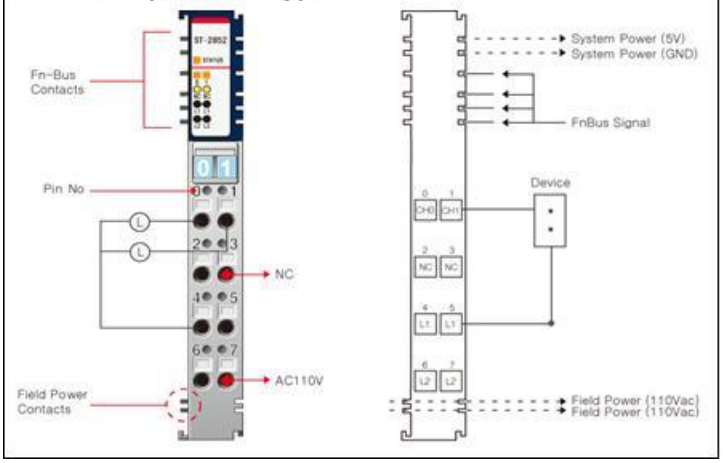
ST-2748 : 8 point Relay Type



ST-2792 : 2 point Manual/Auto Relay Type



ST-2852 : 2 point Triac Type



Analog Input Specifications

Model	ST-3114	ST-3134	ST-3214	ST-3234	ST-3118	ST-3218	ST-3428	ST-3474	ST-3274
Channel	4 Channel				8 Channel			4 Channel	
Input Range	0 ~ 20mA		4 ~ 20mA		0 ~ 20mA	4 ~ 20mA	0~10V		4 ~ 20mA
Type	Current						Voltage		Current
Resolution	12bit	14bit	12bit	14bit	12bit			12bit	
Connector	Terminal block							Sensor Connector	
Accuracy	±0.1% Full Scale @25°C, ±0.3% Full Scale @ 0°C, 60°C								
Input Impedance	120Ω						500KΩ		120Ω
Update Time	4ms / All channel								
Consum. Current	165mA/5Vdc				60mA/5Vdc			40mA/5Vdc	
Common	4 Channels / 2COM (Single Common)				Nothing in the module terminal, Field Power 0V is Common(AGND)				
Isolation	Photocoupler isolation								

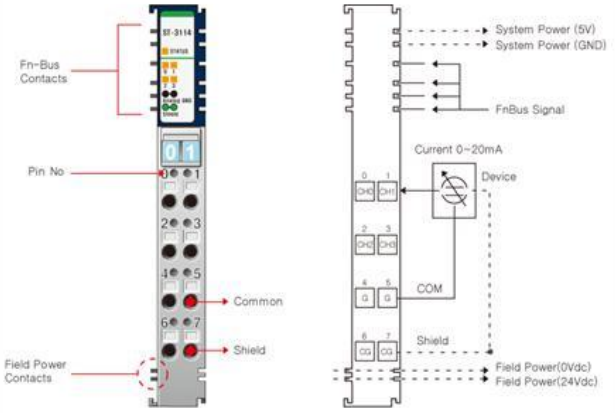
Model	ST-3424	ST-3444	ST-3524	ST-3544	ST-3624	ST-3644	ST-3702	ST-3802	ST-3704	ST-3708	ST-3804	ST-3808
Channel	4 Channel						2 Channel		4Ch	8Ch	4Ch	8Ch
Input Range	0~10V		-10V~10V		0~5V		RTD	TC	RTD		TC	
Type	Voltage						PT100 etc	TypeK etc	PT100 etc.		Type K etc.	
Resolution	12bit	14bit	12bit	14bit	12bit	14bit	±0.1°C/ F, 10mΩ					
Special Function	-						Diagnostic					
Accuracy	±0.1% Full Scale @25°C, ±0.3% Full Scale @ 0°C, 60°C											
Input Impedance	500KΩ						-					
Update Time	4ms / All channel						200msec / All Channel		30msec/1Channel when Normal Conversion			
Consum. Current	165mA /5Vdc	170mA/5Vdc					70mA/5Vdc		100mA/ 5Vdc	110mA/ 5Vdc	120mA/ 5Vdc	140mA/ 5Vdc
Common	4 Channels / 2COM (Single Common)						2 Channels/2COM (Single Common)		4 Common/Module			
Isolation	Photocoupler isolation											

Note: The ST-3704, ST-3708, ST-3804 and ST-3808 require a 20 pin connector. The connector uses a Hirose , HIF3BA-20D-2.54C connector http://www.hirose.co.jp/cataloge_hp/e61000010.pdf

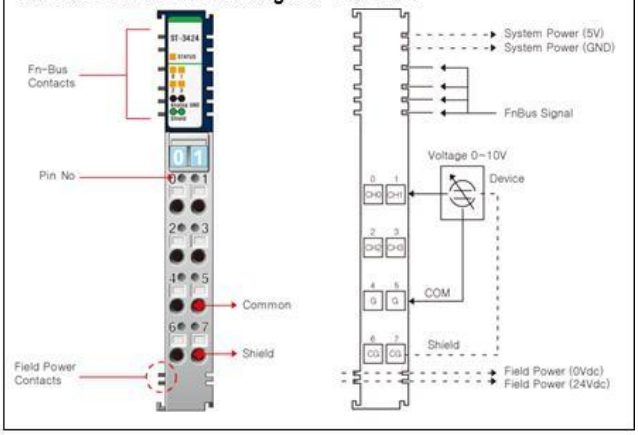
Note: The ST-3274 requires Sensor Connect 3M Mini-Clamp Plug, 37104 Series
http://multimedia.3m.com/mws/mediawebserver?66666UuZjcFSLXTt4xMcLXTyEVuQEcuZgVs6EVs6E666666--

Analog Input Wiring Diagrams

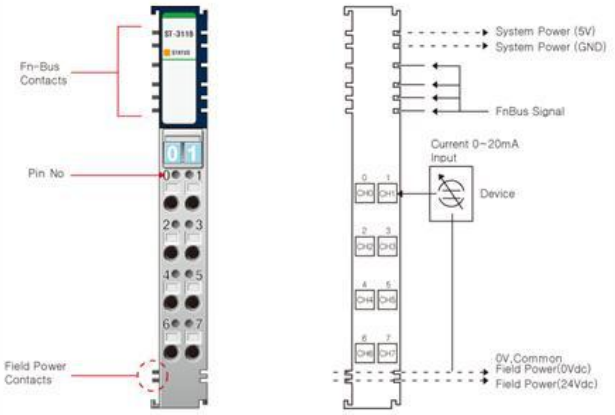
ST-3114 : 4 channels Current 0~20mA 12bit
ST-3214 : 4 channels Current 4~20mA 12bit
ST-3134 : 4 channels Current 0~20mA 14bit
ST-3234 : 4 channels Current 4~20mA 14bit



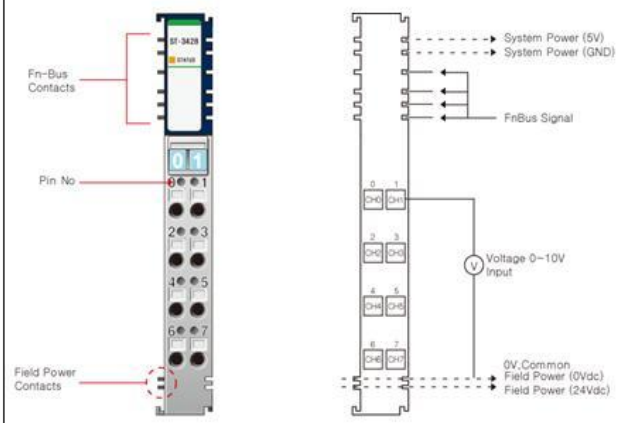
ST-3424 : 4 channels Voltage 0~10V 12bit
ST-3524 : 4 channels Voltage -10~10V 12bit
ST-3444 : 4 channels Voltage 0~10V 14bit
ST-3544 : 4 channels Voltage -10~10V 14bit
ST-3624 : 4 channels Voltage 0V~5V 12bit
ST-3644 : 4 channels Voltage 0V~5V 14bit



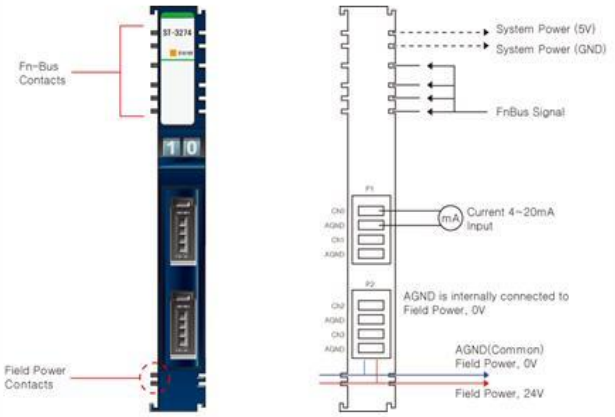
ST-3118 : 8 channels Current 0~20mA 12bit
ST-3218 : 8 channels Current 4~20mA 12bit



