
РЕГИСТРАТОРЫ ДАННЫХ

51101 1, 8, 64;
51101С 1, 8, 64;
54115 24-8;
54130 27-12;
54180 40-20

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

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MODEL 51101/51101C SERIES

KEY FEATURES

- Models with 1, 8, and 64 channels on-line data recording. Multi-sets linked to a PC for hundreds of channels are doable
- Support B, E, J, K, N, R, S, and T type thermal couples with ITS-90 defined temperature range
- Individual channel cold junction compensation with $\pm 0.5^\circ\text{C}$ accuracy
- Temperature resolution up to 0.01°C , error down to (0.01% of reading + 0.5°C)
- VA-480 voltage adaptor :
Voltage range $\pm 480\text{VDC}$; Resolution 1mV ; Accuracy 0.1% of reading + 1mV
- VA-10 voltage adaptor :
Voltage range $\pm 10\text{VDC}$; Resolution 100uV ; Accuracy 0.05% of reading + 500uV
- 1000VDC channel to channel isolation, full protection for testing points with charge and guarantee for accurate measurements
- Thermal couple open circuit detection
- PC-based operation with powerful software for recording and analyzing data
- 1 and 8 channel models are USB powered. No battery or external power supply is required

THERMAL/MULTI-FUNCTION DATA LOGGER MODEL 51101/51101C SERIES

It is a general requirement to record temperatures, voltages, currents, and many physics quantities during research, product development, productions, and quality assurance processes. The number of record channels can be a simple one to several complicated set of hundreds. Thermal/multi-function data loggers are perfect solutions to serve for these measurement and tracking needs.

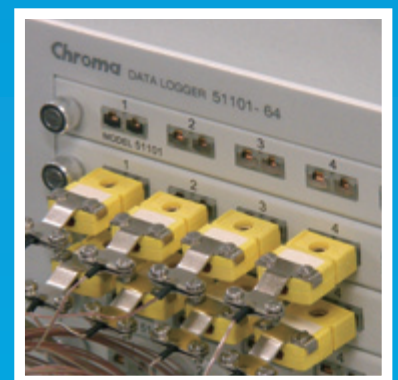
There are several measurement products in the market to perform such a large-scale and extensive time varying recording. Some are expensive, some are limited in accuracy or resolution, and some have low immunity to interference. thermal/multi-function data loggers are by far the most cost-effective solutions for versatility, accuracy, stability, and interference immunity among this category.

thermal/multi-function data loggers measure temperatures, voltages, and currents with high accuracy and resolutions. For example, they support 8 types of thermal couples measurement with ITS-90 defined temperature range at 0.5°C

accuracy and 0.01°C resolution*, while most data loggers in the market are at 1°C accuracy and 0.1°C resolution*. loggers are with 1000VDC channel to channel isolation, which means they can attach thermal couples to objects with high electricity, such as batteries, solar cells, working PCB, etc., and still get correct data. Many competitors are just malfunctioned or even damaged in those cases. Data retrieve in loggers are in a parallel architecture, while most of competitors use a sequential multiplexing method. This means data rate per channel is quick and constant for loggers, while others become much slower when number of channels is bigger.

Using thermal/multi-function data loggers, customers get confidence in measured data and high Performance/Cost ratio. Most of all, we can help in certain cases that our competitors fail, and only succeeds.

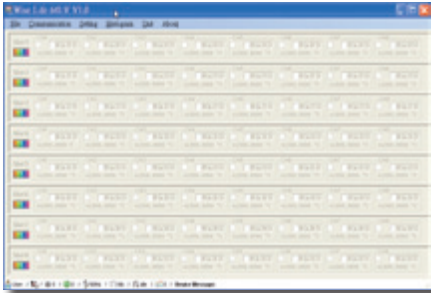
*Thermal couple error excluded. Please see specification list for detail.



