



**MITSUBISHI
ELECTRIC**

Thermocouple Input Module

User's Manual
(Hardware)

AJ65SBT2B-64TD

Thank you for purchasing the programmable controller.

Prior to use, please read this and relevant manuals thoroughly to fully understand the product.





MODEL	AJ65S-64TD-U-HW
MODEL CODE	13JY76
IB(NA)-0800419-F(1612)MEE	

● SAFETY PRECAUTIONS ●

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly. These precautions apply only to this equipment. Refer to the user's manual of the CPU module to use for a description of the programmable controller system safety precautions.

In this manual, the safety precautions are classified into two levels:


" WARNING" and " CAUTION".

 **WARNING**

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

 **CAUTION**

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under " CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

WARNING

- In the case of a communication failure in the network, data in the master module are held.
Check the communication status information (SB, SW) and configure an interlock circuit in the sequence program to ensure that the entire system will operate safely.

CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
Keep a distance of 100mm (3.94 inches) or more between them.
Failure to do so may result in malfunction due to noise.

[Installation Precautions]

CAUTION

- Use the programmable controller in an environment that meets the general specifications in this manual.
Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- For protection of the switches, do not remove the cushioning material before installation.
- Securely fix the module with a DIN rail or mounting screws. Tighten the screws within the specified torque range.
Undertightening can cause drop of the screw, short circuit or malfunction.
Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Do not directly touch any conductive part of the module.
Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

CAUTION

- Shut off the external power supply for the system in all phases before wiring. Failure to do so may result in damage to the product.
- Ground the FG terminals to the protective ground conductor dedicated to the programmable controller. Failure to do so may result in malfunction.
- Tighten any unused terminal screws within the specified torque range (0.42 to 0.50N·m). Failure to do so may cause a short circuit due to contact with a solderless terminal.
- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Tighten the terminal screw within the specified torque range. Undertightening can cause short circuit or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure or malfunction.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Failure to do so may result in malfunction due to noise.
- When disconnecting the cables from the module, do not pull the cable by the cable part. Loosen the screws of connector before disconnecting the cable. Failure to do so may result in damage to the module or cable or malfunction due to poor contact.

[Startup/Maintenance Precautions]

CAUTION

- Do not touch any terminal while power is on.
Doing so may cause malfunction.
- Shut off the external power supply for the system in all phases before cleaning the module or retightening the terminal screws .
Failure to do so may cause the module to fail or malfunction.
Undertightening can cause drop of the screw, short circuit or malfunction.
Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Do not disassemble or modify the modules.
Doing so may cause failure, malfunction, injury, or a fire.
- Do not drop or apply strong shock to the module.
Doing so may damage the module.
- Shut off the external power supply for the system in all phases before mounting or removing the module to or from the panel.
Failure to do so may cause the module to fail or malfunction.
- After the first use of the product, do not mount/remove the terminal block to/from the module more than 50 times. (IEC 61131-2 compliant)
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
Failure to do so may cause the module to fail or malfunction.

[Disposal Precautions]



CAUTION

- When disposing of this product, treat it as industrial waste.

● PRÉCAUTIONS DE SÉCURITÉ ●

(Lire ces précautions avant toute utilisation du produit.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly. Ces précautions ne concernent que cet équipement. Dans le manuel de l'utilisateur du module CPU correspondant, voir l'exposé des précautions de sécurité concernant le système de l'automate programmable.


Dans ce manuel, les précautions de sécurité sont classées en deux niveaux, à savoir : "  AVERTISSEMENT" et "  ATTENTION"

AVERTISSEMENT

Attire l'attention sur le fait qu'une négligence peut créer une situation de danger avec risque de mort ou de blessures graves.

ATTENTION

Attire l'attention sur le fait qu'une négligence peut créer une situation de danger avec risque de blessures légères ou de gravité moyennes ou risque de dégâts matériels.

Dans certaines circonstances, le non-respect d'une précaution de sécurité introduite sous le titre "  ATTENTION" peut avoir des conséquences graves. Les précautions de ces deux niveaux doivent être observées dans leur intégralité car elles ont trait à la sécurité des personnes et aussi du système.

Veiller à ce que les utilisateurs finaux lisent ce manuel qui doit être conservé dans un endroit sûr pour s'y référer en cas de besoin.

