

Digitized Automation for a Changing World

High-Precision Modular Temperature Controller DTDM Series



High-Precision Modular Temperature Controller DTDM Series

Flexibility with Precise Control to Achieve Advanced Stability

Delta High-Precision Modular Temperature Controller DTDM Series is designed to meet the rigid requirements of precise and stable temperature control in the semiconductor industry. Consisting of a host and modules, the DTDM series delivers powerful performance with considerable flexibility based on the combination of the modules, which includes measurement expansion, digital input/output, and EtherCAT communication.

The DTDM series features advanced control functions, including **PID Cascade Control, Multi-Loop Control, Feed-Forward Control, and Linearization Table**. It achieves $\pm 0.1\%$ measurement accuracy and a 10ms sampling period for high precision temperature control.

The DTDM Series supports the RS-485 interface and Modbus ASCII/RTU protocol for data transmission. With its DTDM-ECAT module, it also supports the EtherCAT protocol to achieve high-speed data communication.

The DTDM Series is suitable for semiconductor wafer processing equipment such as chemical vapor deposition (CVD), physical vapor deposition (PVD), oxidation & diffusion furnaces, silicon etching machines, and atomic layer deposition (ALD).

High Precision & Sampling Rate



- $\pm 0.1\%$ Measurement Accuracy
- 10ms Fast Sampling Period

Modularized Expansion



- Various Expansion Modules
- Flexible Output Configuration

Fast Communication



- EtherCAT Compliance
- Central Data Collection

Advanced Control Algorithms



- Cascade Control – dual control loop to increase control precision
- Feed-Forward Control – temperature compensation for disturbances
- Linearization Table – nonlinear correction and temperature compensation



Table of Contents

Highlight Features 3

Modular Design
PID Cascade Control
Multi-Loop Control
Linearization Table
Feed-Forward Control
Status Database & Logic Operation
Multi-Channel PV Comparison & Alarm
Input Switch-Over & Redundancy
EtherCAT Communication

Specifications 9

4-Channel Measurement Unit
I/O Expansion Modules
EtherCAT Communication Module

Dimensions 13

Product Appearance 14

Application Stories 15

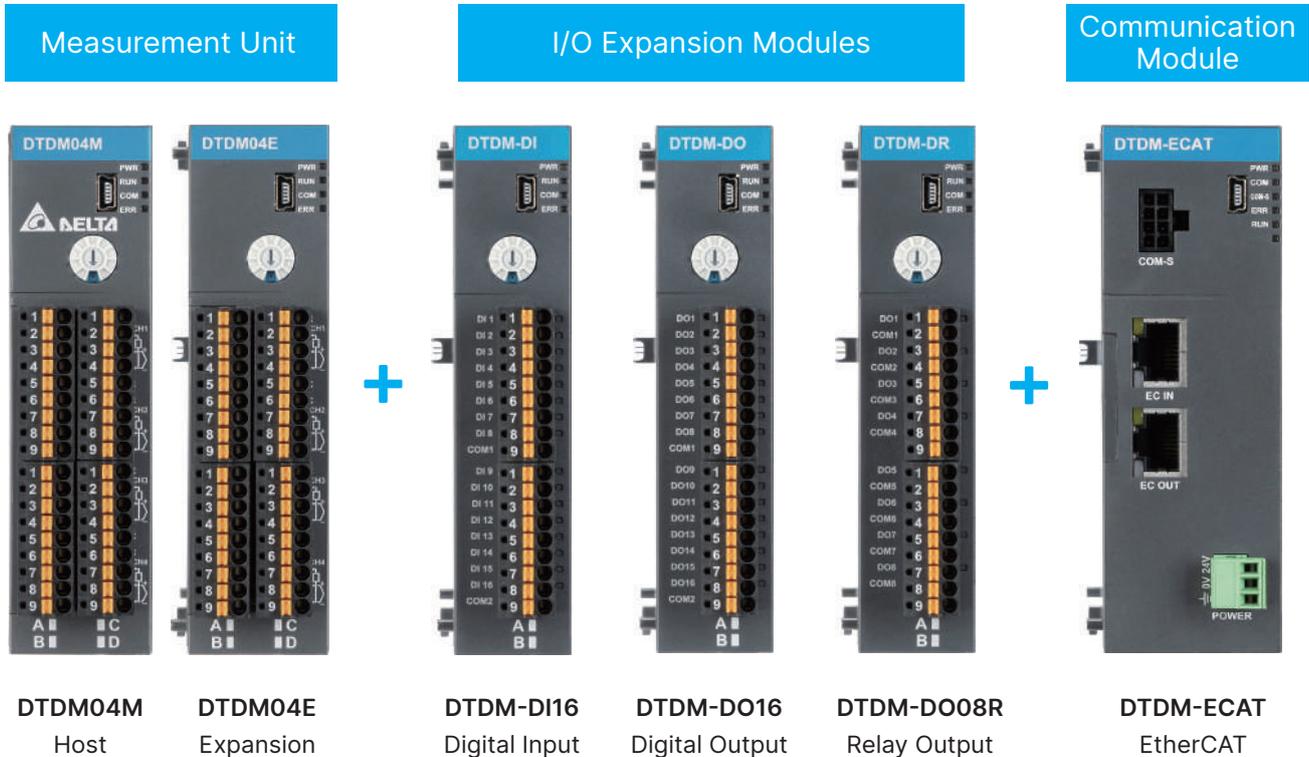
Chemical Vapor Deposition
Dry Etching Processes

Ordering Information 17

Delta Temperature Controller Series 18

Feature Highlights

Modular Design, Flexible Expansion

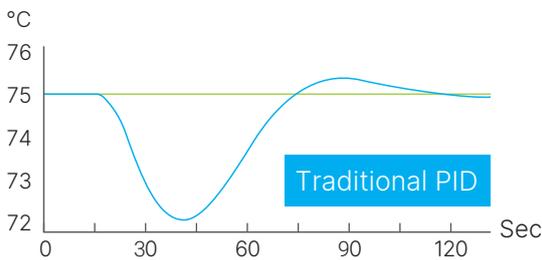
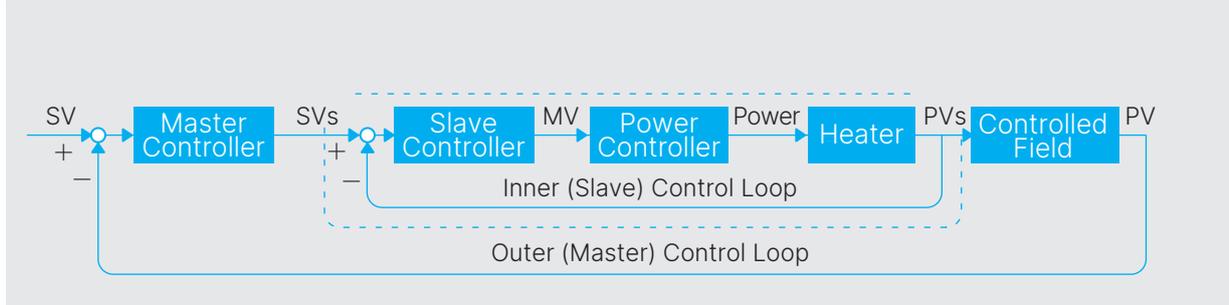


