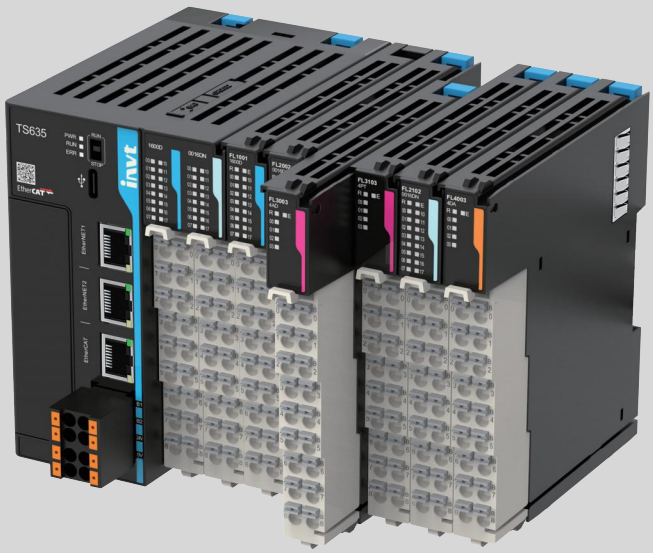
TS600 Series Intelligent PLC



About Us

INVT (Shenzhen INVT Electric Co., Ltd) has been concentrating on industry automation and energy power since its foundation in 2002 and is committed to "Providing the best product and service to allow customers more competitiveness". INVT goes public in 2010 and is the first A-share listed company (002334) in Shenzhen Stock Exchange in the industry. At present, INVT owns 15 subsidiaries and more than 4500 employees, over 40 branches, forming a sales network covering more than 100 overseas countries and regions.

INVT has been awarded as the Key High-tech Enterprise of National Torch Plan based on mastering of key technologies in power electronics, auto control and IT. With business covering industry automation, electric vehicle, network power and rail transit, INVT has established 10 R&D centers nationwide, boasts more than 1400 patents and owns the first lab in the industry awarded ACT qualification from TÜV SÜD, UL-WTDP and CNAS National Lab. The industrial parks in Shenzhen and Suzhou aim to provide customers with advanced integrated product development design management, comprehensive product R&D test and auto informational production. The worldwide INVT branches and warranty service centers are ready to offer customers all-around back-ups including professional solutions, technical trainings and service support.

In the next decade, INVT will continue to take " Sincere Virtuous, Professional Aspiring" as our business philosophy, enhance core business sectors including industrial automation, electric vehicle, network power and rail transit based on the three major technologies in industry automation and energy power fields, and strive to become a leading, responsible and harmonic international professional group armed with proper product structure, leading technologies, efficient management, robust profitability and superior competitiveness.