[Précautions lors de la conception]

AVERTISSEMENT

- *En cas de problème de communication dans le réseau, les données sont gardées en mémoire du module maître.
Vérifier les infos d'état de communication (SB, SW) et constituer un circuit de verrouillage dans le programme séquentiel pour garantir la sécurité de fonctionnement de l'ensemble du système.*

ATTENTION

- *Ne pas entremêler les lignes de commandes ou câbles de communication avec les lignes des circuits principaux ou les câbles d'alimentation.
Les installer en maintenant entre eux une distance minimum de 100mm (3,94 pouces).
Faute de quoi, il y a risque de dysfonctionnement par un bruit.*

[Précautions d'installation]

ATTENTION

- *Utiliser l'automate programmable dans un environnement en conformité avec les spécifications générales que présente ce manuel.
Faute de quoi, il a risque d'électrocution, de départ de feu, de dysfonctionnement, d'endommagement ou de détérioration du produit.*
- *Pour la protection des commutateurs, ne pas enlever le matériau de rembourrage avant l'installation.*
- *Fixer fermement le module avec un rail DIN ou avec des vis. Serrer les vis dans les limites du couple serrage prescrit.
Si les vis sont insuffisamment serrées, le module risque de tomber et il peut y avoir des court-circuits ou des dysfonctionnements.
Un serrage excessif peut endommager les vis et/ou le module, avec aussi un risque de chute, de court-circuits et de dysfonctionnements.*
- *Éviter tout contact direct avec les parties conductrices du module.
Une manipulation incorrecte peut être à l'origine de dysfonctionnements ou de pannes du module.*

[Précautions de câblage]

ATTENTION

- *Couper l'alimentation externe du système sur toutes les phases avant de commencer à câbler.
Faute de quoi, le produit risquerait d'être endommagé.*
- *Mettre à la masse les bornes FG pour le conducteur de mise à la terre protecteur dédié au contrôleur programmable.
Faute de quoi, cela peut entraîner un dysfonctionnement.*
- *Serrer les vis des bornes inutilisées dans les limites du couple de serrage prescrit (0,42 à 0,50N•m).
Faute de quoi, il y a risque de court-circuit par contact avec une borne sans soudure.*
- *Utiliser des bornes sans soudure de type approprié et serrer au couple de serrage prescrit.
Si on utilise des bornes sans soudure de type embrochable, il y a risque de déconnexion et de panne au cas où une vis de borne se desserrerait.*
- *Vérifier la tension nominale et l'affectation des bornes avant le câblage du module et raccorder les câbles correctement.
Le raccordement d'une alimentation d'une tension autre que la tension nominale ou une erreur de câblage peut être à l'origine d'un départ de feu ou d'une panne.*
- *Serrer les vis de borne dans les limites du couple de serrage prescrit.
Un serrage insuffisant peut être à l'origine d'un court-circuit ou de dysfonctionnements. Un serrage excessif peut endommager les vis et/ou le module, avec aussi un risque de chute, de court-circuits et de dysfonctionnements.*
- *Veiller à ne pas laisser la poussière, les copeaux métalliques ou d'autres corps étrangers pénétrer dans le module
Tout corps étranger peut être à l'origine d'un départ de feu, d'une panne ou d'un dysfonctionnement.*
- *Les câbles doivent être placés dans un conduit de câbles ou doivent être attachés.
Faute de quoi, le ballonnement ou le déplacement des câbles pourrait endommager le module ou les câbles et être à l'origine de dysfonctionnements par mauvais contact.*
- *Ne pas entremêler les lignes de commandes ou câbles de communication avec les lignes des circuits principaux ou les câbles d'alimentation. Faute de quoi, il y a risque de dysfonctionnement par un bruit.*

[Précautions de câblage]

ATTENTION

- *Pour débrancher les câbles du module, ne pas tirer sur le câble lui-même. Desserrer les vis du connecteur avant de débrancher le câble. Faute de quoi, il y a risque d'endommagement du module ou du câble ou un mauvais contact pourrait être à l'origine de dysfonctionnements.*

[Mise en service/Précautions de maintenance]

