2-ch USB Temperature Data Logger

SCM-USU2I Series

PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Display method: No mark
- Number of input channels: 2-ch
- Input specifications:
  - Thermo couple: K(CA), J(IC), E(CR), T(CC), B(PR), R(PR), S(PR), N(NN), C(TT), G(TT), L(IC), U(CC), Platinel II
  - RTD: DPt100Ω, DPt50Ω, JPt100Ω, Cu100Ω, Cu50Ω, Nickel120Ω
  - analog: -60-60 mV, 0-200 mV, 0-1 V, 1-5 V, 0-5 V, 0-10 V, 0-20 mA, 4-20 mA
- Sampling period: 50 ms (2-ch synchronous sampling)
- Power supply: 5 VDC⎓ USB bus power
- Protection structure: IP20

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

01. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.(e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**
    Failure to follow this instruction may result in personal injury, economic loss or fire.
02. **Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.**
    Failure to follow this instruction may result in explosion or fire.
03. **Do not connect, repair, or inspect the unit while connected to a power source.**
    Failure to follow this instruction may result in fire or electric shock.
04. **Check 'Connections' before wiring.**
    Failure to follow this instruction may result in fire.
05. **Do not disassemble or modify the unit.**
    Failure to follow this instruction may result in fire or electric shock.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. **Use the unit within the rated specifications.**
    Failure to follow this instruction may result in fire or shortening the life cycle of the product.
02. **Use a dry cloth to clean the unit, and do not use water or organic solvent.**
    Failure to follow this instruction may result in fire or electric shock.
03. **Keep the product away from metal chip, dust, and wire residue which flow into the unit.**
    Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Check the polarity of the terminals before wiring the temperature sensor.
  For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length and for thermocouple (CT) temperature sensor, use the designated compensation wire for extending wire.
- Keep away from high voltage lines or power lines to prevent inductive noise.
  In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
  Do not use near the equipment which generates strong magnetic force or high frequency noise.
- Do not apply excessive power when connecting or disconnecting the connectors of the product.
- When changing the input sensor, turn off the power first before changing.
  After changing the input sensor, modify the value of the corresponding parameter.
- Do not overlapping communication line and power line.
  Use twisted pair wire for communication line and connect ferrite bead at each end of line to reduce the effect of external noise.
- Use USB cable of designated standard, and do not use extension cable.
  Using cable over 3m requires noise countermeasures.
- Use USB hub with the external power supply.
- When connecting multiple SCM-USU2I units to a PC, number of COM port goes up in sequential order and it takes some time to identify and assign number of COM port.
- Make a required space around the unit for radiation of heat.
  For accurate temperature measurement, warm up the unit over 20 min after turning on the power.

CE KC

- Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.
- Do not wire to terminals which are not used.
- Do not connect or disconnect USB cable quickly and repeatedly while communicating. It may cause damage or malfunction of the product and PC.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation Category I

Software

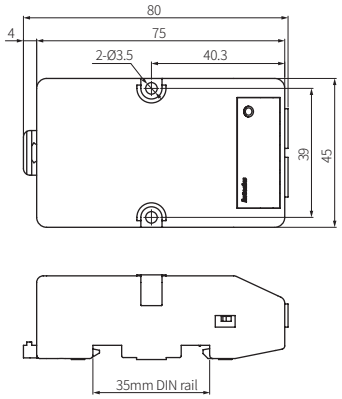
Download the installation file and the manuals from the Autonics website.

■ DAQMaster

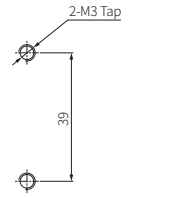
DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring.

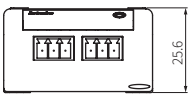
Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.