INVT Guangming
Technology Building

INVT Shenzhen
Production Industry Park


INVT Suzhou Industry Park

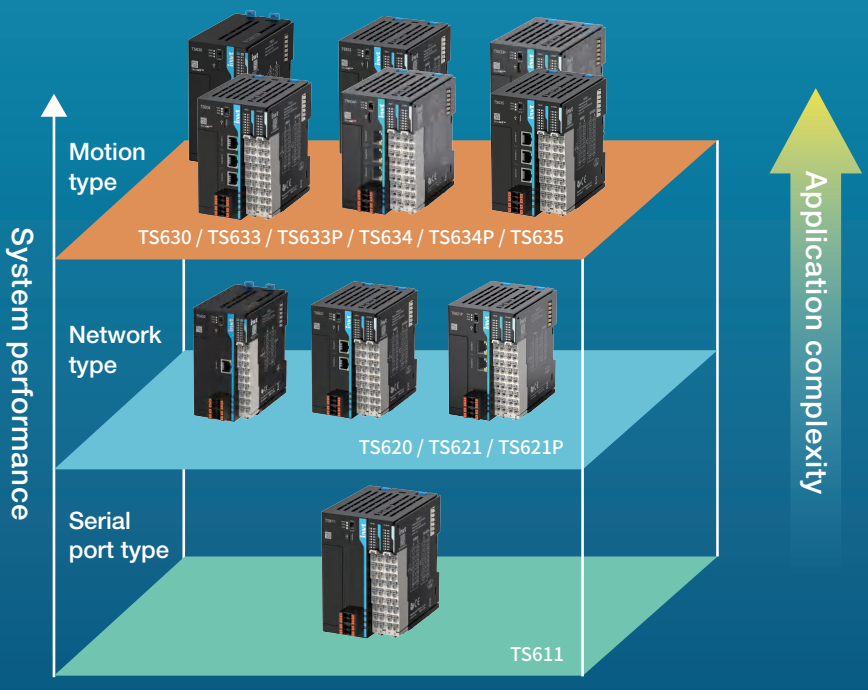

INVT Zhongshan
New Energy Industry Base

TS600 Series Intelligent PLC

Product overview

INVT TS600 series intelligent PLC integrates high-performance embedding technology, and it is based on a high-speed bus system architecture to integrate four types of automation control, namely, sequence, process, information, and motion control, into the same system. It achieves the real-time control and complex calculation through the highly reliable software and hardware real-time system, and provides open communication interfaces, IoT networks, and distributed module system architecture. The completely independent programming software provides customized services, making programming easy.
TS600 can work with INVT VFD, servo, HMI, IoT and other products to construct one-stop automation solutions to create value for customers.

Product positioning

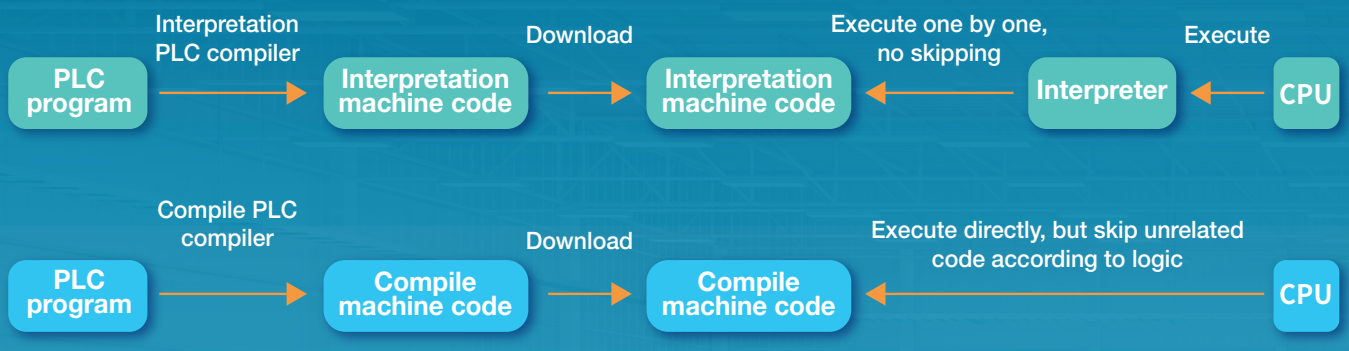



Strong motion control
High performance
Easy connection
6 highlights
Easy programming
Easy scalability
Cloud collaboration

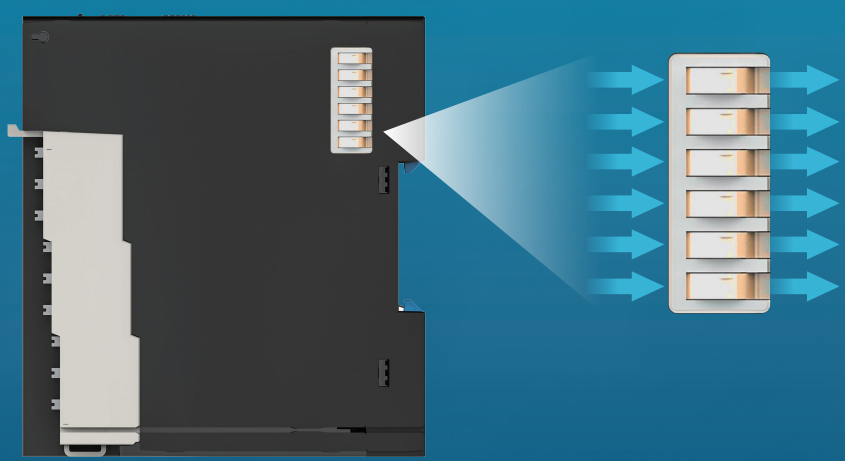
High performance

Running efficiently

1G main frequency, compile command breakthrough, bit operation speeding up to **0.01μs**

