



By Precision, For Simplicity

TCM

Temperature Control Module Brochure



● www.nayolab.com



On Deck— Temperature Control Module

The NAYO Temperature Control Module (**TCM**) is engineered for laboratory automation. It combines compact design and excellent performance for easy integration into mainstream liquid handling workstations.

This makes the NAYO **TCM** ideal for applications with stringent requirements, including high-throughput experiments.

Product Overview

The NAYO **TCM** incorporates advanced heating and cooling technology to deliver a wide working range from 0°C to 120°C, ensuring precise and controllable temperatures for your experimental processes.

It supports SBS-size microplates (1–384 wells), 1.5/2 mL centrifuge tubes, reservoir plates, and other common consumables.

With a small footprint optimized for high-density deck layouts, the module maximizes workspace efficiency without compromising performance.

The compact design features internal **PCBA** integration, eliminating the need for additional control units, and ensures stable operation.

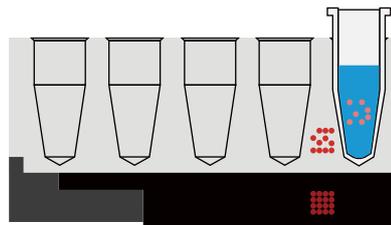


Compact Design,
Selectable Cable Routing Directions

Core Functions & Features

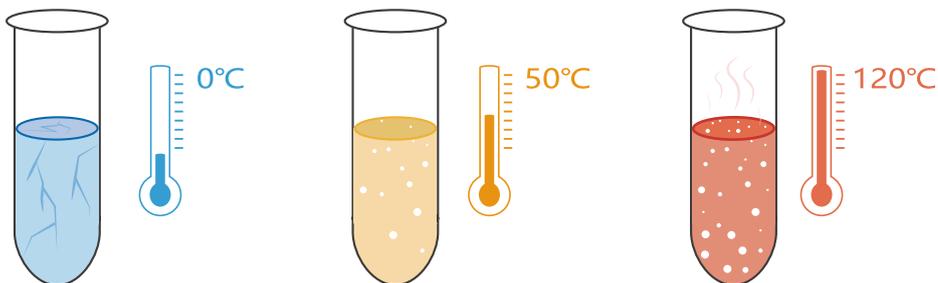
Accurate Temperature Control:

Professional temperature control calibration and compensation technology ensures precise temperature control, with an accuracy of $\leq \pm 0.2$ °C.



Rapid Temperature Change:

The module ensures rapid transitions between any setpoints within its 0°C to 120°C range.



Heating rate:

Within the temperature range of 4°C to 21°C, heating rate ≥ 20 K/min;

Within the temperature range of 21°C to 95°C, heating rate ≥ 8 K/min.

Cooling rate:

Within the temperature range of 95°C to 21°C, cooling rate ≥ 11 K/min;

Within the temperature range 21°C to 4°C, cooling rate ≥ 6 K/min.

High Temperature Uniformity:

Temperature	Temperature Uniformity
4°C	$\leq \pm 1^\circ\text{C}$
15°C	$\leq \pm 0.5^\circ\text{C}$
37°C	$\leq \pm 0.6^\circ\text{C}$
40°C	$\leq \pm 0.6^\circ\text{C}$
90°C	$\leq \pm 2^\circ\text{C}$

High Integration:

The compact design features internal **PCBA** integration, eliminating the need for additional control units.

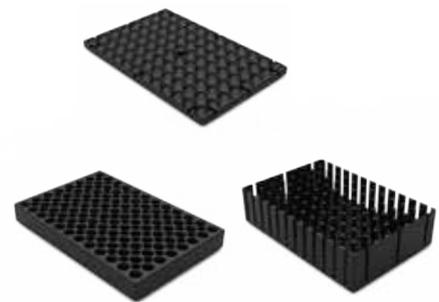
The module communicates via the standard RS422/485 protocol.



Strong Compatibility:

It supports a wide range of standard labware, including SBS-size microplates (1-384 wells) and 1.5/2 ml centrifuge tubes.

Custom adapters for specialized consumables (e.g., deep well plates, tube racks, microfluidic chips) are available to optimize thermal contact and performance.