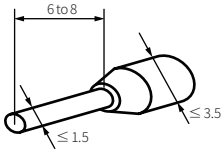
■ Panel cut-out



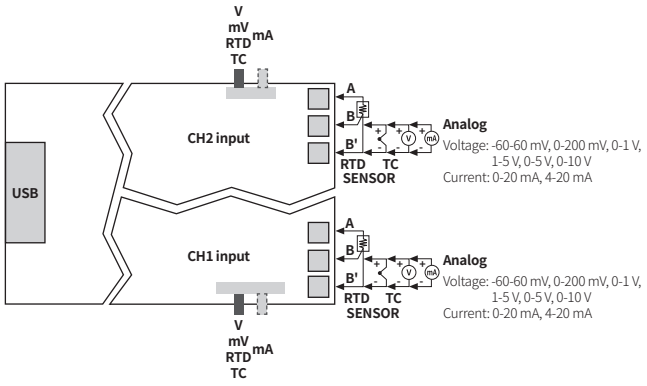


Cautions during Wiring

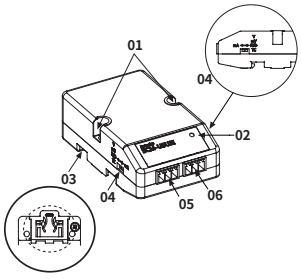
- Unit: mm, use crimp terminals of size specified below.



- Input parts and USB cable connection part are insulated each other.



Unit Descriptions



01. Mounting hole
Used when the unit mounts to the panel.

02. Power Indicator (Red)
Turns ON when supplying power.

03. Rail Lock
Used when the unit mounts on DIN rail.

04. Input type selector
Selects the input type for each CH. the left selector is for CH1 and the right selector is for CH2.

V, mV, RTD, TC ◀▶ mA
(Factory default)

05. CH1 connector

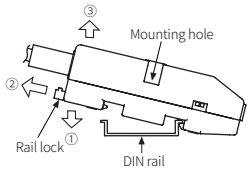
06. CH2 connector

Installation Method

■ DIN rail

• Mounting
01) Hook DIN rail connector on to DIN rail.
02) Push the unit down to the direction ① until it sounds click.

• Removing
01) Pull the rail lock of the unit to the direction ②.
02) Removing the unit by puling to the direction ③.

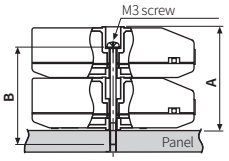


■ Panel

01) The unit is able to mount on the panel with two mounting holes.
02) For mounting this unit to panel, use M3 screws. Tightening torque is 0.4 N m.

- When stacking multi-layer, use long fixing screws to fix several units.

A: 23N+0.5, B: 23N-3



N (number of layers)	A (height of layer)	B (length of screw)
1	23.5 mm	20 mm
2	46.5 mm	43 mm
3	69.5 mm	66 mm
4	92.5 mm	89 mm

Troubleshooting

- When error occurs, it displays on software (DAQMaster).
- When error displays and input is connected or within the rated temperature range, the error display disappears and the unit operates normally.

Display	Descriptions	Troubleshooting
OPEN	Flashes if input is broken or disconnected.	Check input sensor status.
HHHH	Flashes if measured input value is higher than temp. range.	When input is within the rated temp. range, the display disappears.
LLLL	Flashes if measured input value is lower than temp. range.	

Specifications

Model	SCM-USU2I
Power supply	USB BUS POWER (5 VDC⎓)
Allowable voltage range	90 to 110 % of rated voltage
Communication method	USB
Protocol	Modbus RTU
Display method	Check via PC software (DAQMaster)
Input specifications	Refer to 'Input Specifications'
Sampling period	50 ms (2-ch simultaneous sampling)
Unit weight (Packaged)	≈ 140 g (≈ 195 g)

Dielectric strength	500 VAC~ 50/60 Hz for 1 min (between input terminal and power terminal)
Vibration	0.75 mm amplitude at frequency of 5 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)
Memory protection	≈ 10 years (when using non-volatile semiconductor memory)
Ambient temp.	-10 to 50 °C, Storage: -20 to 60 °C (rated at no freezing or condensation)
Ambient humi.	35 to 85 %RH, Storage: 35 to 85 %RH (rated at no freezing or condensation)
Protection structure	IP20 (IEC standard)
Insulation type	Double insulation or reinforced insulation
Installation	DIN rail or panel mounting
Accessory	USB 2.0 AB type Cable: 1 (length: 1 m)
Approval	CE

