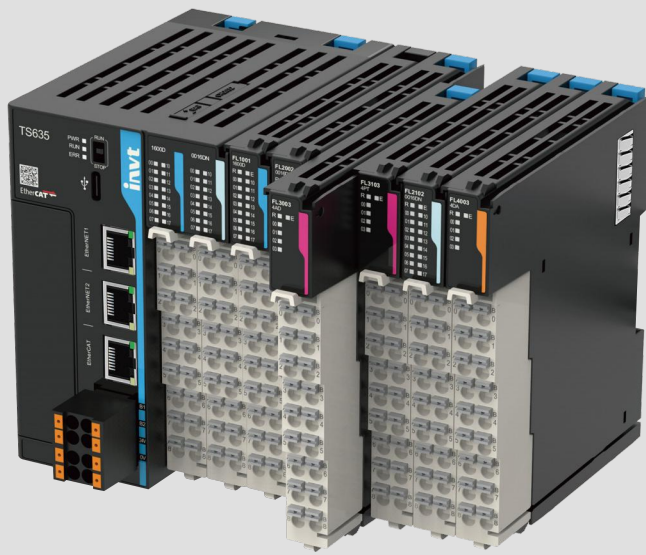


TS600 Series Intelligent PLC



About Us



Corporate Introduction

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 4000 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 11 R&D centers nationwide, boasts more than 1300 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.