- ▶ Flexible configuration of input channels and control loops:
 - Up to 32 PID control loops and 128 input/output channels
 - Measurement Host*1 + Measurement Expansion Module*7 + I/O Expansion Module*8 + Communication Module*1
- ▶ I/O expansion modules can be used for alarm and control outputs
- ▶ Thin-type design saves installation space

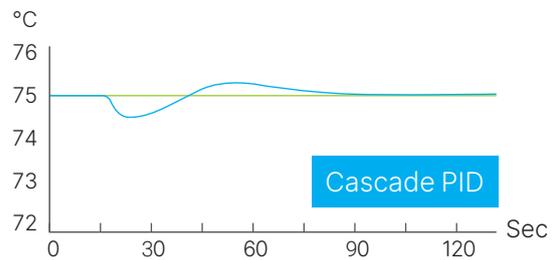


PID Cascade Control | Dual loop PID control shortens response time and increases temperature control precision

By linking the external and internal PID control loops, the response time is shortened. The internal loop's fast response and low latency characteristics quickly eliminate the temperature differences caused by hysteresis or disturbances between the current temperature and the set temperature, thereby achieving stable temperature control.



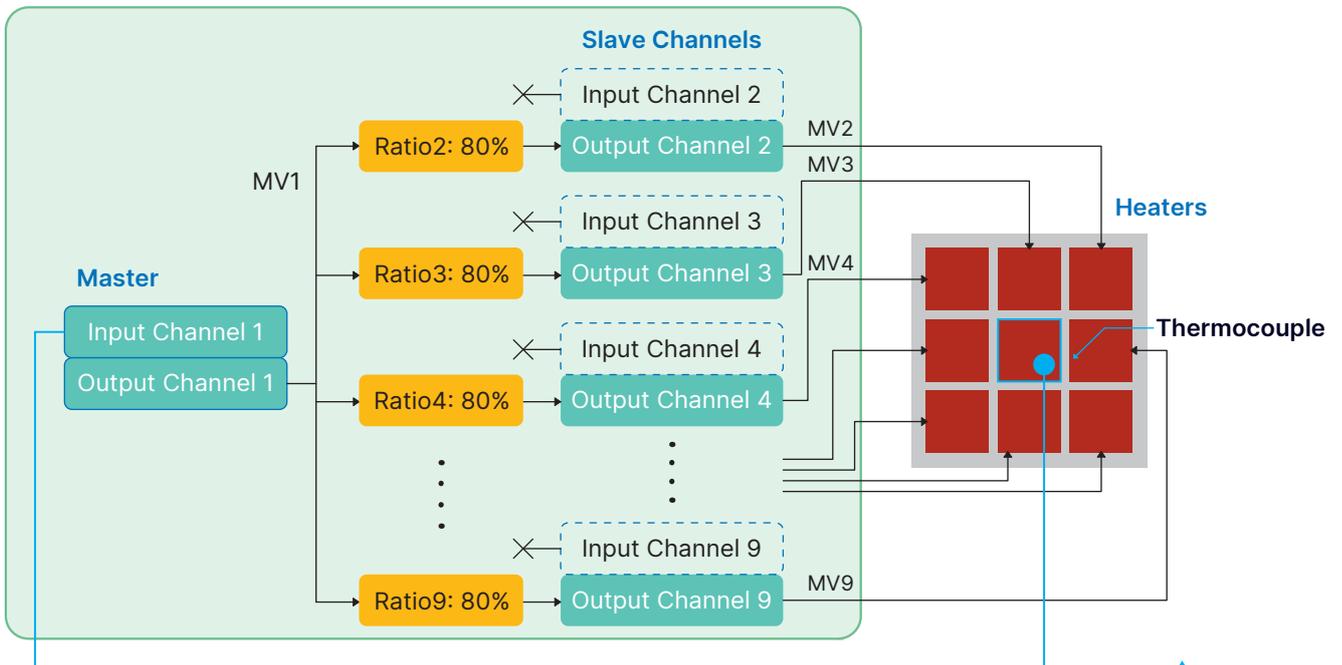
Temperature hysteresis may cause overheating or insufficient heat supply, making temperature control difficult.



Simultaneously control the environment and heater temperatures through different loops for accurate control.

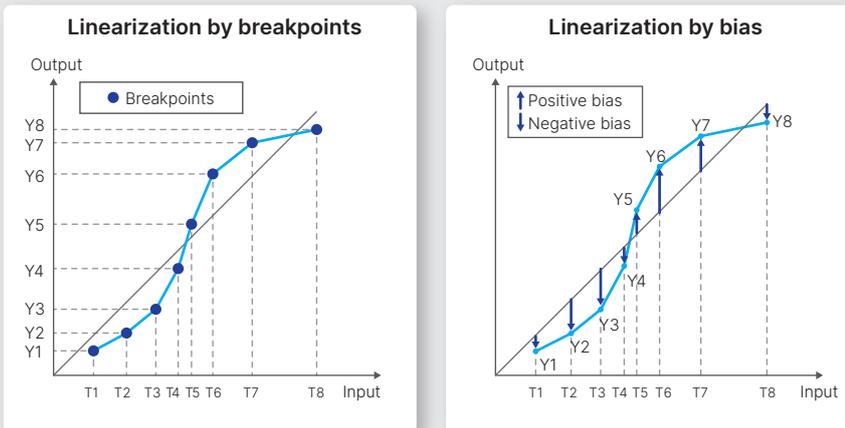
Multi-Loop Control | Uses a single input value to control multiple channels with customized proportional output settings

Suitable for multi-point temperature control applications, such as ceramic heating plates. Users only need to obtain temperature information from a single sensor to control multiple heating outputs in a customized proportion. This reduces the number of sensors needed, as well as costs and time of installation.



Linearization Table | Eliminate temperature reading error due to sensor nonlinearity

Fine compensation and calibration are performed for nonlinear temperature errors. The input lookup table provides 14 temperature calibration points and two calibration methods: breakpoints and bias compensation, to eliminate nonlinear errors of the temperature sensor or temperature difference caused by the measuring point locations.



