



TrustPLC®

Programmable Logic Controller

Selection Guide



Catalog

Trust PLC CTS7-200 PLC

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Trust PLC CTS7-300 PLC

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CTS7-200 PLC Overview

■ Stable and Robust

- Obtained CE certification
- Special design to adapt for the execrable environment
- Storing user program and user data permanently
- With three-scale of password protection

■ Abundant function and high cost-effectivie

- With three communication ports, support multiform communication protocols, such as PPI/MPI,DP,Freeport, Modbus,Ethernet, and so on.
- Integrating abundant function inside
- Expansion modules with more I/O points to extend the application field
- **PID modules and high speed sampling modules help to solve top applications with less cost**

■ High-speed and Large Capacity

- Boolean Execution Speed: 0.15 μ s
- Float Execution Speed: 8 μ s
- Program Memory: 12K-24K
- Data Memory: 8K-10K
- High-speed Counter: 6 counters with 200KHz in maximum
- Pulse Output: 2 outputs with 100KHz in maximum

■ Powerful Expansion Ability

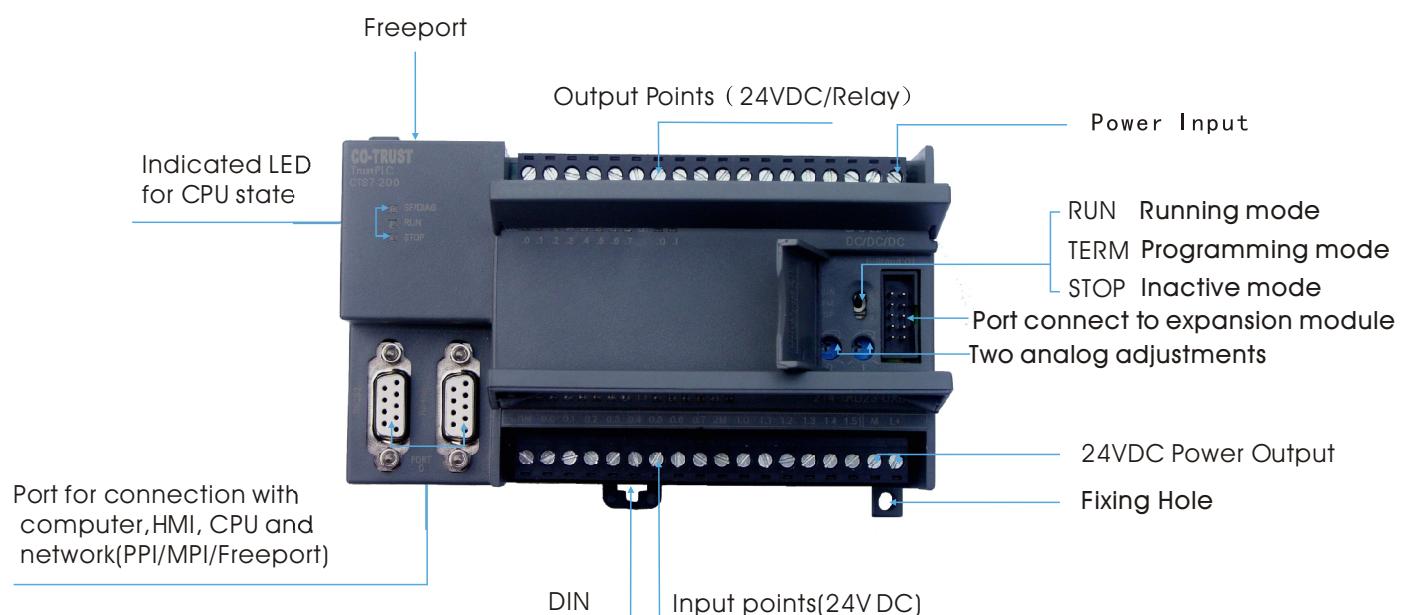
- 56 points of analog I/O in maximum
- 256 points of digital I/O in maximum
- One CPU can connect 7 expansion modules in maximum
- More than 28 type of expansion modules, support AS-I and DP bus protocol, thus,you are able to configure your control system more neatly

■ Easy to program

- Support IEC61131 programming language
- Can be programmed by Step7-MicroWIN V4.0 of SIEMENS
- Support multinational programming language include LAD, STL and FBD
- Chinese/English programming
- Intelligentized help system

■ Abundant Instruction Set

- 144 items of Base Instruction
- 102 items of Applied Instruction
- Float Execution Instruction
- Pilot for PID instruction
- Pilot for movement control
- Pilot for high speed input
- Pilot for data exchange between different CPU



CPU Modules

CPU224+

2 communication ports, 2 for PPI, 2 for FREEPORT

Integrating 14DI/10DO onboard

12KB Program Memory, 8KB Data Memory

6*30KHz high-speed counters, 2*20KHz pulse outputs


CPU226M

3 communication ports, 2 for PPI, 1 for FREEPORT

Integrating 14DI/10DO onboard

24KB Program Memory, 10KB Data Memory

6*30KHz high-speed counters, 2*20KHz pulse outputs


CPU226L

3 communication ports, 2 for PPI, 1 for FREEPORT

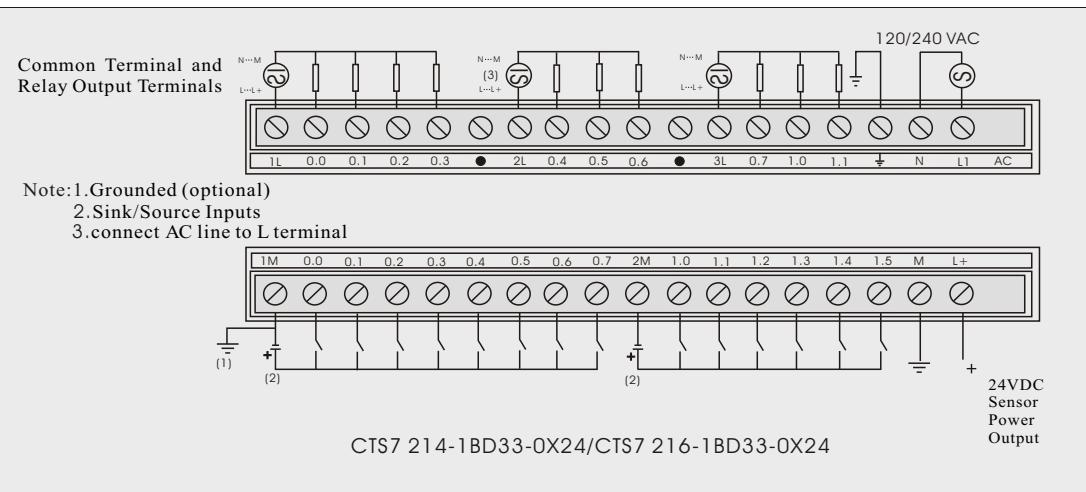
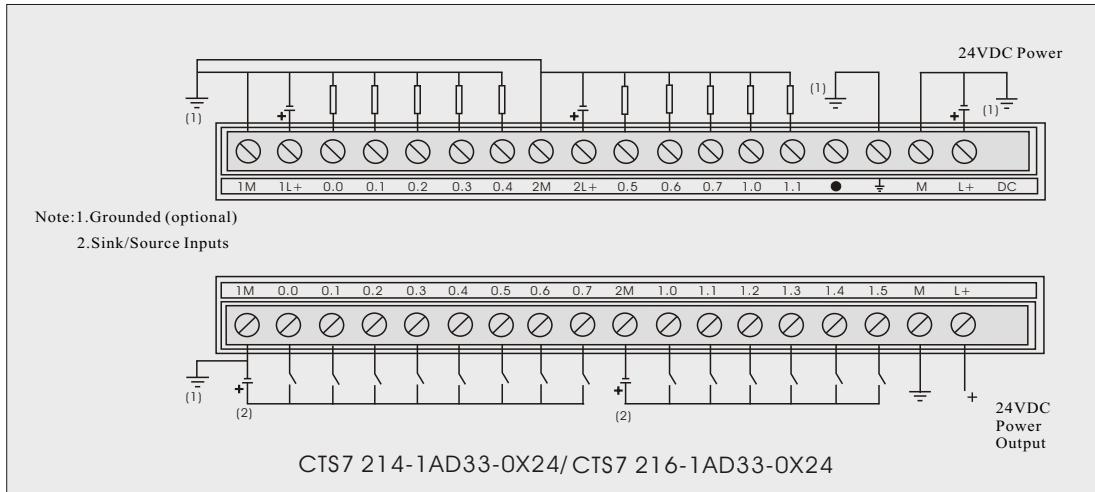
Integrating 24DI/16DO onboard

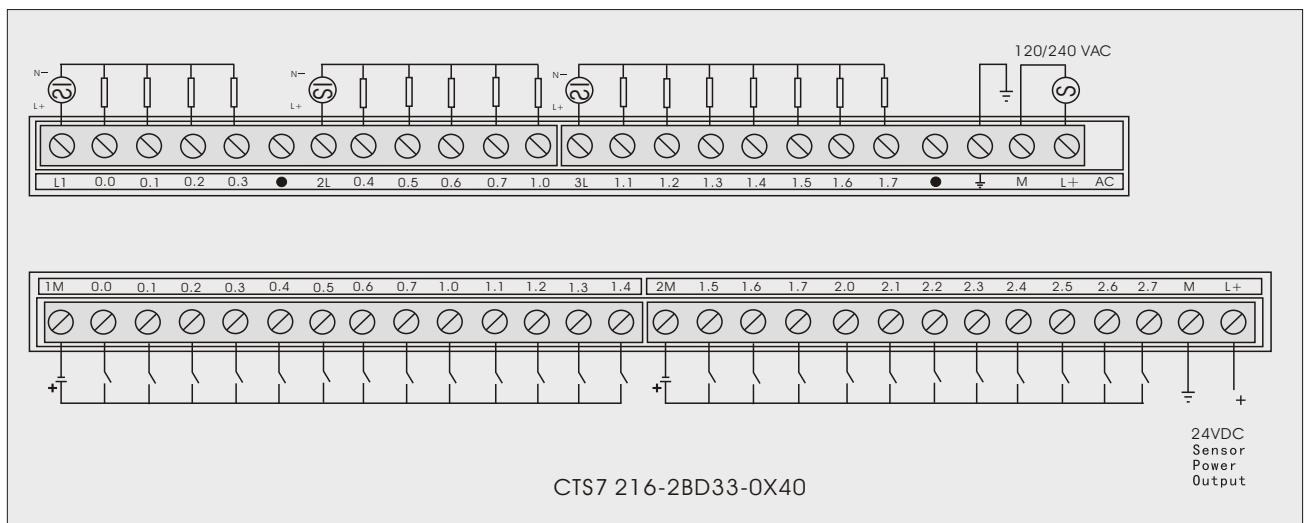
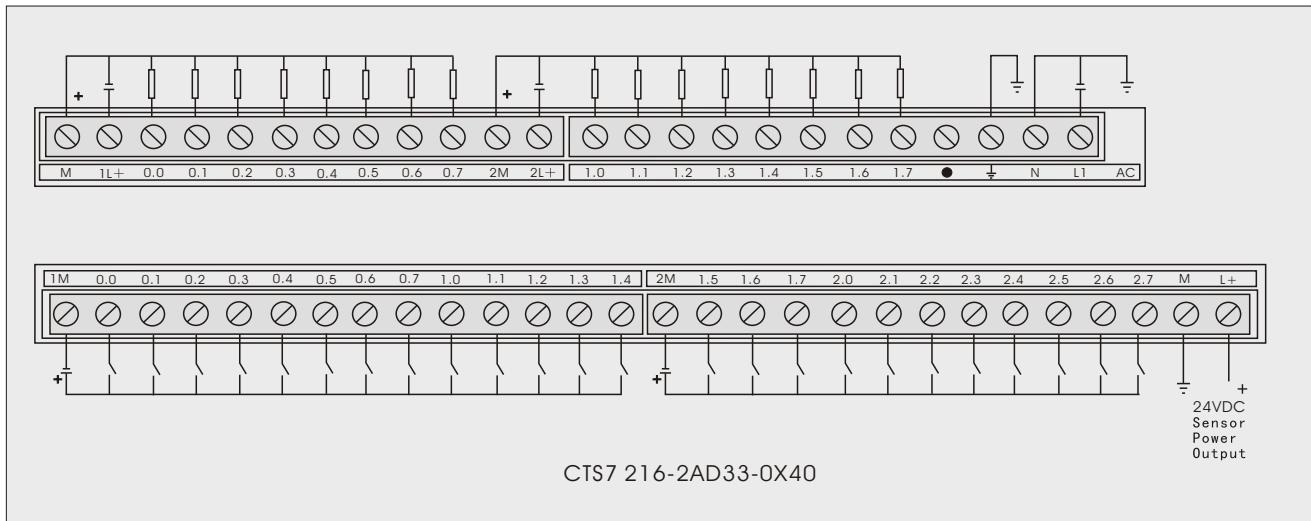
24KB Program Memory, 10KB Data Memory

6*30KHz high-speed counters, 2*20KHz pulse outputs

Description		CPU224+	CPU226M	CPU226L
Dimensions(mm)		137×80×62		196×80×62
Power loss(dissipation)		7W		8W
User program memory size		12KB		24KB
User data memory size		8KB		10KB
Max. expansion modules allowed		7		
Maximum digital I/O points		248		256
Maximum analog I/O points		56AI / 28AQ		
Data stored when power down		Cartridge Battery		
Timers	1ms	4		
	10ms	16		
	100ms	236		
Counters		256		
Internal memory bits		256		
Timed interrupts		2 with 1ms resolution		
Edge interrupts		4 edge up and/or 4 edge down		
Analog adjustments		2 with 8 bit resolution		
Boolean execution speed		0.15 μs per instruction		
Float execution speed		8 μs per instruction		
Real Time Clock		Built-in		
Communications Built-in				
Communication Ports		With 2 Logical Ports: PORT0: PPI/MPI FPORT: FREEPORT	With 3 Logical Ports: PORT0: PPI/MPI in Rs485, PORT1:PPI/MPI in Rs485 or Rs232 FPORT: FREEPORT	
PPI/MPI baudrates		9.6K , 19.2K,187.5K bps		
Freeport baudrates		1.2K--115.2K bps		
Max. number of stations		32 per segment,126 per network		
Max. number of masters		32		
PPI master mode(NETR/NETW)		YES (NETR/NETW)		
MPI connections		4 total with 2 reserved (1 for a PG and 1 for an OP)		
Max. cable length per segment		With isolated repeater: 1000m up to 187.5kbaud, 1200 m up to 38.4 kbaud;Without isolated repeater:50 m		
Digital I/O Specifications				
Number of integrated inputs		14		24
Input type		Sink/Source(IEC Type 1 sink)		
Number of integrated outputs		10	10	16
Output type		Solid State-MOSFET / Dry contact		
Digital I/O image size		256 (128Input/128Input)		
Analog I/O image size		64 (32Input/32Output)		
Max. expansion modules allowed		7		
Number of pulse catch inputs		14		
High-Speed Counters	Total	6		
	Single phase	6×30KHz		
	Two phase	4×20KHz		