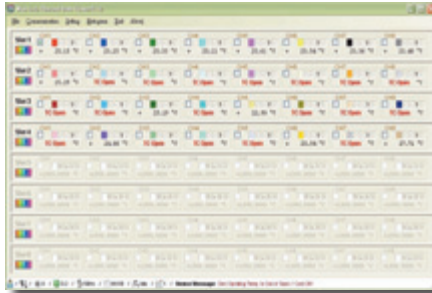
POWERFUL DATA RECORDING AND ANALYZING THROUGH A PC

Personal computers and Notebooks are powerful for their fast calculation and data processing capability, friendly graphic user interface, and huge hard disk storage. While operation of many other data loggers are limited by their small display and memory, data loggers link to PCs or Notebooks for direct display, analyses, and storage.

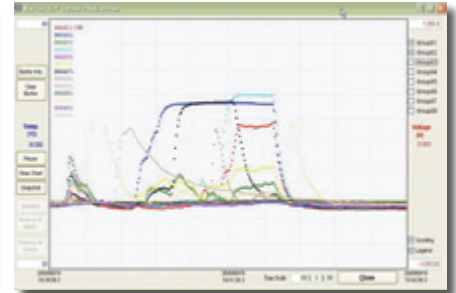
Using the PC software, one can see the detail of all the curves, change drawing time and range scales, create marks, zoom in selected sections, and perform difference calculations, all in few simple steps. The PC RAM is used as buffer to store every data since the logger is powered on, making data tracking back possible without opening the record file. Size of data recording is determined by hard disk free space, which is almost unlimited.



Main panel



Data panel



Data Histogram

APPLICATIONS



Automotive & Aircraft



Electrical & Electronics



Solar Energy



Power



Machinery



Iron & Steel



Metals & Mining



Oil & Gas



Water & Waste



Chemical



Pharmaceutical & Food



Others

SPECIFICATIONS

Model	51101-1 51101C-1	51101-8 51101C-8	51101-64 51101C-64 *4
Thermocouple			
Thermocouple T-type	-200 to 400°C	51101 Series : $\pm (0.01\% \text{ of reading} + 0.5) ^\circ\text{C} *1$ 51101C Series : $\pm (0.01\% \text{ of reading} + 0.8) ^\circ\text{C} *1$	
Thermocouple K-type	-200 to 1372°C		
Thermocouple B-type	250 to 1820°C		
Thermocouple E-type	-200 to 1000°C		
Thermocouple J-type	-210 to 1200°C		
Thermocouple N-type	-200 to 1300°C		
Thermocouple S-type	-50 to 1760°C		
Thermocouple R-type	-50 to 1760°C		
Thermocouple Jacks		B, E, J, K, N, R, S, or T mini-type	
Thermocouple Connector		B, E, J, K, N, R, S, or T mini-type	
Temperature Reading			
Number of Inputs	1	8	8, 16, 24, 32, 40, 48, 56, 64 channel
Temperature Sensor Type	Thermocouple : B, E, J, K, N, R, S, T		
Temperature Scale	ITS-90		
Temperature Resolution	$\pm 0.01 ^\circ\text{C}$		
Temperature Accuracy *1*2	51101 Series : $\pm (0.01\% \text{ of reading} + 0.5) ^\circ\text{C}$ 51101C Series : $\pm (0.01\% \text{ of reading} + 0.8) ^\circ\text{C}$		
CJC Error	51101 Series : $\pm 0.5 ^\circ\text{C}$ 51101C Series : $\pm 0.8 ^\circ\text{C}$		
Maximum Sample Rate	5 sample/sec.		
Channel to Channel Isolation	1000VDC / 750 Vrms		
Input Resistance	5M Ω		
Thermocouple break detection current	100 nA		

SPECIFICATIONS

Digital I/O			
Number of Digital I/O	--	--	4 differential digital inputs and outputs
Digital Input	--	--	1 trigger input(DIO) and 3 general purpose inputs
Digital Input- High Input Voltage	--	--	3 ~ 30 V
Digital Input- Low Input Voltage	--	--	< 0.8 V
Digital Input- High Input Current	--	--	0.8 ~ 13.1 mA
Digital Input- Low Input Current	--	--	<10 μ A
Digital Input- Terminal Resistor	--	--	2.2K Ω
Digital Output Configuration	--	--	transistor switch
Digital Output- External Supply Voltage	--	--	<30 V
Digital Output- ON-state Voltage	--	--	<1.5 V
Digital Output- ON-state Current	--	--	<400 mA
Digital Output- OFF-state Current	--	--	<2.1 μ A
Digital Output- Power Dissipation per Output	--	--	<0.6 W
Isolation Voltage	--	--	\pm 250 V

