Autonics

2-CH USB Temperature Data Logger
SCM-USU2I

INSTRUCTION MANUAL

Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.
※⚠ symbol represents caution due to special circumstances in which hazards may occur.
⚠ **Warning** Failure to follow these instructions may result in serious injury or death.
⚠ **Caution** Failure to follow these instructions may result in personal injury or product damage.

⚠ Warning

1. **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 fire, personal injury, or economic loss.
2. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in electric shock or fire.
3. **Check 'Connections' before wiring.**
   Failure to follow this instruction may result in fire.
4. **Do not disassemble or modify the unit.**
   Failure to follow this instruction may result in electric shock or fire.

⚠ Caution

1. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in fire or product damage.
2. **Use dry cloth to clean the unit, and do not use water or organic solvent.**
   Failure to follow this instruction may result in electric shock or fire.
3. **Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
   Failure to follow this instruction may result in fire or explosion.
4. **Keep metal chip, dust, and wire residue from flowing into the unit.**
   Failure to follow this instruction may result in fire or product damage.

■ Unit Description

1. Mounting hole:
   Used when the unit mounts to the panel.
2. Power indicator (red):
   Turns ON the power indicator (red) when supplying the power.
3. Rail Lock:
   Used when the unit mounts on DIN rail.
4. Input type selector:
   Input type selector by each CH.
   The left selector is for CH1 and
   the right one is for CH2 in the face.
   V, mV, RTD, TC (default) ↔ mA
5. CH1 connector
6. CH2 connector
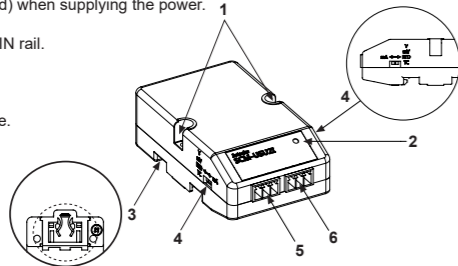
■ Integrated Device Management Program (DAQMaster)

DAQMaster is the integrated device management program. **DAQMaster** sets the parameters by connecting **SCM-USU2I and PC via USB cable.** Visit our website (www.autonics.com) to download DAQMater and the user manual.

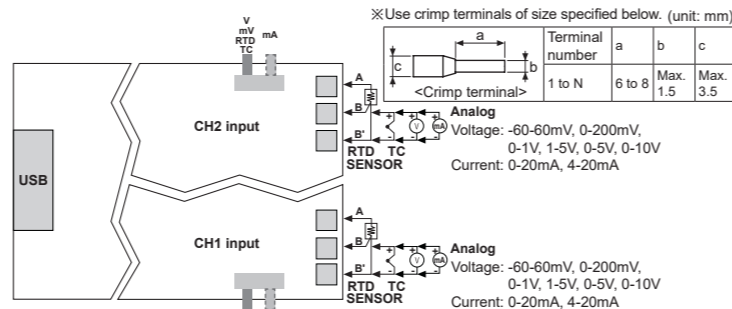| Item	Minimum specifications
System	IBM PC compatible computer with Intel Pentium III or above
Operations	Microsoft Windows 98/NT/XP/Vista/7/8/10
Memory	Min. 256MB
Hard disk	More than 1GB of free hard disk space
VGA	1024×768 or higher resolution display
Other	USB port

※**SCM-USU2I cannot be used alone.**

※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).
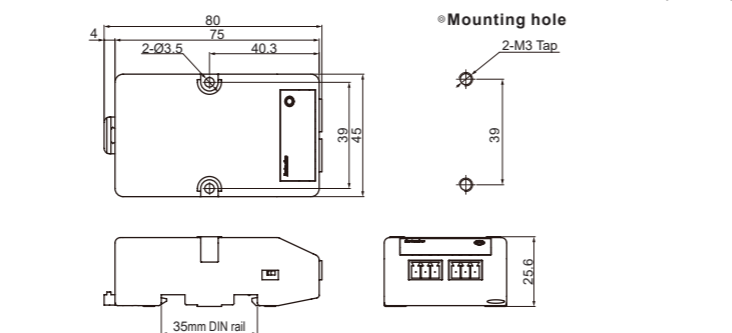
■ Specifications