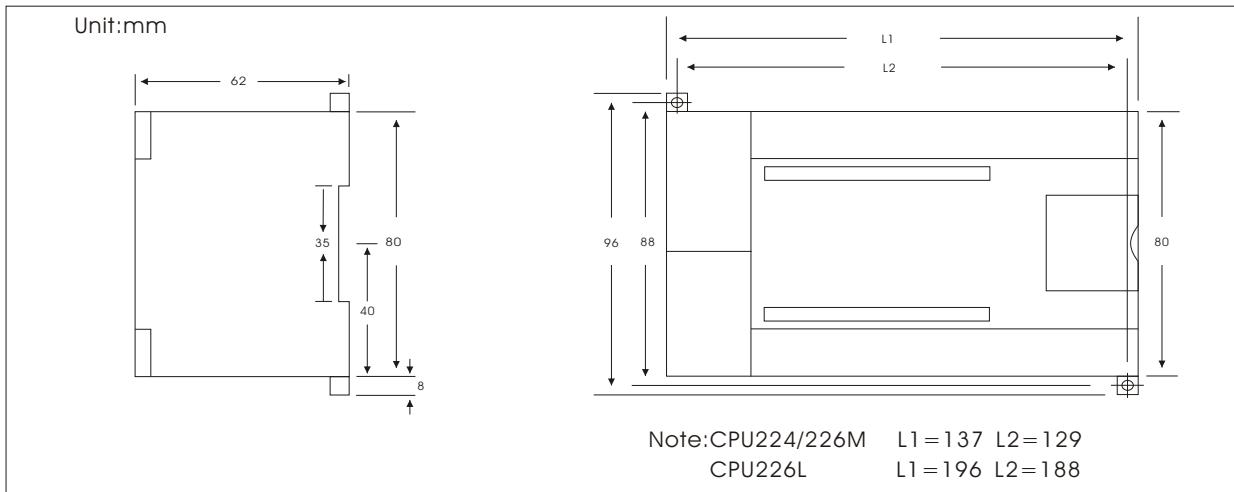
Item	CPU224+	CPU226M	CPU226L	
Digital Inputs specification				
Number of integrated inputs	14		24	
Input type	Sink/Source(IEC Type 1 sink)			
Rated voltage	24V DC at 4mA typical			
Max. continuous permissible voltage	30V DC			
Logic 1 signal(min.)	15V DC at 2.5mA			
Logic 0 signal(max.)	5V DC at 1mA			
Optical isolation(Galvanic)	500V Ac for 1 minute			
Number of inputs ON Simultaneously	14	24		
Cable length (max.)	Shielded	500m		
	Unshielded	300 m		
Digital outputs specification				
Number of integrated outputs	10	16		
Pulse frequency (max.)	20KHz(Q0.0, Q0.1)			
Output type	24 VDC Output	Relay Output		
	Solid State-MOSFET	Relay, dry contact		
Rated Voltage	24V DC	-		
Voltage range	20.4~28.8V DC	-		
Logic 1 signal at max. current	20 VDC, minimum	-		
Logic 0 signal with 10 kohm load	0.1 VDC, maximum	-		
Rated current per point	0.75A	2A		
Max. current per common/group	6A	10A		
Leakage current per point	10 μ A, maximum	-		
Surge current	8A for 100 ms, maximum	7A with contacts closed		
Lamp load	5W	30W DC/200W AC		
ON state resistance(contact resistance)	0.3 ohm typical	0.2Ω(maximum when new)		
Optical isolation(galvanic,field to logical)	500V Ac for 1 minute	-		
Delay (max.)	On to Off	10 μ s(Q0.0, Q0.1), 130 μ s	-	
	Off to On	2 μ s(Q0.0, Q0.1), 15 μ s	-	
	Switching	-	10ms	
Number of outputs ON Simultaneously	All the outputs			
Connecting two outputs in parallel	Yes, only outputs in same group			
Cable Length	Shielded	500m		
	Unshielded	150m		

CPU Modules
Connector Terminal Identification




CPU Modules

Size Diagram



Order Data

Product Model and Specification	Order Number
CPU224+,12K Bytes Memory,24VDC,14DI/10DO,transistor outputs ,0.75A	CTS7214-1AD33-0X24
CPU224+,12K Bytes Memory,220VAC,14DI/10DO,relay outputs ,2A	CTS7214-1BD33-0X24
CPU226M,24K Bytes Memory,24VDC,14DI/10DO,transistor outputs ,0.75A	CTS7216-1AD33-0X24
CPU226M,24K Bytes Memory, 220VAC,14DI/10DO,relay outputs ,2A	CTS7216-1BD33-0X24
CPU226L,24K Bytes Memory,24VDC,24DI/16DO,transistor outputs ,0.75A	CTS7216-2BD33-0X40
CPU226L,24K Bytes Memory, 220VAC,24DI/16DO,relay outputs ,2A	CTS7216-2BD33-0X40

Input Features



CTS7221-1BF32 8DI
 CTS7222-1BF32 8DO
 CTS7222-1HF32 8DI Relay
 CTS7223-1BF32 4DI/4DO
 CTS7223-1HF32 4DI/4DO Relay

		Specifications
Input type		Sink/Source(IEC Type 1 sink)
Rated Voltage		24V DC
Max. continuous permissible voltage		30V DC
Logic 1 signal(minimum)		15V DC at 2.5mA
Logic 0 signal(maximum)		5V DC at 1mA
Optical isolation(Galvanic)		500 VAC, 1 minute
Max. input time delay		4.5ms
Permissible leakage current(max.)		1mA, AC
Number of inputs ON Simultaneously		14
Cable Length	Unshielded(not HSC)	300 m
	Shielded	500m

Output Features



CTS7221-1BH32 16DI
 CTS7222-1BH32 16DO
 CTS7222-1HH3216DO Relay
 CTS7223-1BH32 8DI/8DO
 CTS7223-1PH32 8DI/8DO Relay

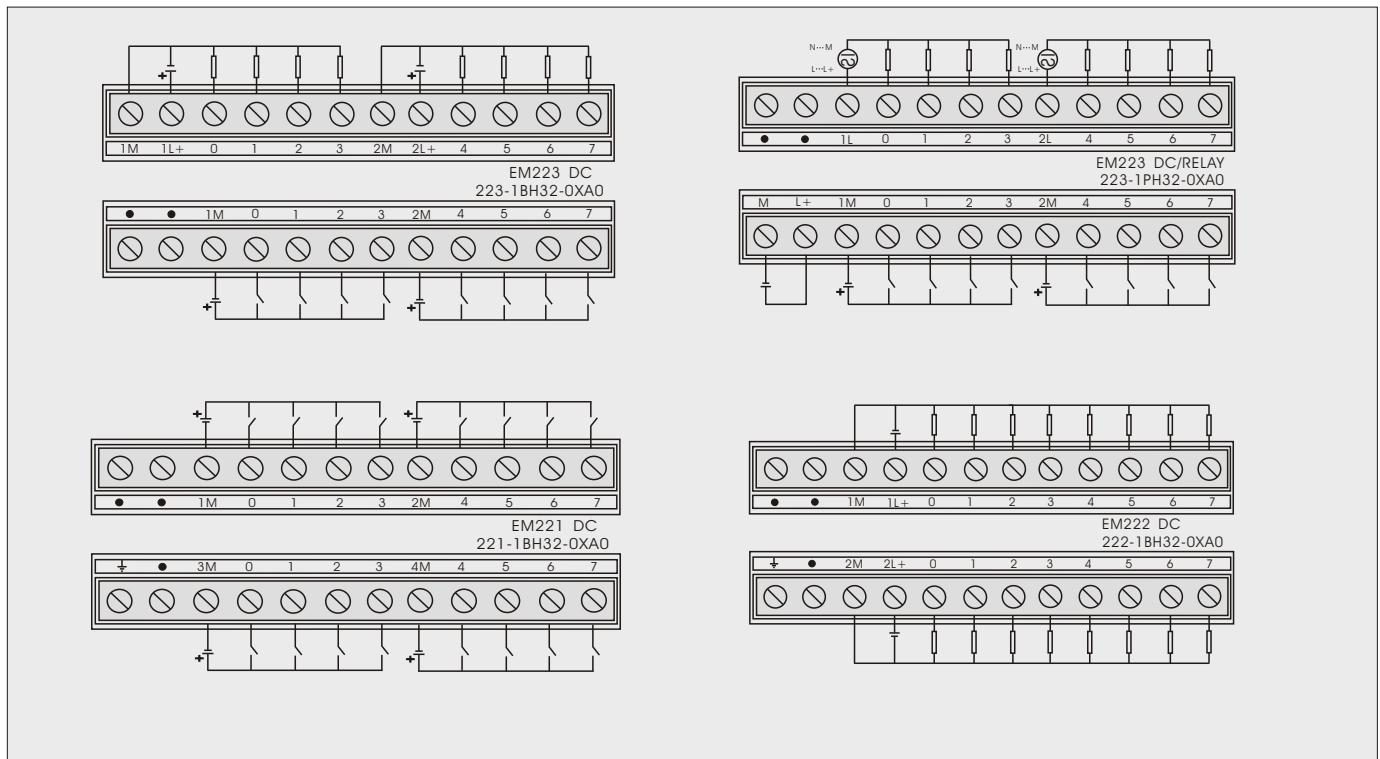
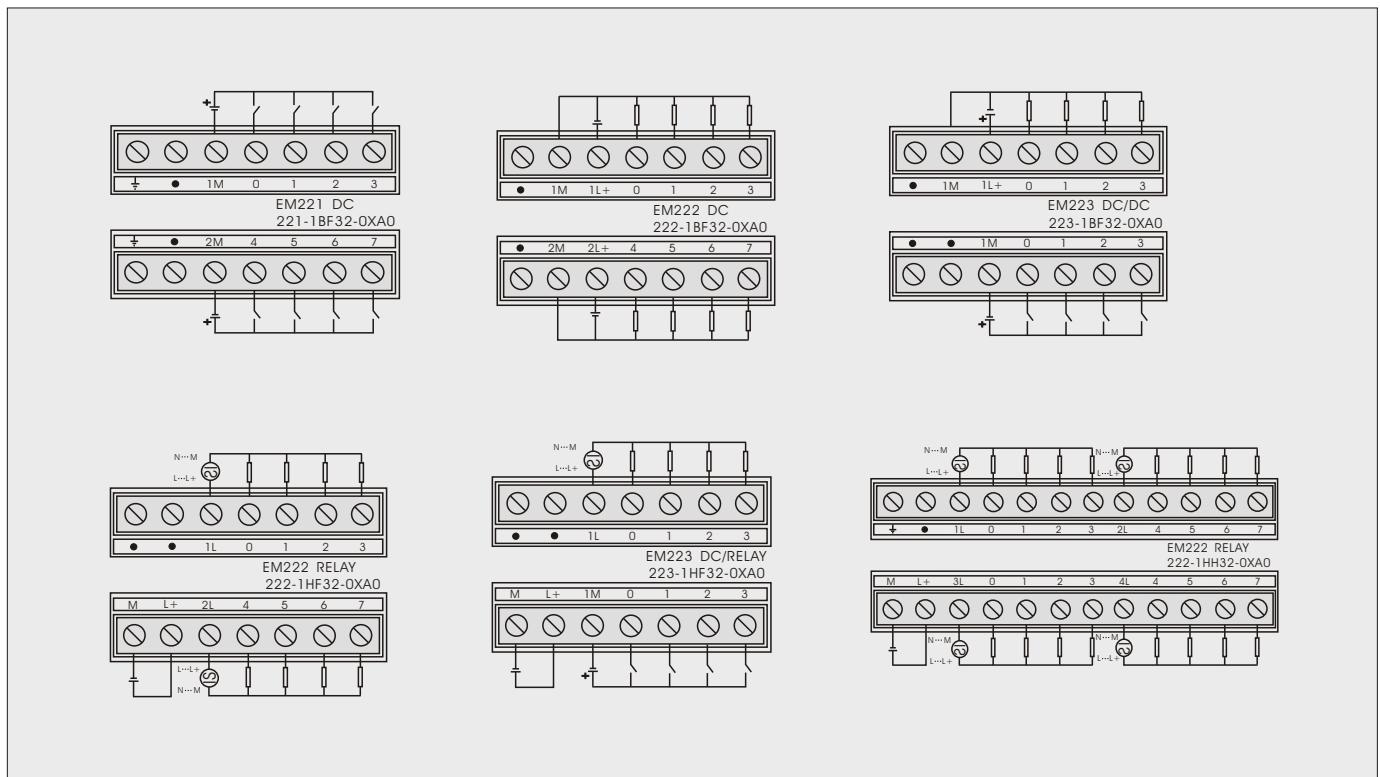
Output	24 VDC Output	Relay Output
	Solid State-MOSFET	Relay, dry contact
Rated Voltage	24V DC	-
Permissible Voltage Range	20.4~28.8V DC	-
Logic 1 signal at maximum current	20V DC, minimum	-
Logic 0 signal with 10 kohm load	0.1V DC, maximum	-
Rated current per point	0.5A	2A
Leakage current per point	10 μ A, maximum	-
Maximum Surge current	8A, 100ms	7A when contacts closed
Lamp load	5W	30W DC/200W AC
contact resistance	0.15 Ω typica(0.32 Ω max.)	0.2 Ω (max. when new)
Isolation	field to logic	500V AC, 1minute
	coil to contact	-
	between open contacts	-
	Isolation resistance	-
Isolation group of outputs	4 or 8	4
Delay (max.)	Off to On	50 μ s
	On to Off	200 μ s
Overload protection	Electronic Protection	-
Number of outputs ON Simultaneously	All outputs	All outputs
Connecting two outputs in parallel	Yes, only outputs in same group	
Switch delay	-	15ms
Relay Features	Switch Frequency	-
	Lifetime mechanical (no load)	-
	Lifetime contacts at rated load	-
Cable Length	Shielded	500m
	Unshielded	150 m