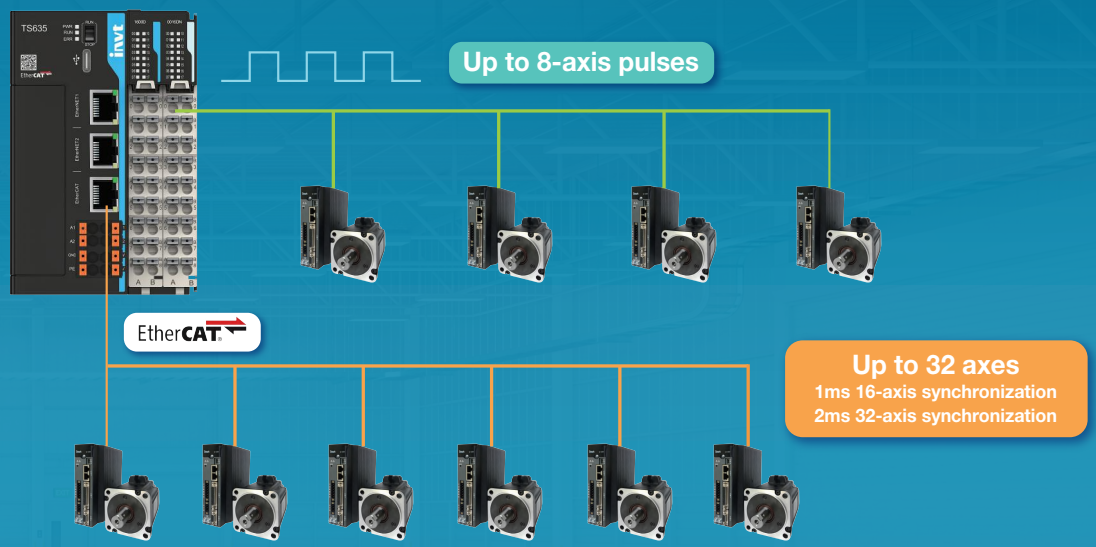


100Mbps backplane bus; **125μs IO** refresh speed; **plating process**, reliable connection; **saving data at power down**, 1s power-down ride-through