Industrial Park in Suzhou

Group's core industrial base and R&D center in East China



Industrial Park in Guangming Shenzhen

Group headquarters, new product development and new business incubation base



TS600 Series Intelligent PLC

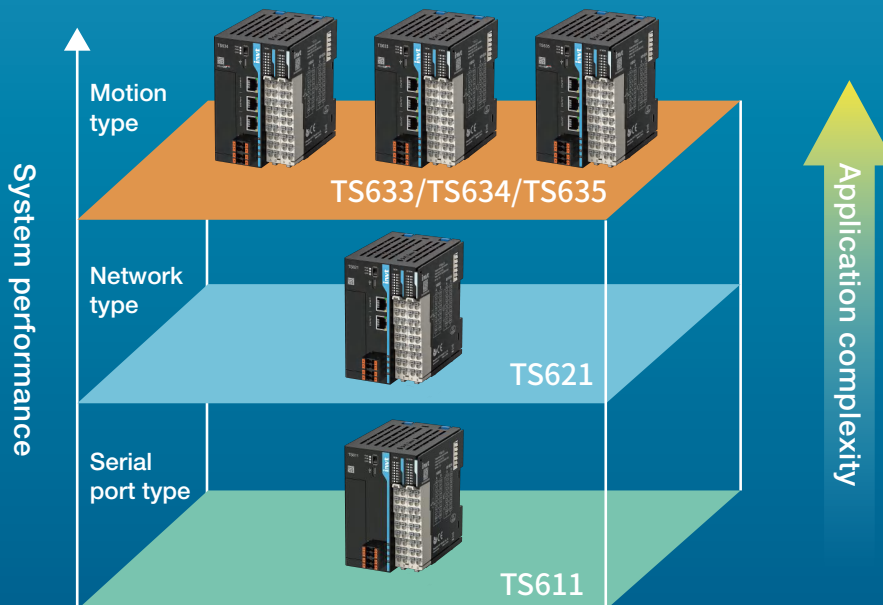
Product overview

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