ATTENTION

- *Ne toucher à aucun des bornes quand le système est sous tension. Cela pourrait être à l'origine de dysfonctionnements.*
- *Avant de nettoyer le module ou de resserrer les vis de borne, couper l'alimentation externe du système sur toutes les phases. Le non-respect de cette précaution peut être à l'origine de pannes ou de dysfonctionnements du module. Si les vis sont insuffisamment serrées, le module risque de tomber et il peut y avoir des court-circuits ou des dysfonctionnements. Un serrage excessif peut endommager les vis et/ou le module, avec aussi un risque de chute, de court-circuits et de dysfonctionnements.*
- *Ne pas démonter ni modifier les modules. Cela pourrait entraîner des pannes ou dysfonctionnements et être à l'origine de blessures ou de départs de feu.*
- *Ne pas faire tomber le module et ne pas le soumettre à des chocs. Cela risquerait d'endommager le module.*
- *Avant d'installer ou retirer le module du tableau, couper l'alimentation externe du système sur toutes les phases. Le non-respect de cette précaution peut être à l'origine de pannes ou de dysfonctionnements du module.*
- *Après la première utilisation du produit, le nombre maximum admissible d'opérations de pose/retrait du bornier sur le module est de 50. (selon IEC 61131-2)*
- *Avant de manipuler un module, se débarrasser de la charge électrostatique qu'accumule le corps humain en touchant un objet métallique raccordé à la terre. Le non-respect de cette précaution peut être à l'origine de pannes ou de dysfonctionnements du module.*

[Précautions de mise au rebut]



ATTENTION

- *Lors de sa mise au rebut, ce produit doit être traité comme un déchet industriel.*

● CONDITIONS OF USE FOR THE PRODUCT ●

- (1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
- where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
- MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
- ("Prohibited Application")
- Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
 - Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
 - Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

* The manual number is given on the bottom right of the cover.

Print date	*Manual number	Revision
Jun., 2009	IB(NA)-0800419-A	First edition
Dec., 2009	IB(NA)-0800419-B	[Addition] CONDITIONS OF USE FOR THE PRODUCT [Partial correction] SAFETY PRECAUTIONS, ABOUT MANUAL, CHAPTER 1, Section 2.1, 2.2, Section 3.1, Section 4.1, Section 5.2, 5.3, Section 6.1, 6.2, CHAPTER 7
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Dec., 2011	IB(NA)-0800419-E	[Addition] SAFETY PRECAUTIONS(Chinese) [Partial correction] Section 2.1, 4.1
Dec., 2016	IB(NA)-0800419-F	[Addition] SAFETY PRECAUTIONS(French) [Partial correction] Section 2.2, Chapter 3, 7

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ABOUT MANUAL

The following manual is also relevant to this product.
If necessary, place an order.

Relevant manual

Manual name	Manual number (Model code)
Thermocouple Input Module AJ65SBT2B-64TD User's Manual	SH-080769ENG (13JZ20)
Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions)	IB-66251 (13J512)

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

To ensure that Mitsubishi Electric programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- User's manual for the CPU module or head module used
- Safety Guidelines

(This manual is included with the CPU module, base unit, or head module)

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

(2) Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

1. OVERVIEW

This user's manual explains the specifications, names of the components and wiring for the AJ65SBT2B-64TD Thermocouple Input Module (hereafter AJ65SBT2B-64TD) which are used as a remote device station in a CC-Link system.

2. SPECIFICATIONS

2.1 General Specifications

The general specifications of the AJ65SBT2B-64TD are shown in the following table.

Table 2.1 General specifications

Item	Specification					
Operating ambient temperature <i>Température ambiante de fonctionnement</i>	0 to 55°C 0 à 55°C					
Storage ambient temperature	-20 to 75°C					
Operating ambient humidity	10 to 90%RH, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	Under intermittent vibration	Frequency	Constant acceleration	Half amplitude	Sweep count
			5 to 8.4Hz	-	3.5mm	10 times each in X, Y, Z directions
		Under continuous vibration	8.4 to 150Hz	9.8m/s ²	-	
			5 to 8.4Hz	-	1.75mm	
8.4 to 150Hz	4.9m/s ²	-				
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147 m/s ² , 3 times each in 3 directions X, Y, Z)					
Operating atmosphere	No corrosive gases					
Operating altitude ^{*1}	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category ^{*2}	II or less					
Pollution degree ^{*3}	2 or less					

- *1 Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.
- *2 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
- *3 This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

2.2 Performance Specifications

The performance specifications for the AJ65SBT2B-64TD are shown in the following table.