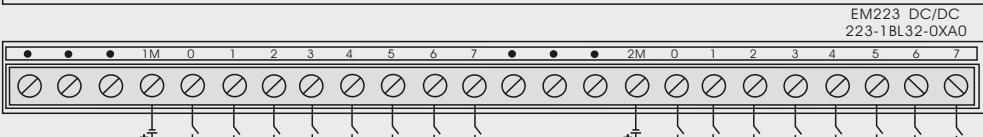
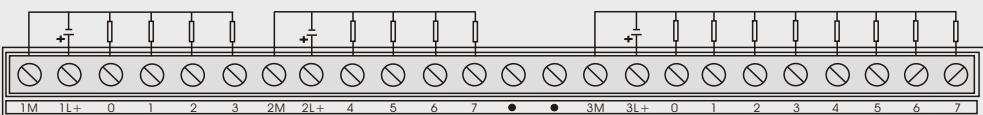
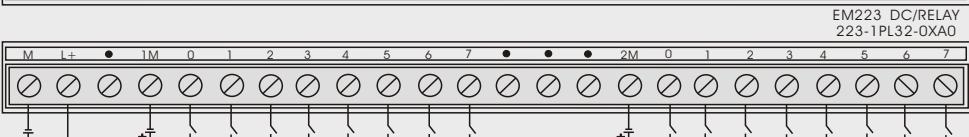
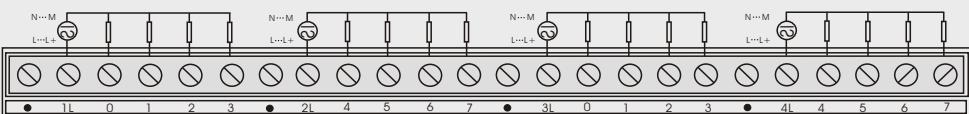
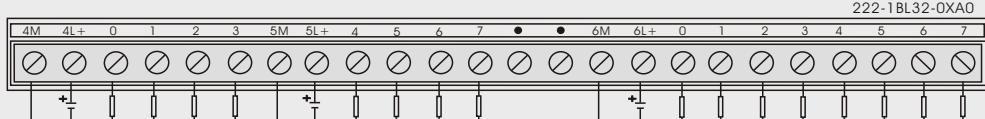
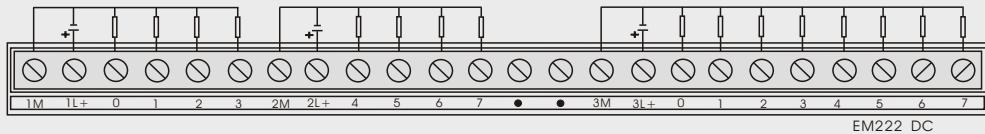
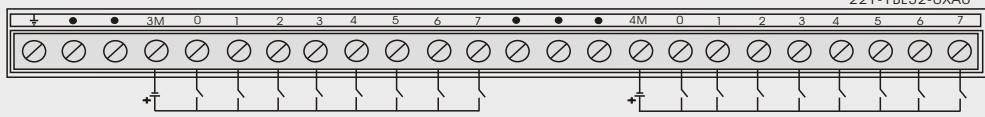
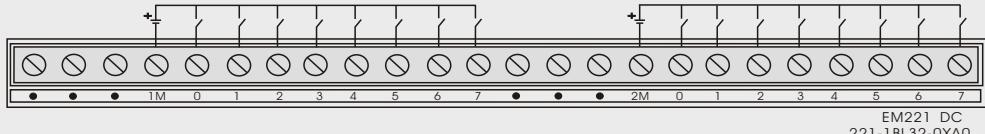
CTS7221-1BL32 32DI
 CTS7222-1BL32 32DO
 CTS7223-1BL32 16DI/16DO
 CTS7223-1PL32 16DI/16DO Relay

Digital Expansion Modules

Connector Terminal Identification



Connector Terminal Identification

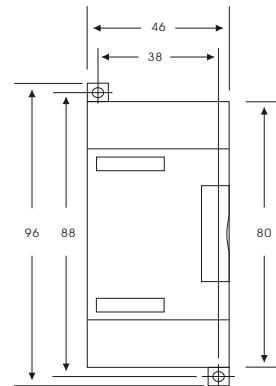
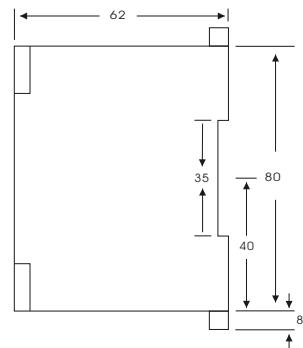


Digital Expansion Modules

Size Diagram

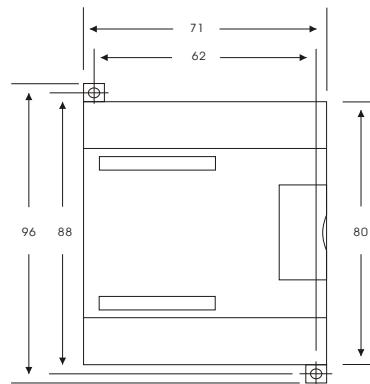
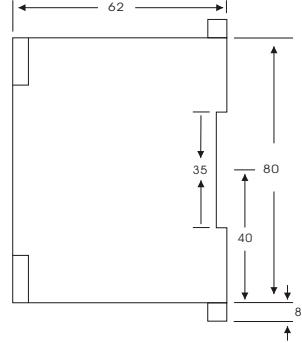
Unit:mm

CTS7221-1BF32
 CTS7222-1BF32
 CTS7222-1HF32
 CTS7223-1BF32
 CTS7223-1HF32



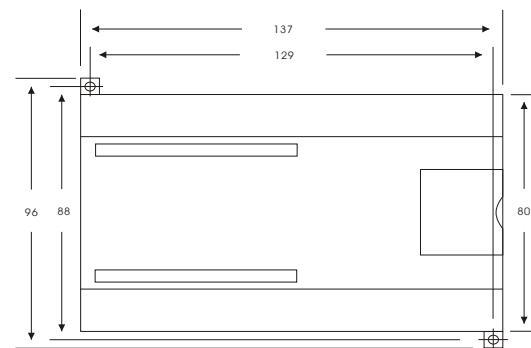
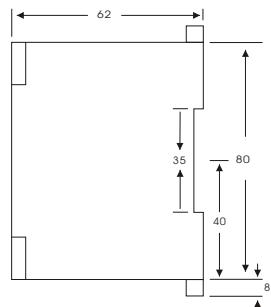
Unit:mm

CTS7221-1BH32
 CTS7222-1BH32
 CTS7222-1HH32
 CTS7223-1BH32
 CTS7223-1PH32



Unit:mm

CTS7221-1BL32
 CTS7222-1BL32
 CTS7223-1BL32
 CTS7223-1PL32



Order Data

Product Model and Specification	Order Number
EM221 Digital Input Module , 8 × 24VDC	CTS7 221-1BF32
EM221 Digital Input Module , 16 × 24VDC	CTS7 221-1BH32
EM221 Digital Input Module , 32 × 24VDC	CTS7 221-1BL32
EM222 Digital Output Module , 8 × 24VDC transistor outputs 0.5A	CTS7 222-1BF32
EM222 Digital Output Module , 8 × Relay outputs 2A	CTS7 222-1HF32
EM222 Digital Output Module , 16 × 24VDC transistor outputs 0.5A	CTS7 222-1BH32
EM222 Digital Output Module , 16 × Relay outputs 2A	CTS7 222-1HH32
EM222 Digital Output Module , 32 × 24VDC Relay outputs 0.5A	CTS7 222-1BL32
EM223 Digital Input/Output Module, 4 × 24VDC inputs ,4×transistor outputs, 0.5A	CTS7 223-1BF32
EM223 Digital Input/Output Module , 4 × 24VDC inputs ,4×relay outputs, 2A	CTS7 223-1HF32
EM223 Digital Input/Output Module , 8 × 24VDC inputs ,8×transistor outputs, 0.5A	CTS7 223-1BH32
EM223 Digital Input/Output Module , 8 × 24VDC inputs ,8×relay outputs, 2A	CTS7 223-1PH32
EM223 Digital Input/Output Module , 16 × 24VDC inputs ,16×transistor outputs, 0.5A	CTS7 223-1BL32
EM223 Digital Input/Output Module , 16 × 24VDC inputs ,16×relay outputs, 2A	CTS7 223-1PL32

Common Analog Expansion Modules



CTS7235-0KD32

Analog combination module, 4AI/1AQ, 12 bits resolution, voltage or current input or output



CTS7231-0HC32

Analog Input module, 4AI, 12 bits resolution, voltage or current input



CTS7232-0HB32

Analog Output module, 2AQ, ± 10V voltage outputs, 0~20mA current output

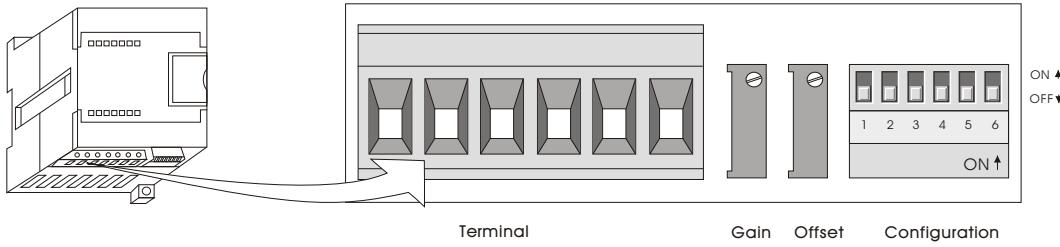
SPECIFICATION		EM231	EM235
Analog inputs specification			
Input type	Differential		
Rated voltage	24V DC		
Max. continuous permissible voltage	30V DC		
Max. input current	30mA		
Input Range	Voltage(unipolar)	0~10V, 0~5V	0-50mV,0-100mV,0-500mV, 0-1V,0-5V,0-10V
	Voltage(bipolar)	±5V, ±2.5V	±25mV,±50mV,±100mV,±250mV, ±500mV,±1V,±2.5V,±5V,±10V
Data Range	Current	0~20mA	
	Bipolar,full-scale range	0~32000	
	Unipolar, full-scale range	−32000~+32000,	
Input Resolution	Voltage(unipolar)	12Bit	
	Voltage(bipolar)	11Bit+Sign Bit	
	Current	11Bit	
Analog to digital conversion time		<300 μ s	
Analog input step response		1.5ms to 95%	
Common mode rejection		40dB, DC - 60Hz	
Common mode voltage		Signal voltage + Commonmode voltage < 12V	
Input Impedance		≥10M Ω	
Isolation(field side to logic circuit)		None	
Inverse polarity protection		Yes	
ADC resolution		12BIT	
AnalogI outputs specification		EM232	EM235
Output type		Voltage, Current	
Signal range		Voltage: ±10V; Current: 0~20mA	
Resolution, full-scale		Voltage:12BIT、Current:11BIT	
Data word format		Voltage: −32000~+32000; Current: 0~ +32000	
Accuracy		typical: ± 0.5% of full scale; Worse: ± 2% of full scale	
Setting time		Voltage output: 100 μ s; Current output: 2ms	
Maximum drive@24VDC power		Voltage output: 5000 ohm, minimum Current output: 500 ohm, maximum	
Isolation(analog to digital)		Optical, 500VAC for 1 minute	



CTS7232-0HF32

Analog Output module, 4AQs, ± 10V voltage outputs, 0~20mA current output

Calibration and Configuration Location for EM 235



Configuration

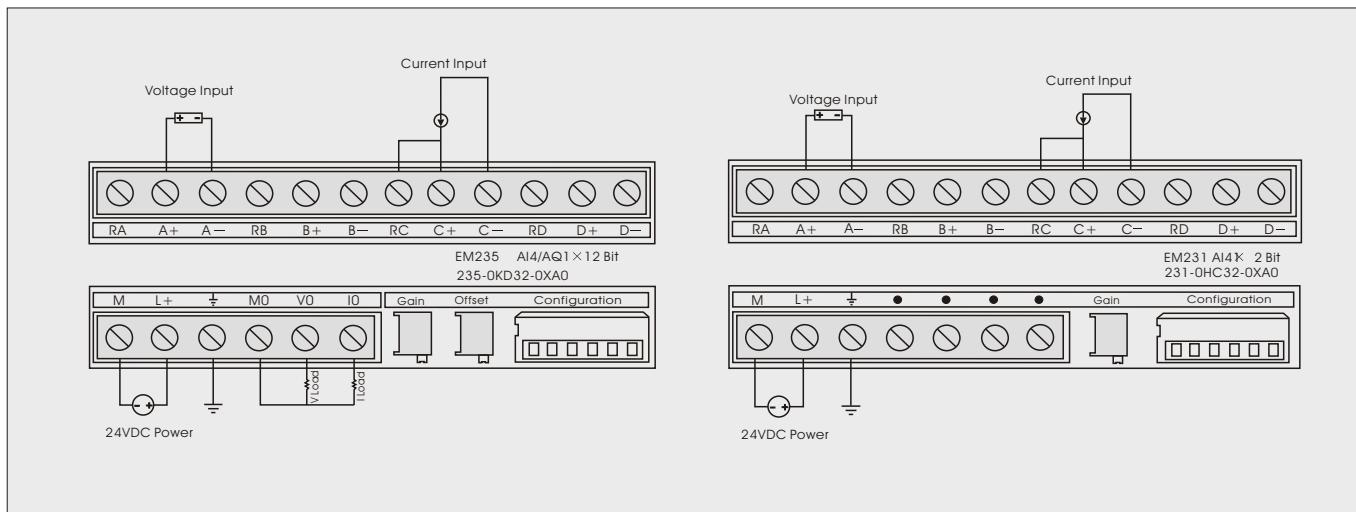
EM 231 Configuration Switch Table to Select Analog Input Range

Mongopolar			Full scale input	Resolution
SW1	SW2	SW3		
ON	OFF	ON	0-10V	2.5mV
	ON	OFF	0 - 5V	1.25mV
Bipolar			0 - 20mA	5 µA
OFF	SW1	SW2	Full scale input	Resolution
	OFF	ON	±5V	2.5mV
	ON	OFF	±2.5V	1.25mV

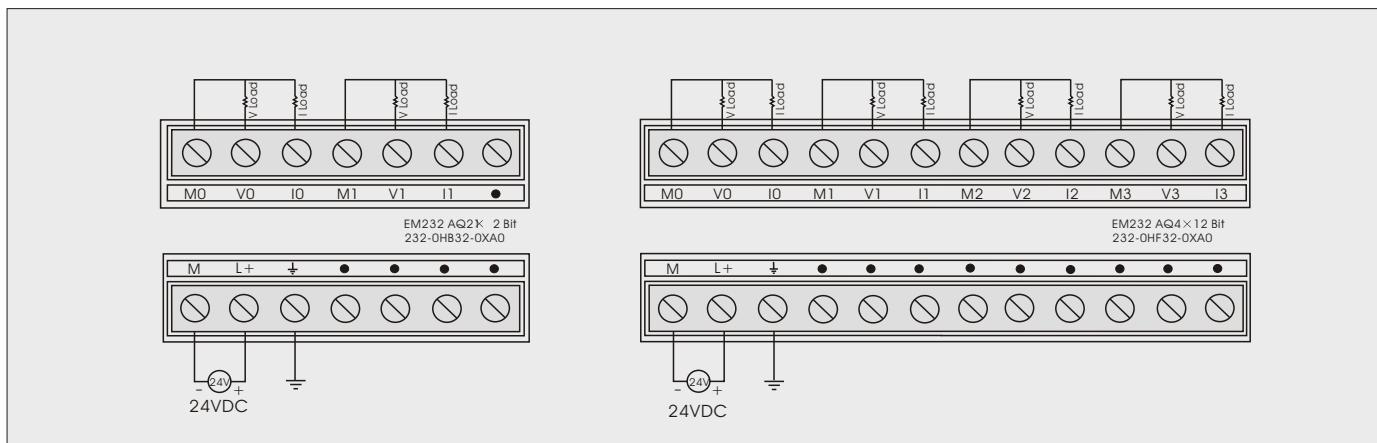
EM 235 Configuration Switch Table to Select Analog Range and Resolution