Strong motion control

- High-speed motion control, easily implementing complex processes



Single-axis control

speed and torque control

Position control

Homing

Multi-axis control

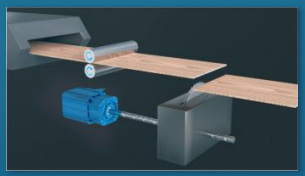
E-gear

E-CAM

Interpolation

Flying shear

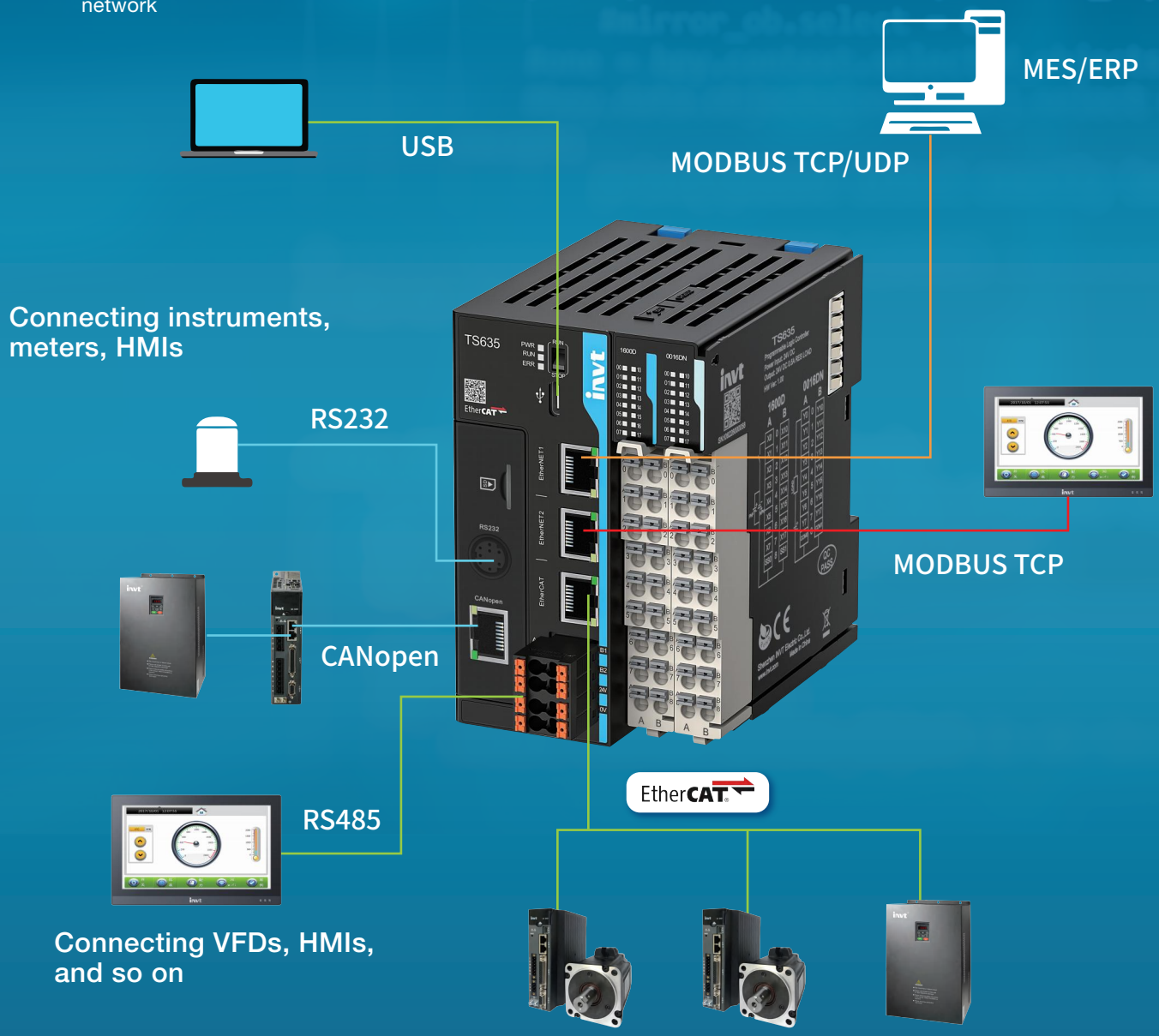
Chasing shear



Easy connection

Multi-protocol support facilitates interconnection

Dual-port design, makes cascading easy, and achieves the isolation between the internal network and external network

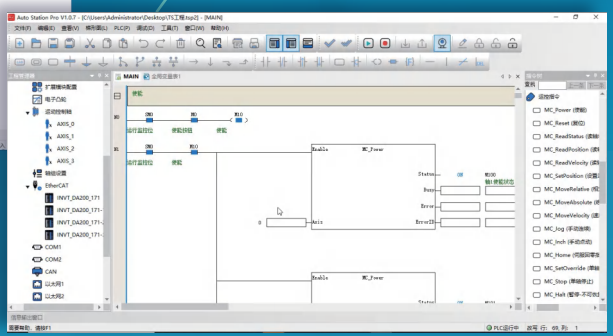


*Ethernet IP slave nodes supported

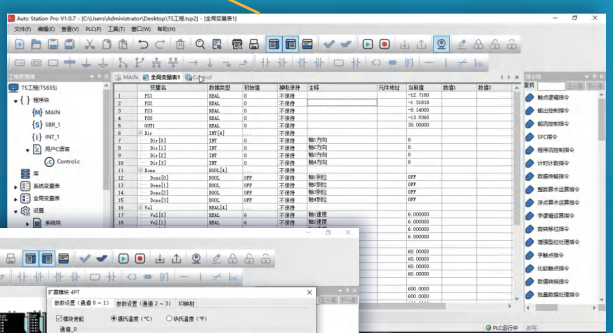
Easy programming

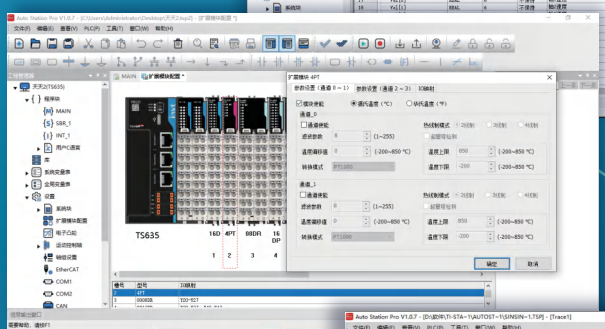
Equipped with the brand new **AutoStationPro**

Compliant with IEC61131 programming specifications, supporting the languages LD, SFC, IL, C, and ST (under development). The **pulse** and **bus axes** are compatible with a set of axis control commands.