Table 2.2 Performance specifications

Item	AJ65SBT2B-64TD	
Temperature sensor input	-270 to 1820°C	
Measured temperature value	16-bit signed binary (-2700 to 18200: value rounded to one decimal place × 10)	
Applicable thermocouple and measured temperature range accuracy ^{*1}	Refer to Table 2.3 Applicable thermocouples and conversion accuracies	
Cold junction compensation accuracy (Operating ambient temperature 25±10°C) ^{*1*2}	±1.0°C	
Overall accuracy ^{*1}	See the calculation formula in *3.	
Maximum resolution	B, R, S, N: 0.3°C K, E, J, T: 0.1°C	
Conversion speed ^{*4}	640ms/4 channels	
Sampling cycle ^{*5}	160ms/4 channels	
Absolute maximum input	±5V	
Number of analog input points	4 channels + Pt100 connection channel × 2	
Built-in terminating resistor	Available (110Ω)	
Number of writes to Flash memory	Up to 10,000 times	
CC-Link station type	Remote device station	
Number of occupied stations	1 station (RX/RV: 32 points each, RWr/RWw: 4 points each)	
Connection cable	CC-Link dedicated cable	
Withstand voltage	Between all power supply systems and all communication systems and cold junction compensation channels	500VAC for one minute
	Between thermocouple input and all communication systems and cold junction compensation channels	
	Between thermocouple input channels	

Table 2.2 Performance specifications

Item		AJ65SBT2B-64TD
Isolation method		<p>Between all power supply systems and all communication systems and cold junction compensation channels</p> <p>Between thermocouple input and all communication systems and cold junction compensation channels</p> <p>Between thermocouple input channels</p> <p>Transformer isolation</p>
Noise immunity		Tested by a noise simulator with noise voltage of 500Vp-p, noise width of 1 μ s, and noise frequency of 25 to 60Hz.
Disconnection detection		Available (for each channel)
External connection system	Communication part, module power supply part	<p>7-point, 2-piece terminal block M3 \times 5.2 Tightening torque: 0.59 to 0.88N·m Number of applicable solderless terminals: maximum 2</p>
	I/O part	<p>18-point, 2-piece terminal block M3 \times 5.2 Tightening torque: 0.59 to 0.88N·m Number of applicable solderless terminals: maximum 2</p>
Applicable wire size		0.3 to 2.0mm ²
Applicable solderless terminal		<ul style="list-style-type: none"> • RAV1.25-3 (JIS C 2805 compliant) [Applicable wire size: 0.3 to 1.25mm²] • V2-MS3, RAP2-3SL, TGV2-3N [Applicable wire size: 1.25 to 2.0mm²]
Module mounting screw		<p>M4 \times 0.7mm \times 16mm or more screw (tightening torque range: 0.78 to 1.08N·m) The module can also be mounted with a DIN rail.</p>
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (IEC 60715 compliant)
External power supply		24VDC (ripple ratio: within 5%) (allowable voltage range 20.4 to 28.8VDC)
		Inrush current: 1.5A 1.3ms
		Current consumption: 0.12A (24VDC)
Weight		0.3kg

- *1 Except when noise is applied. To meet the accuracy, a warm-up (power distribution) period of 30 minutes is required.
- *2 When the module is mounted vertically and the ambient temperature for use is from 0 to 15°C or from 35 to 55°C, the cold junction temperature compensation accuracy is $\pm 1.5^\circ\text{C}$.
- *3 Calculate the overall accuracy by the following method.
(Overall accuracy) = (Conversion accuracy) + (Temperature characteristics) \times (Operating ambient temperature variation)

+(Cold junction compensation accuracy)

The operating ambient temperature variation indicates a deviation of an operating ambient temperature from a range of $25 \pm 5^\circ\text{C}$.

Example) When using the thermocouple B (refer to Table 2.3) at an operating ambient temperature of 35°C and a measured temperature of 1000°C , the overall accuracy is:

$$(\pm 2.5^\circ\text{C}) + (\pm 0.4^\circ\text{C}) \times (35^\circ\text{C} - 30^\circ\text{C}) + (\pm 1^\circ\text{C}) = \pm 5.5^\circ\text{C}$$

- *4 The conversion speed indicates the maximum period of time from when the input temperature changes to when the measured temperature value of the remote register is updated.
- *5 The sampling cycle indicates a cycle that the measured temperature value of a channel is updated.