Plug-and-Play Usability:

Designed for simplicity, it allows for direct control from a host computer, enabling easy setup and seamless integration into automated workflows.

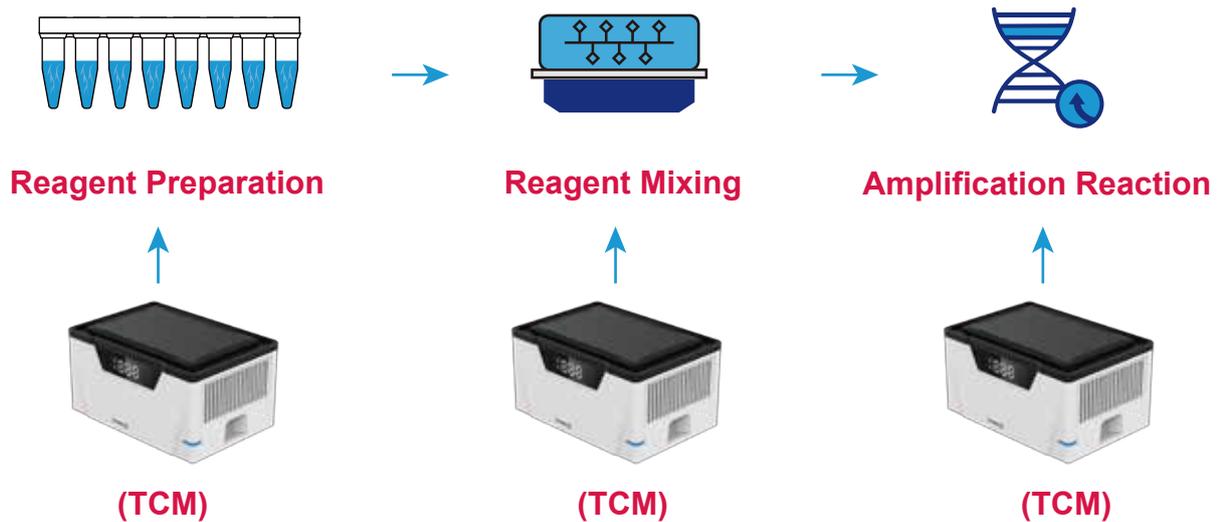


TCM Application:

PCR System Setup Experiment:

The module streamlines PCR workflow by maintaining a stable 4°C storage environment to prevent reagent degradation, while delivering rapid, precise thermal cycling during amplification. This reduces cycle time while improving amplification specificity and yield.

Workflow: Entire process (for low-temperature reagent storage)