Model		SCM-USU2I
Power supply		USB BUS POWER (5VDC)
Permissible voltage range		90 to 110% of rated voltage
Communication method		USB
Protocol		Modbus RTU
Display method		Check via PC Software (DAQMaster)
Input type	RTD	DPt100Ω, DPt50Ω, JPt100Ω, Cu100Ω, Cu50Ω, Nickel120Ω
	Thermocouple	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
	Analog	Voltage: -60-60mV, 0-200mV, 0-1V, 1-5V, 0-5V, 0-10V Current: 0-20mA, 4-20mA
Display accuracy※1	RTD	●At room temperature range (23℃±5℃) : (PV ±0.3% or ±1℃, select the higher one) ±1-digit ●Out of room temperature range : (PV ±0.5% or ±2℃, select the higher one) ±1-digit
	Thermocouple	
	Analog	●At room temperature range (23℃±5℃): ±0.3% F.S. ±1-digit ●Out of room temperature range: ±0.5% F.S. ±1-digit
Sampling cycle		50ms (2-CH simultaneous sampling)
Dielectric strength		500VAC 50/60Hz for 1 min. (between input terminal and power terminal)
Vibration		0.75mm amplitude at frequency of 5 to 55Hz (for 1 min.) in each X, Y, Z direction for 2 hours
Shock		500m/s² (approx. 50G) in each X, Y, Z direction for 3 times
Insulation resistance		Min. 100MΩ (at 500VDC megger)
Memory retention		Approx. 10 years (when using non-volatile semiconductor memory type)
Environment	Ambient temperature	-10 to 50℃, storage: -20 to 60℃
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
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: 1m)
Approval		CE ℞
Weight※2		Approx. 195g (approx. 140g)

※1: At room temperature range (23℃±5℃)
   ●Below -100℃ of thermocouple K, J, T, N, E, and L, U, PLII, RTD Cu50Ω, DPt50Ω : (PV ±0.3% or ±1℃, select the higher one)±1-digit
   ●Below 200℃ of thermocouple C, G and R, S : (PV ±0.3% or ±3℃, select the higher one)±1-digit
   ●Below 400℃ of thermocouple B does not have accuracy standard.
   ●Out of room temperature range
   ●RTD Cu50Ω, DPt50Ω: (PV 0.5% or ±3℃, select the higher one)±1-digit
   ●Thermocouple R, S, B, C, G, L, U: (PV ±0.5% or ±5℃, select the higher one)±1-digit
   ●Below -100℃ of other sensors: within ±5℃
※2: The weight includes packaging. The weight in parentheses is for unit only.
※Environment resistance is rated at no freezing or condensation.

■ Connections

※Input parts and USB cable connection part are insulated each other.
※Use crimp terminals of size specified below. (unit: mm)

Terminal number	a	b	c
1 to N	6 to 8	Max. 1.5	Max. 3.5

<Crimp terminal>

CH2 input
Analog Voltage: -60-60mV, 0-200mV, 0-1V, 1-5V, 0-5V, 0-10V Current: 0-20mA, 4-20mA

CH1 input
Analog Voltage: -60-60mV, 0-200mV, 0-1V, 1-5V, 0-5V, 0-10V Current: 0-20mA, 4-20mA

■ Dimensions

(unit: mm)

●Mounting hole
2-M3 Tap

■ Installation

●Mounting & Removing the unit on DIN rail
   •Mounting
   1)Hook DIN rail connector on to DIN rail.
   2)Push the unit down to the direction "①".
   •Removing
   1)Pull the rail lock of the unit to the direction "②".
   2)Remove the unit by pulling to the direction "③".
●Mounting the unit to panel
   1)The unit is able to mount on the panel with two mounting holes.
   2)For mounting this unit to panel, use M3 screws. Tightening torque is 0.4N·m.
   ※Multi-layer
   Use long fixing screws and several units are fixed by stacking as multi-layer.

