SR-800N

Extended Area Blackbody ControlMaster

CI Systems' advanced architecture ControlMaster SR-800N sets a new standard for accuracy and uniformity in blackbody technology.

Temperature measurement and calibration are both performed in the radiation head itself and then transferred digitally to the ControlMaster controller. The result is accurate, stable, reliable and NIST-traceable.

Temperature is controlled by easily-removable sensors which the user can replace in just minutes. Our factory-supplied replacement sensors provide an efficient means for recalibrating the system, providing an additional 12 months of service. Alternatively, customers may recalibrate the blackbody with our optional CK-800R calibration kit.

Figure 1: SR800N units

FEATURES

- Standard blackbody emitter sizes ranging from 2" to 40". Other sizes are available upon request
- Superior accuracy
- High-uniformity emitting surface
- Resolution in millidegree-Kelvin
- Wide range of radiation temperatures
- Able to operate at a wide range of ambient temperatures
- Configurable resolution and stability
- Interchangeability between head and controller
- Low acoustic noise
- Nitrogen inlet for inert atmosphere on all LT models
- Dual head (optional)

Calibration features:

- Quick calibration procedure by replacing the removable sensor
- NIST-traceable calibration
- Remote control software included

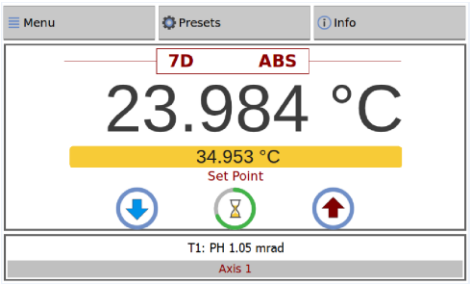

Figure 2: Intuitive touch screens for controlling the system

Controller features:

- Large color LCD display with touch screen user interface
- Ability to control up to four motorized devices
- Certified to MIL-T-28800D, CE, and FCC
- Compact, portable controller
- 19" rack-mount kit included
- Communication ports: Ethernet and RS-232 (optional GPIB)

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SPECIFICATIONS

Model: SR-800N-	2A 2D	4A 4D	7A 7D	8A 8D	10A 10D	12A 12D	14A 14D	16A 16D	20A 20D	40A 40D
Blackbody Emitter Size, inches	2 dia.	4x4	7x7	8x8	10x10	12x12	14x14	16x16	20x20	40x40
Absolute Temp. Range, °C	0 to 125			0 to 100		10 to 80				15 to 80
Differential Temp. Range, °C	-25 to 100			-25 to 75		-15 to 55				-10 to 55
Uniformity, °C (1)	±0.005	±0.010					±0.015			±0.030
Set Point Resolution, °C	0.001									
Absolute Temp. Accuracy, °C (2)	0.015 @ T< 0 , 0.007 @ 0 < T < 50 , 0.015 @ T > 50									
Differential Temp. Accuracy, °C (2)	0.008 @ ΔT ≤ 25 , 0.015 @ ΔT > 25									
Stability, °C	±0.003 @ ΔT ≤ 10 , ±0.008 @ ΔT > 10									±0.010
Emissivity	0.98 ± 0.02									
Settling Time (@ 0.01°C) , Sec.	15									
Operating Voltage, VAC	95 to 240 (50/60 Hz)									
Power Consumption, W	100	200	600	1000	1000	1200	1800	1800	3000	7000
Size, BB Head, HxWxD, cm	Ø6.5x10	20x16x16	27x23x23	35x31x16	35x31x16	40x36x16	59x46x17	59x46x17	71x62x20	128x76x160
Weight, BB Head, kg	1	5	11	16	16	21	50	50	86	450
Size, Controller, HxWxD, cm	15x34x35 (3U)						18x45x60 (4U)			
Weight, Controller, kg	10						15	15	20	60
Operating Temp. Head, °C	-20 to +70									
Operating Temp., Controller, °C	0 to 50									
Storage Temp., °C	-20 to +70									