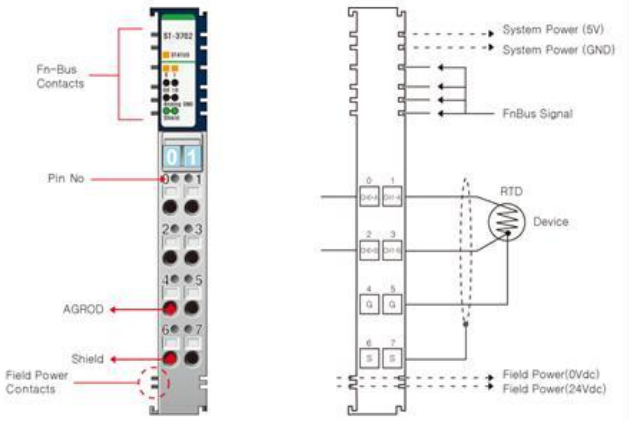
ST-3428 : 8 channels Voltage 0~10V 12bit



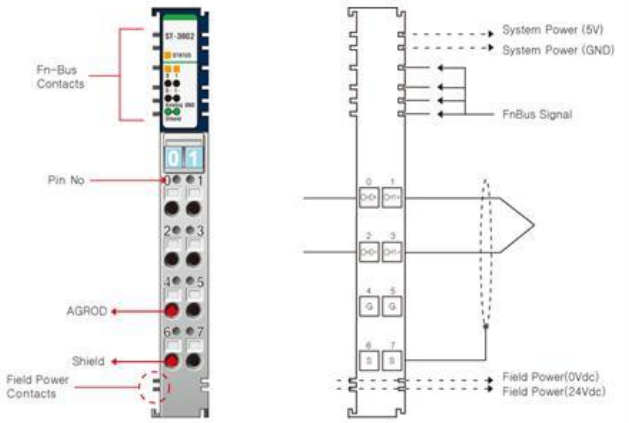
ST-3274 : 4 channels Current Sensor Connector 4~20mA, 12bit



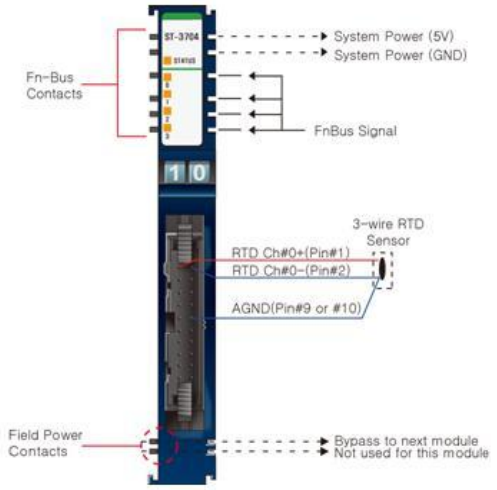
ST-3702 : 2 channels RTD / Resistance



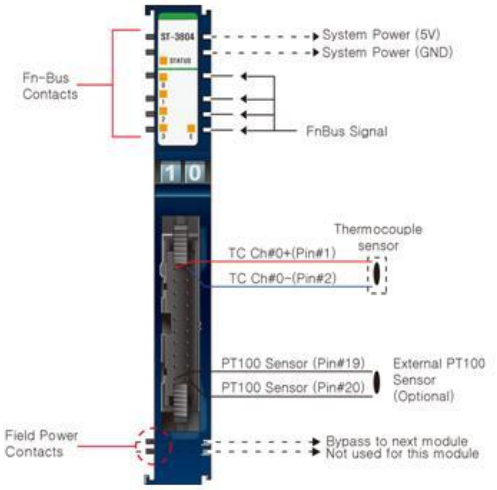
ST-3802 : 2 channels TC / mV



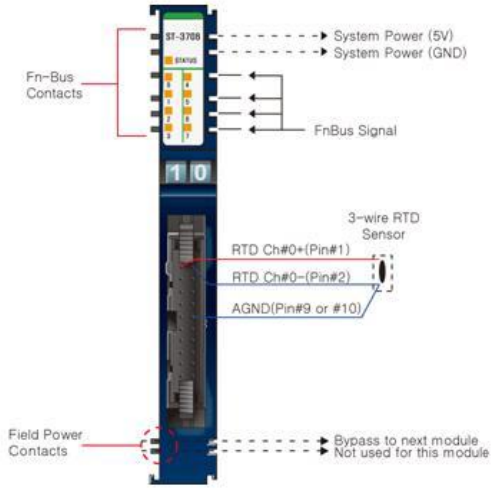
ST-3704 : 4 channels RTD / Resistance



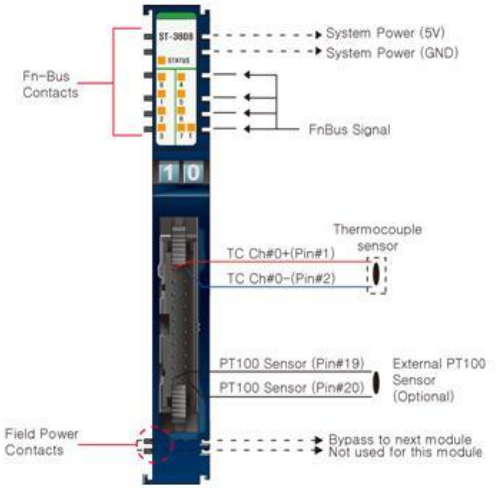
ST-3804 : 4 channels TC / mV



ST-3708 : 8 channels RTD / Resistance



ST-3808 : 8 channels TC / mV



Analog Output Specifications

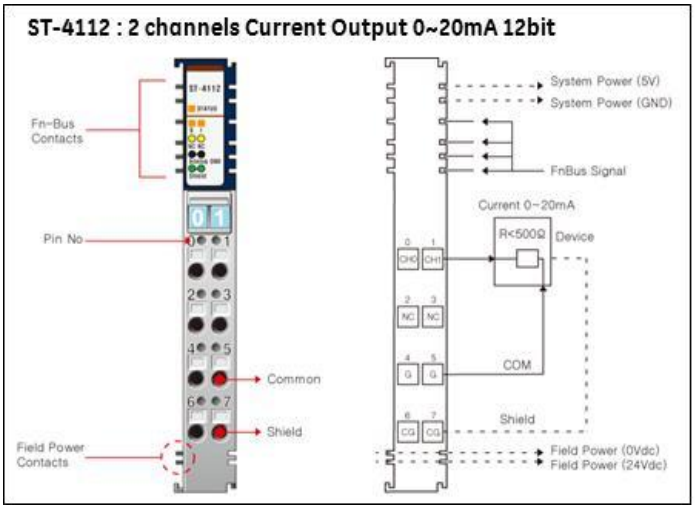
Model	ST-4112	ST-4212	ST-4114	ST-4214	ST-4274	ST-4474	ST-4491
Channels	2 Channels		4 Channels				1 Channel
Analog Output	0~20mA	4~20mA	0~20mA	4~20mA	4~20mA	0~10V	
Connector	Terminal block				Sensor Connector		Terminal block
Resolution	12bit						
Accuracy	±0.1% Full Scale @25°C						
Output Impedance	Max. 500Ω					Min. 2KΩ	
Update Time	2ms / All Channel		4ms / All Channel		1.2ms / All Channel		
Consum. Current	60mA/5Vdc				40mA/5Vdc	60mA/5Vdc	
Common	2 Channels / 2 COM (Single common)		4 Common, Field Power 0V is Common (AGND)			Nothing in the module terminal, Field Power 0V is Common (AGND)	2 Common /Module
Isolation	Photocoupler Isolation						

Model	ST-4422	ST-4522	ST-4622	ST-4424	ST-4911
Channels	2 Channels			4 Channels	1 Channel
Analog Output	0~10V	-10~10V	0~5V	0~10V	0~1A
Resolution	12bit				
Accuracy	±0.1% Full Scale @25°C				
Output Impedance	Min. 5KΩ				13Ω, ±5%
Update Time	2ms / All Channel			4ms / All Channel	1ms / All Channel
Consum. Current	155mA/5Vdc			60mA/5Vdc	
Common	2Channels / 2COM (Single common)			4 Common, Field Power 0V is Common (AGND)	1 Channel/ 2 Common(Field Power 0V)
Isolation	Photocoupler Isolation				