Input Specifications

■ Input type and range

Input type			Decimal	Display	Input range (°C)	Input range (°F)
Thermo -couple	K (CA)		1	K (CA) .H	-200 to 1,350	-328 to 2,462
			0.1	K (CA) .L	-200.0 to 1,350.0	-328.0 to 2462.0
	J (IC)		1	J (IC) .H	-200 to 800	-328 to 1,472
			0.1	J (IC) .L	-200.0 to 800.0	-328.0 to 1472.0
	E (CR)		1	E (CR) .H	-200 to 800	-328 to 1,472
			0.1	E (CR) .L	-200.0 to 800.0	-328.0 to 1,472.0
	T (CC)		1	T (CC) .H	-200 to 400	-328 to 752
			0.1	T (CC) .L	-200.0 to 400.0	-328.0 to 752.0
	B (PR)		1	B (PR)	0 to 1,800	32 to 3,272
	R (PR)		1	R (PR)	0 to 1,750	32 to 3,182
	S (PR)		1	S (PR)	0 to 1,750	32 to 3,182
	N (NN)		1	N (NN)	-200 to 1,300	-328 to 2,372
	C (TT) 01)		1	C (TT)	0 to 2,300	32 to 4,172
	G (TT) 02)		1	G (TT)	0 to 2,300	32 to 4,172
	L (IC)		1	L (IC) .H	-200 to 900	-328 to 1,652
			0.1	L (IC) .L	-200.0 to 900.0	-328.0 to 1,652.0
	U (CC)		1	U (CC) .H	-200 to 400	-328 to 752
			0.1	U (CC) .L	-200.0 to 400.0	-328.0 to 752.0
	Platinel II		1	PLII	0 to 1,390	32 to 2,534
RTD	Cu50 Ω		0.1	CU 50	-200.0 to 200.0	-200.0 to 392.0
	Cu100 Ω		0.1	CU 100	-200.0 to 200.0	-200.0 to 392.0
	JPt100 Ω		1	JPt100.H	-200 to 600	-328 to 1,112
			0.1	JPt100.L	-200.0 to 600.0	-328.0 to 1,112.0
	DPt50 Ω		0.1	DPt50.L	-200.0 to 600.0	-328.0 to 1,112.0
	DPt100 Ω		1	DPt100.H	-200 to 600	-328 to 1,112
			0.1	DPt100.L	-200.0 to 600.0	-328.0 to 1,112.0
	Nickel120 Ω		1	NI12.H	-80 to 200	-112 to 392
Analog	Voltage	0 to 10 V		AV1	-9999 to 9999 (Input range varies depending on decimal position)	
		0 to 5 V		AV2		
		1 to 5 V		AV3		
		0 to 1 V		AV4		
	Current	0 to 200 mV		AMV1		
		-60 to 60 mA		AMV2		
		0 to 20 mA		AMA1		
		4 to 20 mA		AMA2		

01) C(TT): same as existing W5(TT) type sensor
02) G(TT): same as existing W(TT) type sensor

■ Measurement accuracy

Input type	Temperature range	Measurement accuracy
Thermo -couple RTD	At room temperature range (23 ±5 °C)	(PV ±0.3% or ±1 °C select the higher) ±1-digit • Below -100 °C of thermocouple K, J, T, N, E and L, U, PLII, RTD Cu50 Ω, DPt50 Ω: (PV ±0.3% or ±2 °C select the higher) ±1-digit • Below 200 °C of thermocouple C, G and R, S: (PV ±0.3% or ±3 °C select the higher) ±1-digit • Below 400 °C of thermocouple B: no accuracy standard
	Out of room temperature range	(PV ±0.5% or ±2 °C select the higher) ±1-digit • RTD Cu50 Ω, DPt50 Ω: (PV ±0.5% or ±3 °C select the higher) ±1-digit • Thermocouple R, S, B, C, G, L, U: (PV ±0.5% or ±5 °C select the higher) ±1-digit • Other sensors: ≤ ±5 °C (≤-100 °C)
Analog	At room temperature range (23 ±5 °C)	±0.3% F.S. ±1-digit
	Out of room temperature range	±0.5% F.S. ±1-digit

• Connecting 1 or more expansion module can vary measurement accuracy about ±1 °C, regardless of the number of connected expansion module.