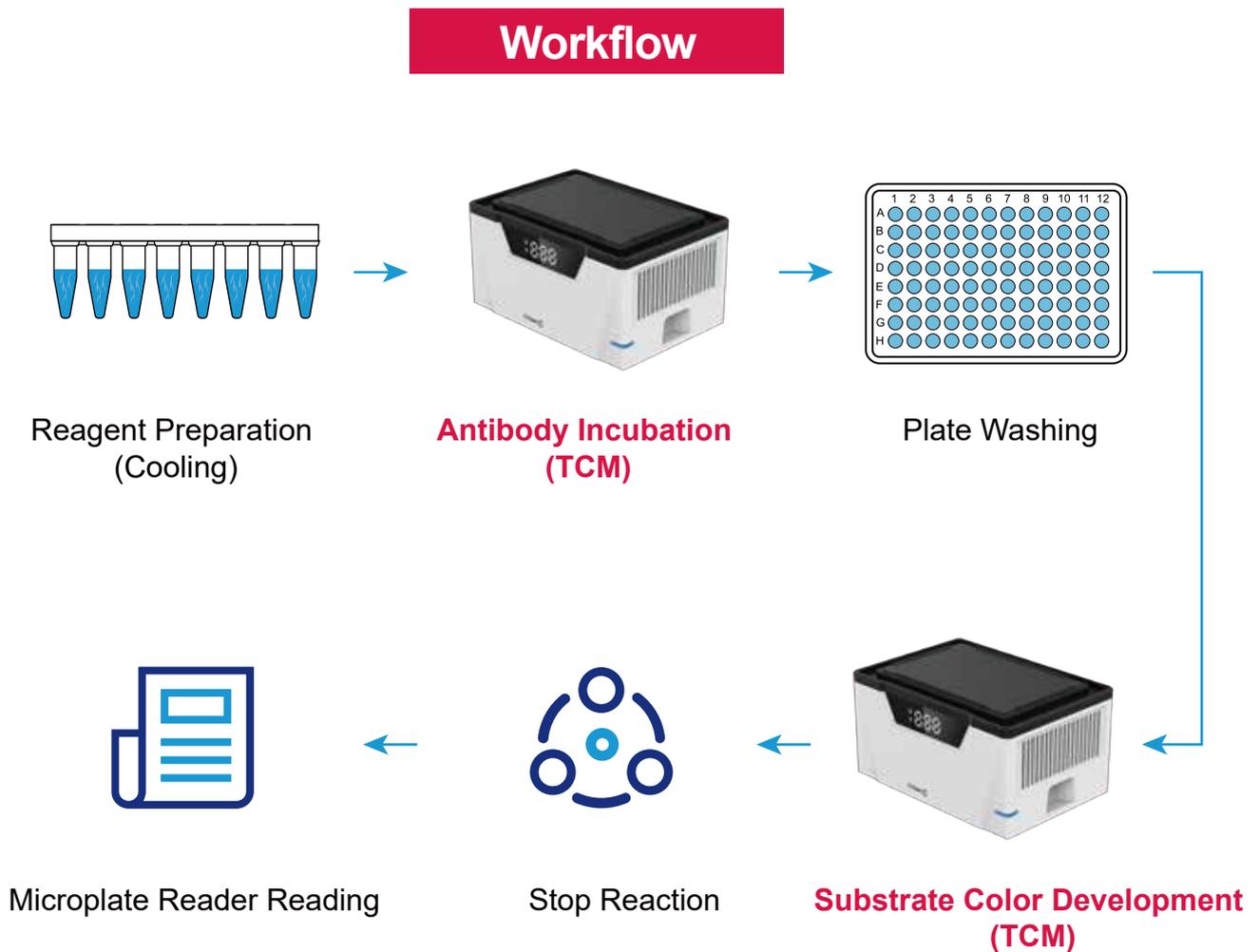
Features:

- Compact design and small footprint enable easy integration into automated systems.
- Rapid cooling reduces assay cycle times.
- Precise temperature control protects reagent integrity and maximizes amplification efficiency.

ELISA Processing:

The module enhances ELISA assay reproducibility by providing cooling during reagent preparation to maintain activity, and by ensuring precise temperature control during critical antibody incubation and substrate development steps.

This minimizes temperature-induced background signal or variation, enabling parallel processing of multiple plates for increased throughput.



Features:

- Broad temperature range adapts to diverse ELISA protocols.
- Excellent temperature uniformity ensures consistent well-to-well results.
- Highly integrated design eliminates the need for an external controller.

Application Areas

The NAYO TCM is widely used in the following scenarios:



Genomics:

Low-temperature reagent storage.



Proteomics:

Enzymatic reactions, Protein purification.



Drug Screening:

Cell culture and, Compound incubation.



Diagnostic Testing:

Sample pretreatment, Reagent reactions.



Performance Parameters:

Model	MT-120-S	
Appearance	Dimensions(W × D × H)	140 mm × 98 mm × 81 mm
	Housing Material	HIPS
Power Supply	Voltage	24V DC
	Max Power	120W

Temperature Control

Temperature range	0°C - 120°C
Heating rate (4°C to 21°C)	≥ 20 K/min
Heating rate (21°C to 95°C)	≥ 8 K/min
Cooling rate (95°C to 21°C)	≥ 11 K/min
Cooling rate (21°C to 4°C)	≥ 6 K/min
Temperature accuracy	± 0.2 °C
Uniformity at 4°C	≤ ± 1.0°C
Uniformity at 15°C	≤ ± 0.5°C
Uniformity at 37°C	≤ ± 0.6°C
Uniformity at 40°C	≤ ± 0.6°C
Uniformity at 90°C	≤ ± 2.0°C
Interface	RS422,RS485



YouTube



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