Table 2.3 Applicable thermocouples and conversion accuracies

Applicable thermocouple type	Measured temperature range*1	Conversion accuracy (At operating ambient temperature $25 \pm 5^\circ\text{C}$)	Temperature characteristic (Per operating ambient temperature variation of 1°C)	Max. temperature error at ambient temperature 55°C
B	0 to 600°C	-----*3	-----*3	-----*3
	600 to 1700°C *2	$\pm 2.5^\circ\text{C}$	$\pm 0.4^\circ\text{C}$	$\pm 12.5^\circ\text{C}$
	1700 to 1820°C	-----*3	-----*3	-----*3
R	-50 to 0°C	-----*3	-----*3	-----*3
	0 to 1600°C *2	$\pm 2.0^\circ\text{C}$	$\pm 0.4^\circ\text{C}$	$\pm 12.0^\circ\text{C}$
	1600 to 1760°C	-----*3	-----*3	-----*3
S	-50 to 0°C	-----*3	-----*3	-----*3
	0 to 1600°C *2	$\pm 2.0^\circ\text{C}$	$\pm 0.4^\circ\text{C}$	$\pm 12.0^\circ\text{C}$
	1600 to 1760°C	-----*3	-----*3	-----*3
K	-270 to -200°C	-----*3	-----*3	-----*3
	-200 to 0°C *2	$\pm 0.5^\circ\text{C}$ or $\pm 0.25\%$ of measured temperature whichever the greater	$\pm 0.06^\circ\text{C}$ or $\pm 0.3\%$ of measured temperature whichever the greater	$\pm 15.5^\circ\text{C}$
	0 to 1200°C *2		$\pm 0.06^\circ\text{C}$ or $\pm 0.02\%$ of measured temperature whichever the greater	$\pm 9.0^\circ\text{C}$
1200 to 1370°C	-----*3	-----*3	-----*3	
E	-270 to -200°C	-----*3	-----*3	-----*3
	-200 to 0°C *2	$\pm 0.5^\circ\text{C}$ or $\pm 0.25\%$ of measured temperature whichever the greater	$\pm 0.06^\circ\text{C}$ or $\pm 0.3\%$ of measured temperature whichever the greater	$\pm 15.5^\circ\text{C}$
	0 to 900°C *2		$\pm 0.06^\circ\text{C}$ or $\pm 0.02\%$ of measured temperature whichever the greater	$\pm 6.75^\circ\text{C}$
900 to 1000°C	-----*3	-----*3	-----*3	
J	-210 to -40°C	-----*3	-----*3	-----*3
	-40 to 750°C *2	$\pm 0.5^\circ\text{C}$ or $\pm 0.25\%$ of measured temperature whichever the greater	$\pm 0.06^\circ\text{C}$ or $\pm 0.02\%$ of measured temperature whichever the greater	$\pm 5.625^\circ\text{C}$
	750 to 1200°C		-----*3	-----*3
T	-270 to -200°C	-----*3	-----*3	-----*3
	-200 to 0°C *2	$\pm 0.5^\circ\text{C}$ or $\pm 0.25\%$ of measured temperature whichever the greater	$\pm 0.06^\circ\text{C}$ or $\pm 0.3\%$ of measured temperature whichever the greater	$\pm 15.5^\circ\text{C}$
	0 to 350°C *2		$\pm 0.06^\circ\text{C}$ or $\pm 0.02\%$ of measured temperature whichever the greater	$\pm 2.625^\circ\text{C}$
350 to 400°C	-----*3	-----*3	-----*3	
N	-270 to -200°C	-----*3	-----*3	-----*3
	-200 to 0°C *2	$\pm 0.5^\circ\text{C}$ or $\pm 0.25\%$ of measured temperature whichever the greater	$\pm 0.06^\circ\text{C}$ or $\pm 0.3\%$ of measured temperature whichever the greater	$\pm 15.5^\circ\text{C}$
	0 to 1250°C *2		$\pm 0.06^\circ\text{C}$ or $\pm 0.02\%$ of measured temperature whichever the greater	$\pm 9.375^\circ\text{C}$
1250 to 1300°C	-----*3	-----*3	-----*3	

*1 If a value input from the thermocouple is outside the measured temperature range given in this table, it is handled as the maximum or minimum value of the measured temperature range.

*2 The accuracies are applied only in the temperature ranges of Class 1 to 3 (shaded areas) in JIS C1602-1995.

To meet the accuracy, a warm-up (power distribution) period of 30 minutes is required.

*3 Temperature can be measured, however; the accuracy is not guaranteed.

3. PART NAMES AND SETTINGS

3.1 Part Names

This section explains the names of the components for the AJ65SBT2B-64TD.