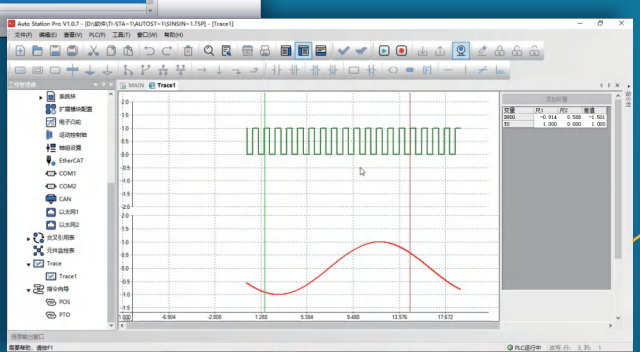


Supporting **user-defined variables**





Supporting **graphic configuration** through dragging , Easy parameter setup and automatic address allocation



Trace function

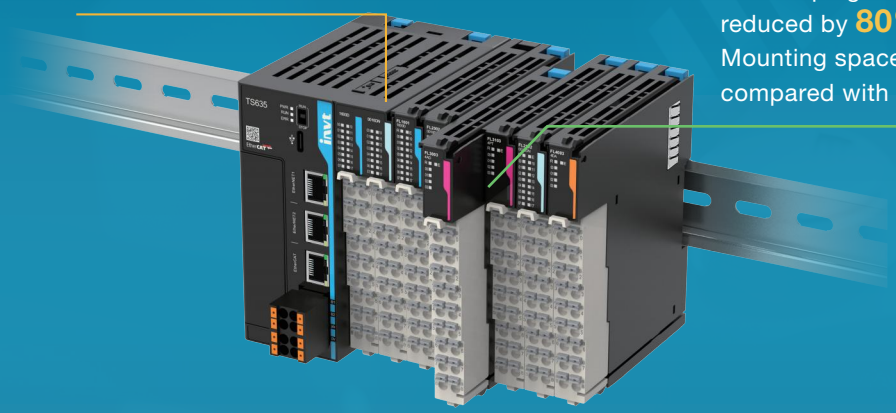
Easy scalability

Standard configuration of CPU

8/16 points of DI
Eight 200kHz high-speed inputs
8/16 points 0f DO
Up to 16 channels of 200kHz high-speed outputs

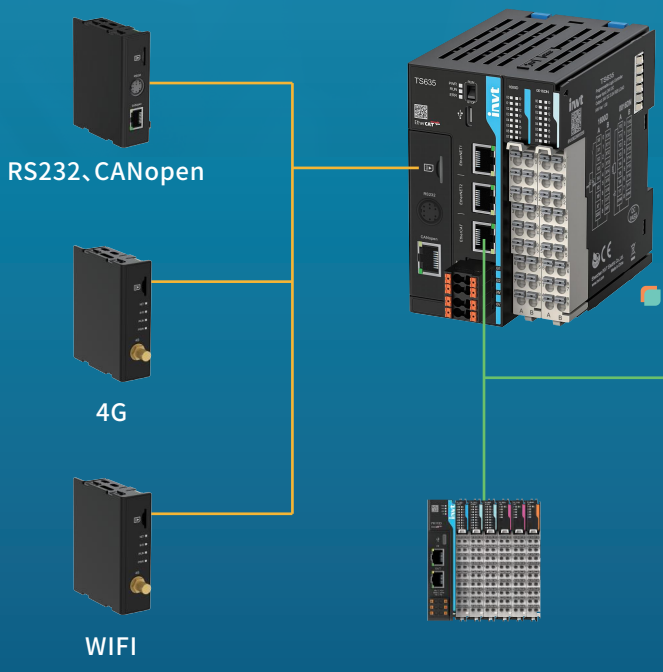
Compatible with Flex series I/O modules for scaling

Up to **16** I/O modules can be expanded locally
Use of push-in terminals, facilitating wiring
Vertical plug-in assembly, with working time reduced by **80%**
Mounting space reduced by more than **60%**, compared with traditional modules



*TS620 and TS630 equipped with 8 DI inputs and 8 DI outputs; TS611, TS621, and TS621P support 16 channels of 200kHz high-speed outputs

Supporting various expansion cards



Supporting 72 EtherCAT slave nodes

*WiFi expansion card is under development

Cloud collaboration

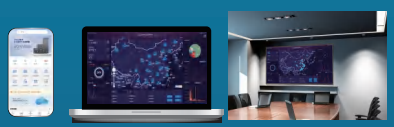
Efficient resource utilization in response to digitalization trends

Supporting the **4G**, **WiFi**, and **RJ45** transmission methods, remote upload and download through VPN, and cloud collaboration through MQTT and API

4G、WIFI、RJ45

IWOCloud IoT cloud platform

- Variousdata presenting means
- Mature IOT applications
- Remote O&M
- API data interface