Communication			
RS-232	--	--	Half Duplex, DB-9 female connector
USB	USB2.0 (full speed device) ; USB A-type connector	--	USB2.0 (full speed device) ; USB B-type connector
LAN	--	--	10/100 Mbps

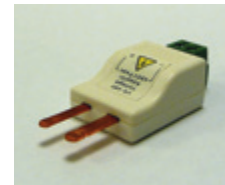
Power Specifications			
Power Requirement	--	4.5~5.5 V	11.4~12.6 V
Maximum Power Consumption	0.22W	--	1.2W
	--	--	18 W

Physical Specifications			
Dimensions (WxDxH)	96 x 29 x 14.5mm	135.3 x 186 x 51.7 mm	277 x 200.7 x 233 mm
Weight for Main Frame	30g	1.2 Kg	2.4 Kg
Weight per Sensor Card	--	--	0.15 Kg
Weight (Main Frame + 8 Sensor Card)	--	--	3.6 Kg

Environmental specifications			
Operating Temperature *1*2	--	--	0~50°C
Humidity	--	--	< 80 %RH
Power Adaptor Input Voltage	--	--	90 to 260 VAC
Power Adaptor Input Frequency	--	--	47 to 63 Hz
Main Frame DC Input	--	--	12.6 V/1.5 A
Thermocouple Differential Input Voltage Limit	\pm 1.2 V	\pm 1.2 V	\pm 1.2 V
Operating Temperature	--	--	0~50°C
Storage Temperature	--	--	-20~60°C
Storage Humidity	--	--	80 %RH

Voltage Reading		
Voltage Input Type	VA-480 Voltage Adaptor	VA-10 Voltage Adaptor
Voltage Resolution	1mV	100uV
Voltage Input Range	\pm 480VDC	\pm 10VDC
Voltage Input Accuracy	\pm (0.1% of reading + 1mV)*3	\pm (0.05% of reading + 500uV)*3
Input Resistance	1M Ω	300 K Ω

Current Reading	
Current Input Type	IA-3 Current Adaptor
Current Resolution	1mA
Current Input Range	\pm 3A
Current Input Accuracy	\pm (1% of reading + 1mA)



Voltage/Current Adaptor



Thermal Coupler

Note *1 : Measure after heat equilibrium is reached and the uncertainty of thermocouple itself is excluded. Operating temperature from 20°C to 30°C

Note *2 : For operating temperature out of range from 20°C to 30°C, additional error (0.01% of reading + 0.03°C) / °C for that out of operating temperature should be added

Note *3 : Under MV_8 filtering mode

Note *4 : Model 51101-64/51101C-64 with LAN module

All specifications are subject to change without notice.

ADVANCED TEC CONTROLLER

MODEL 54100 SERIES

A thermoelectric cooler (TEC) module is a solid state device which can control heat flux using current. First discovered in the 19th century and called the Peltier effect, TEC's operate by electrical current flow between two dissimilar conductors. Depending on the direction of the flow heat will be either absorbed or released. This technology is very useful for small scale temperature control; providing fast temperature response and ultra-high temperature stability. TEC temperature control equipment is also very compact and energy efficient in comparison to conventional thermal chambers. TECs have the added advantage of control case temperatures directly and have mechanical moving parts.

Chroma's Model 54100 series of advanced TEC Controllers provide an excellent temperature monitoring engine via two thermal couple inputs. The cold junction of the engine is internally stabilized to 0.001°C, providing 0.01°C temperature resolution. The TEC driver circuit within the 54100 uses a filtered PWM architecture which provides much higher drive currents over ordinary PWM drivers and provides smooth current modulation which is critical for electro-magnetic sensitive measurements.