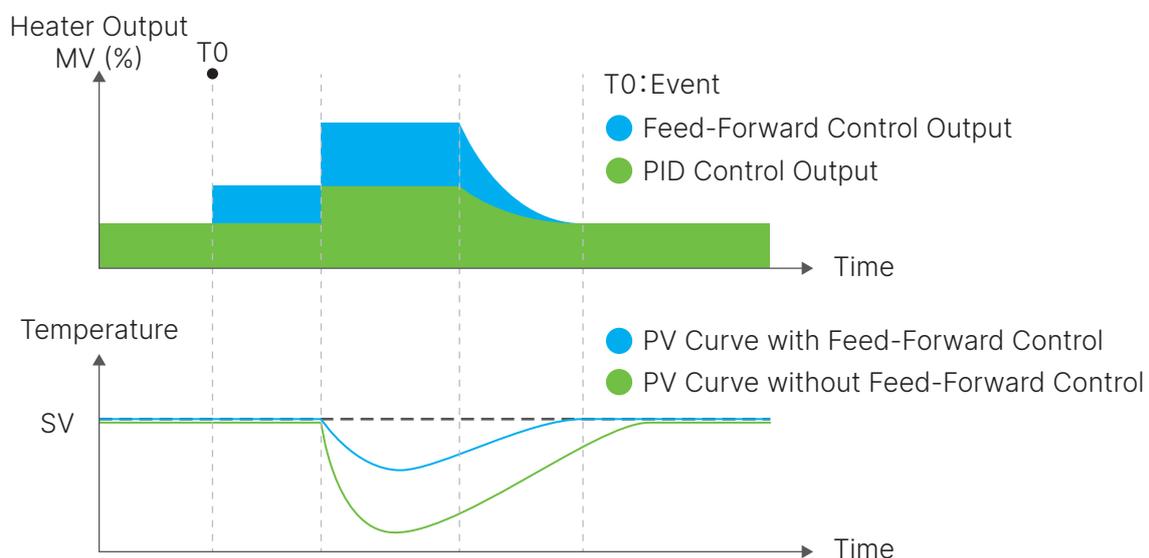
*Illustrations of two calibration methods

Temperature differences could be caused by:

- ▶ Sensor nonlinearity
- ▶ Errors due to distance between measuring points and heating points

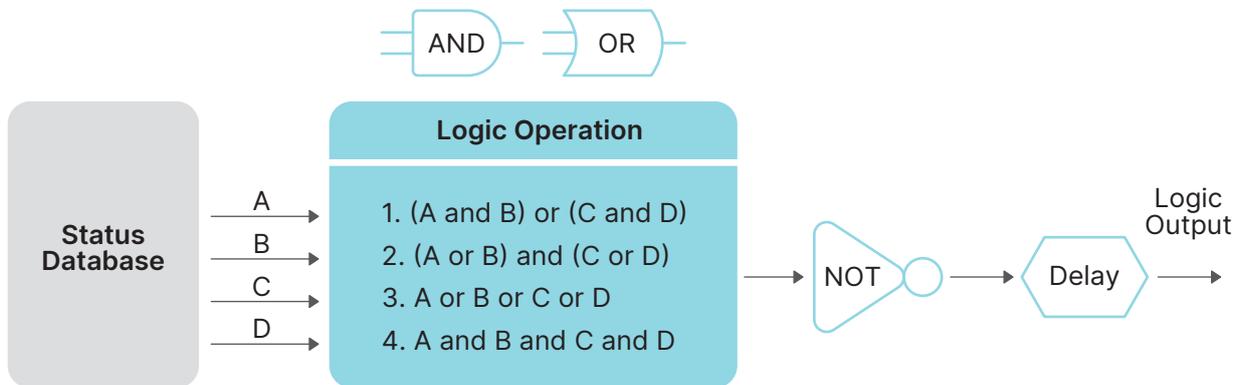
Feed-Forward Control | Temperature compensation for known and anticipated disturbances

For temperature disturbances caused by known process behaviors, feed-forward control can provide a compensation manipulate value to the system. As soon as the process behavior is detected, temperature compensation is applied in advance to maintain temperature stability.



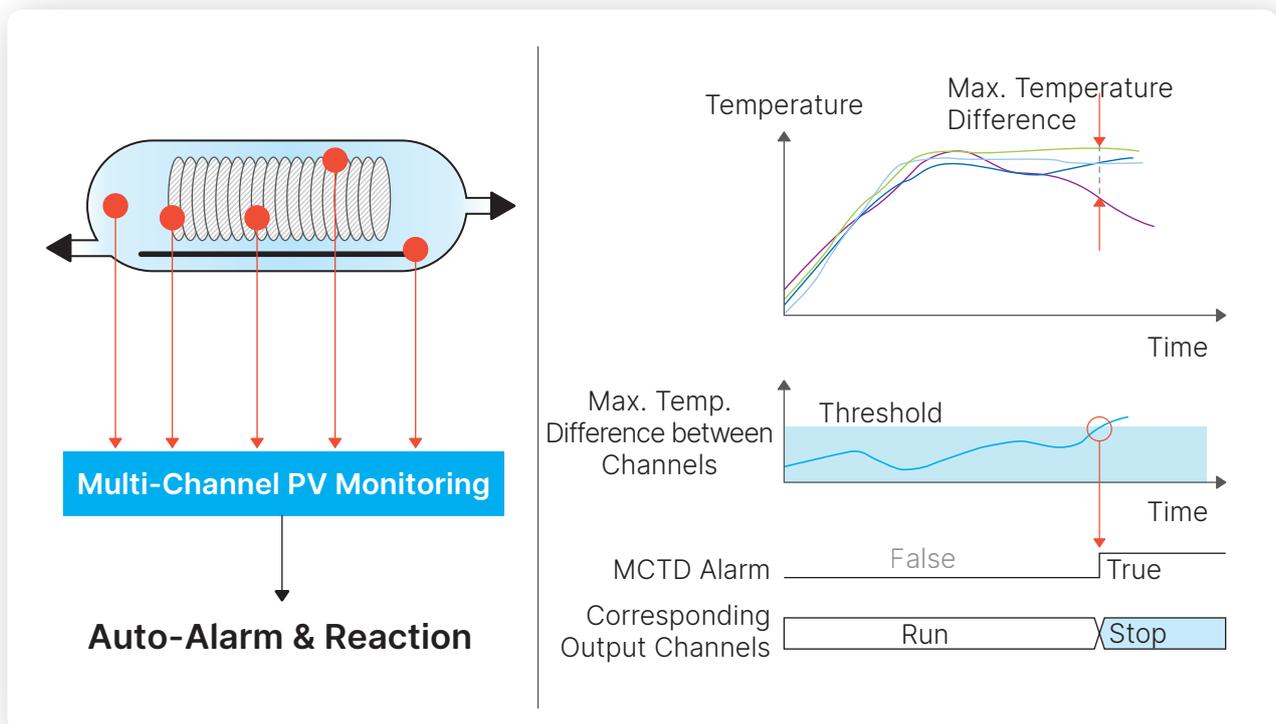
Status Database and Logic Operation | Fast response time and reducing computing load for host computer

The Status Database provides various signals and the status of temperature controllers such as PV, SV, MV, DO. Users can select 4 types of signals or status and perform the Logic Operation in the temperature controller. This feature reduces response time and the computing load of the host computer.