Mongopolar						Full scale input	Resolution
SW1	SW2	SW3	SW4	SW5	SW6		
ON	OFF	OFF	ON	OFF	ON	0 - 50mV	12.5 µ V
OFF	ON	OFF	ON	OFF	ON	0- 100mV	25 µ V
ON	OFF	OFF	OFF	ON	ON	0- 500mV	125 µ V
OFF	ON	OFF	OFF	ON	ON	0-1V	250 µ V
ON	OFF	OFF	OFF	OFF	ON	0-5V	1.25 µ V
ON	OFF	OFF	OFF	OFF	ON	0- 20mA	5 µ A
OFF	ON	OFF	OFF	OFF	ON	0-10V	2.5mV
Bipolar						Full scale input	Resolution
SW1	SW2	SW3	SW4	SW5	SW6		
ON	OFF	OFF	ON	OFF	OFF	±25mV	12.5 µ V
OFF	ON	OFF	ON	OFF	OFF	±50mV	25 µ V
OFF	OFF	ON	ON	OFF	OFF	±100mV	50 µ V
ON	OFF	OFF	OFF	ON	OFF	±250mV	125 µ V
OFF	ON	OFF	OFF	ON	OFF	±500mV	250 µ V
OFF	OFF	ON	OFF	ON	OFF	±1V	500 µ V
ON	OFF	OFF	OFF	OFF	ON	±2.5V	1.25mV
OFF	ON	OFF	OFF	OFF	ON	±5V	2.5mV
OFF	OFF	ON	OFF	OFF	OFF	±10V	5mV

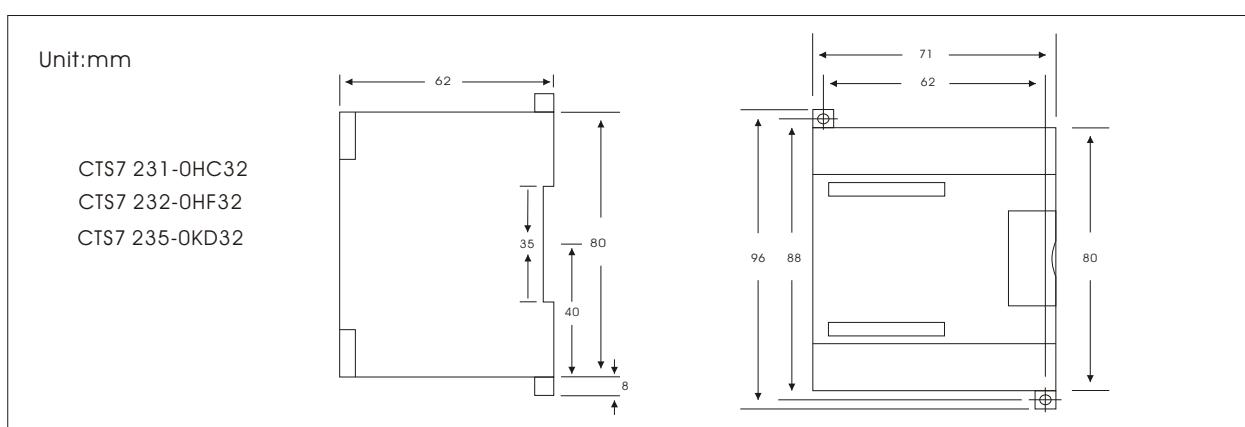
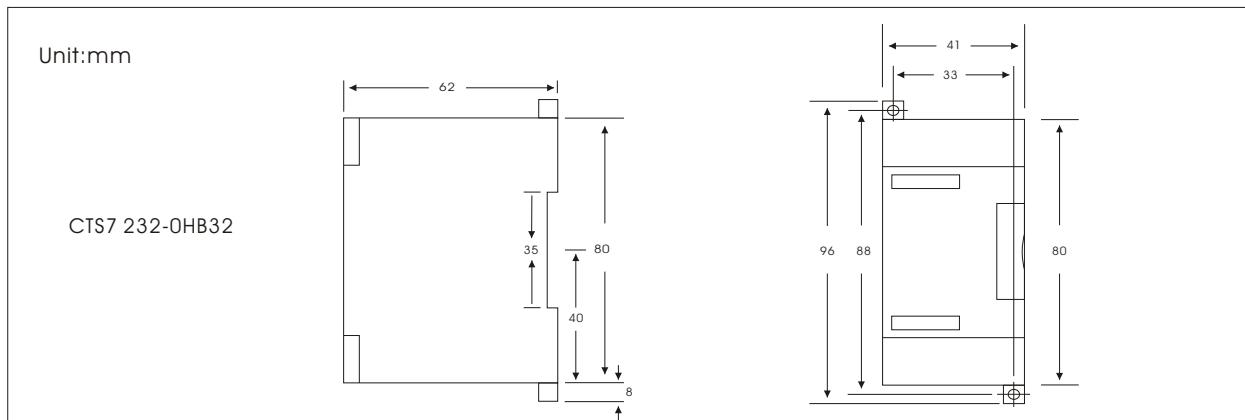
Connector Terminal Identification



Common Analog Expansion Modules



Size Diagram



Order Data

Product Model and Specification	Order Number
EM231 Analog Input Module , 4 × 12 bits resolution	CTS7 231-0HC32
EM232 Analog Output Module , 2 × 12 bits resolution (voltage)/ 11 bits resolution (current)	CTS7 232-0HB32
EM232 Analog Output Module , 4 × 12 bits resolution (voltage)/ 11 bits resolution (current)	CTS7 232-0HF32
EM235 Analog I/O Module , 4 AI & 1AQ, voltage resolution: 12 bits, current resolution: 11 bits	CTS7 235-0KD32

Specification



CTS7231-7HC32

4 Inputs of voltage signal,
16 bits resolution,
2 points of 10VDC power output



CTS7231-0HF32

8 Inputs of voltage signal,
16 bits resolution,
optical Isolated

Model and Specification		CTS7 231-7HC32	CTS7 231-0HF32
input type		Differential	Differential
Number of analog inputpoints		4	8
Rated voltage		24V DC	24V DC
Max.continuous input voltage allowed		30V DC	30V DC
Max. input current		25mA	30mA
Input Range	Voltage(unipolar)	0~10V, 0~5V	0~10V, 0~5V
	Voltage(bipolar)	±10V, ±5V	±5V, ±2.5V
Measuring principle		Successive approximation	Delta-Sigma
Analog to digital conversiontime		<200 μ s	500 μ s
Analog input step response		<1ms	5ms, 8 Channels
Data Range	Unipolar, full-scale range	-	0~32000
	Bipolar, full-scale range	-32000~+32000	-32000~+32000
Input Resolution	Voltage(unipolar)	10V: 0.675mV; 5V: 0.338mV	10V: 0.3mV; 5V: 0.15mV
	Voltage(bipolar)	±10V: 1.25mV; ±5V: 0.675mV	±5V: 0.3mV; ±2.5V: 0.15mV
Analog input step response		0.5ms	5ms
Common mode rejection		85dB, DC to 60Hz	40dB, DC to 60Hz
Maximum accuracy		<0.1%	<0.1%
Linear accuracy		±0.025%	±0.025%
Isolation(field side to logic circuit)		-	500VAC, 1minute
Inverse polarity protection		Yes	Yes
ADC resolution		16BIT	24BIT
Power output	Rated voltage output	10V DC	-
	Rated current output	10mA	-
	Overload protection	Yes	-

Switch Table to Select Input Range

Bipolar			Full-Scale input	Resolution
SW1	SW2	SW3		
OFF	ON	OFF	±5V	150 μ V
	OFF	ON	±10V	300 μ V

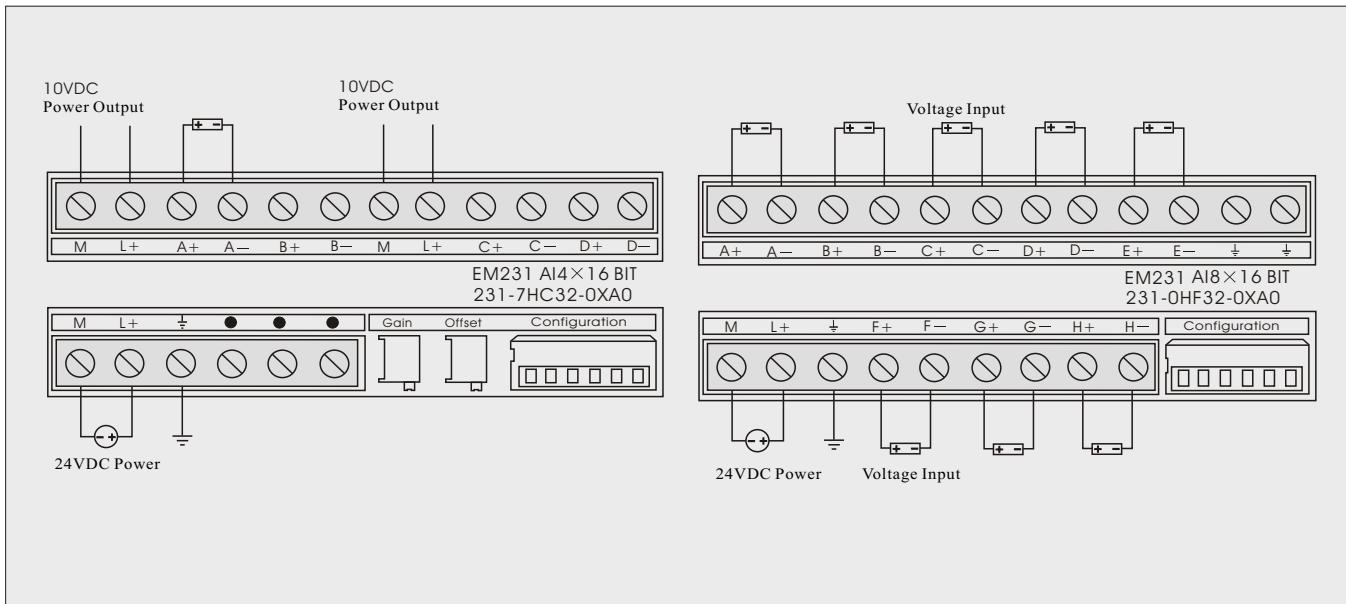
CTS7231-7HC32(4AI×16BIT)

Unipolar			Full-Scale input	Resolution
SW1	SW2	SW3		
ON	OFF	ON	0-10V	150 μ V
	ON	OFF	0-5V	75 μ V
Bipolar			Full-Scale input	Resolution
SW1	SW2	SW3		
OFF	OFF	ON	±5V	150 μ V
	ON	OFF	±2.5V	75 μ V

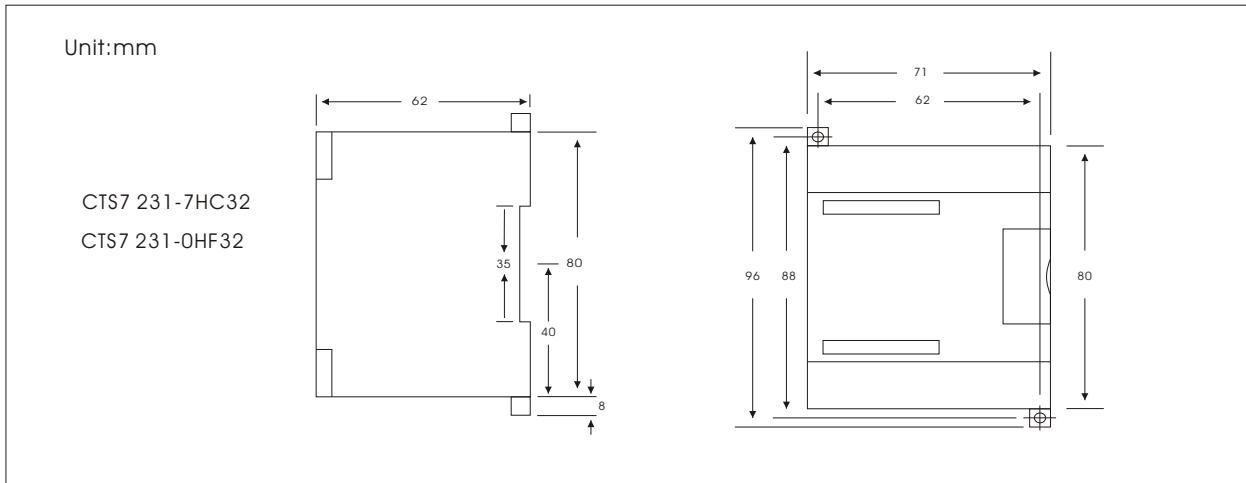
CTS7231-0HF32(8AI×16BIT)

High Resolution Analog Input Modules

Connector Terminal Identification



Size Diagram



Order Data

Product Model and Specification	Order Number
EM231 high resolution voltage input module, 4×16bits resolution, sampling time <200 μ s /channel	CTS7 231-7HC32
EM231 high resolution voltage input module, 8×16bits resolution, optical isolated	CTS7 231-0HF32

Specification



CTS7231-7PB32 Isolated, 2 RTD Inputs, 16bits resolution

CTS7231-7PC32 Isolated, 4 RTD Inputs, 16bits resolution



CTS7231-7PD32 Isolated, 4 TC Inputs, 16bits resolution

CTS7231-7PF32 Isolated, 8 TC Inputs, 16bits resolution

Input type		Thermocouple Input	RTD Input
		Floating TC	Module ground referenced RTD
Number of analog inputpoints		4/8	2/4
Rated voltage		24V DC	24V DC
Max. input voltage allowed		30V DC	30V DC
Input range		TC type(select one per module): S/T/R/E/N/K/J; Voltage range: +/-80mV	RTD type(select one permodule): Pt-100Ω, 200Ω, 500Ω, 1000Ω Cu-9.035Ω, Pt-1000Ω Ni-10Ω, 120Ω, 1000Ω R-150Ω, 300Ω, 600Ω FS
Isolation	Field to Logic	500V Ac, 1minute	500V Ac, 1minute
	Field to 24V DC	500V Ac, 1minute	500V Ac, 1minute
	24V DC to logic	500V Ac, 1minute	500V Ac, 1minute
Module update time:All channels		4 Channels 425ms, 8 Channels 825ms	2 Channels 425ms, 4 Channels 825ms
Measuring principle		Sigma-Delta	Sigma-Delta
Common mode input range (input channel to inputchannel)		120VAC	120VAC
Common mode rejection		>120dB@120V AC	>120dB@120V AC
Input resolution	Temperature	0.1°C/0.1°F	0.1°C/0.1°F
	Resistance	15 bits plus sign	-
	Resistance	-	15 bits plus sign
wire length to sensor maximum		100m to sensor	100m to sensor
Wire loop resistance,maximum		100Ω	20Ω , CU2.7Ω
Suppression of interference		85dB@50Hz/60Hz/400Hz	85dB@50Hz/60Hz/400Hz
Data word format		Voltage: -27648 to +27648	Resistance: 0 to +27648
Input impedance		>1MΩ	>10MΩ
Basic error		0.1% Fs (Voltage)	0.1% Fs (Resistance)
Repeatability		0.05% FS	0.05% FS
Cold junction error		±1.5°C	-
24V DC supply voltage range		20.8~28.8VDC	