Another important feature of Chroma's 54100 TEC Controllers is its true auto tune function providing for optimum control and temperature response. Stability down to the temperature resolution of 0.01°C is regularly achieved regardless of the size and geometry of thermal platforms.

High TEC driving capability is another merit of Chroma's 54100 controllers. Currently two models are available (150W and 300W) with 800W under development. More TEC driving power means wider temperature range, faster temperature response, and larger platform applications. For comparable accuracy and stability, offers one of the best TEC driving power-to-price ratio in the market.

* Operation temperature range of platform is independent with TEC controller range, and proper platform design should be considered to obtain certain temperature.

MODEL 54100 SERIES

KEY FEATURES

- Bidirectional driving with 150W (24V 8A), 300W (27V/12A), or 800W (40V/20A) output
- Filtered PWM output with >90% driving power efficiency while maintaining linear driving with current ripples < 20 mA
- Temperature reading and setting range -50 to 150°C with 0.01°C resolution and 0.3°C absolute accuracy
- Short term stability (1 hour) $\pm 0.01^\circ\text{C}$ and long term stability $\pm 0.05^\circ\text{C}$ with optimal PID control
- Feature true TEC large signal PID auto tune for best control performance
- 2 T-type thermal couple inputs, one for control feedback and the other for monitor and offset, providing versatile control modes
- RS232 serial communication port for PC remote operation and thermal data recording
- Powerful and user-friendly PC program available
- Perfect matching all designed temperature controlled platforms



SPECIFICATIONS

Model	54115-24-8	54130-27-12	54180-40-20
TEC Output Voltage	24VDC	27VDC	40VDC
TEC Output Current	8A	12A	20A
TEC Driving Output Power	150W	300W	800W
Controller Temperature Performance			
Controller Temperature Setting Range	-49 to 149°C		- 70 to 250°C *1
Controller Setting Resolution	0.01°C		
Temperature Control Stability	Short Term	≤0.01°C	
	Long Term	≤0.05°C	
Temperature Monitoring			
Monitoring Temperature Range	-49 to 149°C		- 70 to 250°C *1
Temperature Sensor Type	T-type thermocouple		Standard : T-type thermocouple Optional : K-type thermocouple
Monitoring Temperature Resolution	0.01°C		
Monitoring Temperature Relative Accuracy	< ±0.3°C		
Monitoring Temperature Absolute Accuracy	< ±(0.3+0.002 × T-25) °C		
Environmental			
Working Temperature	5~40°C		
Humidity	< 80 % RH		
Power Requirement	90 to 240 VAC, 50/60 Hz		
Maximum Power Consumption	330W	550W	1400W
Fuse	3A/250V	5A/250V	12A/250V
PC Communication Port	RS-232 Half Duplex		RS-232 Half Duplex ; USB2.0 ; LAN 10/100Mbps
Storage Temperature	-20~60°C		
Storage Humidity	80%RH		
Dimensions (WxDxH)	362 x 286 x 131.2 mm / 14.3 x 11.3 x 5.17 inch		241 x 441 x 135 mm / 9.5 x 17.4 x 5.3 inch
Weight	6.3 kg / 13.9 lbs	6.6 kg / 14.6 lbs	9.5 kg / 20.9 lbs

Note *1 : Platform temperature range is highly relating to the structure and design and will need to apply external elements to reach extreme conditions. To reach below -30 degree, it will need extra coolant. To reach beyond 150 degree, other heating material will need to be considered.

Note *2 : The temperature control stability depends on not only the controller but also platform and environment. The PID parameters must be optimized for the platform. Avoid any liquid or air turbulence around the platform. Attach the temperature feedback thermocouple firmly with good thermal conductivity. Shield for electromagnetic interference if necessary. Extremely high control temperature stability can be achieved with all these issue taken care.

Note *3 : Monitoring Temperature Relative Accuracy is defined as the temperature difference between the two thermocouples reading the same thermal point. It is the working ambient temperature, which must be thermal balance within 20~30°C, and exclude thermocouples error for controller specifications to be guaranteed. If the operation temperature is out of 20~30°C, the specification will be modified to < ±(0.3+0.002 × |T-25|), where T here is the working ambient temperature.

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