Mobile phone | PC | Large screen

Real-time data monitoring

Remote O&M

Third-party IoT platform

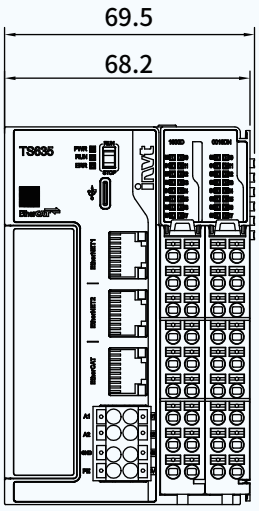
Product specifications

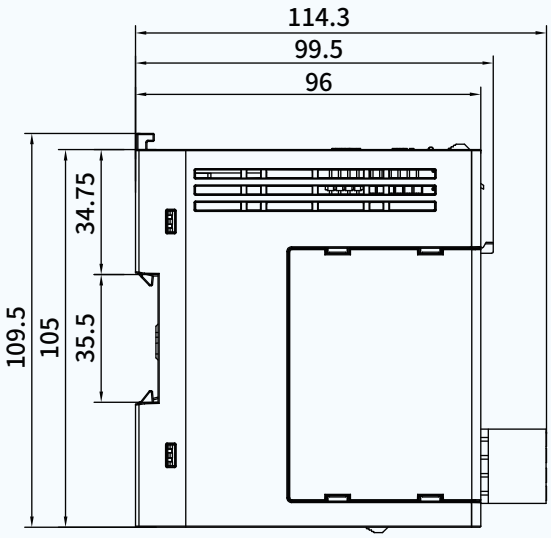
Model	TS635	TS634	TS634P	TS633	TS633P	TS630	TS621	TS621P	TS620	TS611
General specifications										
EtherNet interface	2	2	2	2	2	1	2	2	1	-
EtherCAT interface	1	1	1	1	1	1	-	-	-	-
Max. number of axes (bus+pulse)	32 (bus) +4 (pulse)	16 (bus) +4 (pulse)	16 (bus) +4 (pulse)	8 (bus) +4 (pulse)	8 (bus) +4 (pulse)	8 (bus) +4 (pulse)	8 (pulse)	8 (pulse)	4 (pulse)	8 (pulse)
RS485 bus	2 channels, supporting Modbus RTU master/slave function									
EtherNet bus	Supporting Modbus TCP/UDP, program upload and download, and firmware upgrade									
USB interface	1 channel, Type-C interface, supporting program upload and download, and firmware upgrade									
DI	16 inputs originally, including eight 200kHz high-speed inputs					8 inputs originally, including eight 200kHz high-speed inputs	16 inputs originally, including eight 200kHz high-speed inputs		8 inputs originally, including eight 200kHz high-speed inputs	16 inputs originally, including eight 200kHz high-speed inputs
DO	16 outputs originally, including eight 200kHz high-speed outputs					8 outputs originally, including eight 200kHz high-speed outputs	16 outputs originally, including sixteen 200kHz high-speed outputs		8 outputs originally, including eight 200kHz high-speed outputs	16 outputs originally, including sixteen 200kHz high-speed outputs
Pulse axis	up to 4 axes						up to 8 axes		up to 4 axes	up to 8 axes
Input power	24V DC (-15% – +20%)/1A, supporting reversal protection									
Standalone power consumption	<3W									
Backplane bus power supply	5V/2.5A									
Power-down protection	Supported (retention by the internal flash)									
Real-time clock	Supported (CR2032 battery is optional; the real-time clock works about four days without a battery)									
Local expansion modules	Up to 16, disallowing hot swapping									
Local expansion card	1 expansion card, supporting SD card, CANopen card, RS232 card, 4G IoT card and so on									
Program language	LD, SFC, IL, and C									
Program download	USB port, Ethernet port, SD card (expansion card), and remote download (expansion card)									
Program data capacity	200K steps of user program 2MByte user-defined variables, in which 128KByte support power-down retention About 150K soft elements, the soft elements numbered after 1000 support power-down retention									
Command speed (step)	20K steps at 0.2ms									
Bit handling command	0.0127μs									
Word transmission command	0.0014μs									
Floating-point transmission command	0.0027μs									
Four operations of math	0.033μs									
Power specifications										
Terminal input power rated voltage	24V DC									
Terminal input power rated current	1A									
24V input power protection	Protection against reverse connection and surges									
Hot swapping of module	Not supported									

