

# MITSUBISHI

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# Analog-Digital Converter Module

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User's Manual  
(Hardware)

## AJ65VBTCU-68ADV N/ADIN

Thank you for buying the Mitsubishi general-purpose programmable controller MELSEC Series

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.



MODEL	AJ65V-68ADN-U-HW
MODEL CODE	13JP19
IB(NA)-0800251-G(1206)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".

 <b>WARNING</b>	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
 <b>CAUTION</b>	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.

## [Design Precautions]



### 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 the detailed manual.  
Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Securely fix the module with a DIN rail or CC-Link connector type metal installation fitting.  
Not doing so can cause a drop 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 pin and FG1 pin to the protective ground conductor dedicated to the programmable controller. Failure to do so may result in malfunction.
- Check the rated voltage and pin 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.
- Do not insert the one-touch connector plug for I/O of the one-touch connector type/connector type compact remote I/O unit into the one-touch connector for analog I/O accidentally. Doing so can cause the module to be damaged.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- Always fit a non-wired, one-touch connector plug to the open one-touch connector for power supply and FG. Not doing so can cause a 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 cable 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.

## [Wiring Precautions]

### CAUTION

- Smoke and fire may occur when an overcurrent flows intermittently for a long period of time. To avoid this, configure a safety circuit, such as an external fuse, to protect the product.

## [Starting and Maintenance Precautions]

### CAUTION

- Do not touch any pin while power is on. Doing so will cause malfunction.
- Shut off the external power supply for the system in all phases before cleaning the module.  
Failure to do so may cause the module to fail 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.
- 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.

## ● CONDITIONS OF USE FOR THE PRODUCT ●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;

- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
- ii) 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
Mar., 2003	IB(NA)-0800251-A	First edition
Jul., 2005	IB(NA)-0800251-B	<u>Partial correction</u> SAFETY PRECAUTIONS
Sep., 2006	IB(NA)-0800251-C	<u>Partial correction</u> Chapter 3, Chapter 8
Apr., 2007	IB(NA)-0800251-D	<u>Partial correction</u> Section 2.1, Section 6.2, Chapter 8
Sep., 2010	IB(NA)-0800251-E	<u>Addition</u> CONDITIONS OF USE THE PRODUCT <u>Partial correction</u> SAFETY PRECAUTIONS, About Manuals, Compliance with the EMC and Low Voltage Directives, Section 2.1, Chapter 3, Section 5.2, Section 6.1, Section 6.2, Chapter 7 <u>Deletion</u> Section 5.1
Dec., 2011	IB(NA)-0800251-F	<u>Addition</u> SAFETY PRECAUTIONS(Chinese) <u>Partial correction</u> COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES
Jun., 2012	IB(NA)-0800251-G	<u>Partial correction</u> Section 5.1, 6.2

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## **MANUAL**

The following manuals are also related to this product.  
In necessary, order them by quoting the details in the tables below.

### Detailed Manual

Manual name	Manual number (Model code)
Analog-Digital Converter Module type AJ65VBTCU-68ADV/ADIN User's Manual	SH-080401E (13JR65)

### Related Manual

Manual name	Manual number (Model code)
CC-Link System Master/Local Module Type AJ61BT11/A1SJ61BT11 User's Manual	IB-66721 (13J872)
CC-Link System Master/Local Module Type AJ61QBT11/A1SJ61QBT11 User's Manual	IB-66722 (13J873)
MELSEC-Q CC-Link System Master/Local Module User's Manual	SH-080394E (13JR64)
MELSEC-L CC-Link System Master/Local Module User's Manual	SH-080895ENG (13JZ41)

## **COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES**

### (1) Method of ensuring compliance

To ensure that Mitsubishi 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).