Multi-Channel PV Comparison & Alarm | Avoid significant temperature differences for a stable temperature

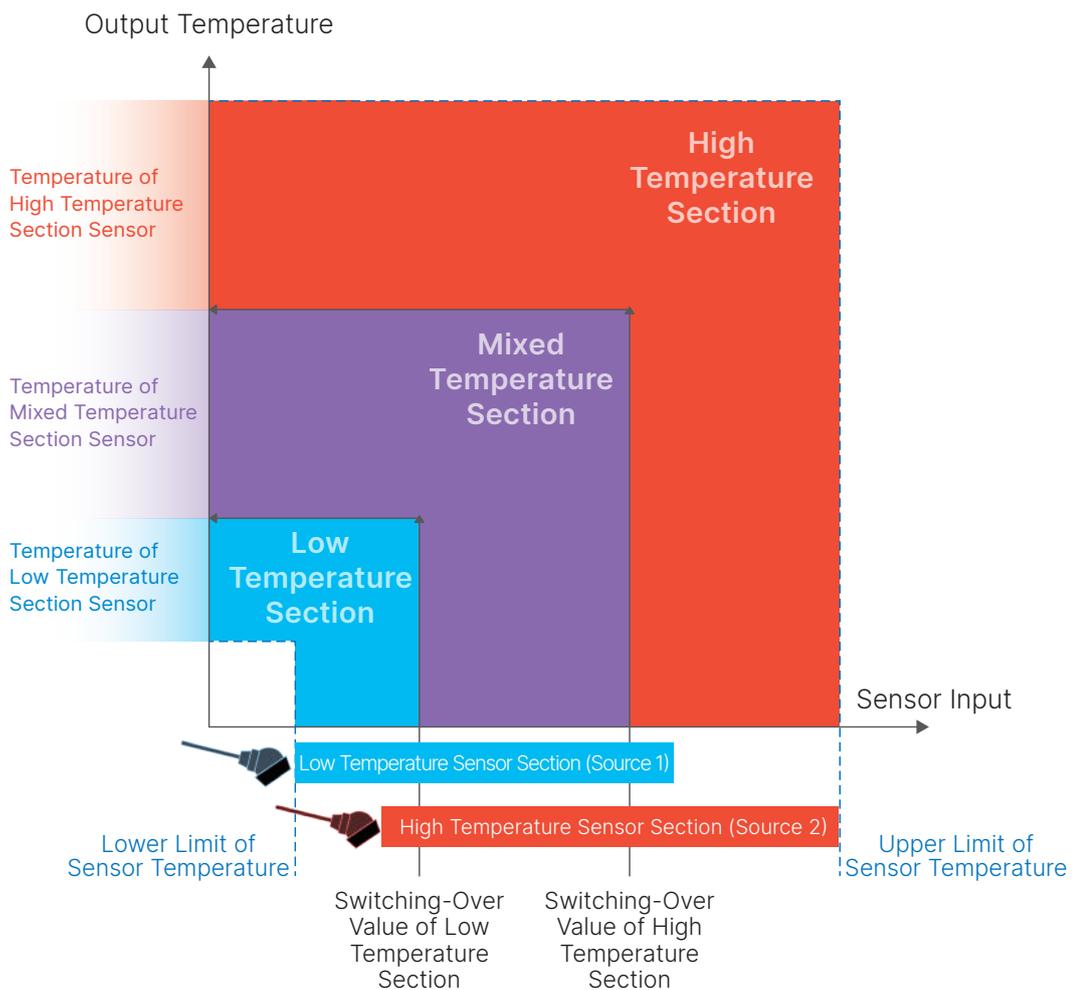
In temperature control applications with strict uniformity requirements, the DTDM series carries out simultaneous multi-channel monitoring of the process variables (PV). If the difference between PVs exceeds the threshold, an alarm is triggered and the system executes the pre-defined actions.



Input Switch-Over and Redundancy | Creating a more accurate and reliable temperature control system

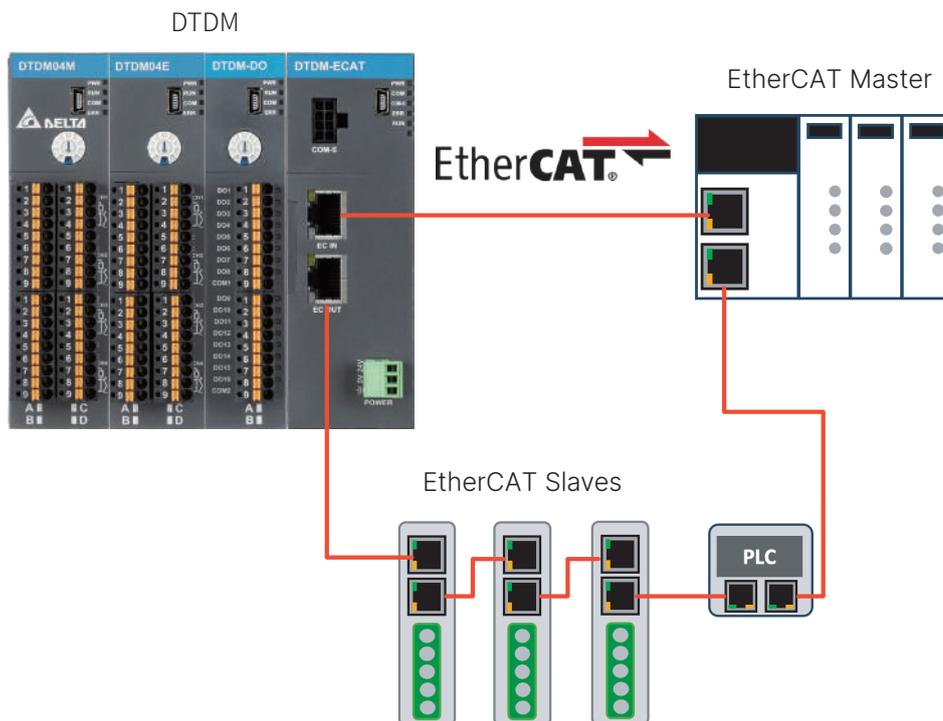
For applications with a wide temperature control range, two temperature sensors can be used, each with its own temperature range setting. The system automatically switches to the most appropriate sensor based on the measured temperature for achieving more accurate temperature measurements.

Additionally, if one of the sensors fails or is disconnected, the system will automatically switch to the other one to prevent downtime.



EtherCAT Communication | Fast communication and easy integration

The module DTDM-ECAT supports EtherCAT communication, offering easy integration and flexible configurations. Featuring dual ports, it allows fast command transmission, efficient data exchange, and parameter reading/writing with the host computer and EtherCAT devices. The information gathered can also be uploaded to the host computer for further analysis. In addition, the DTDM Series' standardized EtherCAT design also accelerates the time to market.



Specifications

DTDM04M / DTDM04E 4-Channel Measurement Unit

The DTDM series delivers $\pm 0.1\%$ high-precision temperature measurement and a 10 ms temperature sampling period. Leveraging a variety of control algorithms, it enables precise temperature management. The series supports the EtherCAT communication protocol to rapidly transmit the status and data of the control group to the host computer.