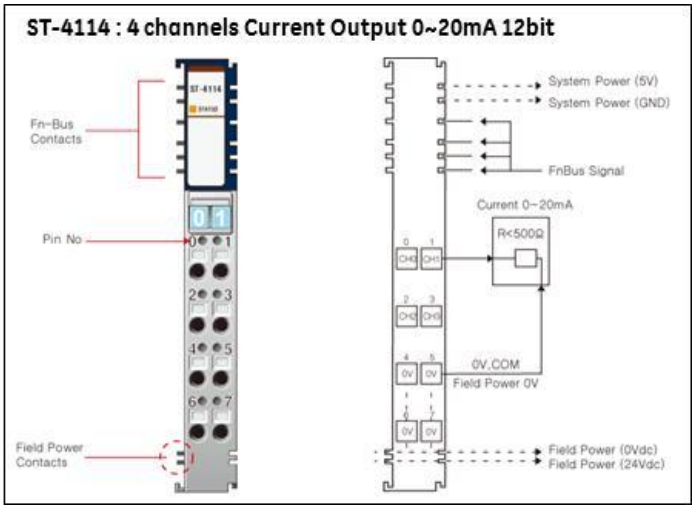
Note: The ST-4274 and ST-4474 requires Sensor Connect 3M Mini-Clamp Plug, 37104 Series
http://multimedia.3m.com/mws/mediawebserver?66666UuZjcFSLXTt4xMcLXTyEVuQEcuZgVs6EVs6E666666--

Analog Output Wiring

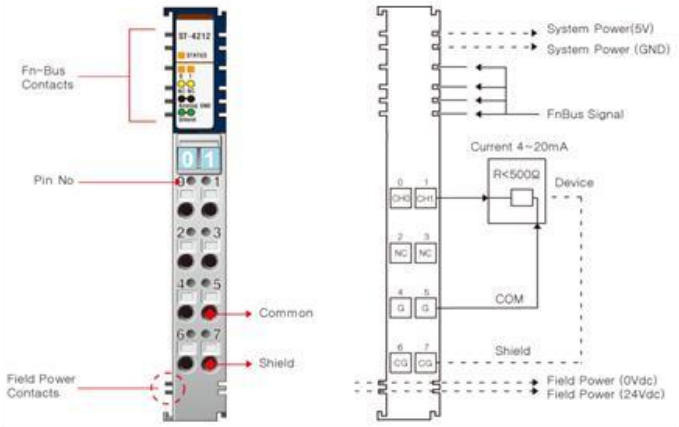
ST-4112 : 2 channels Current Output 0~20mA 12bit



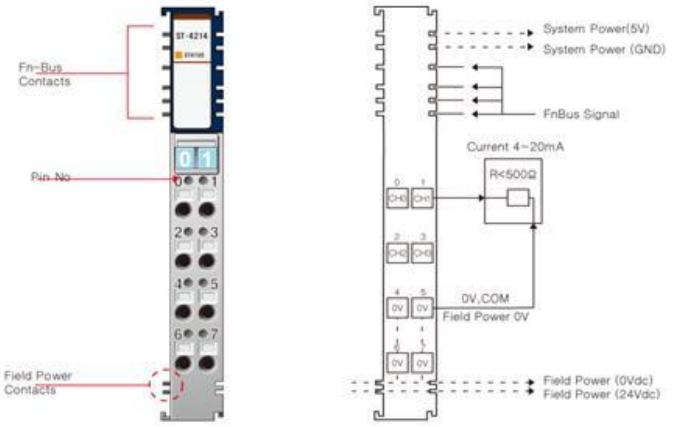
ST-4114 : 4 channels Current Output 0~20mA 12bit



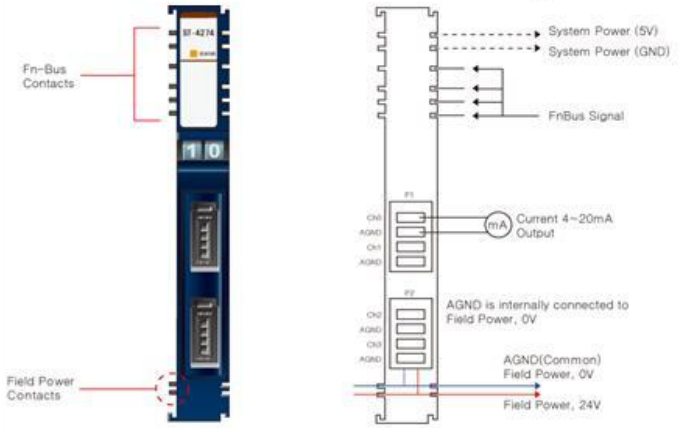
ST-4212 : 2 channels Current Output 4~20mA 12bit



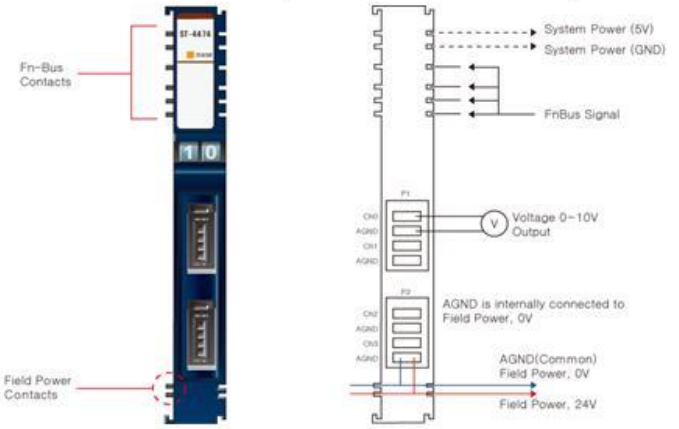
ST-4214 : 4 channels Current Output 4~20mA 12bit



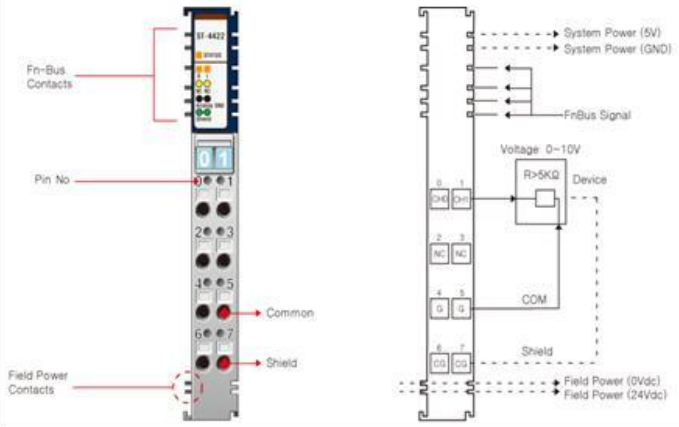
ST-4274 : 4 channels Current Sensor Connector 4~20mA, 12bit



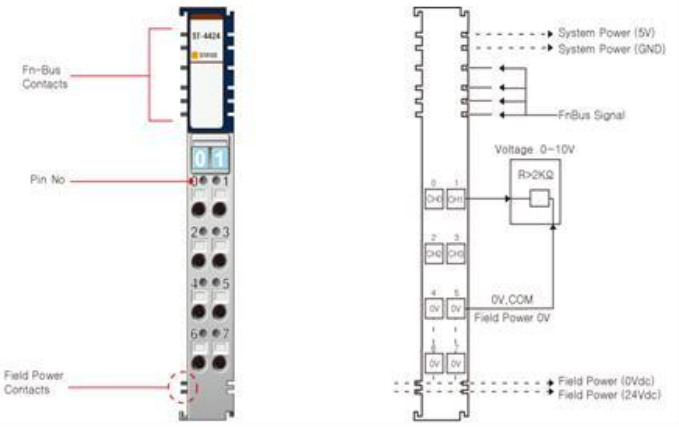
ST-4474 : 4 channels Voltage Sensor Connector 0~10V,12bit



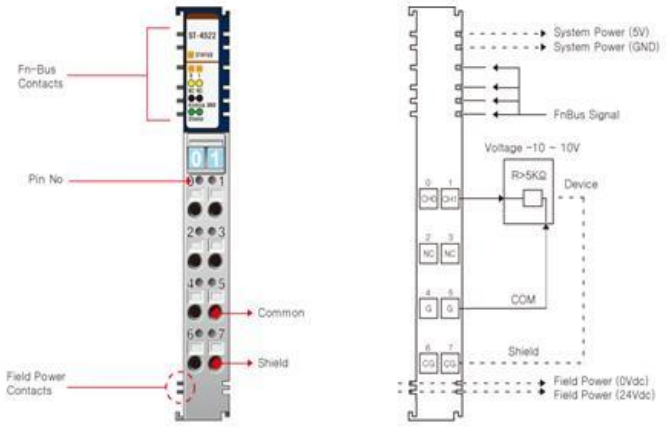
ST-4422 : 2 channels Voltage Output 0~10V, 12bit