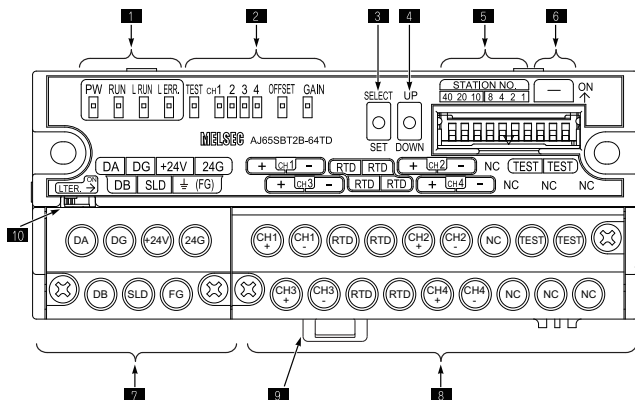


Figure 3.1 Appearance of the AJ65SBT2B-64TD

Table 3.1 Part names

No.	Name	Description		
1	Operating status indication LED	PW LED	On: Power supply on Off: Power supply off	
		RUN LED	Normal mode	On: Normal operation Flashing: Indicates that out of average processing setting range error or faulty hardware, or RTD Pt100 is disconnected, or user range read error. Off: Indicates that 24VDC power supply interrupted, watchdog timer error occurred.
			Test mode	On: Indicates that the SELECT/SET switch is in the SET position. Flashing: Indicates that the offset value or the gain value is out of the setting range, or the gain value is less than 10°C greater than the offset value, or faulty hardware, or RTD Pt100 is disconnected, or write error for Flash memory. Off: Indicates that the SELECT/SET switch is in the SELECT or center position.
		L RUN LED	On: Normal communication Off: Communication cutoff (time expiration error)	
		L ERR. LED	On: Indicates that station number setting is outside the range. Flashing regularly: Indicates that station number setting was changed from that at power-on. Flashing irregularly: Indicates that the terminating register is not connected. The module or CC-Link dedicated cable is affected by noise. Off: Indicates normal communication.	
2	Offset/gain adjusting LEDs	TEST CH OFFSET GAIN	Normal mode	Always off.
			Test mode	Turns on when the TEST terminal is short-circuited. The LEDs lit change every time the SELECT/SET switch is moved to SELECT.
3	SELECT/SET switch	When the switch is moved to SELECT during the test mode, the offset value or gain value of the specified channel can be adjusted. Moving the switch to SET determines the offset value or gain value.		
4	UP/DOWN switch	Used to adjust the offset value and gain value of the channel specified by the SELECT/SET switch.		

Table 3.1 Part names

No.	Name	Description																																																																																																														
5	Station number setting switches	<p>Use the switches in STATION NO. "10", "20" and "40" to set the tens place of the station number. Use the switches in STATION NO. "1", "2", "4" and "8" to set the ones place of the station number. The switches are all factory-set to off. Set the station number within the range from 1 to 64. Setting any other number than 1 to 64 will result in an error, with the "L ERR." LED on. The switches cannot set the same station number to two or more stations.</p> <table border="1" data-bbox="280 365 925 671"> <thead> <tr> <th rowspan="2">Station number</th> <th colspan="3">Tens place</th> <th colspan="4">Ones place</th> </tr> <tr> <th>40</th> <th>20</th> <th>10</th> <th>8</th> <th>4</th> <th>2</th> <th>1</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>2</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>3</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>4</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>10</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>11</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>64</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> </tbody> </table> <p>(Example) To set the station number to "32", set the switches as indicated below.</p> <table border="1" data-bbox="280 754 925 838"> <thead> <tr> <th rowspan="2">Station number</th> <th colspan="3">Tens place</th> <th colspan="4">Ones place</th> </tr> <tr> <th>40</th> <th>20</th> <th>10</th> <th>8</th> <th>4</th> <th>2</th> <th>1</th> </tr> </thead> <tbody> <tr> <td>32</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> </tbody> </table>	Station number	Tens place			Ones place				40	20	10	8	4	2	1	1	OFF	OFF	OFF	OFF	OFF	OFF	ON	2	OFF	OFF	OFF	OFF	OFF	ON	OFF	3	OFF	OFF	OFF	OFF	OFF	ON	ON	4	OFF	OFF	OFF	OFF	ON	OFF	OFF	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	10	OFF	OFF	ON	OFF	OFF	OFF	OFF	11	OFF	OFF	ON	OFF	OFF	OFF	ON	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	64	ON	ON	OFF	OFF	ON	OFF	OFF	Station number	Tens place			Ones place				40	20	10	8	4	2	1	32	OFF	ON	ON	OFF	OFF	ON	OFF
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6	Use prohibited	Do not use.																																																																																																														
7	Terminal block for transmission and module power supply	<p>Terminal block for transmission and module power supply</p> <table border="1" data-bbox="251 962 925 1311"> <thead> <tr> <th>Terminal</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>DA</td> <td rowspan="4">Connection terminal for CC-Link dedicated cable</td> </tr> <tr> <td>DB</td> </tr> <tr> <td>DG</td> </tr> <tr> <td>SLD</td> </tr> <tr> <td>FG</td> <td>Connection terminal for grounding to the protective conductor *SLD and FG terminals are connected inside of the module.</td> </tr> <tr> <td>+24V</td> <td rowspan="2">Connection terminal for external power supply</td> </tr> <tr> <td>24G</td> </tr> </tbody> </table>	Terminal	Description	DA	Connection terminal for CC-Link dedicated cable	DB	DG	SLD	FG	Connection terminal for grounding to the protective conductor *SLD and FG terminals are connected inside of the module.	+24V	Connection terminal for external power supply	24G																																																																																																		
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Table 3.1 Part names