Configuration

Configuration for TC Modules

TC Sensor Type	SW1	SW2	SW3
J(Default)	0	0	0
K	0	0	1
T	0	1	0
E	0	1	1
R	1	0	0
S	1	0	1
N	1	1	0
+/-80mV	1	1	1

Configuration Item	CTS7231-7PD32		CTS7231-7PF32	
	Switch	Setting	Switch	Setting
Open Wire Detect Direction	SW5	0:Upscale(+3276.7degree) 1:Downscale(-3276.8degree)	SW4	0:Upscale(+3276.7degree) 1:Downscale(-3276.8degree)
Open Wire Detect Enable	SW6	0:Enable,1:Disable	Enable Always	
Temperature Scale	SW7	0:Celsius,1:Fahrenheit	SW5	0:Celsius,1:Fahrenheit
Code Junction Enable	SW8	0:Enable,1:Disable	SW6	0:Enable,1:Disable

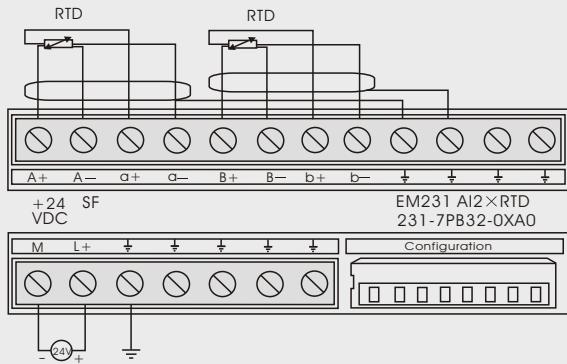
Temperature Measure Modules

Configuration for RTD Modules

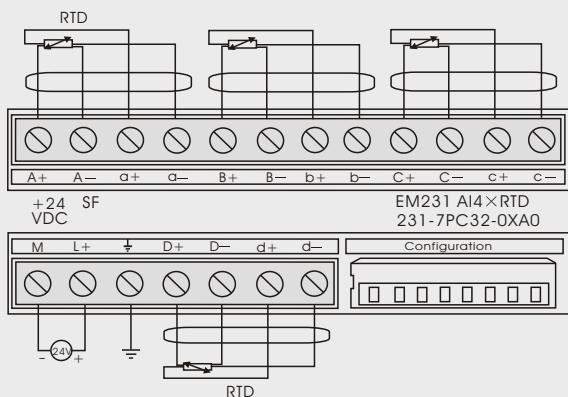
RTD Type	SW1	SW2	SW3	SW4	SW 5
100 Pt 0.003850(Default)	0	0	0	0	0
200Ω Pt 0.003850	0	0	0	0	1
500Ω Pt 0.003850	0	0	0	1	0
1000Ω Pt 0.003850	0	0	0	1	1
100Ω Pt 0.003920	0	0	1	0	0
1200Ω Pt 0.003920	0	0	1	0	1
500Ω Pt 0.003920	0	0	1	1	0
1000Ω Pt 0.003920	0	0	1	1	1
100Ω Pt 0.00385055	0	1	0	0	0
200Ω Pt 0.00385055	0	1	0	0	1
500Ω Pt 0.00385055	0	1	0	1	0
1000Ω Pt 0.00385055	0	1	0	1	1
100Ω Pt 0.003916	0	1	1	0	0
200Ω Pt 0.003916	0	1	1	0	1
500Ω Pt 0.003916	0	1	1	1	0
1000Ω Pt 0.003916	0	1	1	1	1
100Ω Pt 0.00302	1	0	0	0	0
200Ω Pt 0.003902	1	0	0	0	1
500Ω Pt 0.003902	1	0	0	1	0
1000Ω Pt 0.003902	1	0	0	1	1
Reserved	1	0	1	0	0
100Ω Ni 0.00672	1	0	1	0	1
120Ω Ni 0.00672	1	0	1	1	0
1000Ω Ni 0.00672	1	0	1	1	1
100Ω Ni 0.006178	1	1	0	0	0
120Ω Ni 0.006178	1	1	0	0	1
1000Ω Ni 0.006178	1	1	0	1	0
10000Ω Pt 0.003850	1	1	0	1	1
10Ω Cu 0.004270	1	1	1	0	0
150Ω FS Resistance	1	1	1	0	1
300Ω FS Resistance	1	1	1	1	0
600Ω FS Resistance	1	1	1	1	1

SW6	Open Wire DetectDirection	SW7	Temperature Scale	SW8	Wiring Scheme
0	Upscale (+3276.7degree)	0	Celsius (°C)	0	3-wire
1	Downscale(-3276.8degree)	1	Fahrenheit (°F)	1	2-wire or 4-wire

Connector Terminal Identification

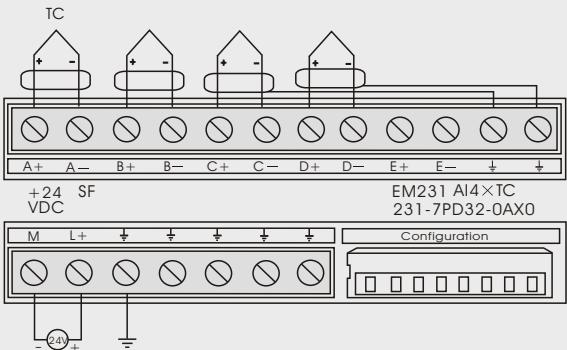


CTS7 231-7PB32

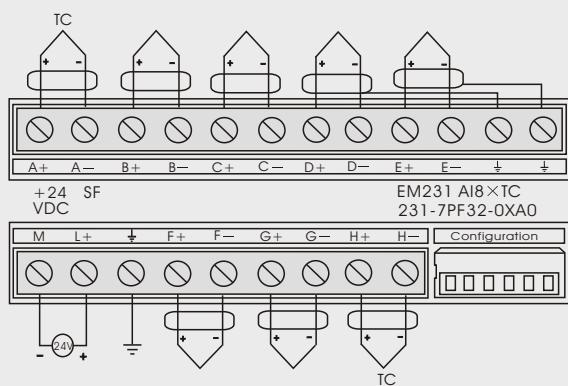


CTS7 231-7PC32

EM231 RTD Modules



CTS7 231-7PD32



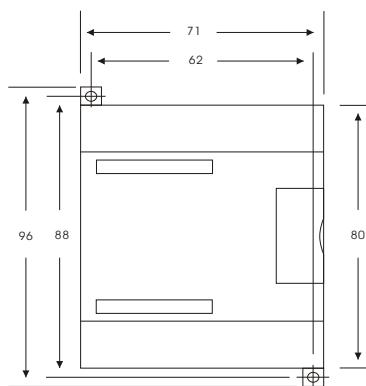
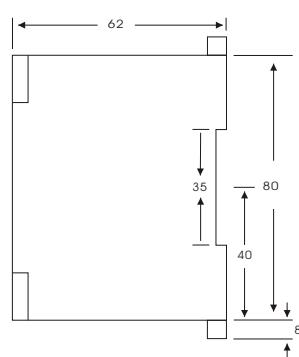
CTS7 231-7PF32

EM231 TC Modules

Size Diagram

Unit:mm

CTS7 231-7PB32
CTS7 231-7PC32
CTS7 231-7PD32
CTS7 231-7PF32



Temperature Measure Modules



CTS7 231-7ND32

EM231 NTC Module
 With 2 inputs of NTC/PT100, and
 2 inputs of voltage/current,
 16 bits resolution, isolated



CTS7 231-7NF32

EM231 NTC Module
 With 8 inputs of NTC,
 16 bits resolution, isolated

Specification

Specification		CTS7231-7ND32	CTS7231-7NF32	
Dimension(W×H×D)		71.2×80×62mm		
Power loss		1.7W	2.1W	
Power Consumption	From +5V	87mA		
	From L+	60mA	70mA	
	L+ voltage range	20.4~28.8V DC		
LED Indicator		24V DC: ON=power supply good, OFF=no supply power SF: ON=Module Failure, BLINK=Input Signal Error, OFF=no fault		
Input type		Module reference ground RTD		
Input range		RTD type(select one): Pt100Ω(α =3850PPm,3920PPm,3850.55PPm, 3916PPm, 3902PPm) NTC(R25=10K B=3950, R25=10KB=3435)	NTC R25=10K B=3950, R25=10K B=3435	
Voltage input range		±5V, ±10V, 0~5V, 0~10V		
Current input range		0~20mA		
Number of input		4 points total,2 points of PT100/NTC and 2 points of voltage/current	8 points of NIC	
Isolation	Field to logic	500V AC		
	Field to 24V DC	500V AC		
	24VDC to logic	500V AC		
Common mode input range (Input channel to input channel)		0		
Common mode rejection		>120dB@120V AC		
Input resolution	Temperature	0.1°C/0.1°F		
	Voltage	15bits plus sign		
Measuring principle		Sigma-Delta		
Module update time: All channel		425ms	1s	
Wire length to sensor		100m(maximum)		
Wire loop resistance		20Ω		
Suppression of interference		85dB@50Hz/60Hz/400Hz		
Data word format		Voltage: -27648 ~ +27648		
Input impedance		>10MΩ		
Maximum input voltage		30V DC		
Input filter attenuation		-3dB@21KHz		
Basic error		0.05% Fs(Resistance)		
Repeatability		0.1% Fs		

Configuration

CTS7 231-7ND32

Sensor Type	SW1	SW2	SW3	SW4	SW 5
100 Pt 0.003850(Default)	0	0	0	—	—
100Ω Pt 0.003920	0	0	1	—	—
100Ω Pt 0.00385055	0	1	0	—	—
100Ω Pt 0.003916	0	1	1	—	—
100Ω Pt 0.00302	1	0	0	—	—
NTC R25=10K B=3950	1	0	1	—	—
NTC R25=10K B=3435	1	1	0	—	—
Reserved	1	1	1	—	—
0~5V	—	—	—	1	0
0~20MA	—	—	—	1	1
0~10V	—	—	—	0	0
-10V~10V	—	—	—	0	1
-5V~5V	—	—	—	1	0

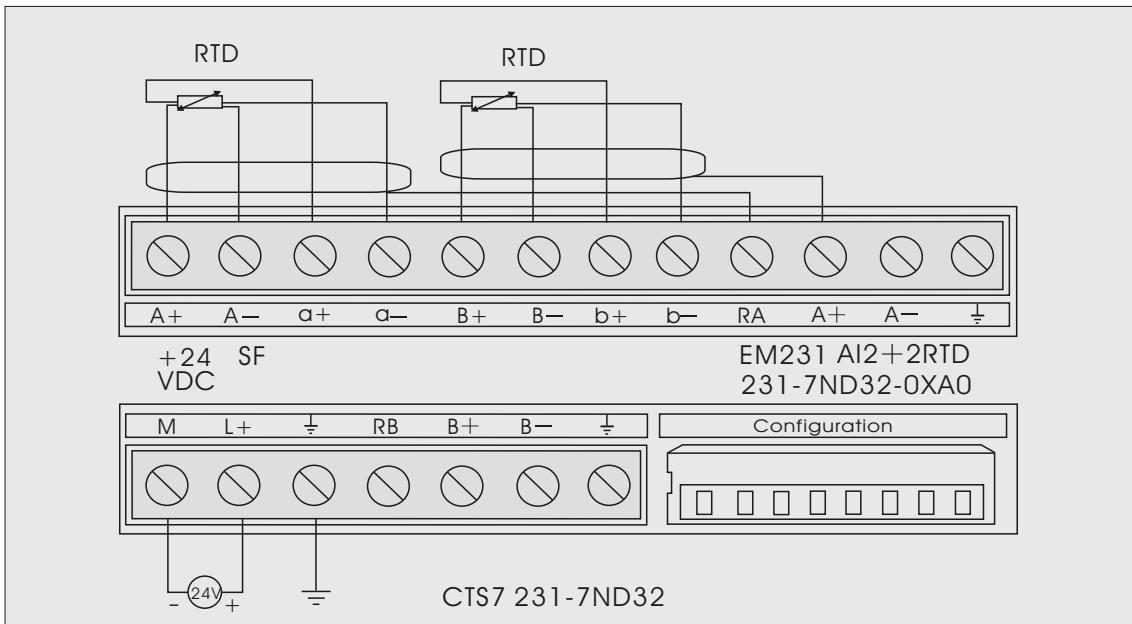
SW6	Open Wire DetectDirection	SW7	Temperature Scale	SW8	Wiring Scheme
0	Upscale (+3276.7degree)	0	Celsius (°C)	0	3-wire
1	Downscale(-3276.8degree)	1	Fahrenheit (°F)	1	2-wire

CTS7 231-7NF32

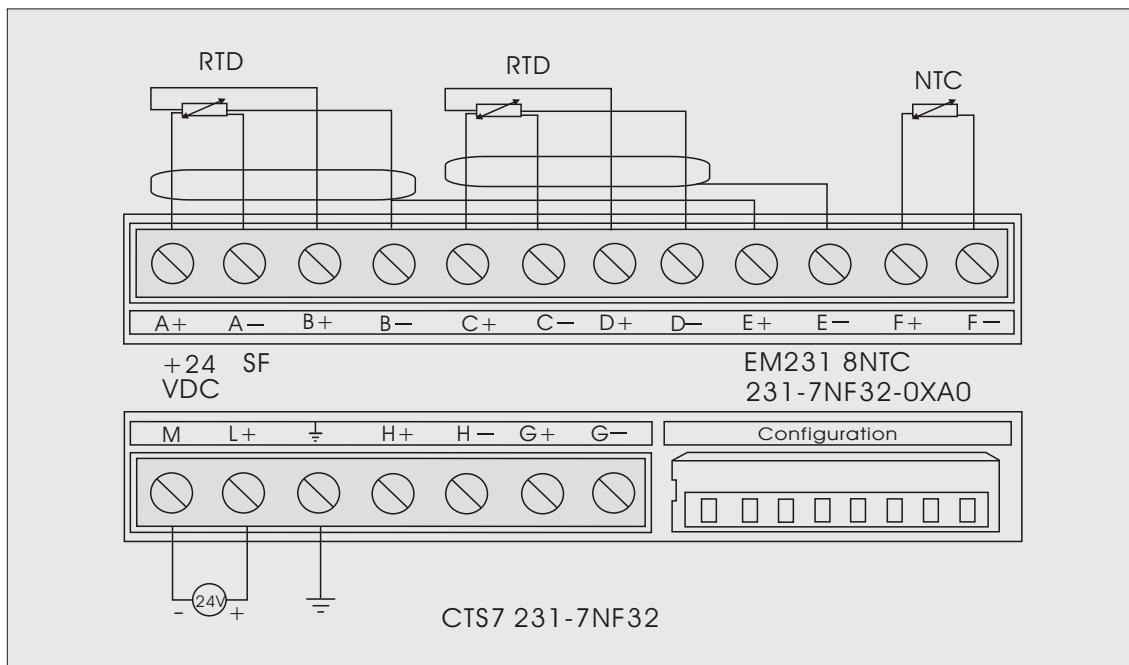
Sensor Type	SW1	SW2	SW3	SW4	SW 5
NTC R25=10K B=3950	1	0	1	—	—
NTC R25=10K B=3435	1	1	0	—	—