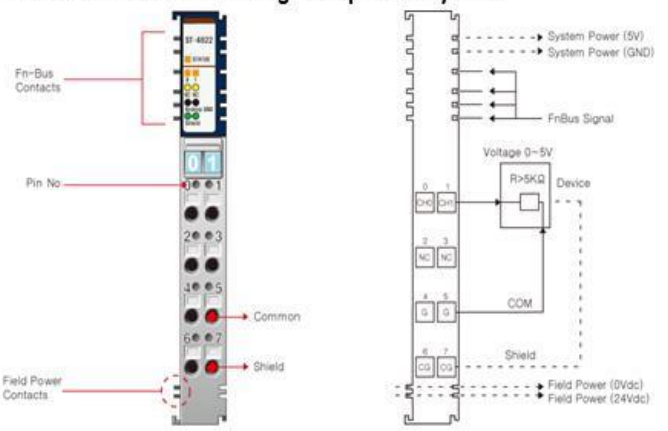
ST-4424 : 4 channels Voltage Output 0~10V, 12bit



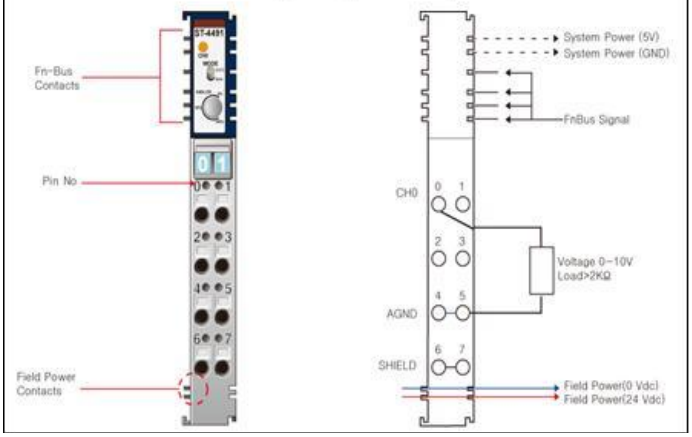
ST-4522 : 2 channels Voltage Output -10~10V , 12bit



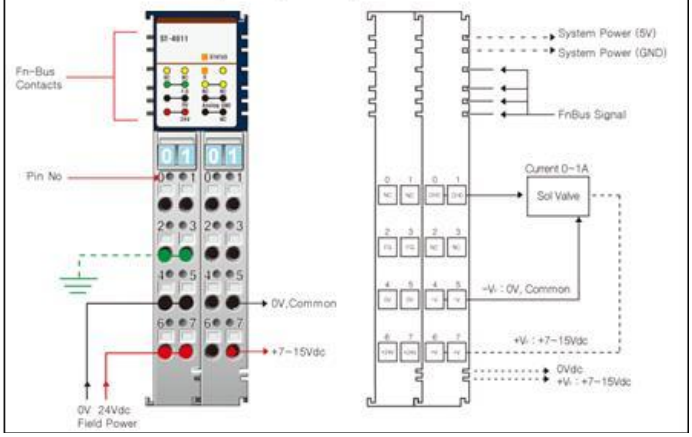
ST-4622 : 2 channels Voltage Output 0~5V, 12bit



ST-4491: 1 channel Voltage Output 0~10V, 12bit



ST-4911 : 1 Channel, 0~1A, 12Bit, RTB

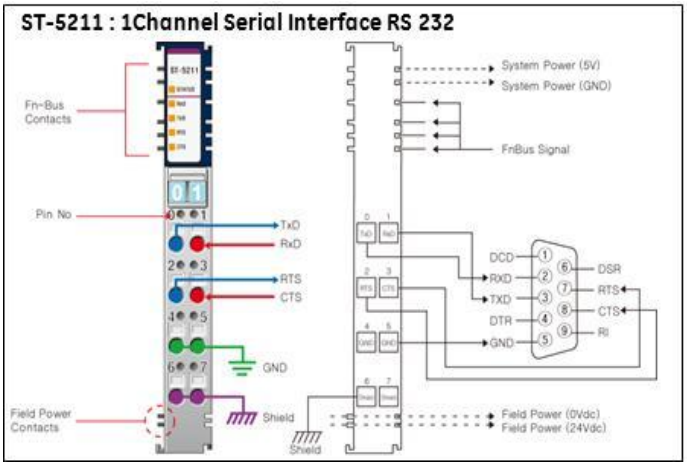


Serial Module Specifications

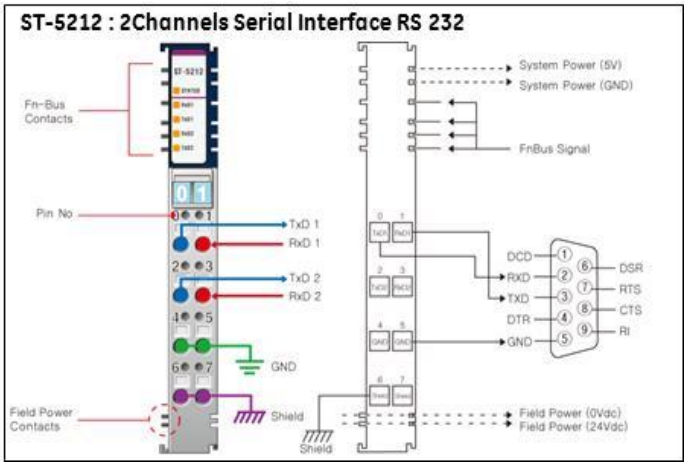
Model	ST-5211	ST-5212	ST-5252	ST-5221	ST-5231	ST-5232	ST-5272
Specificity	Serial Interface						
Communicat. Type	RS 232			RS 422	RS 485		
Channel Number	1 Channel	2 Channels		1 Channel		2 Channels	
Transfer Type	Full Duplex Type				Half Duplex Type		
Transfer Rate	300~115200bps		1200bps ~ 115200bps	300~115200bps			1200bps ~ 115200bps
Data bit	7bits, 8bits, 9bits						
Parity bit	None, Odd, Even						
Stop bit	1bit, 2bits						
Flow Control	RTS, CTS	--					
Bit Distortion	<1.6%						
Connection	Spring force of RTB						
Cable Length	Max. 15m			1Km twisted pair			
Low Signal voltage	-18V ~ -3V			--			
High Signal voltage	3V ~ 18V			--			
Isolation	Photocoupler Isolation, Isolation Voltage:1000Vrms/Vac						
Input Buffer size	1024 bytes		256 byte/ channel	1024 bytes			256 byte/ channel
Output Buffer size	256 bytes		256 byte/channel	256 bytes			
Line Impedance	--			120Ω			
Input Image size	6 Bytes	12 Bytes	38 Bytes	6 Bytes		12 Bytes	38 Bytes
Output Image size	6 Bytes	12 Bytes	38 Bytes	6 Bytes		12 Bytes	38 Bytes
Power Dissipation	95mA Max. @5.0Vdc	110mA Max. @5.0Vdc		155mA Max. @5.0Vdc	110mA Max. @5.0Vdc	155mA Max. @5.0Vdc	

Serial Module Wiring Diagrams

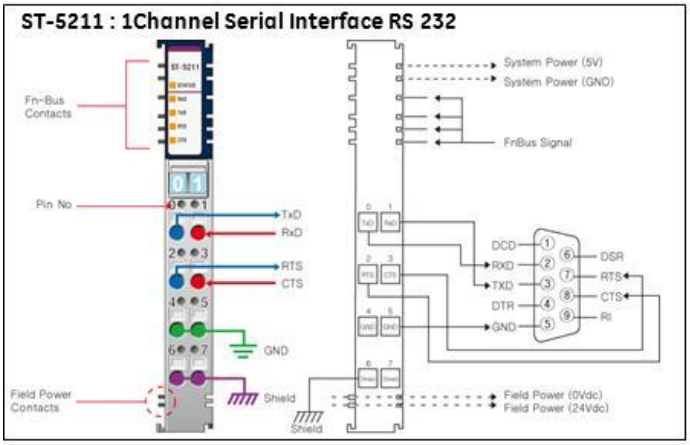
ST-5211 : 1Channel Serial Interface RS 232



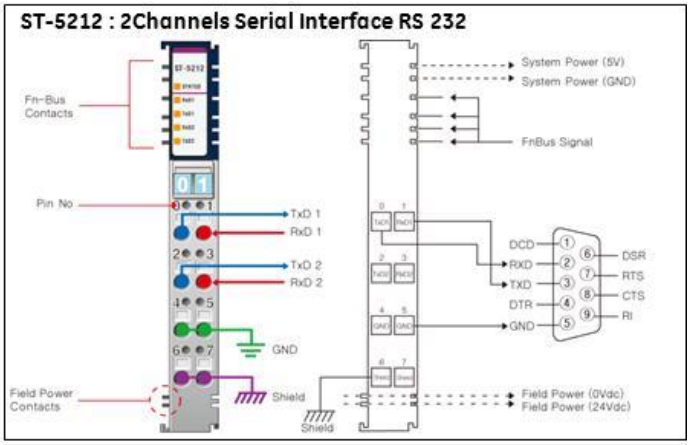
ST-5212 : 2Channels Serial Interface RS 232