Model	TS635	TS634	TS634P	TS633	TS633P	TS630	TS621	TS621P	TS620	TS611
Input specifications										
Input type	DI									
Number of input channels	16					8	16		8	16
Input mode	Source and sink									
Input voltage class	24VDC(-10%~+10%)									
Input current	Typical value for X0–X7: 13.5mA; Typical value for X10–X17: 4.2mA					Typical value for X0–X7: 17.5mA	Typical value for X0–X7: 13.5mA; Typical value for X10–X17: 4.2mA		Typical value for X0–X7: 17.5mA	Typical value for X0–X7: 13.5mA; Typical value for X10–X17: 4.2mA
Max. input frequency	200kHz for X0–X7; 200Hz for X10–X17					200kHz for X0–X7	200kHz for X0–X7; 200Hz for X10–X17		200kHz for X0–X7	200kHz for X0–X7; 200Hz for X10–X17
Input resistance	Typical value for X0–X7: 1.7kΩ; Typical value for X10–X17: 5.7kΩ					Typical value for X0–X7: 1.3kΩ	Typical value for X0–X7: 1.7kΩ; Typical value for X10–X17: 5.7kΩ		Typical value for X0–X7: 1.3kΩ	Typical value for X0–X7: 1.7kΩ; Typical value for X10–X17: 5.7kΩ
ON voltage	⩾ 15VDC									
OFF voltage	⩽ 5VDC									
Isolation method	Capacitive isolation									
Common terminal method	8 channels/group									
Input action display	When the input is in the driving state, the input indicator is on (software control)									
Output specifications										
Output type	Transistor output									
Number of output channels	16					8	16		8	16
Output mode	sink	Source	sink	Source		sink	sink	Source	sink	sink
Output voltage class	24VDC(-10%~+10%)									
Output load (resistive)	0.5A/point, 2A/group									
output load (inductive)	7.2W/point, 24W/group									
Hardware response time	<2us									
Load current requirement	Load current ⩾ 12mA when output frequency is greater than 10kHz									
Max. output frequency	200kHz for resistive load, 0.5Hz for inductive load, and 10Hz for lighting load									
Leakage current at OFF	Below 30μA (24V typical voltage)									
Max. residual voltage at ON	⩽ 0.5VDC									
Isolation method	Capacitive isolation									
Common terminal method	8 channels/group									
Short-circuit protection function	Supported									
External inductive load requirement	Flyback diode needed for external inductive load connection									
Output action display	When the output is valid, the output indicator is on (software control)									
Output derating	The current at each common terminal group cannot exceed 1A at ambient temperature of 55°C									

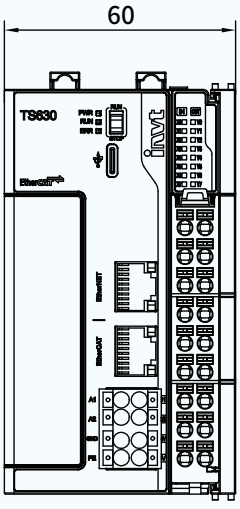
Dimension drawings

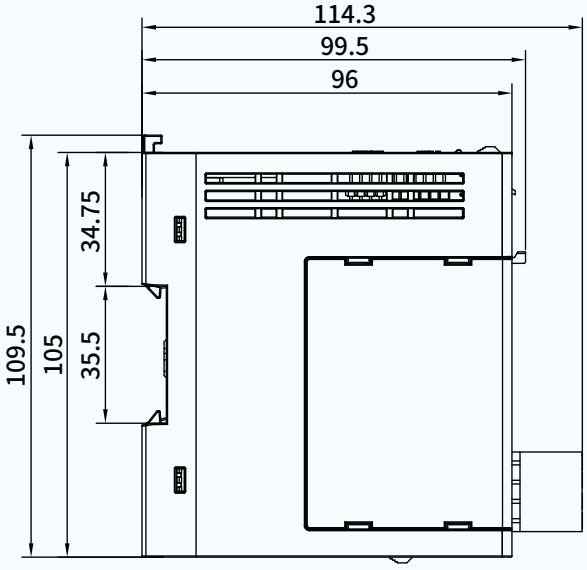
TS635、TS634、TS634P、TS633、TS633P、TS621、TS621P、TS611