SW6	Open Wire DetectDirection	SW7	Temperature Scale	SW8	Wiring Scheme
0	Upscale (+3276.7degree)	0	Celsius (°C)	0	3-wire
1	Downscale(-3276.8degree)	1	Fahrenheit (°F)	1	2-wire

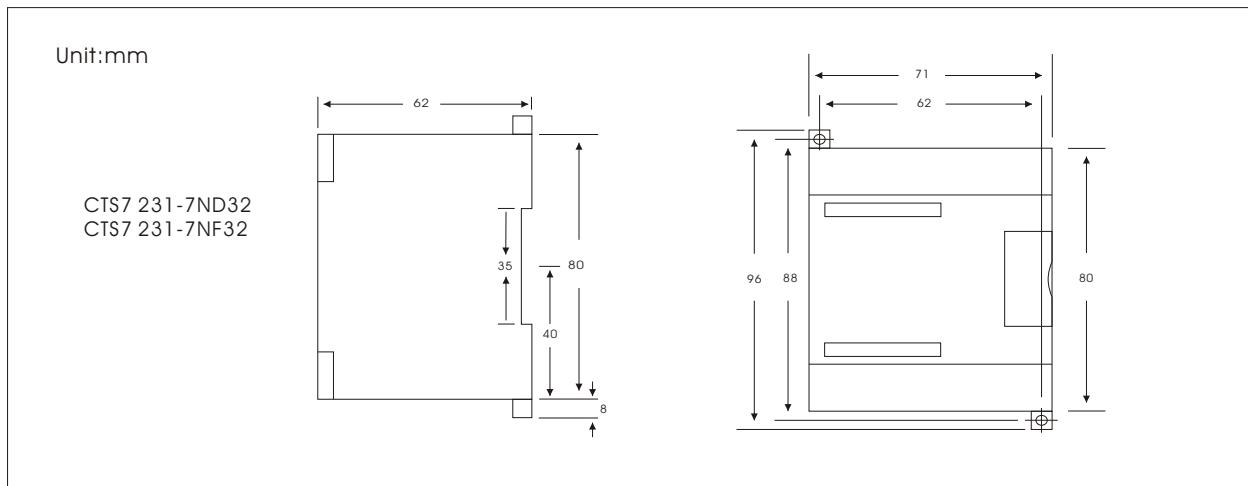
Connector Terminal Identification



Temperature Measure Modules



Size Diagram



Order Data

Product Model and Specification	Order Number
EM231 Analog Input RTD , 2×16bits resolution , isolated	CTS7 231-7PB32
EM231 Analog Input RTD , 4×16bits resolution , isolated	CTS7 231-7PC32
EM231 Analog Input Thermocouple , 4×16bits resolution , J/K/R/S/T/E/N , isolated	CTS7 231-7PD32
EM231 Analog Input Thermocouple , 8×16bits resolution , J/K/R/S/T/E/N , isolated	CTS7 231-7PF32
EM231 Combination Temperature Input Module, 2 NTC/PT100, 2 inputs of voltage/current, isolated	CTS7 231-7ND32
EM231 Temperature Input Module, 8 inputs of NTC, isolated	CTS7 231-7NF32


CTS7231-7TD32

Isolated TC input, integrating intelligent PID arithmetic inside


CTS7231-7TF32

Isolated 8TC input,integrating intelligent PID arithmetic inside

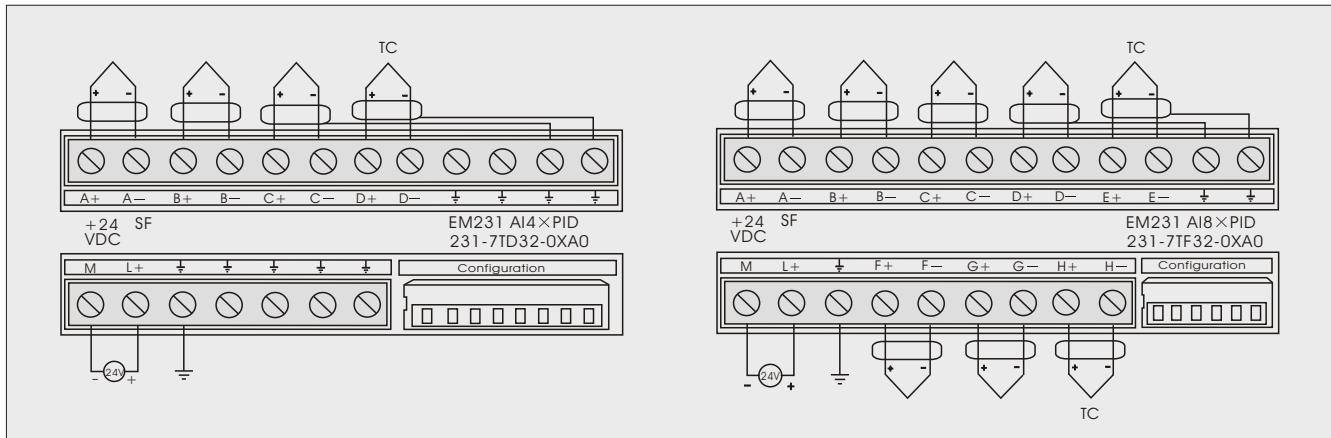
Specifications		231-7TD32	231-7TF32
Dimensions(mm)		120.5×80×62	
Number of input points		4	8
Input range		TC type: Jor K	
Maximum input voltage		30VDC	
Isolation		Yes	
● Field to Logic		500VAC	
		500VAC	
		500VAC	
Module update time>All channels		405ms	825ms
Measuring principle		SIGMA-DELTA	
Input resolution	Temperature	0.1 °C / 0.1 °F	
	Voltage	15 bits plus sign	
Noise suppression		85dB	
● Noise frequently		50/60/400Hz	
Common mode input range (input channel to inputchannel)		120V AC	
Common mode rejection		>120dB@120V AC	
Data word format		-27648--+27648	
Basic error		0.1%FS(Voltage)	
Repeatability		0.05%FS	
Cold junction error		±1.5°C	
Diagnostic program		LED: EXTF,SF	
wire length to sensor maximum		100m to sensor	
Wire loop resistance		100Ω	
Power Consumption		-	
● From +5V(from I/O bus)		87mA	
		60mA	
Power Loss(dissipation)		1.8W	

Configuration

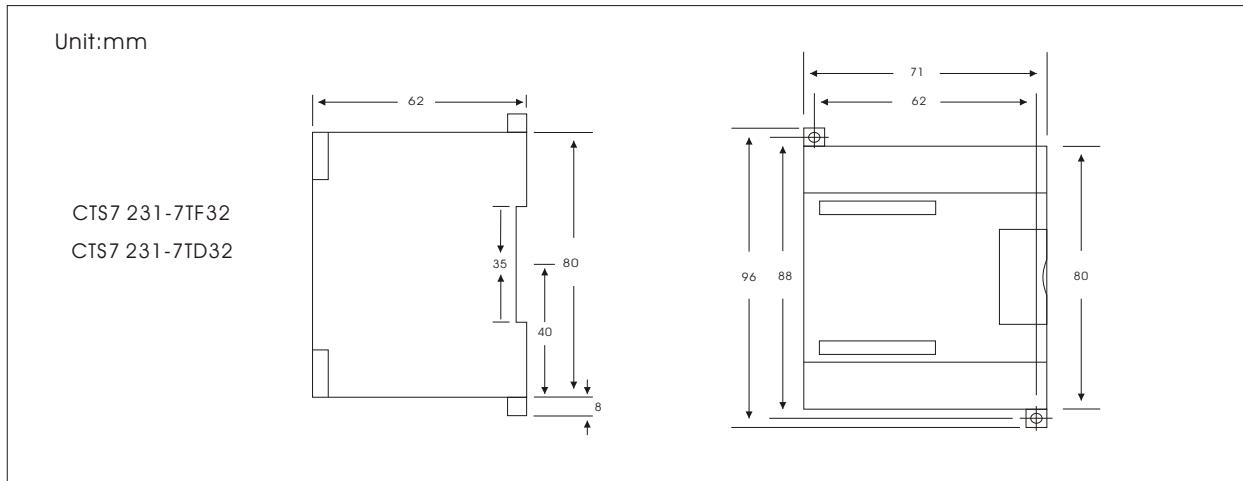
Item	Switch	Setting
TC Type	SW3	0:J 1:K
Open Wire Detect Direction	SW4	0:Upscale(+3276.7degree) 1:Downscale(-3276.8degree)
Temperature Scale	SW5	0:Celsius, 1:Fahrenheit
Code Junction Enable	SW6	0:enable,1:Disable

PID Control Modules

Connector Terminal Identification



Size Diagram



Order Data

Product Model and Specification	Order Number
EM231 4PID Module with J/K TC input, isolated, PID arithmetic integrated	CTS7 231-7TF32
EM231 8PID Module with J/K TC input, isolated, PID arithmetic integrated	CTS7 231-7TD32

Specification



CTS7 277-0AA32

**PROFIBUS-DP Module, Slave Station,
12Mbps in maximum,isolated**

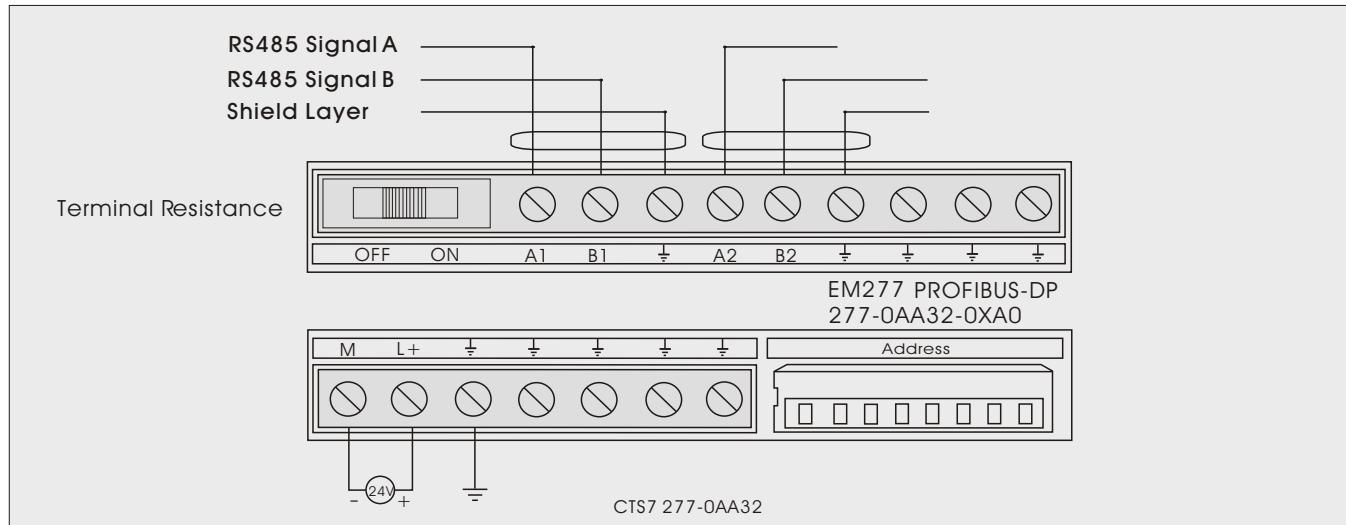


CTS7 177-0AA32

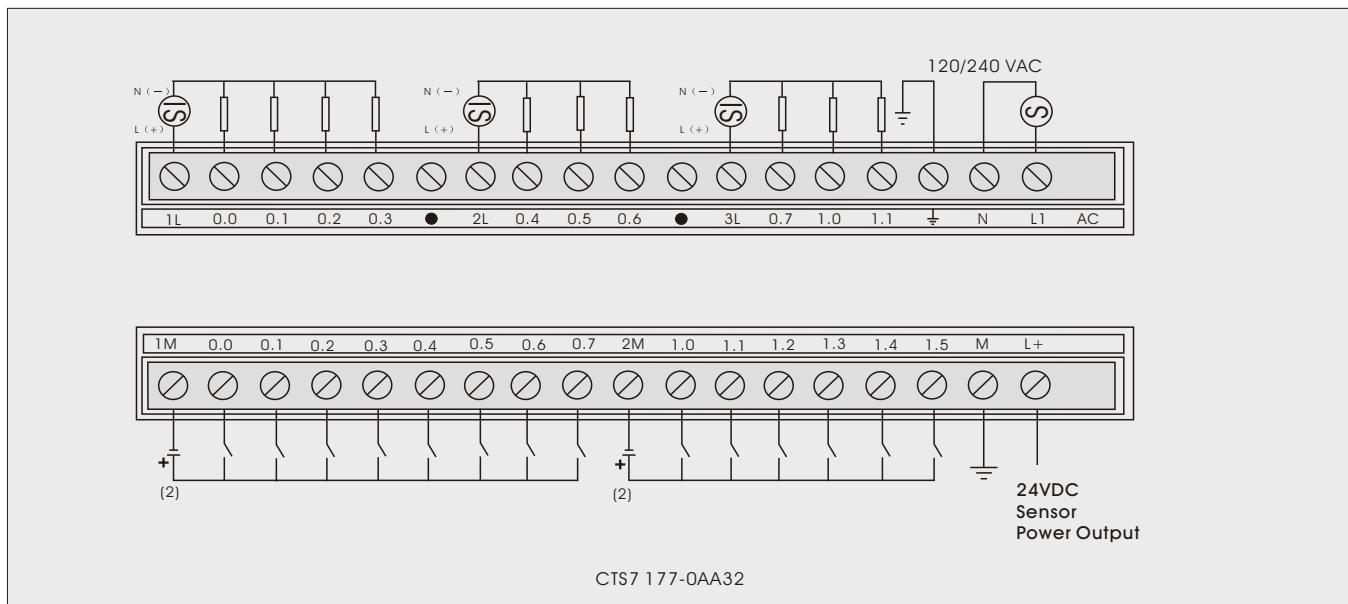
**PROFIBUS-DP Module, Slave Station,
12Mbps in maximum,isolated,
Integrating 14DI/10DO onboard**

Specification	EM277	EM177	
Number of ports	1		
Electrical interface	Isolated RS-485		
Onboard I/O	0	14DI/10DO	
PROFIBUS-DP/MP baud rates (Set automatically)	9.6, 19.2, 45.45, 93.75, 187.5 and 500K baud 1, 1.5, 3, 6 and 12M baud	PROFIBUS-DP baud rates (auto. set) 9.6, 19.2, 45.45, 93.75, 187.5 and 500K baud; 1M, 1.5M baud	
Protocols	PROFIBUS-DP slave and MPI slave	PROFIBUS-DP VO	
Cable Length			
Up to 93.75K baud	1200m	Shield	500m
187.5K baud	1000m		
500K baud	400m		
1 to 1.5M baud	200m	Unshield	300m
3 to 12M baud	100m		
Network Capabilities			
Station address settings	0 to 126(set by rotary switches)	1 to 125(select by switches)	
Max. stations per segment	32		
Max. stations per network	126, up to 125 EM277 stations	126(include station with zeroaddress)	
MPI Connections	6 total, 2 reserved (1 for PG, 1 for OP)	—	
24VDC Input Power Requirements			
Voltage range	20.4 to 28.8 VDC(Class2, limited power, or sensor power from PLC)		
Max. current(Module only with port active)	70mA	1.5A peak	
Ripple noise(<10 MHz)	<1 V peak topeak(maximum)		
Isolation(Field to logic)	500 VAC, 1 minute	Not insulated	
220VAC Inputs			
Voltage Range	—	85-264VAC(47-63Hz)	
Isolation	—	1500VAC	