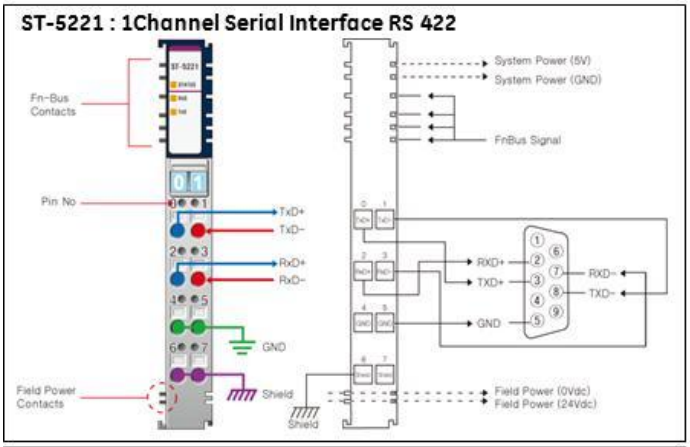
ST-5211 : 1Channel Serial Interface RS 232



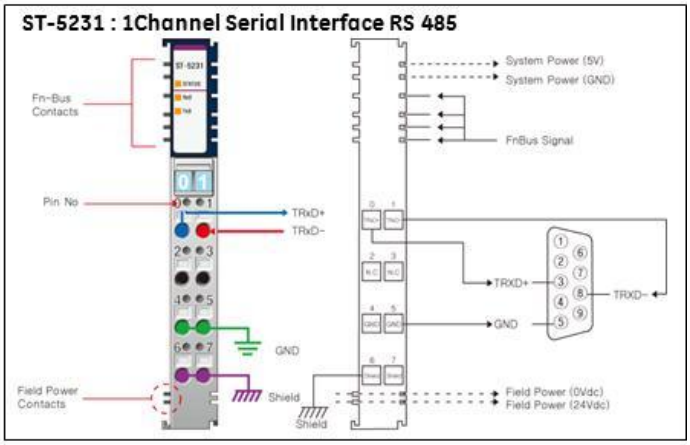
ST-5212 : 2Channels Serial Interface RS 232



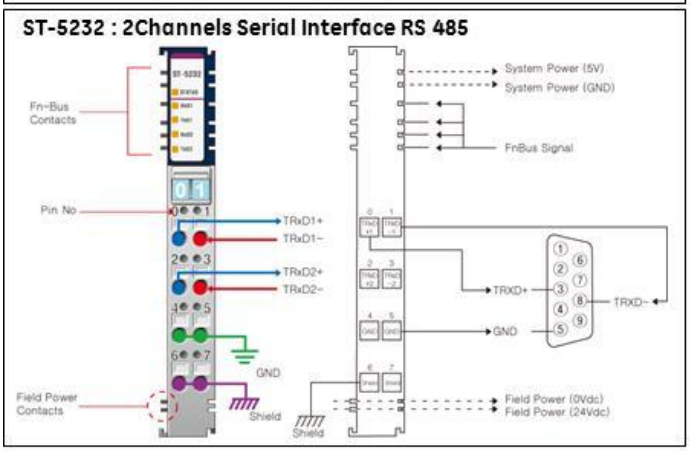
ST-5221 : 1Channel Serial Interface RS 422



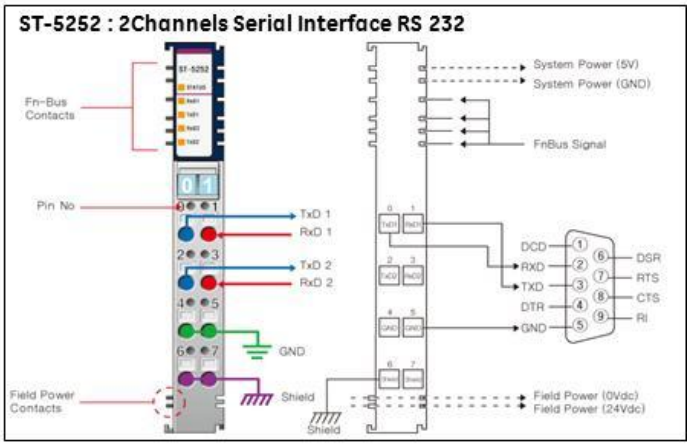
ST-5231 : 1Channel Serial Interface RS 485



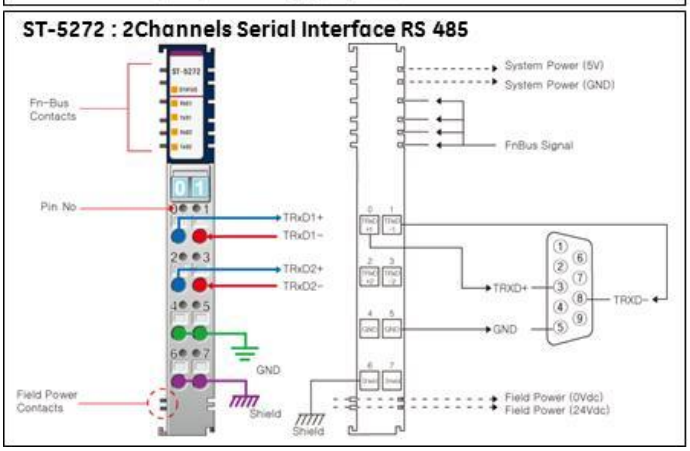
ST-5232 : 2Channels Serial Interface RS 485



ST-5252 : 2Channels Serial Interface RS 232



ST-5272 : 2Channels Serial Interface RS 485



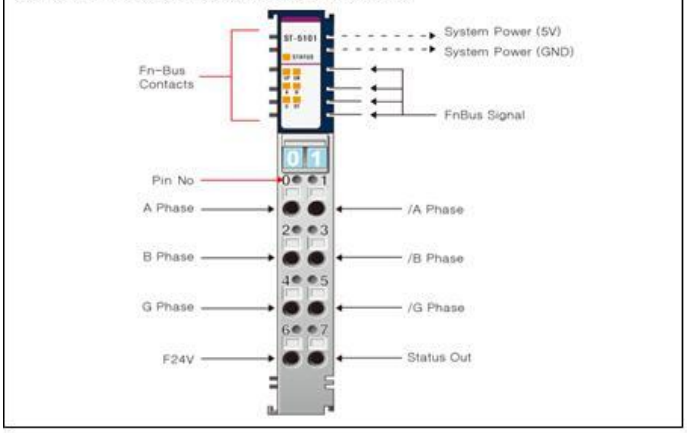
Motion Module Specifications – High Speed Counter

Model	ST-5101	ST-5111	ST-5112	ST-5114
Specificity	High Speed Counter			
Input Channels	1 Channel		2Channels	4Channels
Input Voltage	5Vdc	24Vdc		
Input Current	16.2mA/5Vdc	6.1mA/24Vdc		
Input Frequency	Max. 1.5MHz		0~100KHz except Encoder 4x	0~50KHz except Encoder 4x
Input Duty Range	10%~90%		20%~80%	
Counter Size	24bit-wide		32bit-wide/Channel	
Common Type	0-1, 2-3, 4-5		2Common	
Number of Outputs	6-7 Status Output		2 Channels, source Type	
Output Voltage	5 to 28.8Vdc		24Vdc	
Output Current	Max. 0.5A		0.5A/Ch, 1A/All Channel	
Power Dissipation	Max. 80mA/5.0Vdc		Max. 160mA/5.0Vdc	
Isolation	Photocoupler Isolation			

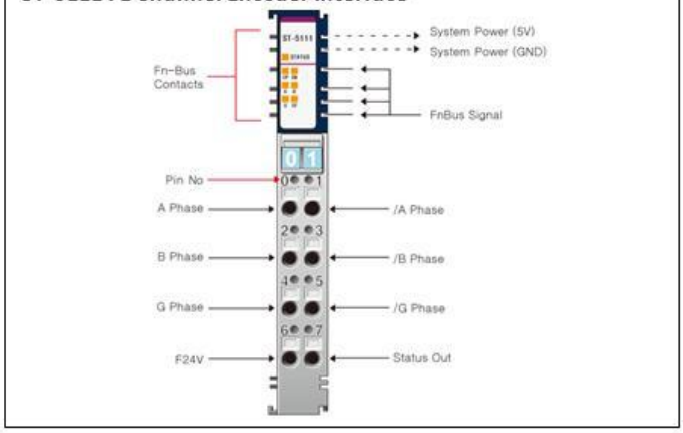
Model	ST-5351
Specificity	SSI Interface
Number of Channels	1 Channel
SSI Data Rate	62.5K, 100K, 125K,250K,500K,1M,2Mbps
SSI Data Width	Max. 30bit
SSI Data Delay Time	20usec~10msec
SSI Output	C+,C- RS422 Differential Output
SSI Input	D+,D- RS422 Differential Input
SSI Data Code Type	Gray Code or Natural Binary
Digital Input	24Vdc Input nominal, Sink Type
Diagnostic	Field Power, SSI Frame
Common Type	1 Common, 1 Shield
Power Dissipation	Max. 150mA@5.0Vdc
Isolation	Photocoupler Isolation