Mounting hole
Rail lock
DIN rail

Number of layers(N)	'A' (23N+0.5)	'B' (23N-3)
1	23.5mm	20mm
2	46.5mm	43mm
3	69.5mm	66mm
4	92.5mm	89mm

■ Parameter Groups

1. Parameter 1 group
※Alarm□: Alarm1, Alarm2, Alarm3, Alarm4   ※CH□: CH1, CH2

Parameter	Display	Descriptions
Alarm output□ target CH	Alarm□ Target CH	Set the CH for monitoring by alarm. Setting range: CH1, CH2, CH1 or CH2, CH1 and CH2
Alarm output□ mode※1	Alarm□ Mode	Setting range: OFF, AL-1, AL-2
Alarm output□ low-limit SV CH□	Alarm□ Low_CH□	Setting range: Refer to the '■Input type and Temperature Range' ※When changing alarm operation mode, alarm output high/ low-limit SV is automatically reset as min./max. value which has no alarm.
Alarm output□ high-limit SV CH□	Alarm□ High_CH□	
Alarm output□ hysteresis CH□	Alarm□ Hysteresis_CH□	Set the hysteresis of alarm output. Setting range: 1 to 100 (000.1 to 100.0)

※1: Alarm output mode

Mode	Name	Operations		Descriptions
OFF	—			No alarm output
AL-1	Absolute value high-limit alarm	OFF ←⌐H⌐→ ON PV 90℃ Alarm absolute value: Sets 90℃	OFF ⌐H⌐→ ON PV 110℃ Alarm absolute value: Sets 110℃	Alarm output turns ON when PV is more than alarm absolute value.
AL-2	Absolute value low-limit alarm	ON ←⌐H⌐ OFF PV 90℃ Alarm absolute value: Sets 90℃	ON ⌐H⌐→ OFF PV 110℃ Alarm absolute value: Sets 110℃	Alarm output turns ON when PV is lower than alarm absolute value.

※H: Alarm output hysteresis

2. Parameter 2 group

Parameter	Display	Descriptions
CH□ input type	CH□ Input Type	Setting range: Refer to the '■Input type and temperature range'.
CH□ sensor temperature unit	CH□ Unit	℃↔°F ※Does not set in analog input.
CH□ low-limit input value	CH□ Low Range	Set the low-limit input value within analog input range. Setting range: min. range to {high-limit input value (CH□ High Range)-F.S. 10% digit}
CH□ high-limit input value	CH□ High Range	Set the high-limit input value within analog input range. Setting range: {low-limit input value (CH□ Low Range)+F.S. 10% digit}] to max. range
CH□ decimal point place of scale value	CH□ Scale Dot	Within high/low-limit scale value, set the decimal point place for display value (PV). Setting range: 0, 0.0, 0.00, 0.000
CH□ low-limit scale value	CH□ Low Scale	Set display scale for analog low-limit input value (CH□ Low Range). Setting range: -9999 to 9999
CH□ high-limit scale value	CH□ High Scale	Set display scale for analog high-limit input value (CH□ High Range). Setting range: -9999 to 9999
CH□ analog display unit	CH□ Digital Unit	For analog input, set the display unit. Setting range: ℃, °F, % , OFF
CH□ input correction	CH□ Input Bias	Input correction is to correct deviation occurred from temperature sensor. ※After input correcting, when present value (PV) is over the temperature range of the sensor, HHHH or LLLL is displayed. Setting range: -999 to 999 (-999.9 to 999.9)
CH□ input digital filter	CH□ Digital Filter	If the present value (PV) is fluctuating repeatedly by rapid change of input signal, stable recording is difficult. Input digital filter makes the present value stable. When input digital filter is set as 0.4 sec., input digital filter is applied for the input values for 0.4 sec. and the present value is may be different with the actual input value. Setting range: 0.1 to 120.0 (sec.)

※□ : Enables to set in analog input.