DTDM04M
Measurement
Host

DTDM04E
Measurement
Expansion Module

Features

- ▶ **$\pm 0.1\%$ high-precision temperature measurement, 10ms sampling period**
- ▶ A single DTDM group can connect up to 8 measurement units, enabling 32 PID loops
- ▶ Combined with I/O modules, a DTDM group can support up to 128 input and output channels
- ▶ **PID Cascade Control:** Dual-loop control shortens response time. With auto-tuning and one-click calibration, it allows for quick and efficient adjustments
- ▶ **Feed-Forward Control:** Compensates for known heat loss in advance to reduce temperature disturbances and fluctuations
- ▶ **Linearization Table:** Input/output temperature compensation and fine temperature calibration
- ▶ **Multi-Loop Control:** Uses a single input value to control multiple channels with customized proportional output settings
- ▶ **Dual Input Switching and Redundancy:** Supports dual sensor input switching to achieve the optimal temperature measurement. When one of the temperature sensors fails or is disconnected, the redundancy design allows switching to another sensor to ensure continuous system operation
- ▶ **Multi-channel PV Comparison & Alarm:** When the temperature differences between multiple control points exceed the set value, an alarm is triggered and the corresponding action is automatically executed
- ▶ **Status Database and Logic Operations:** Multiple state combination operations can be performed in temperature controller for output settings or to increase response speed, while also reducing the host computer's workload
- ▶ **Event Function:** Users can configure automatic event triggers and actions (max. 16 sets) based on different scenarios
- ▶ **PID Groups:** Provides 4 PID group settings, allowing the system to automatically select or the user to choose the PID group configuration that best matches the current temperature control requirements
- ▶ **Slope Control:** Controls the rate of change (slope) to the pre-set target temperature
- ▶ **Cold Junction Compensation** ensures accurate temperature measurement
- ▶ The measurement host is equipped with an RS-485 communication interface and supports Modbus ASCII/RTU communication protocols
- ▶ The DTDM-ECAT module supports **EtherCAT** communication
- ▶ Supports remote firmware update

Specifications of the DTDM04 Measurement Unit

Models	DTDM04ML / DTDM04MC: Measurement Host DTDM04EL / DTDM04EC: Measurement Expansion Module
Input Power	DC24V \pm 10% with isolated switching power
Power Consumption (Max.)	Analog current measurement host (expansion module)= 5.5W Analog voltage measurement host (expansion module)= 4.5W
Input Sensor Support	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK, C, D
	RTD: Pt100, JPt100, Ni120, Cu50
	Voltage input: 0~5V; 0~10V Millivolt input: 0~50mV Current input: 0~20mA; 4~20mA
Sampling Period	10ms, 50ms
Control Modes	PID, ON/OFF, PID Cascade, Programmable, Feed-Forward Control
Digital Input	Built-in 12V SINK input for N type contacts
Digital Output	<ul style="list-style-type: none"> ▪ Pulse output: Built-in 12V OD-P (open-drain P-type) output ▪ OD-N (open-drain N-type) output: Effective operating voltage of DC 24V -15% to +20%, rated maximum current \leq100mA, residual voltage when conducting \leq1.2V, equipped with overcurrent protection
Analog Output	DTDM04ML / DTDM04EL <ul style="list-style-type: none"> ▪ Analog voltage output: 0~10V, minimum load resistance 2kΩ, equipped with short circuit protection (The input data range is set by default from 0 to 1000, and can be configured within the range of -32000 to 32000. The output value is default at 0V, and the output range can be set from 0 to 10000mV)
	DTDM04MC / DTDM04EC <ul style="list-style-type: none"> ▪ Analog current output: 4~20mA, maximum load resistance 500Ω, equipped with open circuit protection (The input data range is set by default from 0 to 1000, and can be configured within the range of -32000 to 32000. The output value is default at 4mA, and the output range can be set from 4000 to 20000μA.)
Alarm Function	8 alarm modes
Communication Function	RS-485 interface with 4,800bps ~ 115,200bps transmission speed
Communication Protocol	Modbus RTU and Modbus ASCII
Internal Connection	Transmits 24V power and communication signals
Vibration Resistance	10 ~ 55Hz, 10m/s ² , 3-axial directions, 10min
Shock Resistance	Max 300m/s ² , 3 times each in 6 directions along 3 axes
Operating Temperature	0° C ~ +55° C
Storage Temperature	-20° C ~ +65° C
Operating Humidity	35% ~ 85% RH (no dew)
Operating Altitude	Lower than 2000 m
Pollution Level	2
IP Rating	IP20

DTDM-DI16 / DTDM-DO16P / DTDM-DO16N / DTDM-DO08R I/O Expansion Modules

The DTDM I/O expansion modules support various types of input and output, including digital output, digital input, and relay output. These can be preceded by PID control loops and set as control or alarm outputs for the respective control loops.



DTDM-DI16
Digital Input
Module

DTDM-DO16P/N
Digital Output
Module

DTDM-DO08R
Relay Output
Module

Specifications

Models	DTDM-DI: digital input module; DTDM-DO: digital out module
Input Power	DC24V \pm 10% with isolated power switch
Power Consumption (Max.)	DTDM-DI16 / DTDM-DO16P / DTDM-DO16N: 2W DTDM-DO08R: 2.5W
Input Protection	Equipped with polarity protection and soft start circuit
Digital Input	DTDM-DI16 SINK or SOURCE type inputs can be paired with N-type or P-type contacts based on wiring method differences, with an effective operating voltage of DC 24V -15% to +20%
Digital Output	DTDM-DO16P <ul style="list-style-type: none"> OC-P (Open-collector P-type), effective operating voltage DC 24V -15% to +20%, rated maximum current \leq 100mA The residual voltage is \leq 2V when conducting, providing overcurrent protection DTDM-DO16N <ul style="list-style-type: none"> OC-P (Open-collector N-type), effective operating voltage DC 24V -15% to +20%, rated maximum current \leq 100mA The residual voltage is \leq 2V when conducting, providing overcurrent protection DTDM-DO08R <ul style="list-style-type: none"> Form A (normal open) relay, maximum load of AC250V 2A resistive load
Isolation	DTDM-DO16P / DTDM-DO16N / DTDM-DI16 / DTDM-DO08R <ul style="list-style-type: none"> OC-P output, OC-N output, RELAY contact, digital input, and internal control circuit are isolated by an optical coupler or equivalent isolation component; insulation level: 500VDC The RELAY contact and internal control circuit are isolated by an optical coupler or equivalent isolation component; insulation level: 3000VAC
Internal Connection	Transmits 24V power and communication signals
Vibration Resistance	10 ~ 55Hz, 10m/s ² , 3-axial directions, 10min
Shock Resistance	Max 300m/s ² , 3 times each in 6 directions along 3 axes
Operating Temperature	0° C ~ +55° C
Storage Temperature	-20° C ~ +65° C
Operating Humidity	35% to 85% RH (no dew)
Operating Altitude	Lower than 2000 m
Pollution Level	2

DTDM-ECAT EtherCAT Communication Module

The DTDM-ECAT module enables EtherCAT communication for high-speed data transmission and exchange. It also allows the host computer (computer/PLC controller) to read and write all parameters of the DTDM devices.

Each DTDM-ECAT module is equipped with two EtherCAT ports. By daisy-chaining through the EtherCAT ports on the DTDM-ECAT, the connection configuration can be flexible and simplified.