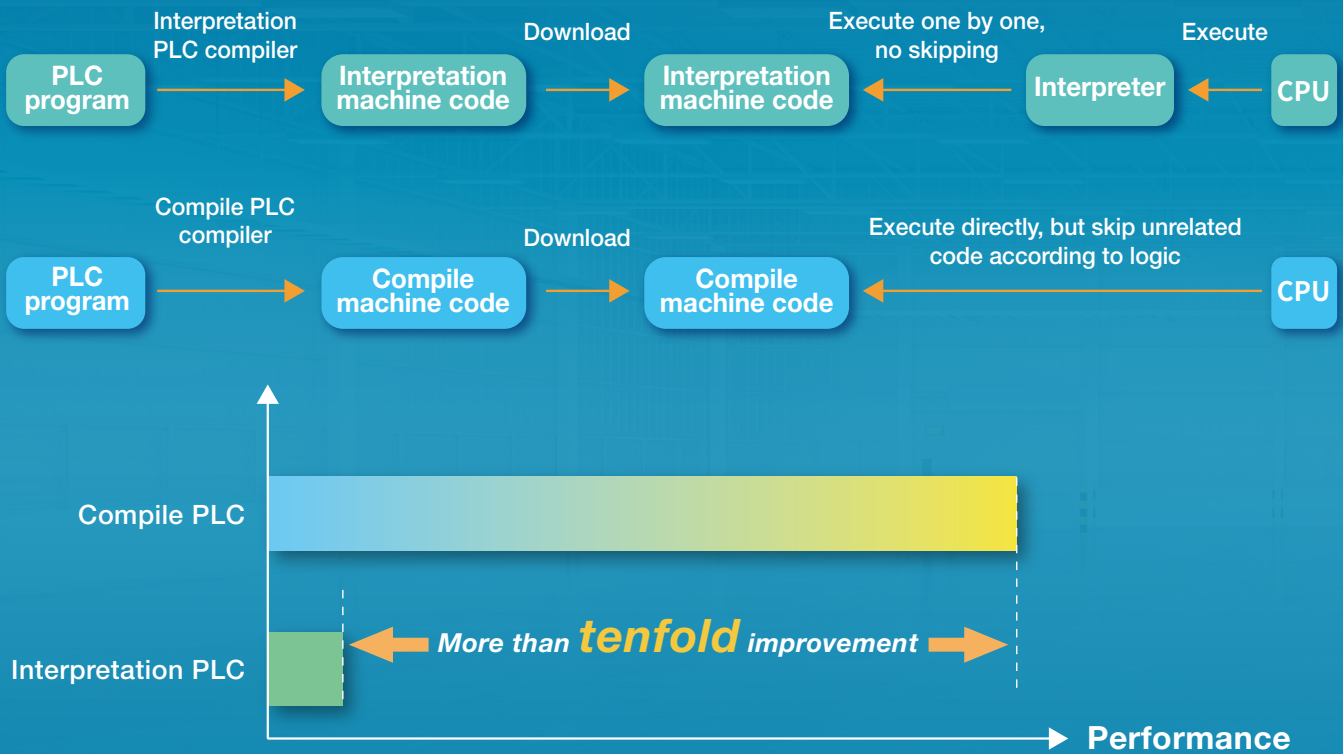




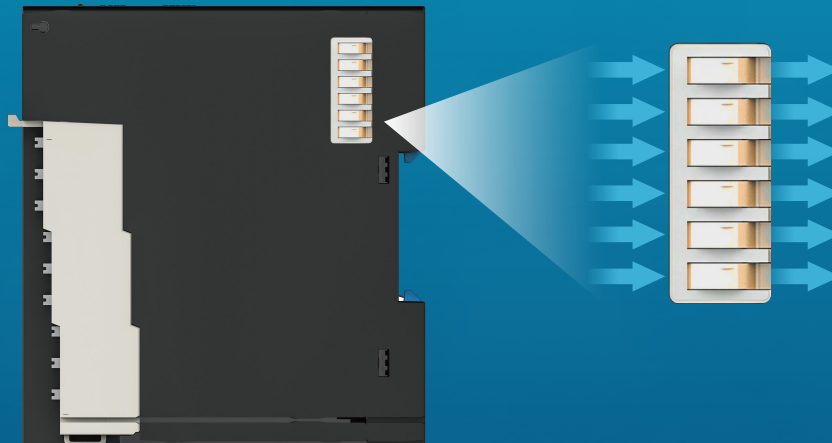
High performance

Running efficiently

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

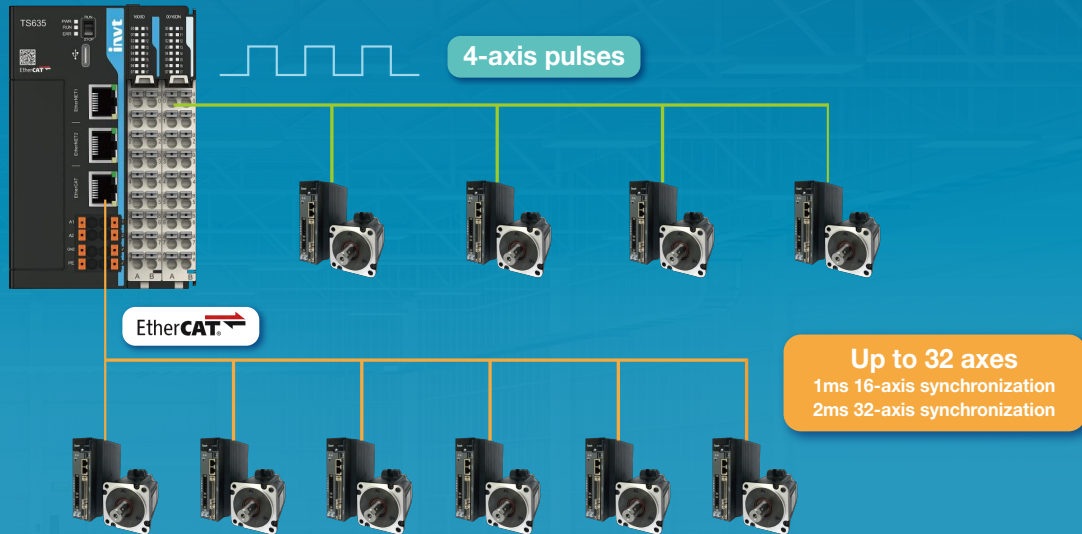


100Mbps backplane bus; **125μs IO** refresh speed; **plating process**, reliable connection; **saving data at power down**, 1s power-down ride-through