No.	Name	Description											
8	Terminal block for analog input signal	Used to connect I/O signals.											
		<table border="1"> <thead> <tr> <th>Terminal</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>CH□+</td> <td rowspan="2">Connection terminal for CH□ thermocouple or compensation lead wire</td> </tr> <tr> <td>CH□-</td> </tr> <tr> <td>TEST</td> <td>Connection terminal for short circuit at TEST mode</td> </tr> <tr> <td>RTD</td> <td>Connection terminal for RTD Pt100</td> </tr> <tr> <td>NC</td> <td>Reserved</td> </tr> </tbody> </table>	Terminal	Description	CH□+	Connection terminal for CH□ thermocouple or compensation lead wire	CH□-	TEST	Connection terminal for short circuit at TEST mode	RTD	Connection terminal for RTD Pt100	NC	Reserved
		Terminal	Description										
		CH□+	Connection terminal for CH□ thermocouple or compensation lead wire										
		CH□-											
		TEST	Connection terminal for short circuit at TEST mode										
RTD	Connection terminal for RTD Pt100												
NC	Reserved												
9	DIN rail hook	Used to install the module to the DIN rail.											
10	L TER. (Line Termination) switch	Turned on to use the terminating resistor built in the AJ65SBT2B-64TD. Turned on when the AJ65SBT2B-64TD is used in the end of the network.											

* The transmission speed is automatically set according to the setting of the master module.

4. LOADING AND INSTALLATION

4.1 Handling Precautions

The following is an explanation of handling precautions of the AJ65SBT2B-64TD.

- (1) Tighten screws (such as a module fixingscrew) within the tightening torque range specified in the table below.

Table 4.1 Tightening torque range

Screw location	Tightening torque range
Module mounting screw (M4 screw)	0.78 to 1.08N•m
Terminal block terminal screw (M3 screw) <i>Vis de borne sur plaque à bornes (vis M3)</i>	0.59 to 0.88N•m <i>0,59 à 0,88 N•m</i>
Terminal block installation screw (M3.5 screw)	0.68 to 0.98N•m

- (2) To prevent defect during transportation, a protective film is attached on the surface of the module. Remove the film before using the module.
- (3) When using the DIN rail, pay attention to the following.
 - (a) Applicable DIN rail type (Compliant with IEC 60715)
TH35-7.5Fe
TH35-7.5Al
 - (b) DIN rail installation screw pitch
When installing a DIN rail, tighten the screws at a pitch of 200mm or less.
- (4) When mounting the AJ65SBT2B-64TD to the DIN rail, press the centerline of the DIN rail hook at the bottom of the module with your finger until it clicks.

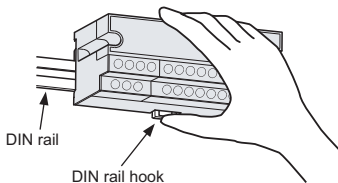


Figure 4.1 Installation to DIN rail

- (5) For the use with the AJ65SBT2B-64TD, refer to the master module user's manual for the name, specification, and manufacturer of applicable cables.
- (6) Do not touch the RTD Pt100 with a driver or the like when mounting and removing the module, and when wiring, because the RTD Pt100 is precision part.

5. DATA LINK CABLE WIRING

5.1 Wiring Precautions

When using existing CC-Link dedicated cables, rewire the system using communication terminal block for the AJ65SBT2B-64TD.

5.2 CC-Link Dedicated Cable Connection Method

Méthode de raccordement par câble dédié CC-Link

The following shows a connection example of CC-Link dedicated cables for the AJ65SBT2B-64TD.

On trouvera ci-après un exemple de connexion du AJ65SBT2B par câbles dédiés CC-Link.