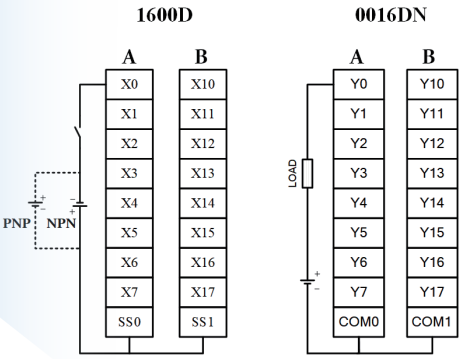
TS630、TS620



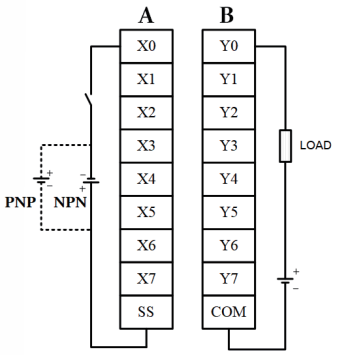


wiring diagrams

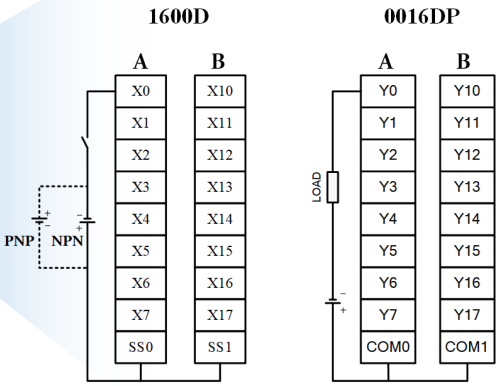
TS611、TS621、TS633、TS634、TS635



TS620、TS630



TS621P、TS633P、TS634P



Expansion card specifications

Model	TS-CAN-232
Product picture	
Product description	TS600 series expansion card, which supports Micro SD cards, CANopen bus, and one channel of RS232 communication
IP rating	IP20
Working temperature	-20°C~55°C
Terminal resistor	Built-in terminal resistor, which can be selected through the dial switch
RS232	1
CAN communication baud rate	1Mbps：Distance<20m 500Kbps：Distance<80m 250Kbps：Distance<150m 125Kbps：Distance<300m 100Kbps：Distance<500m 50Kbps：Distance<1000m
SD card capacity	Up to 32GB
SD card specifications	Micro SD
SD card communi-cation interface	SDIO
Hot swapping	Supported by SD cards, but not supported by the expansion card

Model	TS-4G
Product picture	
Product description	TS600 series expansion card, which supports Micro SD cards and 4G IoT
IP rating	IP20
Working temperature	-20°C~55°C
Entire machine power consumption	Less than 0.2W
Antenna	3 meters as standard configuration
SIM card	China Mobile 4G IoT card as standard configuration
Reconnection upon disconnection	Supported
Resumable upload	Supported
API interface	Supported
VNC function	Supported
Data monitoring	Up to 280 data points
Historical data	Up to 20000 records of data
Alarm push	Through clients and WeChat official account
SD card capacity	Up to 32GB
SD card specifications	Micro SD
SSD card communi-cation interface	SDIO
Hot swapping	Supported by SD cards, but not supported by the expansion card

Ordering catalog

Material code	Model	Specifications	Certification
11060-00315	TS611	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, sixteen200K outputs, up to 8 axes（pulse）	CE
11060-00328	TS620	8 inputs and 8 transistor（NPN） outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 1xEtherNet, up to 4 axes（pulse）	CE
11060-00323	TS621P	16 inputs and 16 transistor（PNP） outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, sixteen 200K outputs, 2xEtherNet, up to 8 axes（pulse）	CE
11060-00318	TS621	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, sixteen200K outputs, 2xEtherNet, up to 8 axes（pulse）	CE
11060-00329	TS630	8 inputs and 8 transistor（NPN） outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 1xEtherNet,1xEtherCAT, up to 12 axes（8 bus axes +4pulse axes）	CE

Material code	Model	Specifications	Certification
11060-00324	TS633P	16 inputs and 16 transistor (PNP) outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2xEtherNet,1xEtherCAT,up to 12 axes (8 bus axes +4pulse axes)	CE
11060-00317	TS633	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2xEtherNet,1xEtherCAT,up to 12 axes (8 bus axes +4pulse axes)	CE
11060-00325	TS634P	16 inputs and 16 transistor (PNP) outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2xEtherNet,1xEtherCAT,up to 20 axes (16 bus axes +4pulse axes)	CE
11060-00316	TS634	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2xEtherNet,1xEtherCAT,up to 20 axes (16 bus axes +4pulse axes)	CE
11060-00312	TS635	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2xEtherNet,1xEtherCAT,up to 36 axes (32 bus axes +4pulse axes)	CE
11060-00313	TS-CAN-232	TS600 series expansion card TS-CAN-232, which supports Micro SD cards, CANopen bus, and one channel of RS232 communication	CE
11060-00314	TS-4G	TS600 series expansion card TS-4G, which supports Micro SD cards and 4G IoT	CE

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- Solar Inverter
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- New Energy Vehicle Charging System
- New Energy Vehicle Motor

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