Strong motion control

- High-speed motion control, easily implementing complex processes



Single-axis control

speed and torque control

Position control

Homing

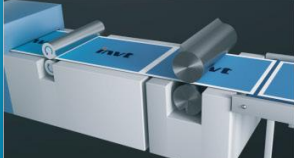
Multi-axis control

E-gear

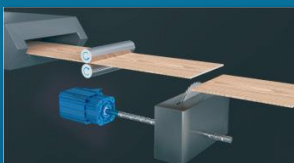
E-CAM

Interpolation

Flying shear



Chasing shear



```

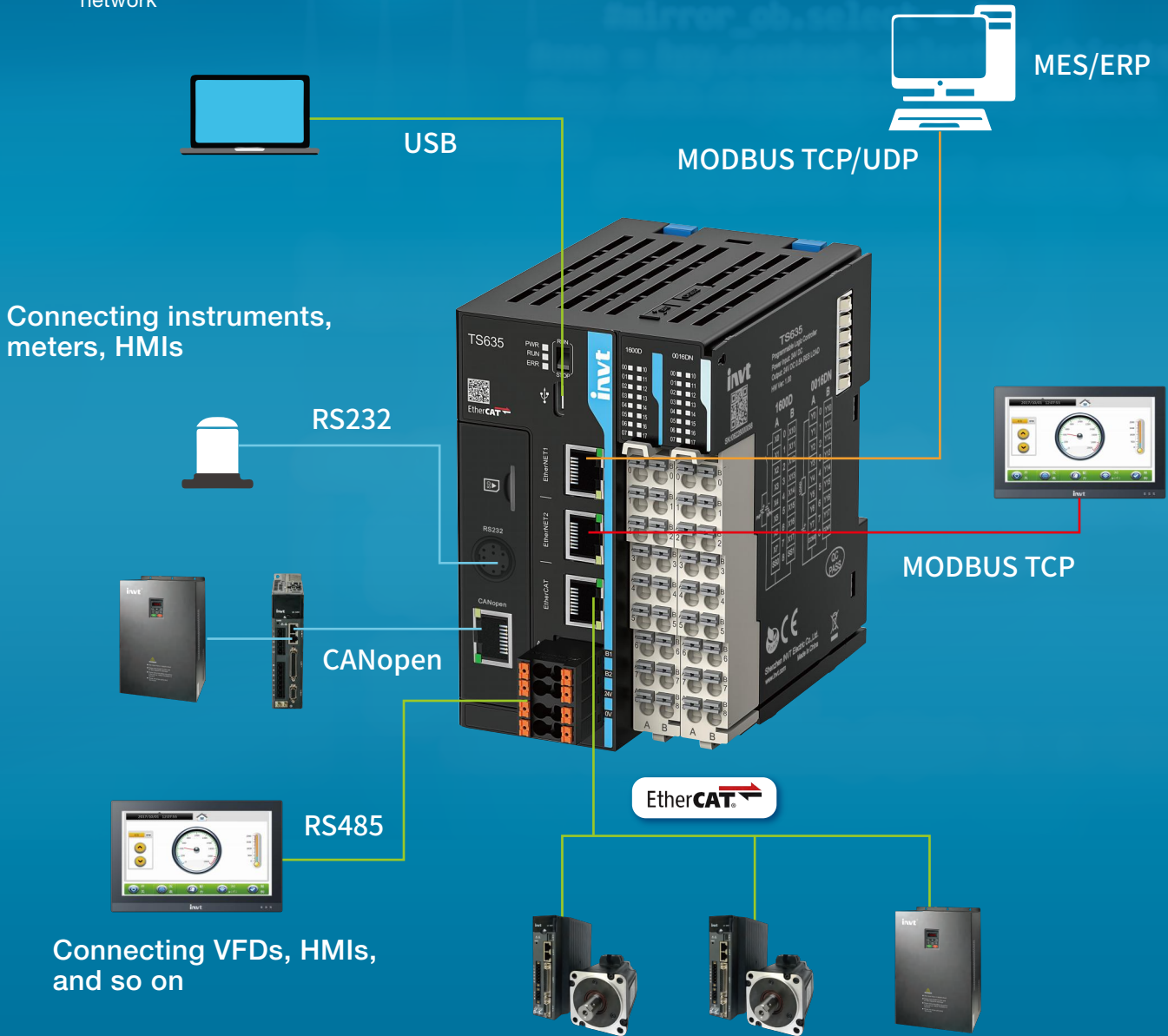
mirror_mod.use_y = True
mirror_mod.use_z = False
elif_operation == "MIRROR_Z":
mirror_mod.use_x = False
mirror_mod.use_y = False
mirror_mod.use_z = True

```

Easy connection

Multi-protocol support facilitates interconnection

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



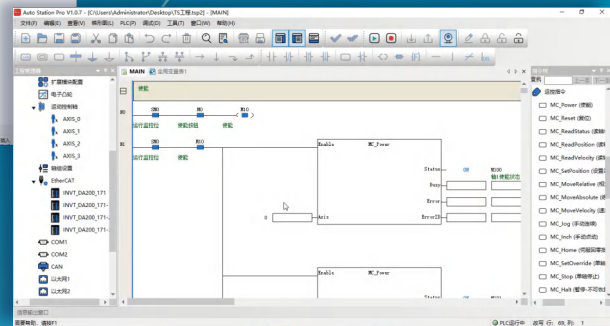
*Ethernet IP will be supported at the end of August

Easy programming

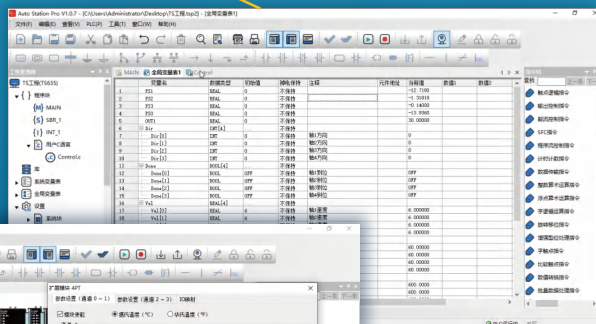
Equipped with the brand new **AutoStationPro**