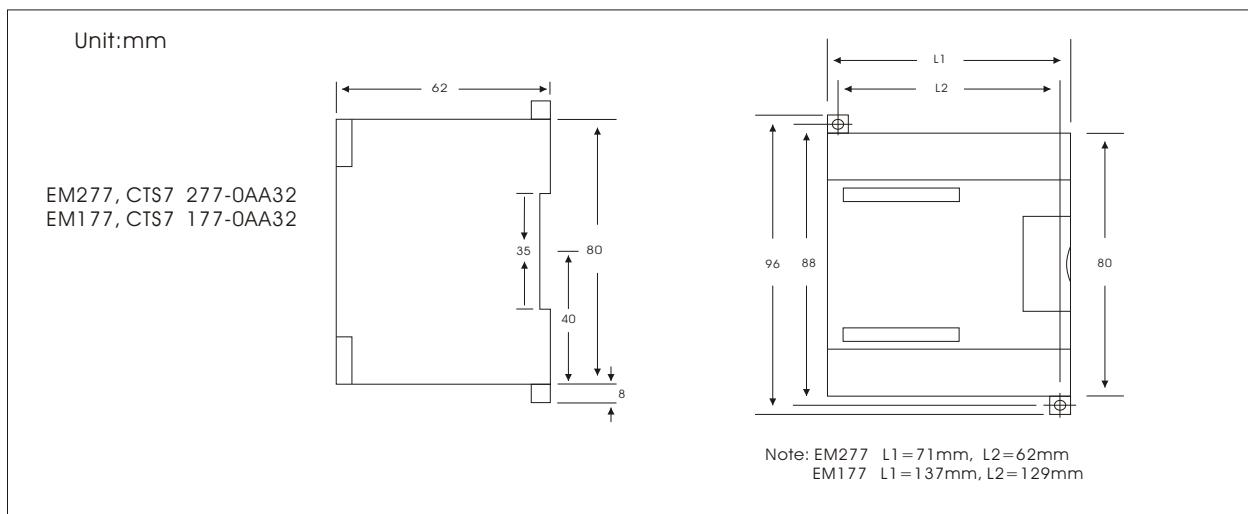
Connection Terminal Identification



Communication Expansion Modules



Size Diagram



Order Data

Product Model and Specification	Order Number
EM277 PROFIBUS-DP Expansion Module, slave station	CTS7 277-0AA32-0XA0
EM177 PROFIBUS-DP Expansion Module, slave station, Integrating 14DI/10DO onboard	CTS7 177-0AA32-0XA0

Digital Input Features



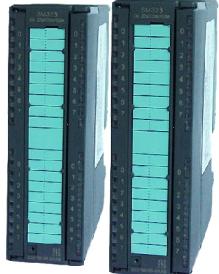
CTS7321-1BH01

**EM321, 16DI × 24VDC,
Optical Isolation,
20PIN front connector**



CTS7321-1BL00

**EM321, 32DI × 24VDC,
Optical Isolation,
40PIN front connector**



CTS7323-1BL00

**EM323, 16DI/16DO × 24VDC,
Optical Isolation,
40PIN front connector**

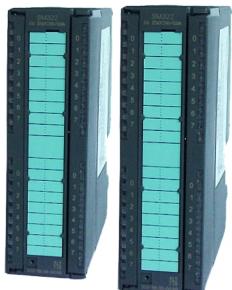
Specification	CTS7 321-1BH01 CTS7 323-1BL00	CTS7 321-1BL00
Front connector	20PIN	40PIN
Number of inputs	16	32
Rated voltage	24V DC	
Max. continuous permissible	30V DC	
Logic 1 signal(minimum)	13V~30V	
Logic 0 signal(maximum)	-30V~5V	
Input group number	2	4
Number of Inputs per group	8	
Number of inputs ON Simultaneously	16	32
Isolation	Channel and field bus	yes
	Channel and Channel	yes
	isolation groups of	8
Max. input delay time	26ms	
Optical isolation	500VAC	
Input current	7mA(aprox.)	
Interrupt	None	
Diagnosis	None	
Status indicator	LED for each channel	
Max. cable length	Shield	100 meter
	Unshield	600 meter

Digital Output Features



CTS7322-1BH01

**EM322, 16DO × 24VDC,
Optical Isolation,
20PIN front connector**



CTS7322-1BL00

**EM322, 32DO × 24VDC,
Optical Isolation,
40PIN front connector**

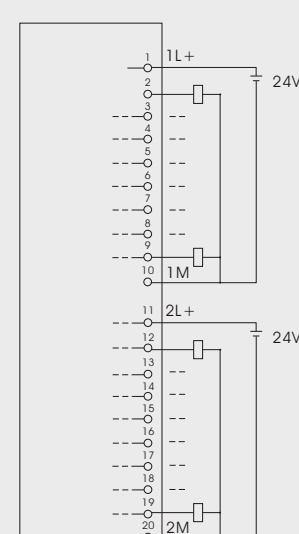
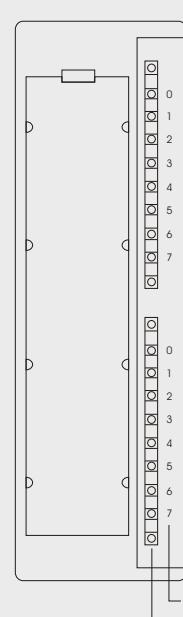
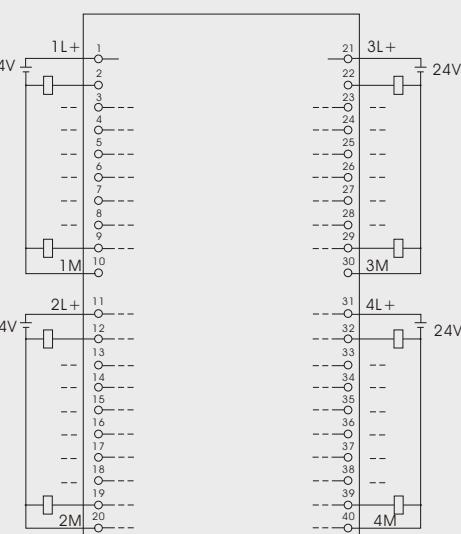
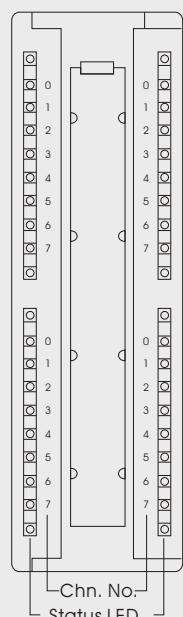
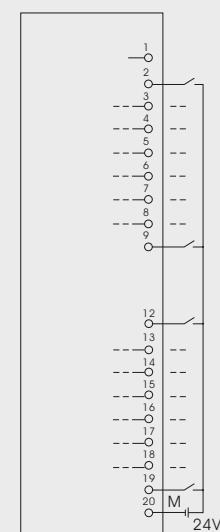
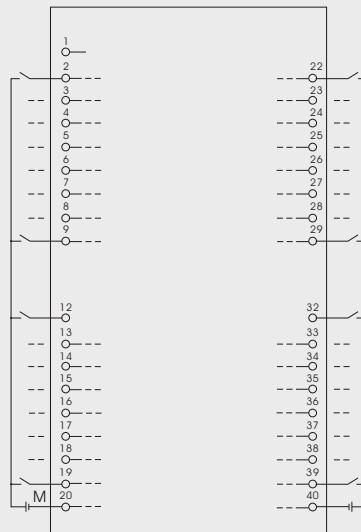
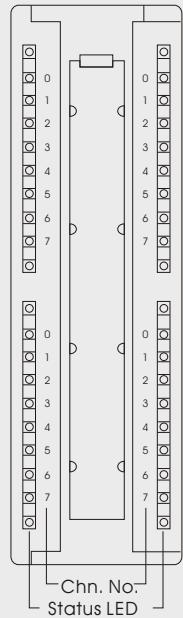


CTS7322-1HH00

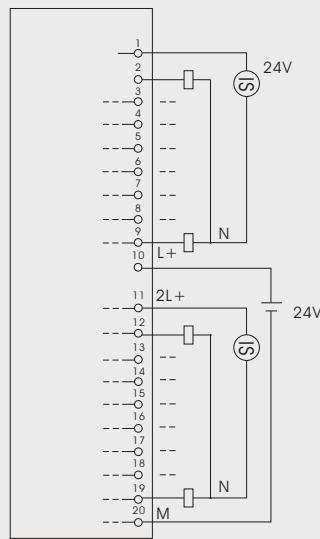
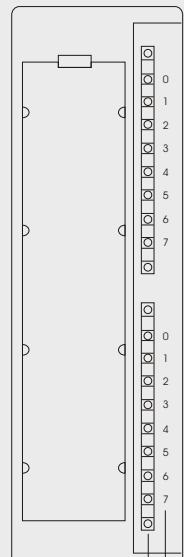
**EM322, 16DO × Relay,
20PIN front connector**

Specification		CTS7 322-1BH01 CTS7 323-1BL00	CTS7 322-1BL00	CTS7 322-1HH00
Power loss		4.9W	4.5W	4.5W
Front connector		20PIN	40PIN	20PIN
Number of outputs		16	32	16
Output type		Solid-MOSFET	Solid-MOSFET	Relay-Dry contact
Voltage of logic "1"		Minimum L+: ±0.8V	Minimum L+: ±0.8V	DC:5~30V, AC:5~250V
Output current	Logic signal1 "1"	0.5A	0.5A	2A
	Number of output groups	2	4	2
	Per group mounting(max.)	8	8	8
	Number of output ON(max.)	16	32	16
	Max. current per group	4A	4A	8A
	Lamp load	5W	5W	5W
	Contact resistance	—	—	0.2 Ω
	Surge current(max.)	—	—	8A, 100ms
Isolation	Overload protection	Electron	Electron	from external
	Channel and field bus	500VAC	—	500VAC
	Channel and Channel	500VAC	—	500VAC
	Coil and contact	1500V AC,1 minute	1500V AC,1 minute	1500V AC,1 minute
Switch Frequency	L+current	36.1mA/no load	36.1mA/no load	236mA/no load
	Switch delay	130 μs	130 μs	—
	On→Off	130 μs	130 μs	—
	Off→On	360 μs	360 μs	—
	Lifetime mechanical (no load)	—	—	20,000,000
	Lifetime contacts at rated load	—	—	300,000
	Impedance load(max.)	100HZ	100HZ	—
	Inductive Load(max.)	0.5HZ	0.5HZ	—
Cable Length	Lamp load(max.)	10HZ	10HZ	1HZ
	Interrupt	None	None	None
	Diagnosis	None	None	None
	Status Indicator	With LED each channel	With LED each channel	With LED each channel
Power Consumption	Unshield	600 meter	600 meter	600 meter
	Shield	1000 meter	1000 meter	1000 meter
	From bus(+5V DC)	80 mA maximum	90 mA maximum	100 mA maximum
Length	From L+(no load)	120 mA maximum	200 mA maximum	250 mA maximum

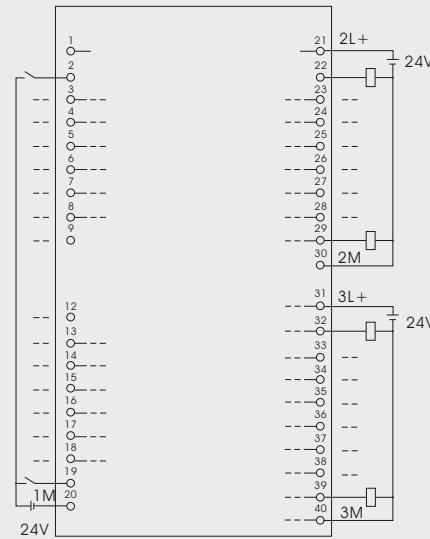
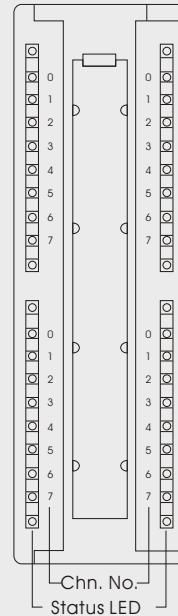
Connector Terminal Identification



Digital Expansion Modules



CTS7 322-1HH00



CTS7 322-1BL00

Order Data

Product Model and Specification	Order Number
EM321 Digital Input Module, 16DI × 24VDC, optical isolation, 20PIN front connector	CTS7 321-1BH01
EM321 Digital Input Module, 32DI×24VDC, optical isolation, 40PIN front connector	CTS7 321-1BL00
EM322 Digital Output Module, 16×24VDC, 0.5A, optical isolation, 20PIN front connector	CTS7 322-1BH01
EM322 Digital Output Module, 16×Relay, 2A, optical isolation, 20PIN front connector	CTS7 322-1HH00
EM322 Digital Output Module, 16×24VDC, 0.5A, optical isolation, 40PIN front connector	CTS7 322-1BL00
EM323 Digital I/O Module, 16DI/16DO×24VDC, 0.5A, optical isolation, 40PIN front connector	CTS7 323-1BL00

Analog Input Features



CTS7 331-7KB02

EM331 Analog Input Module
2 AI of voltage, current, TC or RTD,
optical isolation,
20PIN front connector



CTS7 331-7KF02

EM331 Analog Input Module
8 AI of voltage, current, TC or RTD,
optical isolation,
20PIN front connector

Specification		EM331, CTS7 331-7KB02/CTS7331-7KF02
Dimension(W×H×D)		40×125×120mm
Power loss		1W
Front connector		20PIN
From +5V(bus)		50 mA(max.)
Input voltage range		20.4~28.8V DC
Number of inputs		2/8
Alarm	Limit value alarm	Parameterizable channels 0 and 2
	Diagnostic alarm	Parameterizable
Diagnostic		LEDs: channel error and sum error monitor, information readable
Isolation to backplane bus		500V AC
Input range	Voltage Input	±80mV, ±250 mV, ±500 mV, ±1V, ±2.5V, ±5V, 1~5V, ±10 V
	Current Input	±3.2 mA, ±10 mA, ±20 mA, 0~20 mA, 4~20 mA
	Resistance input	150Ω, 300Ω, 600Ω,
	TC input	TC type: E,N,J,K,L
	RTD input	Pt100, Ni100
Full Scale	Voltage	80mV ----±1%, 250 -1000mV---- ±0.6%, 2.5 -10V ----±0.8%
	Current	3.2 - 20mA ---- ±0.7%
	Resistance	150Ω;300Ω;600Ω ---- ±0.7%
	TC	E,N,J,K,L ---- ±1.1%
	RTD	Pt100, Ni100 ---- ±0.7%, Pt 100 ---- ±0.8%
Input error In 25°C	Voltage	80mV ----±0.6%, 250 -1000mV---- ±0.4%, 2.5 -10V
	Current	3.2 - 20mA ---- ±0.6%
	Resistance	150Ω;300;600Ω ---- ±0.5%
	TC	E,N,J,K,L ---- ±0.5%
	RTD	Pt100, Ni100, Pt 100 ---- ±0.7%,
Resolution	Permissible input voltage for voltage input	50V, maximum
	Permissible input current for current input	32 mA, maximum
Resolution	Voltage input	11 bits plus sign
	Current input	11 bits plus sign
parameterized interference frequency Hz		400/60/50/10 Hz
Basic error		± 0.05 %
Analog to digital conversion time		22ms
ADC resolution		16BIT