Motion Module Wiring – High Speed Counter

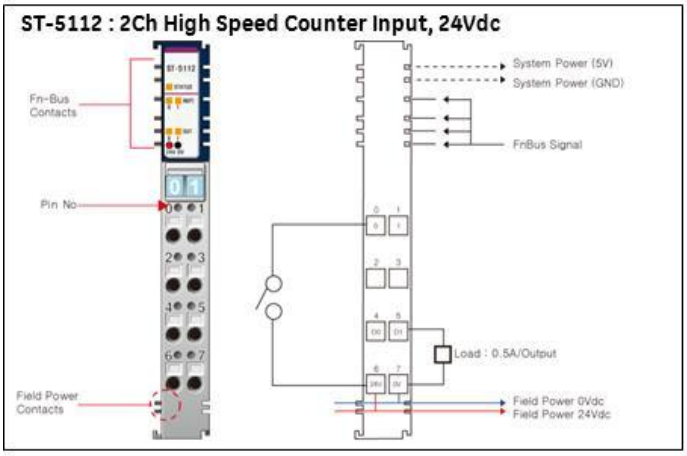
ST-5101 : 1 Channel Encoder Interface



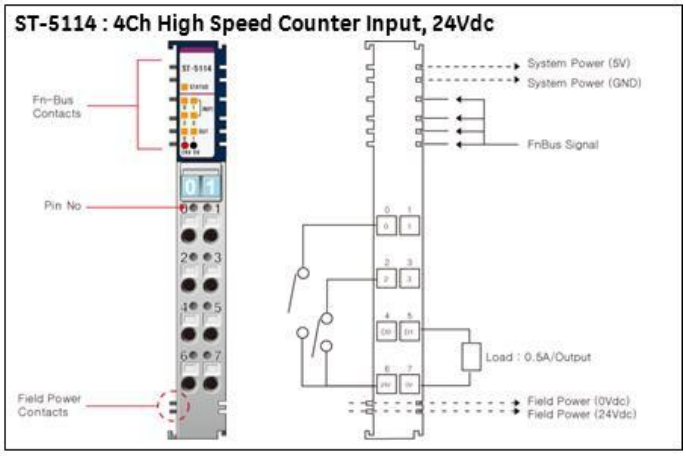
ST-5111 : 1 Channel Encoder Interface



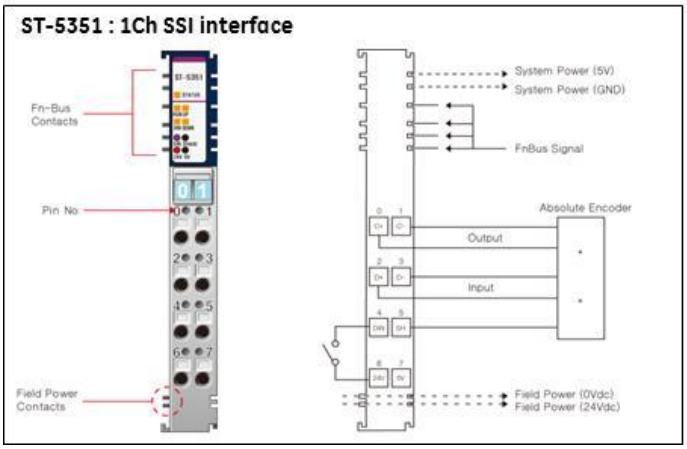
ST-5112 : 2Ch High Speed Counter Input, 24Vdc



ST-5114 : 4Ch High Speed Counter Input, 24Vdc



ST-5351 : 1Ch SSI interface



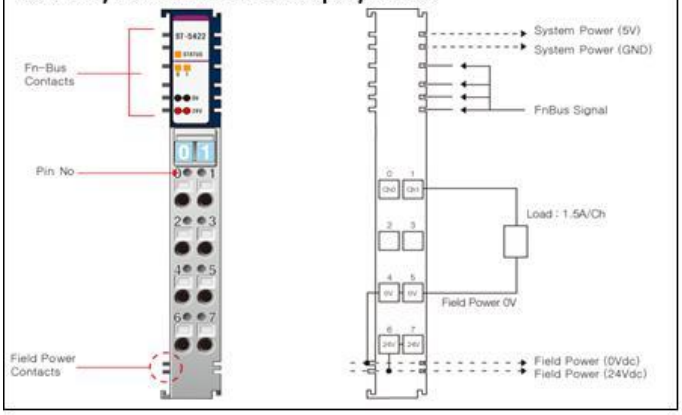
Motion Module Specifications – PWM and Pulse Train Outputs

Model	ST-5422	ST-5442	ST-5444
Specificity	PWM Output		
Number of Outputs	2 Channels		4 Channels
Type	Source		
Output Current	1.5A/Ch, 3A/All Channel	0.5A/Ch, 1A/All Channel	0.5A/Ch, 2A/All Channel
Output Inrush Current	Max. 2A, 100ms/Ch	Max.1.5A, 100ms/Ch	
PWM Frequency	1~2500Hz±0.5%		
PWM Duty	0.0~100.0%±1.0(0.1%/1LSB), Ton>5us, Toff>5us		
Diagnostic	Short Protection		
Common Type	2Common		
Power Dissipation	Max. 150mA@5.0Vdc		
Isolation	Photocoupler Isolation		

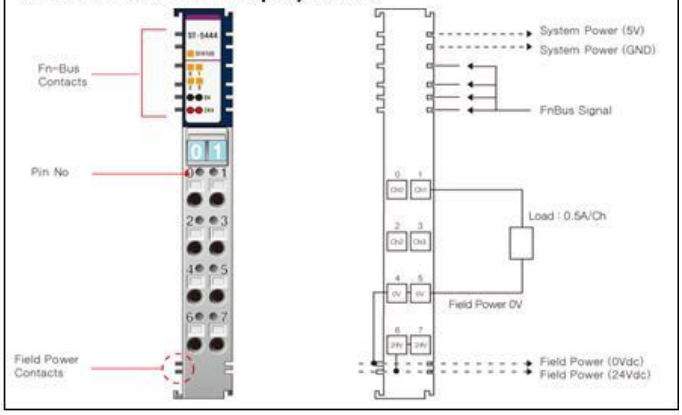
Mode	ST-5641	ST-5642	ST-5651
Specificity	PULSE Output		
Number of Channels	1 Channel	2Channels	1 Channel
Number of Outputs	2 Output/Channel		2 Output
Type	Source		RS 422
Output Current	0.5A/Output, 1A/All Output	0.5A/Output, 2A/All Output,	-
Pulse Output Frequency	1~20,000Hz±0.5%		5~20,000Hz±1.0%
Pulse Output Duty	50%±3.0% Fixed, Ton>5us, Toff>5us		50%±0.1% Fixed, Ton>10ns, Toff>10ns
Pulse Output Quantity	Max. +1~+32767 : Pulse Direction Output OFF, Max. -1~-32767 : Pulse Direction Output ON.		
Pulse Output Counter	Signed 32bit-wide		
Diagnostic	Short protection		-
Common Type	2Common		1 Common, 1 Shield
Power Dissipation	Max. 150mA@5.0Vdc		
Isolation	Photocoupler Isolation		