3. Parameter 3 group

Parameter	Display	Descriptions
Communication write enable/disable	Communications Write	Parameter setting is enable or disable by software (DAQMaster) setting. (reading parameter set value (Read) is always possible.) Enable : Enables changing and writing by parameters Disable : Disables changing and writing by parameters
Parameter reset	Parameter Initialize	Setting range: NO, YES

※Parameters reset by changing the parameter

Group	Parameter	Display	Reset parameters
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 temprature unit	CH□ Unit	Alarm□ High/Low_CH□, CH□ Input Bias

■ Factory Default

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

■ Input Type and Temperature Range

Input type			Display	Temperature range (℃)	Temperature range (°F)
Thermocouple	K(CA)		K(CA).H	-200 to 1350	-328 to 2462
			K(CA).L	-200.0 to 1350.0	-328.0 to 2462.0
	J(IC)		J(IC).H	-200 to 800	-328 to 1472
			J(IC).L	-200.0 to 800.0	-328.0 to 1472.0
	E(CR)		E(CR).H	-200 to 800	-328 to 1472
			E(CR).L	-200.0 to 800.0	-328.0 to 1472.0
	T(CC)		T(CC).H	-200 to 400	-328 to 752
			T(CC).L	-200.0 to 400.0	-328.0 to 752.0
	B(PR)		B(PR)	0 to 1800	32 to 3272
	R(PR)		R(PR)	0 to 1750	32 to 3182
	S(PR)		S(PR)	0 to 1750	32 to 3182
	N(NN)		N(NN)	-200 to 1300	-328 to 2372
	C(TT)※1		C(TT)	0 to 2300	32 to 4172
	G(TT)※2		G(TT)	0 to 2300	32 to 4172
	L(IC)		L(IC).H	-200 to 900	-328 to 1652
			L(IC).L	-200.0 to 900.0	-328.0 to 1652.0
	U(CC)		U(CC).H	-200 to 400	-328 to 752
			U(CC).L	-200.0 to 400.0	-328.0 to 752.0
	Platinel II		PLII	0 to 1390	32 to 2534
RTD	Cu50Ω		CU50	-200.0 to 200.0	-200.0 to 392.0
	Cu100Ω		CU100 .L	-200.0 to 200.0	-200.0 to 392.0
	JPt100Ω		JPt100 .H	-200 to 600	-328 to 1112
			JPt100 .L	-200 to 600.0	-328.0 to 1112.0
	DPt50Ω		DP50 .L	-200.0 to 600.0	-328.0 to 1112.0
	DPt100Ω		DPt100.H	-200 to 600	-328 to 1112
			DPt100. L	-200.0 to 600.0	-328 to 1112.0
	Nickel120Ω		NI120.H	-80 to 200	-112 to 392
Analog	Voltage	0-10V	AV1	-9999 to 9999 (the display range varies depending on the decimal point setting.)	
		0-5V	AV2		
		1-5V	AV3		
		0-1V	AV4		
		0-200mV	AmV1		
		-60-60mV	AmV2		
	Current	0-20mA	AmA1		
		4-20mA	AmA2		

※1. C(TT): same as existing W5(TT) type sensor   ※2. G(TT): same as existing W(TT) type sensor

■ Troubleshooting

Displays at software (DAQMaster).

Display	Description	Troubleshooting
OPEN	Flashes if input is broken or disconnected.	Check input sensor status.
HHHH	Flashes if present value is higher than the temperature range of the sensor.	When input is within the rated temperature range of the sensor, this display disappears.
LLLL	Flashes if present value is lower than the temperature range of the sensor.	

※When error displays and input is connected or within the rated temperature range of the sensor, the error display disappears and the unit operates normally.

■ Cautions during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
2. 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.
   For thermocouple (CT) temperature sensor, use the designated compensation wire for extending wire.
3. 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.
4. Do not apply excessive power when connecting or disconnecting the connectors of the product.
5. When changing the input sensor, turn off the power first before changing.
   After changing the input sensor, modify the value of the corresponding parameter.
6. 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.
7. Use USB cable of designated standard, and do not use extension cable.
   Using cable over 3m requires noise countermeasures.
8. Use USB hub with the external power supply.
9. 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.
10. 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.
11. Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.
12. Do not wire to terminals which are not used.
13. Do not connect or disconnect USB cable quickly and repeatedly while communicating.
    It may cause damage or malfunction of the product and PC.
14. This unit may be used in the following environments.
    ①Indoors (in the environment condition rated in 'Specifications')
    ②Altitude max. 2,000m
    ③Pollution degree 2
    ④Installation category I

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