Analog Expansion Modules

Analog Output Features



CTS7 332-5HB01

EM332 Analog Output Module
 2 points of Voltage/Current output,
 11bits plus sign or 12bits,
 Diagnostic Function, Isolation,
 20PIN front connector

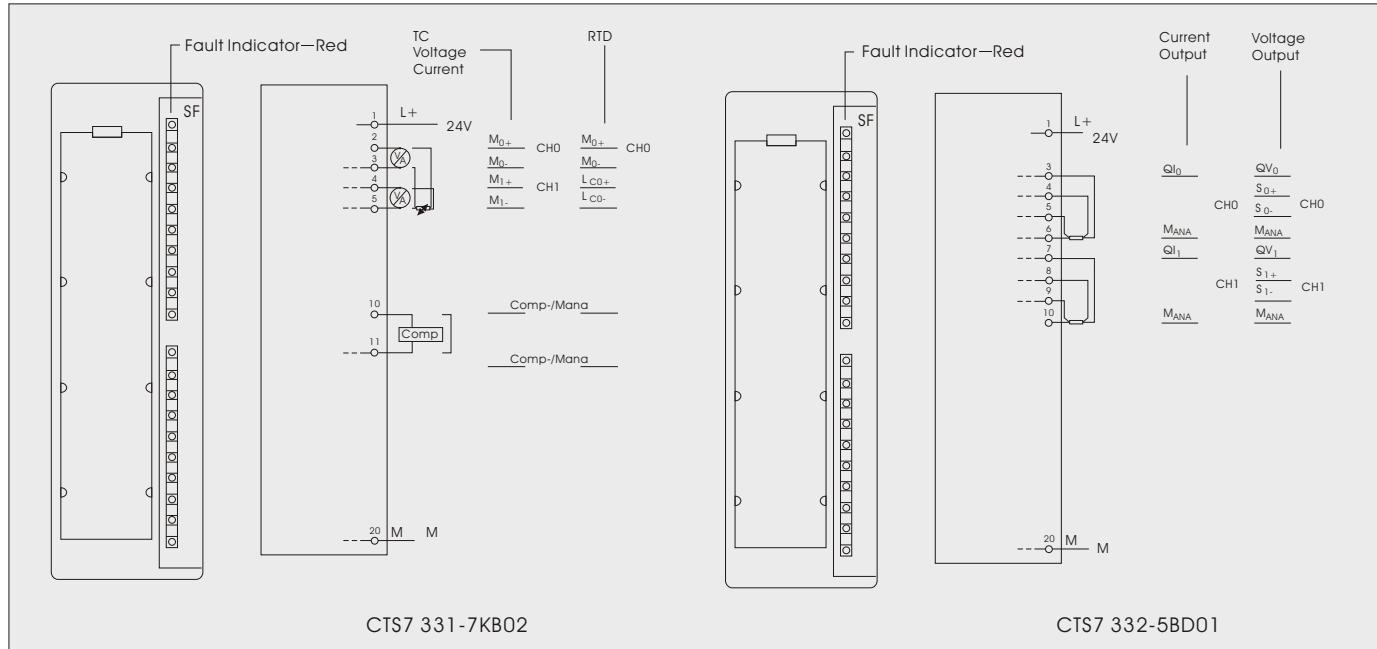
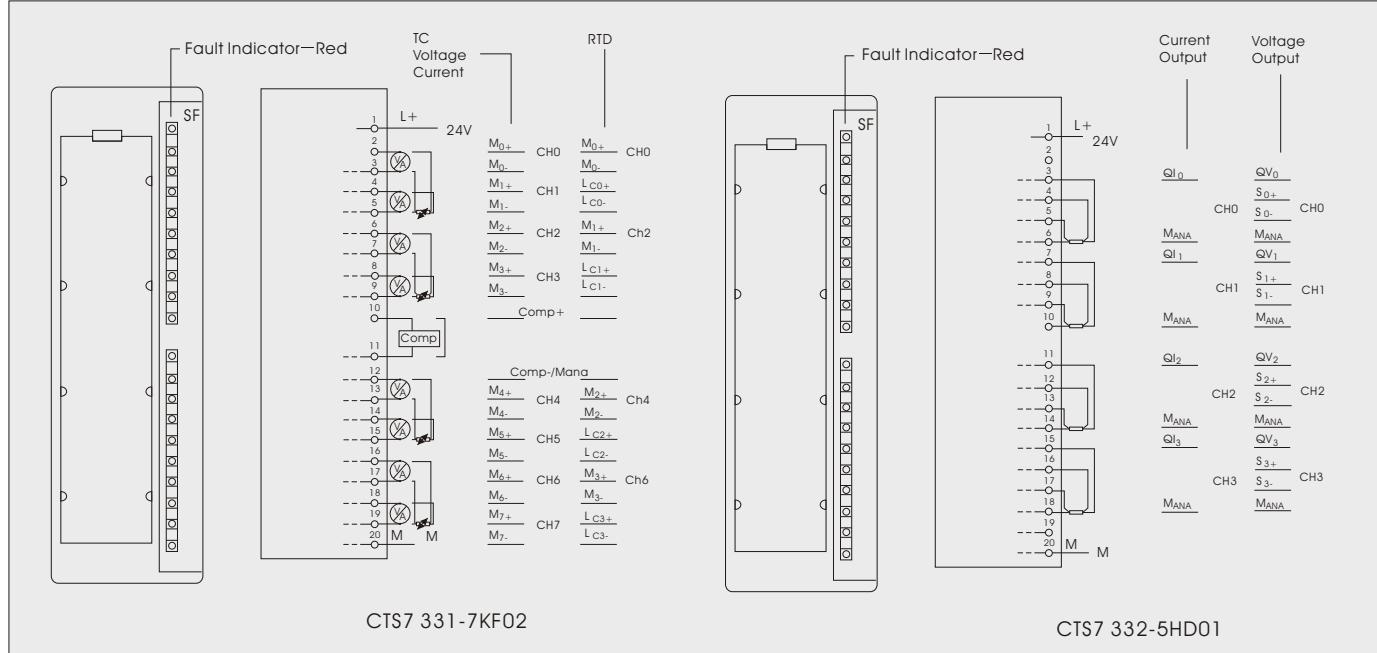
Model/Specification		EM332, CTS7 332-5HB01 /CTS7 332-5HD01
Dimension(W×H×D)		40 x 125 x120mm
Power loss		3W
Power Consumption	+5V DC	60 mA
	L+	240 mA
Rated voltage		24V DC
Front connector		20针
Number of outputs		2/4
Diagnostic alarm		Parameterizable
Diagnostic Function	Sum error monitor	Red LED(SF)
	Information readable	Possible
Replacement value setting		Yes
Output Range	Voltage	0 ~ 10 V; ±10 V; 1~ 5 V
	Current	4 ~ 20 mA ±20 mA, 0~ 20 mA
Resolution		11 bits +sign(+/- 10 V, +/- 20 mA, 4 - 20 mA, 1 - 5 V); 12 bits(0 - 10 V, 0 - 20 mA)
Voltage Output	Short Circuit Protection	Yes
	Short circuit current	25mA
Current Output	No-load operation	18V, maximum
Cycle time(max.)		0.8ms
Boot time	Impedance load	0.1ms
	Capacitive load	3.3ms
	Inductive load	0.5ms
Isolation between channels and backplane bus		Optical, 500V AC
Burden Resistance	Voltage outputs	1K Ω , maximum
	Current outputs	500 Ω , maximum
	Capacitive load	1 mF,maximum
	Inductive load	10 mH, maximum
Basic Error	Voltage output	Typical: ±0.2%(full scale),Worse: ±0.5%(full scale)
	Current output	Typical:±0.3%(full scale),Worse: ±0.6%(full scale)
Cable length(shield)		200 meter, maximum
Reverse protection		Yes



CTS7 332-5HD01

EM332 Analog Output Module
 4 points of Voltage/Current output,
 11bits plus sign or 12bits,
 Diagnostic Function, Isolation,
 20PIN front connector

Connector Terminal Identification



Order Data

Model and Specification	Order Number
EM331, 2 analog inputs of voltage,current, resistance, RTD or TC, 9/12/14bits(plussign), isolation, alarm and diagnostic function, 20PIN front connector	CTS7 331-7KB02
EM331, 2 analog inputs of voltage,current, resistance, RTD or TC, 9/12/14bits(plussign), isolation, alarm and diagnostic function, 20PIN front connector	CTS7 331-7KF02
EM332, 2 analog outputs of voltage or current, 11bits plus sign or 12 bits, isolation,20PIN front connector	CTS7 332-5HB01
EM332, 2 analog outputs of voltage or current, 11bits plus sign or 12 bits, isolation,20PIN front connector	CTS7 332-5HD01

Order Data for TrustPLC series PLC

Order Data	Order Number
CTS7-200 PLC	
CPU224,12K Bytes Memory,24VDC,14DI/10DO,transistor outputs ,0.5A	CTS7214-1AD33-0X24
CPU224,12K Bytes Memory,220VAC,14DI/10DO,relay outputs ,2A	CTS7214-1BD33-0X24
CPU226,24K Bytes Memory,24VDC,14DI/10DO,transistor outputs ,0.5A	CTS7216-1AD33-0X24
CPU226,24K Bytes Memory, 220VAC,14DI/10DO,relay outputs ,2A	CTS7216-1BD33-0X24
CPU226,24K Bytes Memory,24VDC,24DI/16DO,transistor outputs ,0.5A	CTS7216-1BD33-0X40
CPU226,24K Bytes Memory, 220VAC,24DI/16DO,relay outputs ,2A	CTS7216-1BD33-0X40
EM221 Digital InputModule , 8 ×24VDC	CTS7 221-1BF32
EM221 Digital InputModule , 16 ×24VDC	CTS7 221-1BH32
EM221 Digital InputModule , 32 ×24VDC	CTS7 221-1BL32
EM222 Digital OutputModule , 8 ×24VDC transistor outputs 0.5A	CTS7 222-1BF32
EM222 Digital OutputModule , 16×24VDC transistor outputs 0.5A	CTS7 222-1BH32
EM222 Digital OutputModule , 16 × Relay outputs 2A	CTS7 222-1HH32
EM222 Digital OutputModule , 32 ×24VDC Relay outputs 0.5A	CTS7 222-1BL32
EM223 Digital Input/OutputModule, 4 ×24VDC inputs ,4×transistor outputs, 0.5A	CTS7 223-1BF32
EM223 Digital Input/OutputModule , 4 ×24VDC inputs ,4×relay outputs, 2A	CTS7 223-1HF32
EM223 Digital Input/OutputModule , 8 ×24VDC inputs ,8×transistor outputs, 0.5A	CTS7 223-1BH32
EM223 Digital Input/OutputModule , 8 ×24VDC inputs ,8×relay outputs, 2A	CTS7 223-1PH32
EM223 Digital Input/OutputModule , 16×24VDC inputs ,16×transistor outputs, 0.5A	CTS7 223-1BL32
EM223 Digital Input/OutputModule , 16 ×24VDC inputs ,16×relay outputs, 2A	CTS7 223-1PL32
EM231 Analog Input Module , 4 ×12-bit precision	CTS7 231-0HC32
EM232 Analog Output Module , 2 ×12-bit precision (voltage)/11-bit precision(current)	CTS7 232-0HB32
EM232 Analog Output Module , 4 ×12-bit precision (voltage)/11-bit precision(current)	CTS7 232-0HF32
EM235 Analog Input/Output Module , 4 ×12-bit inputs ,1 ×12-bit output	CTS7 235-0KD32
EM231 High-speed Voltage Input Module , 4×16-bit precision , sampling time<200μ s /channels	CTS7 231-7HC32
EM231 Isolated Voltage Input Module , 8×16-bit precision	CTS7 231-0HF32
EM231 Analog Input RTD , 2×16-bit precision ,isolation	CTS7 231-7PB32
EM231 Analog Input RTD , 4×16-bit precision ,isolation	CTS7 231-7PC32
EM231 Analog Input Thermocouple , 4×16-bit precision ,J/K/R/S/T/E/N , isolation	CTS7 231-7PD32
EM231 Analog Input Thermocouple , 8×16-bit precision ,J/K/R/S/T/E/N , isolation	CTS7 231-7PF32
EM231 Analog Input Thermocouple , 4×16-bit precision ,K, isolation ,intelligent PID	CTS7 231-7TD32
EM231 Analog Input Thermocouple , 8×16-bit precision ,K, isolation ,intelligent PID	CTS7 231-7TF32
EM231 Combination Temperature Input Module,2 NTC/PT100, 2inputs of voltage/current,isolated	CTS7 231-7ND32
EM231 Temperature Input Module,8inputs of NTC, isolated	CTS7 231-7NF32
EM277 PROFIBUS-DP Expansion Module, slave station	CTS7 277-0AA32-0XA0
EM177 PROFIBUS-DP Expansion Module, slave station,Integrating 14DI/10DO onboard	CTS7 177-0AA32-0XA0

Order Data for TrustPLC series PLC

Order Data	Order Number
CTS7-300 PLC	
EM321 Digital Input Module, 16DI × 24VDC, optical isolation, 20PIN front connector	CTS7 321-1BH01
EM321 Digital Input Module, 32DI×24VDC, optical isolation, 40PIN front connector	CTS7 321-1BL00
EM322 Digital Output Module, 16×24VDC, 0.5A, optical isolation, 20PIN front connector	CTS7 322-1BH01
EM322 Digital Output Module, 16×Relay, 2A, optical isolation, 20PIN front connector	CTS7 322-1HH00
EM322 Digital Output Module, 16×24VDC, 0.5A, optical isolation, 40PIN front connector	CTS7 322-1BL00
EM323 Digital I/O Module, 16DI/16DO×24VDC, 0.5A, optical isolation, 40PIN front connector	CTS7 323-1BL00
EM331, 2 analog inputs of voltage,current, resistance, RTD or TC, 9/12/14bits(plussign), isolation, alarm and diagnostic function, 20PIN front connector	CTS7 331-7KB02
EM331, 2 analog inputs of voltage,current, resistance, RTD or TC, 9/12/14bits(plussign), isolation, alarm and diagnostic function, 20PIN front connector	CTS7 331-7KF02
EM332, 2 analog outputs of voltage or current, 11bits plus sign or 12 bits, isolation, 20PIN front connector	CTS7 332-5HB01
EM332, 2 analog outputs of voltage or current, 11bits plus sign or 12 bits, isolation, 20PIN front connector	CTS7 332-5HD01