* *See notes on next page*

EXAMPLES FOR STANDARD MODELS

Figure 3: Blackbody head SR-800N-20A

Figure 4: Blackbody head and refrigerator SR-800N-12A-LT

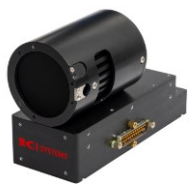

Figure 5: Blackbody head SR-800N-2A

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OPTIONS

	Option:	Model: SR-800N-	2A 2D	4A 4D	7A 7D	8A 8D	10A 10D	12A 12D	14A 14D	16A 16D	20A 20D
Room Temp. Environment	ET	Absolute temp. range, °C	0 to 175			0 to 125			10 to 125		
		Differential temp. range, °C	-25 to 150			-25 to 100			-15 to 100		
	LT *(3)*	Absolute temp. range, °C	---	-40 to 150					---		
		Differential temp. range, °C	---	-65 to 125					---		
	WTR	Absolute temp. range, °C	-40 to 150	-20 to 150		-15 to 150	---		---		
		Differential temp. range, °C	-65 to 125	-45 to 125		-40 to 125	---		---		
	HE		0.99 ± 0.01						---		
	Dual Head	Absolute temp. range, °C	0 to 125			---			---		
		Differential temp. range, °C	-25 to 100			---			---		
Chamber Environment	CH-STD	Chamber temperature, °C	-30 to 70								
		Absolute temp. range, °C	-40 to 80								
		Differential temp. range, °C	-10 to 40								
	CH-ET	Chamber temperature, °C	-40 to 80			-40 to 80			-40 to 80		
		Absolute temp. range, °C	-40 to 150			-40 to 150			-40 to 150		
		Differential temp. range, °C	-20 to 125			-20 to 100			-15 to 100		
	CH-LT *(3)*	Chamber temperature, °C	---	-40 to 80					---		
		Absolute temp. range, °C	---	-40 to 150					---		
		Differential temp. range, °C	---	-65 to 125					---		
	CH-WTR	Chamber temperature, °C	-40 to 80	---							
		Absolute temp. range, °C	-40 to 150	---							
		Differential temp. range, °C	-65 to 125	---							
	Differential accuracy (2), °C		0.020 @ (-20 < T ambient < 80) , 0.040 @ (T ambient < -20)								
	Stability, °C		0.005 @ (ΔT < 10) , 0.010 @ (ΔT > 10)								

Notes:

1) Uniformity values are for a ±1°C step from ambient Temp @ 80% of the central area. For other Temp. multiply by ΔT
2) Accuracy is referenced to a NIST-calibrated CI Systems master sensor
3) Includes refrigerator (power consumption depends on model)
4) All values are valid at an ambient temperature of 25°C, and in a non-condensing environment
5) Typical yearly drift: 0.02°C
6) Total system uncertainty: 0.02°C @ ΔT < ±25°C and 0.03°C @ ΔT > ±25°C
7) Differential temperature range is limited to absolute temperature range, and absolute temperature range is limited to differential temperature range
8) All mechanical sizes are approximate. Please contact CI Systems for ICD drawing with the accurate sizes.
9) For mechanical characteristics of optional models please contact CI Systems
10) See page 4 for special applications

ABBREVIATIONS

A	Absolute Blackbody model
D	Differential Blackbody model
BB	Blackbody
Temp.	Temperature
ET	Extended Temperature Range
WTR	Wide Temperature Range
LT	Low Temperature
HE	High Emissivity
CH	Chamber Environment
STD	Standard Temperature Range
HxWxD	Height x Width x Depth

ORDERING INFORMATION

Model: SR-800N - [1] [2] - [3]

1) Blackbody Emitter size
2) A (Absolute) or D (Differential)
3) Option

Examples:
SR-800N-4D
SR-800N-2D-CH-ET
SR-800N-8A-WTR

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DUAL-HEAD BLACKBODY SYSTEM (OPTIONAL MODEL)

Blackbody system with dual extended area blackbody emitters. One controller accurately control two separate blackbody emitter heads with two different temperature differentials.

The controller display shows both controlled temperatures on the same screen *(see the figure at the right).*

(*) Currently available for blackbody emitter sizes: 2", 4" and 7"

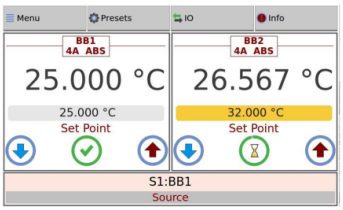

Figure 6: Dual-Head Blackbody Controller Display

Figure 7: Dual-Head Blackbody System

EXAMPLE OF SPECIAL APPLICATION: WEATHERPROOF BLACKBODY SYSTEM

A weatherproof (IP44) absolute temperature blackbody head can operate while water is splashing against the enclosure (except for the blackbody emitter surface). For use at ambient temperatures of 0°C to 25°C.

Absolute temperature range from T(ambient) to T(ambient)+75°C.

Operates with the standard SR-800N controller and a 24V power supply (the controller is not weatherproof).

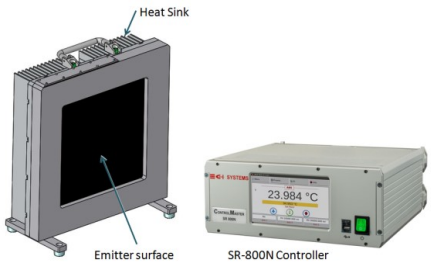

Figure 8: Weatherproof Blackbody System

EXAMPLE OF SPECIAL APPLICATION: NUC TOWER SYSTEM

The CI Systems NUC (Non-Uniformity Correction) Tower is ideal for testing multiple cameras or detectors for fast NUC tables, including ambient temperature reference.

The system shown on the right delivers a fast NUC process at three different temperatures.

It is used for enhancing the throughput of mass production cameras and detectors inside or outside an environmental chamber.

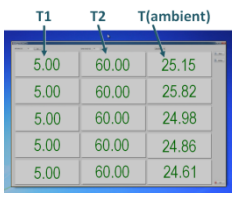

Figure 9: Main screen

The system consists of ten high emissivity and uniformity blackbodies and five high emissivity and uniformity surfaces at ambient temperature.

The high-accuracy controllers ensure that all surfaces are within an accuracy better than 0.015°C.

The blackbody controllers are mounted in a standard rack mount and communicate with one central PC.

Figure 10: "NUC Tower" System with 15 controlled temperature blackbodies

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