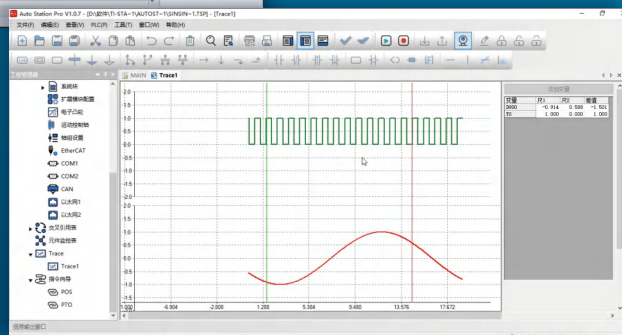
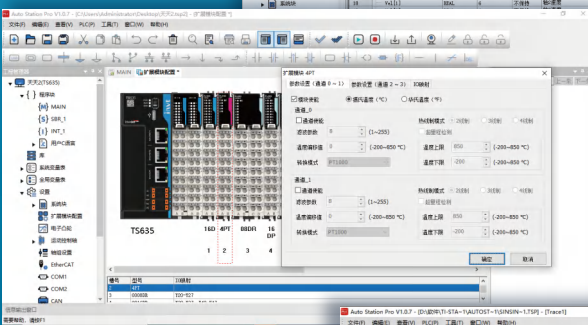
Compliant with IEC61131 programming specifications, supporting the languages LD, SFC, IL, C, and ST (under development). The **pulse** and **bus axes** are compatible with a set of axis control commands.