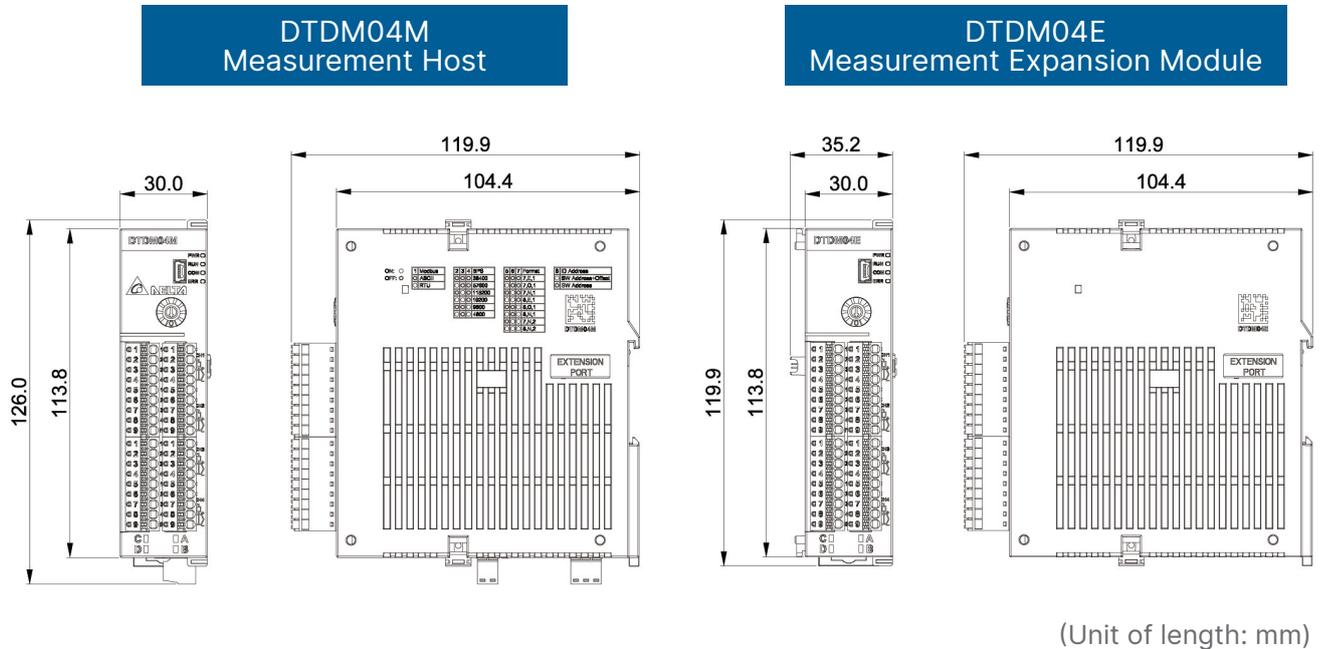


Specifications

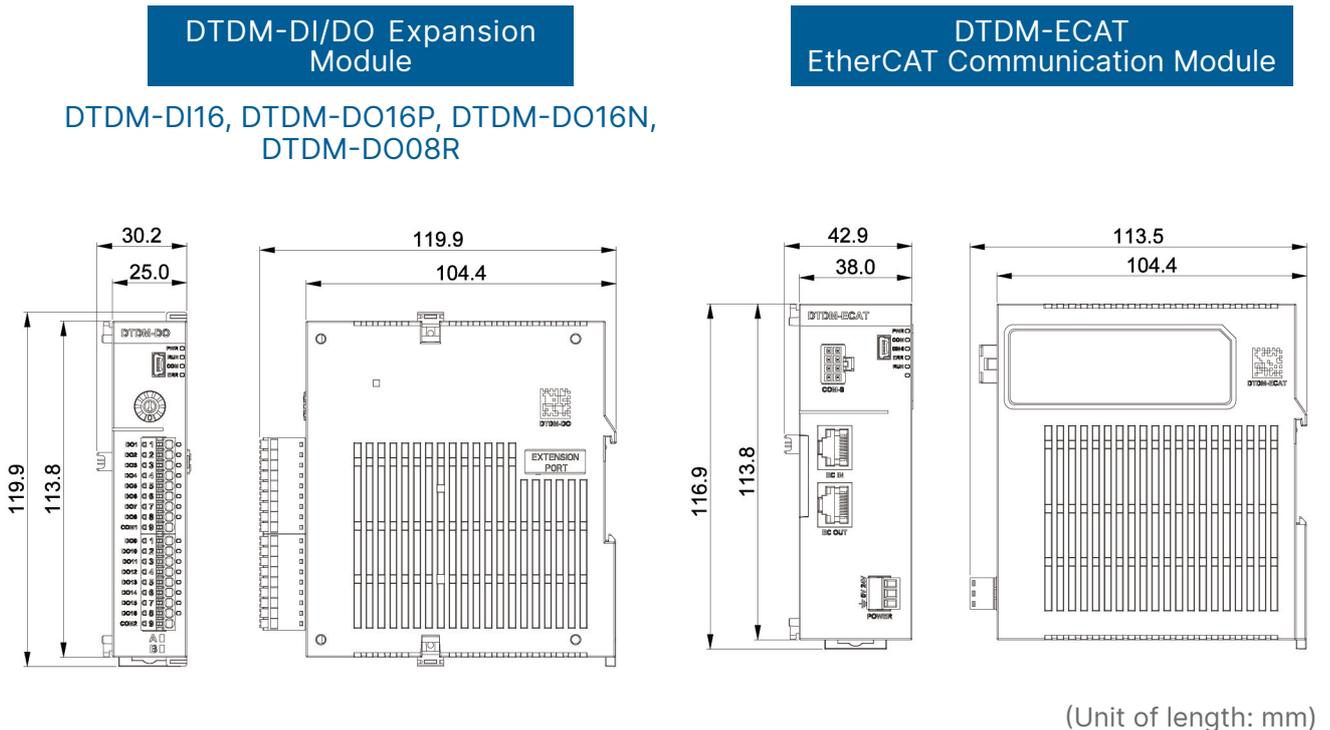
Model	DTDM-ECAT
Communication Protocol	EtherCAT
Communication Speed	10/100 Mbps Auto-Detection
Communication Types	IEEE 802.3, IEEE 802.3u
Cables	Category 5e cable, up to 100m; the distance between two adjacent nodes does not exceed 30M (Max)
Communication Interface	RJ-45 with Auto MDI/MDIX
Number of EtherCAT Ports	2
Synchronized Mode	Free operation mode (asynchronous)
Communication Target	Process Data Object (PDO), Service Data Object (SDO)
Network Topology	Point-to-point, Ring, Linear, Star
Input Power	DC24V \pm 10% with isolated power switch
Power Consumption (Max.)	3W
Installation	DIN Rail, The DTDM-ECAT must be installed on the far-right side of the DTDM connection group
Weight	200g
Internal Connection	Transmits communication signals
Vibration Resistance	10 ~ 55Hz, 10m/s ² , 3-axial directions, 10min
Shock Resistance	Max 300m/s ² , 3 times each in 6 directions along 3 axes
Operating Temperature	0° C ~ +55° C
Storage Temperature	-20° C ~ +65° C
Operating Humidity	35% to 85% RH (no dew)
Operating Altitude	Lower than 2000 m
Pollution Level	2