Motion Module Wiring – PWM and Pulse Train Outputs

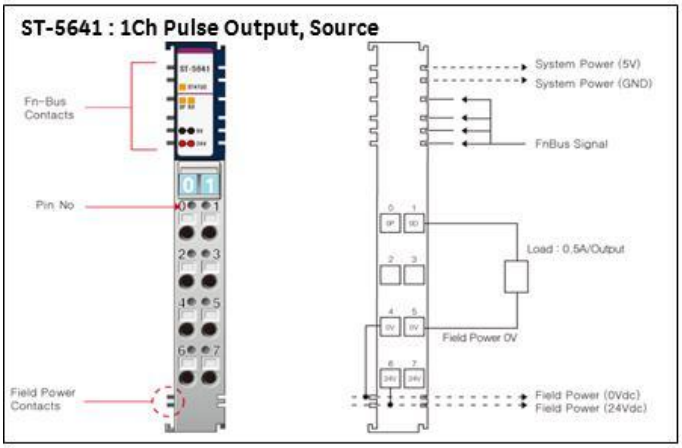
ST-5422, 5442 : 2Ch PWM Output, Source



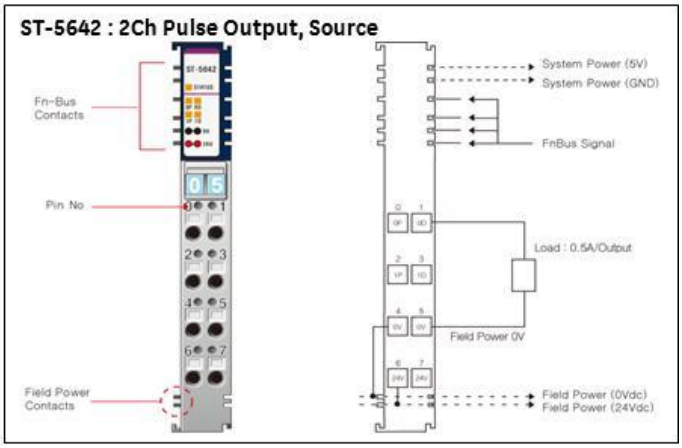
ST-5444 : 4Ch PWM Output, Source



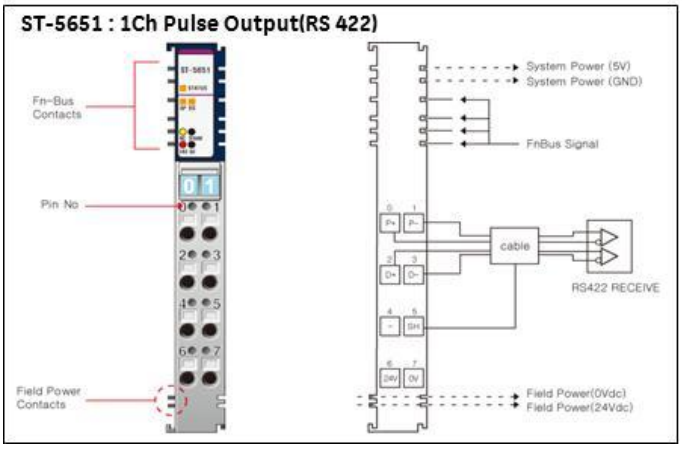
ST-5641 : 1Ch Pulse Output, Source



ST-5642 : 2Ch Pulse Output, Source



ST-5651 : 1Ch Pulse Output(RS 422)



System Modules Specifications

Power Modules	ST-7111	ST-7511	ST-7241	ST-7641
System Input Voltage range	11Vdc to 28.8Vdc		--	
System Power Input Voltage	Normal 24Vdc		--	
Field Power Input Voltage	Normal 24Vdc (20%)		Arbitrary 5Vdc,24Vdc,48Vdc,110Vac,220Vac	
Fn-Bus Output Voltage	Max. 5Vdc, 1A		--	
Field Power Contacts Current	Max. 10A			
Indicator	2 Green Input state	1 Green/Red LED, Module Status / 2Green LED, Input Status	Non Indicate	1 Green/Red LED, Module Status
Type	--	ID Type	--	ID Type
weight	70g			
Cable wiring	I/O Cable Max. 2.0 (AWG 14)			

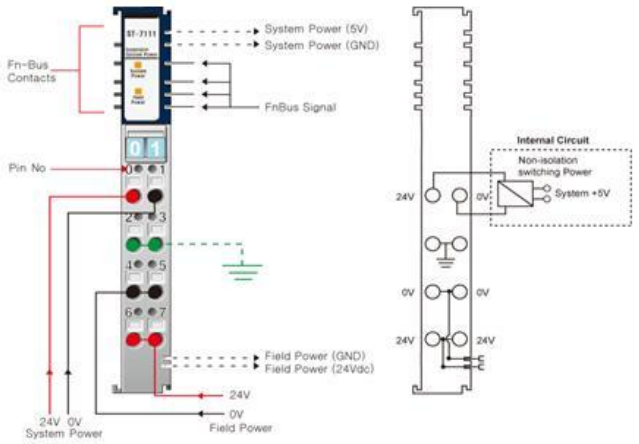
Distribution Modules	ST-7008	ST-7108	ST-7118	ST-7188	ST-7408	ST-7508	ST-7518	ST-7588
Field Power Voltage	Shield	0Vdc	24Vdc	24Vdc, 0Vdc	Shield	0Vdc	24Vdc	24Vdc, 0Vdc
Field Power Contacts Current	Max.10A							
indicator	Non Indicate				1 Green/Red LED, Module Status			
power dissipation	Expansion Power Distributor	--		Expansion Power Distributor	--		Max. 18mA @ 5Vdc	
Type	--				ID Type			
weight	65g				70g	65g	64g	65g
Cable wiring	I/O Cable Max. 2.0㎟(AWG 14)							

Expansion Modules	ST-5725 (Master)	ST-5726 (Slave)
Number of Expansion I/O slots	Max 32 slots	
Max. Length Extension Line	Approximately Max. 300m	
Number of Extension Nodes	Max 3 Nodes	
Connection Type	RTB 8Points	
Power Dissipation	Max. 100mA @5Vdc	
Field Power	No Connection with Field Power	
Wiring	Extension Cable	

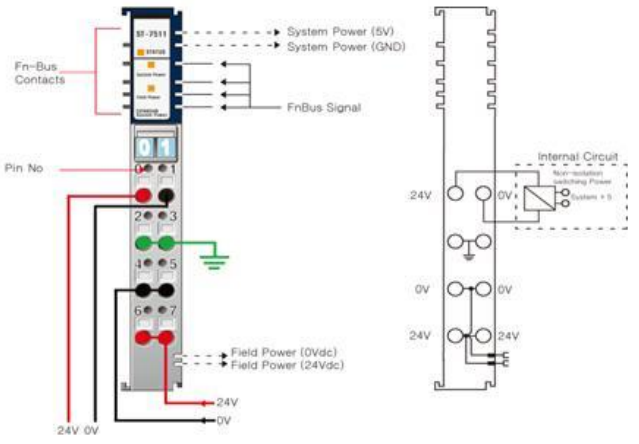
Note: The Bus Master (ST-5725) and Slave (ST-5726) enables the RSTi to break the bus in the event that panel width or the user wishes to distribute the modules. When expansion is required, add a Bus Master to the end of the DIN rail section, then put in a Bus Slave at the beginning of the next set of I/O modules. Connection between the master and slave is a twisted shielded cable. The master and slave have screw terminals so you don't need special connectors. The Master-Slave network is NOT multi-drop. Each Master can have only 1 Slave. You can add more drops by putting a Master at the end of the second DIN rail and connecting to another Slave. The limit is 3 Master Slave pairs with a total distance of 300 meters. The maximum number of modules allowed is a total of 32, Master and Slave modules occupy a module address.

System Modules Wiring

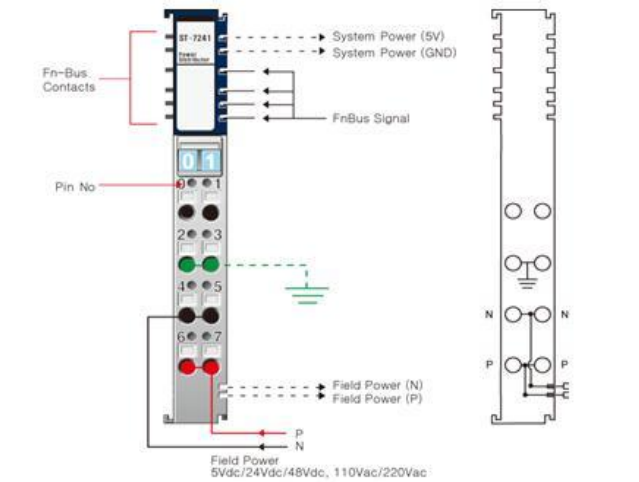
ST-7111 : 1Channel Expansion Power Supply Module



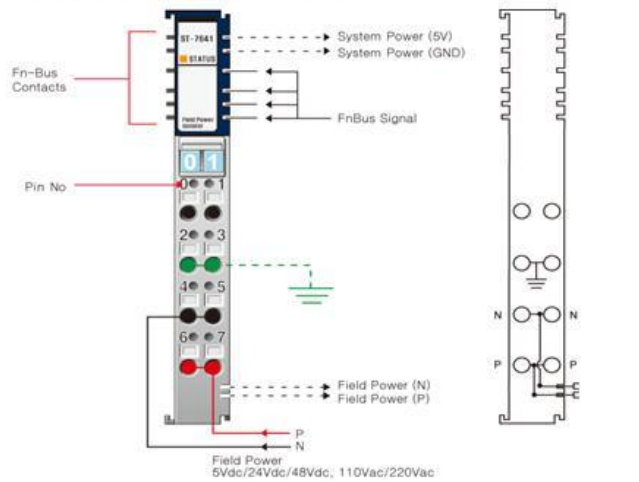
ST-7511 : 1Channel Expansion Power Supply with module ID