Supporting **user-defined variables**



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



Trace function

Easy scalability

Standard configuration of CPU

16 points of DI

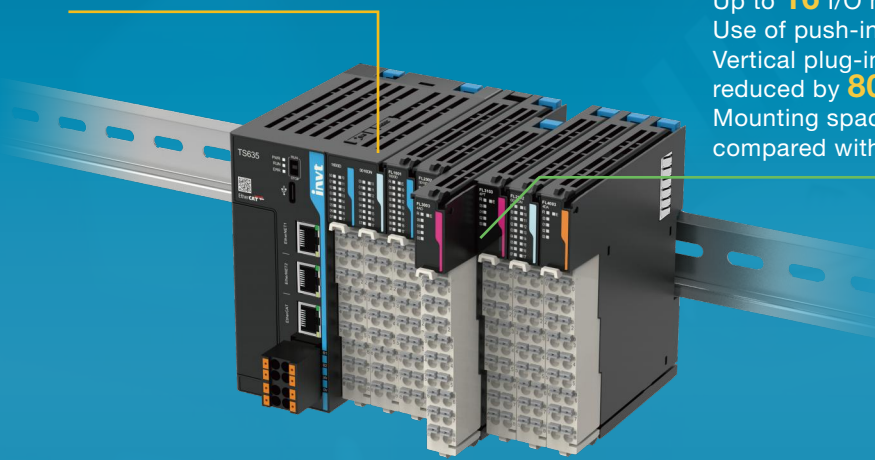
Eight 200kHz high-speed inputs

16 points Of DO

Eight 200kHz high-speed out puts

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

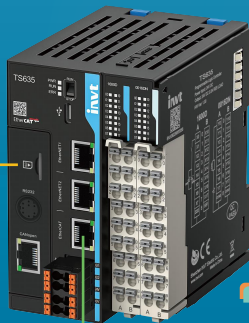


Supporting various expansion cards

RS232, CANopen

4G

WIFI



Supporting 72 EtherCAT slave nodes

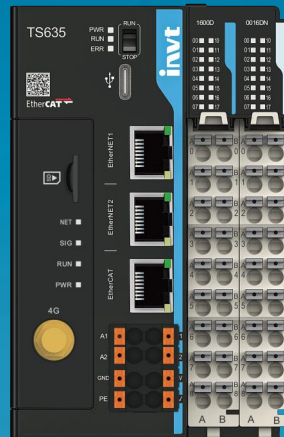


*WiFi expansion card is under development

Cloud collaboration

Efficient resource utilization in response to digitalization trends

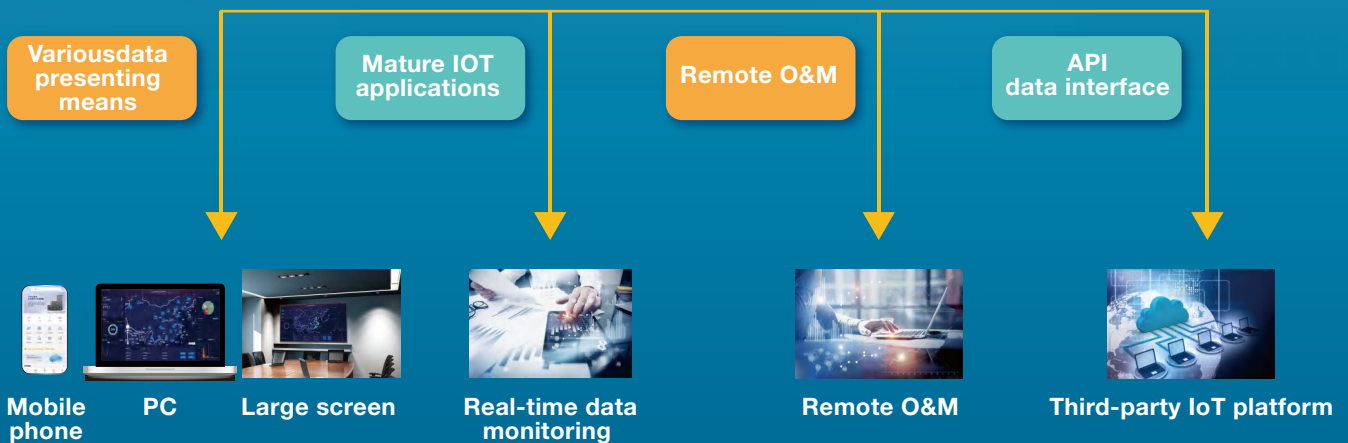
Supporting the **4G**, **WiFi**, and **RJ45** transmission methods, remote upload and download through VPN, and cloud collaboration through MQTT and API








4G, WIFI, RJ45



IWOCloud IoT cloud platform





Product specifications

Model	TS635	TS634	TS633	TS621	TS611
Product picture					
General specifications					
EtherNet interface	2	2	2	2	-
EtherCAT interface	1	1	1	-	-
Max. number of axes (bus+pulse)	32	16	8	-	-
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				
DO	16 outputs originally, including eight 200kHz high-speed outputs				
Pulse axis	Up to 4 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	TS633	TS621	TS611
Input specifications					
Input type	DI				
Number of input channels	16				
Input mode	Source and sink				
Input voltage class	24V DC (-10% ~ +10%)				
Input current	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				
Input resistance	Typical value for X0–X7: 1.7kΩ Typical value for X10–X17: 5.7kΩ				
ON voltage	≥15VDC				
OFF	≤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				
Output mode	Sink				
Output voltage class	24V DC (-10% ~ +10%)				
Output load (resistive)	0.5A/point, 2A/group				
output load (inductive)	7.2W/point, 24W/group				
Hardware response time	≤2μs				
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				