Dimensions

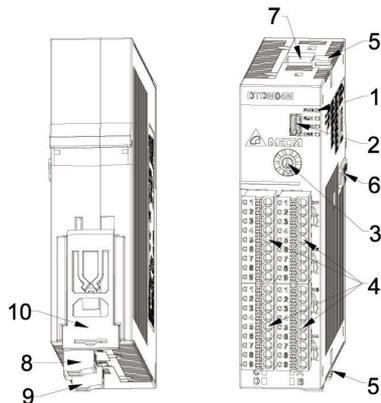
Measurement Units



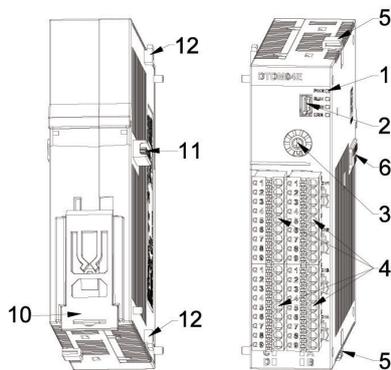
Expansion Modules



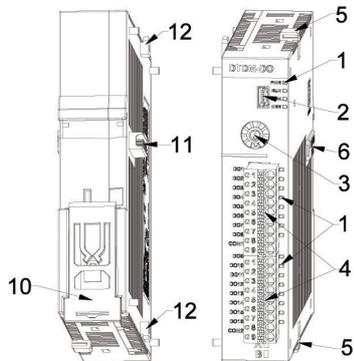
Product Appearance



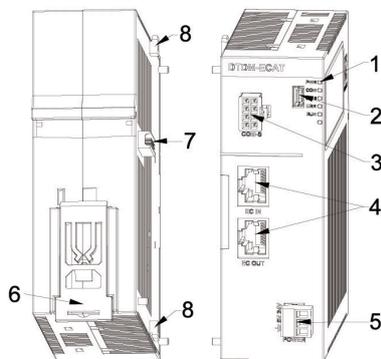
DTDM04M Measurement Host			
No.	Name	No.	Name
(1)	Status Indicator	(7)	Communication Protocol Switch
(2)	Mini USB Port*	(8)	Power Input Terminal
(3)	Station ID Knob	(9)	RS-485 Terminal
(4)	Input / Output Terminal	(10)	DIN RAIL Fastener
(5)	Expansion Fastener	/	/
(6)	Expansion Adapter / Protection Cover	/	/



DTDM04E Measurement Expansion Module			
No.	Name	No.	Name
(1)	Status Indicator	(7)	/
(2)	Mini USB Port*	(8)	/
(3)	Station ID Knob	(9)	/
(4)	Input / Output Terminal	(10)	DIN RAIL Fastener
(5)	Expansion Fastener	(11)	Expansion Adapter
(6)	Expansion Adapter / Protection Cover	(12)	Expansion Fastening Structure



DTDM-DI/DO Expansion Module			
No.	Name	No.	Name
(1)	Status Indicator	(7)	/
(2)	Mini USB Port**	(8)	/
(3)	Station ID Knob	(9)	/
(4)	Output Terminal	(10)	DIN RAIL Fastener
(5)	Expansion Fastener	(11)	Expansion Adapter
(6)	Expansion Adapter / Protection Cover	(12)	Expansion Fastening Structure



DTDM-ECAT EtherCAT Module			
No.	Name	No.	Name
(1)	Status Indicator	(5)	24V Power Input Terminal
(2)	Mini USB Port**	(6)	DIN RAIL Fastener
(3)	RS-485 Remote SSR Port	(7)	Expansion Adapter
(4)	EtherCAT Port	(8)	Expansion Fastening Structure

* The Mini USB is provided not only for use by Delta technical personnel for product maintenance but also to allow customers to quickly adjust the settings. However, please note the following when using it:

- It must be connected after the product is powered on; otherwise, it will enter engineering mode.
- Avoid performing large-scale data writing.
- Please be sure to remove the USB cable when not in use.

**The Mini USB port is a product maintenance interface and is only for use by Delta technical personnel.

Success Story

Optimizing the Semiconductor Chemical Vapor Deposition Process

Chemical Vapor Deposition (CVD) is an essential process in semiconductor fabrication. In a high-temperature CVD reactor tube furnace, gaseous precursor chemicals undergo chemical reactions on the wafer surface to form high-purity, high-performance solid films. The process requires precise control of temperature, humidity, gas concentration, and pressure in the furnace to ensure high-quality results.

As wafer sizes continue to increase, the size of the CVD reaction furnace also grows. Combined with multiple materials, gases, and flow rates inside the furnace, the nonlinear temperature characteristics and heating delay phenomena in the system become more pronounced, making precise temperature measurement and control even more challenging.

The DTDM temperature controller supports **PID cascade control**, using multiple temperature sensors to monitor the temperature inside the furnace and the heater. By utilizing both the outer and inner loops, it rapidly calculates the target temperature (SV) and the current temperature (PV), and immediately outputs control commands. With the fast response and low latency features of the inner loop, it quickly eliminates interference within the system, achieving stable temperature control.

Due to the large size of the CVD reactor furnace, the placement of temperature sensors is typically at a distance from the actual point of chemical reactions, which causes temperature differences. With DTDM's **linearization table** feature, users can define the calibration values for temperature points that need compensation. Additionally, the **±0.1% measurement accuracy** provided by DTDM enables finer temperature monitoring to prevent temperature fluctuations in the furnace and ensures precise temperature control.

With the **event function**, the DTDM temperature controller automatically triggers response actions to eliminate interference once over-temperature or abnormal temperature disturbances are detected, providing assurance for precise temperature control.



Success Story

Advancing Semiconductor Dry Etching Processes

Typical etching processes include "wet" etching or "dry" etching methods. Wet etching uses a chemical solution to remove the thin film material from the wafer surface to achieve the desired etching effect. Dry etching, on the other hand, usually employs plasma technology or reactive ion tech (Reactive-Ion Etching, RIE) to form patterns. It uses gas molecules or ions and free radicals generated by the plasma to physically sputter and chemically react with the wafer material, thereby removing the etched portions.

In the dry etching process, the wafer is heated to a specific temperature using an electrostatic chuck (E-Chuck, ESC) heater, while introducing different gases in stages, where the plasma interacts with the wafer's thin film to carry out the etching reaction. However, the complexity of the process recipe and gas introduction can disrupt the stability of wafer temperature control. The DTDM temperature controller supports **SV target temperature switching and PID group functions**. It can trigger the switching of the SV target temperature based on events when different process recipes are introduced. By pre-setting up to four corresponding PID parameter groups, the electrostatic chuck can provide more precise heating for the wafer in each heating zone, ensuring the quality of wafer etching.

The shape and linewidth of dry etching are governed by the sidewall deposition of etching byproducts, and the adhesion of these byproducts is strongly influenced by temperature. As gases are introduced and plasma etching progresses, the wafer temperature is simultaneously cooled by the gases and heated by the plasma. To maintain temperature stability, the DTDM temperature controller mobilizes **feed-forward control** to perform temperature compensation ahead of time to reduce the temperature disturbances caused by the introduction of gases and plasma.

During the heating process, due to the wafer's thickness and the delay in temperature rise, the heater usually continues to output heat toward the target temperature (SV). This can lead to excessive heating of the wafer, potentially affecting the quality of the components. The DTDM temperature's **PID cascade control** feature leverages outer and inner loops to rapidly calculate the setpoint temperature (SV) and the current temperature (PV), and then outputs control commands in real-time to quickly eliminate disturbances within the system, achieving stable temperature control.