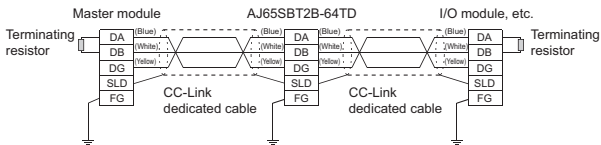


Figure 5.1 Connection of the CC-Link dedicated cables

English	French
Master module	<i>Module maître</i>
I/O module, etc.	<i>Module d'entrée/sortie, etc.</i>
Terminating resistor	<i>Résistance d'extrémité</i>
Blue	<i>bleu</i>
White	<i>blanc</i>
Yellow	<i>jaune</i>
CC-Link dedicated cable	<i>Câble dédié pour CC-Link</i>

5.3 Connection of Terminating Resistor

The AJ65SBT2B-64TD has a built-in terminating resistor of 110Ω . Therefore, there is no need to connect a terminating resistor externally.

(1) Precautions

- (a) Move the L TER. switch until it clicks.



- (b) Before wiring CC-Link dedicated cables, check between DA and DB is high resistance (when the L TER. switch is off) or is 110Ω (When the L TER. switch is on) with a tester.
- (c) The built-in terminating resistor cannot be used in the following cases. Connect a terminating resistor (110 or 130Ω).
- A CC-Link system is configured using CC-Link dedicated cables of 130Ω .
 - The AJ65SBT2B-64TD may be replaced during data link.

6. WIRING

6.1 Wiring Precautions

External wiring that is susceptible to noise is required as a highly reliable system and making full use of functions of the AJ65SBT2B-64TD.

The precautions when performing external wiring are as follows:

- (1) Use separate cables for the AC control circuit and the AJ65SBT2B-64TD signals output externally to avoid the influence of the AC side surges and inductions.
- (2) Place the thermocouple at least 10cm away from the main circuit cables and AC control circuit lines. Keep it away from high-voltage cables and circuits, which include high frequency waves, such as an inverter's load circuit. Not doing so will cause the module more susceptible to noises, surges and inductions.
- (3) The shield wire or the shield of the shielded cable must be grounded at one end. However, grounding outside may be suitable depending on the noise.

6.2 Wiring with Thermocouple

The method for connecting between the AJ65SBT2B-64TD and the thermocouple is shown in Figure 6.1.

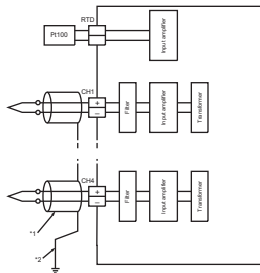
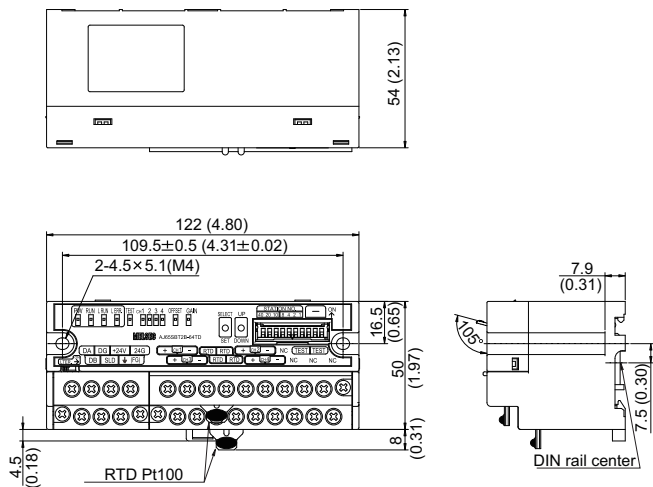


Figure 6.1 Wiring of thermocouple

- *1 Use a shielded compensation lead wire.
- *2 The thermocouple must be used. For details of grounding, refer to the "EMC AND LOW VOLTAGE DIRECTIVES" chapter of the user's manual for the CPU module used.

7. EXTERNAL DIMENSIONS

The external dimensions of the AJ65SBT2B-64TD are shown below.



Unit: mm (inches)

WARRANTY

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

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France	MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets, 92741 Nanterre Cedex, France Tel : +33-1-55-68-55-68	Vietnam	MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Hanoi Branch 6th Floor, Detech Tower, 8 Ton That Thuyet Street, My Dinh 2 Ward, Nam Tu Liem District, Hanoi, Vietnam Tel : +84-4-3937-8075
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Russia	MITSUBISHI ELECTRIC (RUSSIA) LLC St. Petersburg Branch Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027 St. Petersburg, Russia Tel : +7-812-633-3499		

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA, JAPAN

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