Expansion card specifications

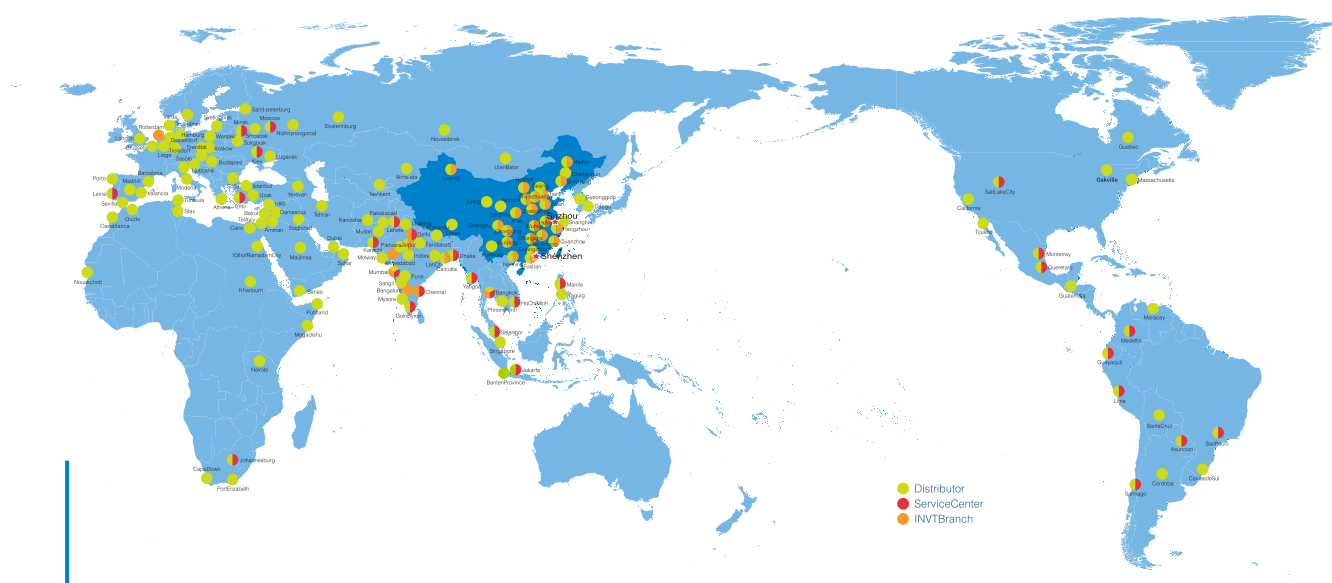
Model	TS-CAN-232	Model	TS-4G
Product picture		Product picture	
Product description	TS600 series expansion card, which supports Micro SD cards, CANopen bus, and one channel of RS232 communication	Product description	TS600 series expansion card, which supports Micro SD cards and 4G IoT
IP rating	IP20	IP rating	IP20
Working temperature	-20°C~55°C	Working temperature	-20°C~55°C
Terminal resistor	Built-in terminal resistor, which can be selected through the dial switch	Entire machine power consumption	Less than 0.2W
RS232	1	Antenna	3 meters as standard configuration
CAN communication baud rate	1Mbps: Distance<20m 500Kbps: Distance<80m 250Kbps: Distance<150m 125Kbps: Distance<300m 100Kbps: Distance<500m 50Kbps: Distance<1000m	SIM card	China Mobile 4G IoT card as standard configuration
SD card capacity	Up to 32GB	Reconnection upon disconnection	Supported
SD card specifications	Micro SD	Resumable upload	Supported
SD card communication interface	SDIO	API interface	Supported
Hot swapping	Supported by SD cards, but not supported by the expansion card	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 communication 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, eight 200K outputs	CE
11060-00318	TS621	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2×EtherNet	CE
11060-00317	TS633	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2×EtherNet, 1×EtherCAT, up to 8 axes (bus+pulse)	CE
11060-00316	TS634	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2×EtherNet, 1×EtherCAT, up to 16 axes (bus+pulse)	CE
11060-00312	TS635	16 inputs and 16 transistor outputs, 1×USB (Type-C), 2×RS485, eight 200K inputs, eight 200K outputs, 2×EtherNet, 1×EtherCAT, up to 32 axes (bus+pulse)	CE

Material code	Model	Specifications	Certification
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

INVT marketing service network



Factories* **3**
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 Overseas subsidiaries and offices***8**
 More than **100** overseas partners

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- Industrial Automation:**
- HMI
 - PLC
 - VFD
 - Servo System
 - Elevator Intelligent Control System
 - Rail Transit Traction System
- Electric Power:**
- UPS
 - DCIM
 - Solar Inverter
 - New Energy Vehicle Powertrain System
 - New Energy Vehicle Charging System
 - New Energy Vehicle Motor

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