DTDM Series Ordering Information

Measurement Units

DTDM	04	<input type="checkbox"/>	<input type="checkbox"/>	
Product Series	No. of Channel	Category	Output Type	Model Number & Description
M= Host			C=Analog Current Output (Source type)	DTDM04MC 4-Channel Input Measurement Host, paired with analog current (source type) control output.
			L=Analog Voltage Output	DTDM04ML 4-Channel Input Measurement Host, paired with analog voltage control output.
E= Expansion Module			C=Analog Current Output (Source type)	DTDM04EC 4-Channel Input Measurement Expansion Module, paired with analog current (source type) control output.
			L=Analog Voltage Output	DTDM04EL 4-Channel Input Measurement Expansion Module, paired with analog voltage control output.

Expansion Modules

DTDM-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Product Series	Category	Number of Channel	Output Type	Model Number & Description
	DI=Input	16	/	DTDM-DI16 16-Channel Digital Input Expansion Module
DO=Output		08	R= Relay	DTDM-DO08R 8-Channel Relay Output Expansion Module
			16	P= OC P-Type
		N= OC N-Type		DTDM-DO16N 16-Channel OC N-Type (N-Type Open Collector) Output Expansion Module
ECAT= EtherCAT		/	/	DTDM-ECAT EtherCAT Communication Module

Delta Temperature Controller Series

Modular Type

Multi-loop Modular Temperature Controller - DTM Series

- A single group supports up to 64 PID control loops
- Input types: Analog voltage/current, thermocouple, platinum resistance
- Supports RS-485 and Ethernet communication, and multi-point temperature control
- Data collection by the Host function increases communication efficiency



Economical Multi-Loop Modular Temperature Controller - DTN Series

- Thin-type design saves installation space
- A single group supports up to 64 PID control loops
- Various expansion modules (Measurement, I/O, Ethernet, EtherCAT)
- RS-485 communication connects multiple modules



Multi-channel Modular Temperature Controller - DTE Series

- Various input modules: relay, voltage pulse, current, analog voltage
- PID, ON/OFF, Programmable PID control modes or manual control
- RS-485 and Modbus ASCII / RTU



Modular Temperature Controller - DTC Series

- Modular design saves installation space
- RS-485 and Modbus ASCII / RTU
- Supports Programmable PID control
- 3-level password protection, communication protocol synchronization and station number automatic setting



Meter Type

Advanced Intelligent Temperature Controller - DT3 Series

- Function modules for flexible expansion
- Multiple PID setting and control modes, and auto-tuning
- Heater disconnection detection
- Supports heating and cooling dual control outputs



Intelligent Temperature Controller - DTK Series

- Sampling period - 100 ms
- High resolution LCD display
- Dual alarm outputs, each provides 9 alarm modes



Advanced Temperature Controller - DTB Series

- PID, ON/OFF, Programmable PID control modes or manual control
- Supports heating and cooling dual control outputs
- RS-485 and Modbus ASCII / RTU



Valve Controller - DTV Series

- Dual alarm outputs with 17 alarm modes
- RS-485 interface and built-in Modbus for efficient data collection





Smarter. Greener. Together.

Industrial Automation Headquarters

Taiwan: Delta Electronics, Inc.

Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: +886-3-362-6301 / FAX: +886-3-371-6301

Asia

China: Delta Electronics (Shanghai) Co., Ltd.

No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: +86-21-6872-3988 / FAX: +86-21-6872-3996
Customer Service: 400-820-9595

Japan: Delta Electronics (Japan), Inc.

Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: +81-3-5733-1155 / FAX: +81-3-5733-1255

Korea: Delta Electronics (Korea), Inc.

1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: +82-2-515-5305 / FAX: +82-2-515-5302

Singapore: Delta Energy Systems (Singapore) Pte Ltd.

4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: +65-6747-5155 / FAX: +65-6744-9228

India: Delta Electronics (India) Pvt. Ltd.

Plot No.43, Sector 35, HSIDC Gurgaon,
PIN 122001, Haryana, India
TEL: +91-124-4874900 / FAX: +91-124-4874945

Thailand: Delta Electronics (Thailand) PCL.

909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: +66-2709-2800 / FAX: +66-2709-2827

Australia: Delta Electronics (Australia) Pty Ltd.

Unit 2, Building A, 18-24 Ricketts Road,
Mount Waverley, Victoria 3149 Australia
Mail: IA.au@deltaww.com
TEL: +61-1300-335-823 / +61-3-9543-3720

Americas

USA: Delta Electronics (Americas) Ltd.

5101 Davis Drive, Research Triangle Park, NC 27709, U.S.A.
TEL: +1-919-767-3813

Brazil: Delta Electronics Brazil Ltd.

Estrada Velha Rio-São Paulo, 5300 Eugênio de
Melo - São José dos Campos CEP: 12247-004 - SP - Brazil
TEL: +55-12-3932-2300 / FAX: +55-12-3932-237

Mexico: Delta Electronics International Mexico S.A. de C.V.

Gustavo Baz No. 309 Edificio E PB 103
Colonia La Loma, CP 54060
Tlalnepantla, Estado de México
TEL: +52-55-3603-9200

EMEA

EMEA Headquarters: Delta Electronics (Netherlands) B.V.

Sales: Sales.IA.EMEA@deltaww.com
Marketing: Marketing.IA.EMEA@deltaww.com
Technical Support: iatechnicalsupport@deltaww.com
Customer Support: Customer-Support@deltaww.com
Service: Service.IA.emea@deltaww.com
TEL: +31(0)40 800 3900

BENELUX: Delta Electronics (Netherlands) B.V.

Automotive Campus 260, 5708 JZ Helmond, The Netherlands
Mail: Sales.IA.Benelux@deltaww.com
TEL: +31(0)40 800 3900

DACH: Delta Electronics (Netherlands) B.V.

Coesterweg 45,D-59494 Soest,Germany
Mail: Sales.IA.DACH@deltaww.com
TEL: +49 2921 987 238

France: Delta Electronics (France) S.A.

ZI du bois Challand 2, 15 rue des Pyrénées,
Lisses, 91090 Evry Cedex, France
Mail: Sales.IA.FR@deltaww.com
TEL: +33(0)1 69 77 82 60

Iberia: Delta Electronics Solutions (Spain) S.L.U

Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
TEL: +34(0)91 223 74 20
Carrer Llacuna 166, 08018 Barcelona, Spain
Mail: Sales.IA.Iberia@deltaww.com

Italy: Delta Electronics (Italy) S.r.l.

Via Meda 2-22060 Novedrate(CO)
Piazza Grazioli 18 00186 Roma Italy
Mail: Sales.IA.Italy@deltaww.com
TEL: +39 039 8900365

Turkey: Delta Greentech Elektronik San. Ltd. Sti. (Turkey)

Şerifali Mah. Hendem Cad. Kule Sok. No:16-A
34775 Ümraniye – İstanbul
Mail: Sales.IA.Turkey@deltaww.com
TEL: + 90 216 499 9910

MEA: Eltek Dubai (Eltek MEA DMCC)

OFFICE 2504, 25th Floor, Saba Tower 1,
Jumeirah Lakes Towers, Dubai, UAE
Mail: Sales.IA.MEA@deltaww.com
TEL: +971(0)4 2690148