Factory Default

Group	Parameters	Factory default
Parameter 1 group	Alarm☐ Target CH	Alarm1/2 : CH1, Alarm3/4 : CH2
	Alarm☐ Mode	Alarm1/3 : AL-1, Alarm2/4 : AL-2
	Alarm☐ Low_CH☐	-200
	Alarm☐ High_CH☐	1350
	Alarm☐ Hysteresis_CH☐	1
Parameter 2 group	CH☐ Input Type	K (CA).H
	CH☐ Unit	°C
	CH☐ Low Range	000.0
	CH☐ High Range	100.0
	CH☐ Scale Dot	0
	CH☐ Low Scale	000.0
	CH☐ High Scale	100.0
	CH☐ Digital Unit	%
	CH☐ Input Bias	0
	CH☐ Digital Filter	0.1
Parameter 3 group	Communications Write	Enable
	Parameter Initialize	NO

Parameter Settings

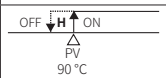
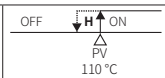
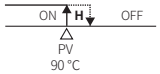
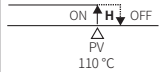
• Alarm☐: Alarm1, Alarm2, Alarm3, Alarm4
• CH☐: CH1, CH2

■ Parameter 1 group

Item	Parameter	Setting range
AlarmOutput☐ target CH	Alarm☐ Target CH	CH1, CH2, CH1 or CH2, CH1 and CH2
AlarmOutput☐ Operation mode 01)	Alarm☐ Mode	OFF, AL-1, AL-2
AlarmOutput☐ low-limit SV CH☐	Alarm☐ Low_CH☐	Within the range of 'Input type and range' (When changing alarm operation mode, alarm output high/low-limit SV is automatically reset as min./max. value which has no alarm.)
AlarmOutput☐ high-limit SV CH☐	Alarm☐ High_CH☐	
AlarmOutput☐ hysteresis CH☐	Alarm☐ Hysteresis_CH☐	1 to 100 (000.1 to 100.0)

01) Alarm output mode

• H: Alarm output hysteresis

Mode	Name	Operations		Descriptions
OFF	-	-		Disable
AL-1	Absolute value high-limit alarm			Alarm output turns ON when PV is more than alarm absolute value.
		Alarm absolute value: sets 90 °C	Alarm absolute value: sets 110 °C	
AL-2	Absolute value low-limit alarm			Alarm output turns ON when PV is lower than alarm absolute value.
		Alarm absolute value: sets 90 °C	Alarm absolute value: sets 110 °C	

■ Parameter 2 group

Item	Parameter	Setting range	
CH☐ Input type	CH☐ Input Type	Refer to 'Input type and range'.	-
CH☐ sensor temperature unit	CH☐ Unit	°C, °F (Setting is not available when analog input is selected.)	CH☐ Input type: Analog
CH☐ low-limit input	CH☐ Low Range	Min. range to {high-limit input (CH☐ High Range) - F.S. 10 % digit}	CH☐ Input type: Thermocouple, RTD
CH☐ upper-limit input	CH☐ High Range	{low-limit input (CH☐ Low Range) + F.S. 10 % digit} to Max. range	
CH☐ scale value decimal place	CH☐ Scale Dot	0, 0.0, 0.00, 0.000	
CH☐ low-limit scale	CH☐ Low Scale	-9999 to 9999	
CH☐ high-limit scale	CH☐ High Scale	-9999 to 9999	
CH☐ analog display unit	CH☐ Digital Unit	°C, °F, %, OFF	
CH☐ input correction	CH☐ Input Bias	-999 to 999 (-999.9 to 999.9)	
CH☐ input digital filter	CH☐ Digital Filter	0.1 to 120.0 (sec)	-

■ Parameter 3 group

Item	Parameter	Setting range
Communication write enable/disable	Communications Write	Enable, Disable
Parameter reset	Parameter Initialize	NO: return, YES: execute

■ Parameters reset by changing the parameter

Group	Item	Parameter	Reset parameter
Parameter 1 group	Alarm output☐ mode	Alarm☐ Mode	Alarm☐ High/Low_CH☐
Parameter 2 group	CH☐ input type	CH☐ Input type	Alarm☐ High/Low_CH☐ CH☐ Low/High Range CH☐ Scale Dot CH☐ Low/High Scale CH☐ Digital Unit CH☐ Input Bias
	CH☐ sensor temperature unit	CH☐ Unit	Alarm☐ High/Low_CH☐ CH☐ Input Bias

18, Bansong-ro 513Beon-gil, Haeundae-gu, Busan, Republic of Korea, 48002
www.autonics.com | +82-2-2048-1577 | sales@autonics.com