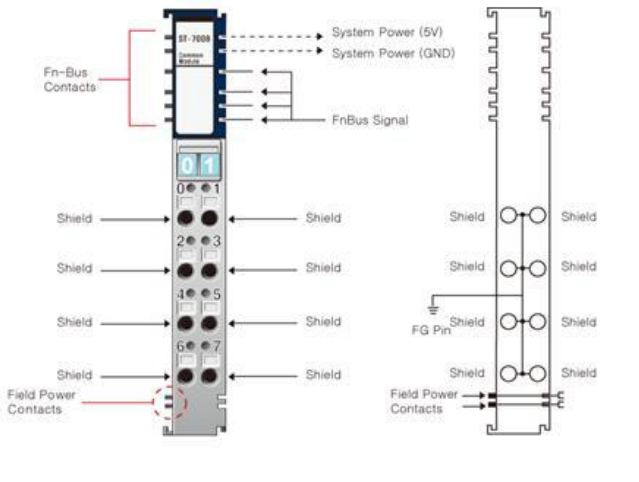
ST-7241 : 1Channel Field Distributor, 5V~48Vdc,110~220Vac



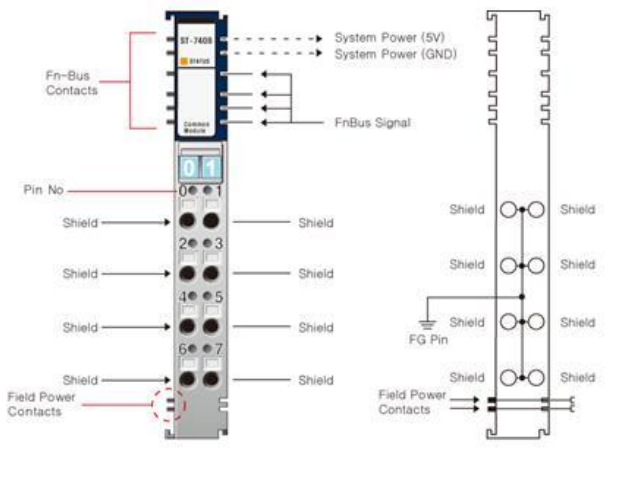
ST-7641 : 1Channel Field Distributor Module 5V~48Vdc,110~220Vac with module ID



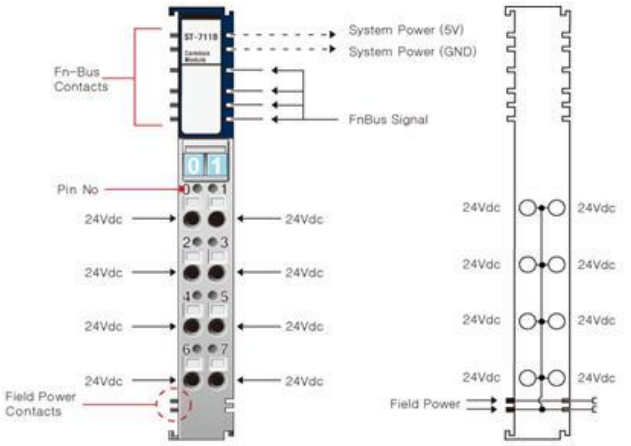
ST-7008 : 8 Channels Shield Module



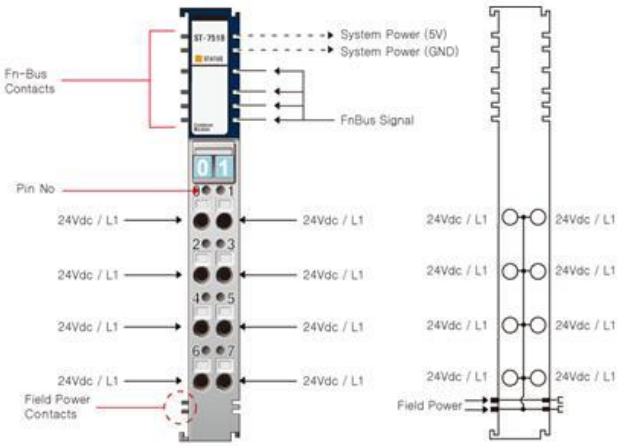
ST-7408 : 8Channels Shield Module with module ID



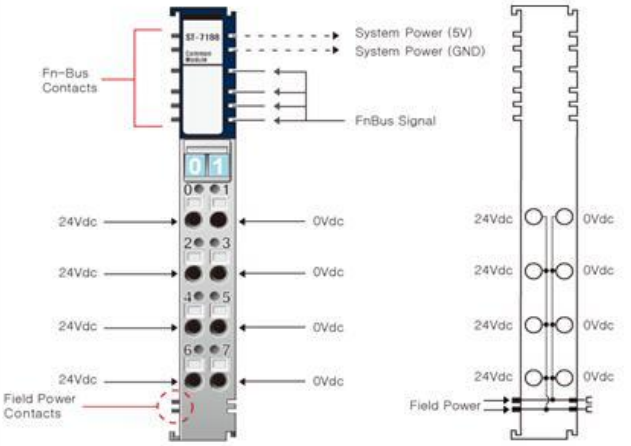
ST-7118 : 8 Channels Common Module for 24Vdc



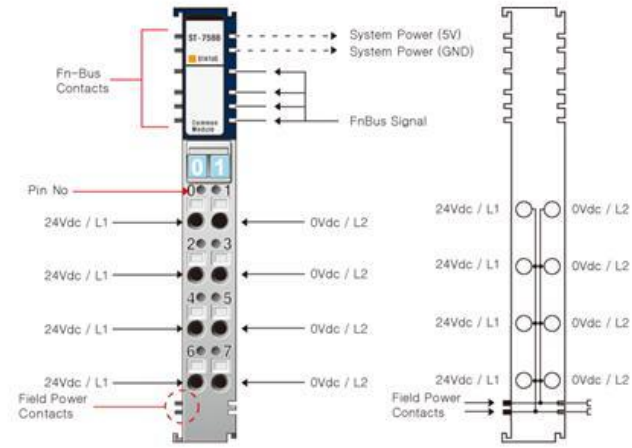
ST-7518 : 8 Channels Common for 24Vdc with module ID



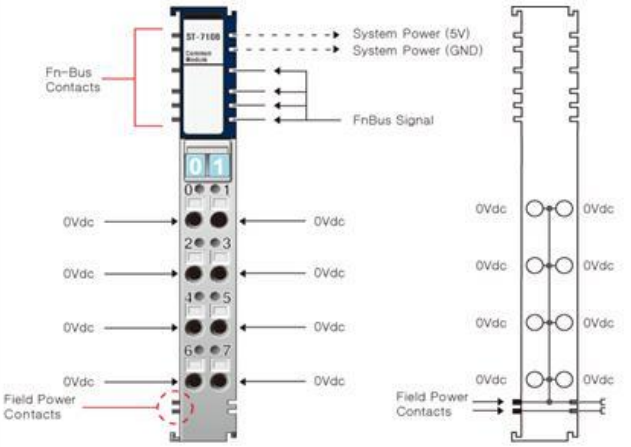
ST-7188 : 8 Channels Common Module 24Vdc/0Vdc



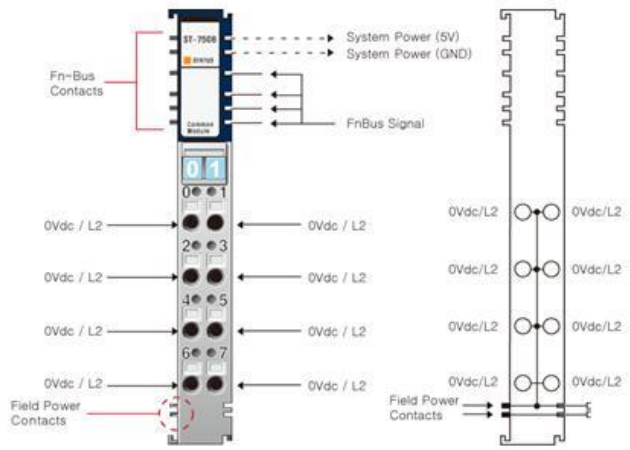
ST-7588 : 8 Channels Common 24Vdc/0Vdc with module ID



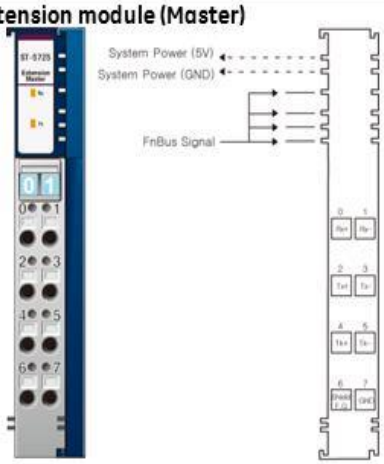
ST-7108 : 8 Channels Common Module, 0V



ST-7508 : 8 Channels Common, 0V with module ID



ST-5725 : Extension module (Master)



ST-5726 : Extension module (Slave)