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## 1. OVERVIEW

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This user's manual explains the specifications, names and setting of parts, wiring and others of Type AJ65VBTCU-68ADVn analog-digital converter module (hereafter abbreviated to the "AJ65VBTCU-68ADVn") and Type AJ65VBTCU-68ADIN analog-digital converter module (hereafter abbreviated to the "AJ65VBTCU-68ADIN") which is used as a remote device station of a CC-Link system. In this manual, the AJ65VBTCU-68ADVn and AJ65VBTCU-68ADIN are generically referred to as the AJ65VBTCU-68ADVn/ADIN.

Confirm if the following items are included in the package after unpacking.

Item name	Number of items
Analog-Digital Converter Module type AJ65VBTCU-68ADVn	1
Analog-Digital Converter Module type AJ65VBTCU-68ADIN	1

## 2. SPECIFICATION

### 2.1 Performance specifications

The performance specifications of the AJ65VBTCU-68ADV/N/ADIN are shown below. For general specifications, refer to detailed manual.

Item		AJ65VBTCU-68ADV/N	AJ65VBTCU-68ADIN			
Protection class		IP1XB				
Analog input	Voltage	-10 to 0 to 10V DC (input resistance 1M $\Omega$ )	-			
	Current	-	0 to +20mA DC (input resistance 250 $\Omega$ )			
Digital output		16-bit signed binary (-4096 to 4095)	16-bit signed binary (-96 to 4095)			
I/O characteristics, maximum resolution, accuracy (accuracy relative to maximum value of digital output value)		Analog input range	Digital output	Accuracy		Max. Resolution
				Ambient temperature 0 to 55°C	Ambient temperature 25 $\pm$ 5°C	
	AJ65VBTCU-68ADV/N (Voltage)	-10 to 10V	-4000 to 4000	$\pm$ 0.3% ( $\pm$ 12 digit <sup>-1</sup> )	$\pm$ 0.2% ( $\pm$ 8 digit <sup>-1</sup> )	2.5mV
		User range setting 1 (-10 to 10V)				
		0 to 5V	0 to 4000			1.25mV
		1 to 5V				1.0mV
	AJ65VBTCU-68ADIN (Current)	0 to 20mA	0 to 4000			5 $\mu$ A
		4 to 20mA				
		User range setting (0 to 20mA)	4 $\mu$ A			
	Maximum conversion speed		1ms/channel.			
Absolute maximum input		Voltage $\pm$ 15 V	Current $\pm$ 30mA <sup>2</sup>			
Analog input points		8 channels/module				
CC-Link station type		Remote device station (Ver.1 remote device station, Ver.2 remote device station)				
Number of occupied stations		Ver.1 remote device station (Ver.1 compatible slave station) setting: 3 stations (32 points for RX and RY, 12 points for RWr and RWw) Ver.2 remote device station (Ver.2 compatible slave station) setting: 1 station (32 points for RX and RY, 16 points for RWr and RWw, expanded cyclic settings: 4 times)				
Communication cable		Ver.1.10 compatible CC-Link dedicated cable: FANC-110SBH, FA-CBL200PSBH, CS-110				

Item	AJ65VBTCU-68ADV N	AJ65VBTCU-68ADIN		
Insulation	Insulated area	Insulation method	Dielectric withstand voltage	Insulation resistance
	Across communication system terminals and all analog input terminals	Photocoupler	500VAC for 1 minute	5MΩ or higher, measured with 500VDC insulation resistance tester
	Across power supply system terminals and all analog input terminals	Transformer		
	Between channels	Non-insulation	-	-
Noise durability	By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency			
External wiring system	<p>One-touch connector for communication [Transmission circuit]            (5 pins pressure welding type, the plug for the connector is sold separately)            One-touch connector for power supply and FG [Unit power supply and FG]            (5 pins pressure welding type, the plug for the connector is sold separately)            One-touch connector for analog I/O            (4 pins pressure welding type, the plug for the connector is sold separately)            &lt;Sold separately&gt;            Online connector for communication: A6CON-LJ5P            Online connector for power supply: A6CON-PWJ5P</p>			
Applicable wire size	One-touch connector for communication	Communication line : Ver. 1.10 compatible CC-Link dedicated cable 0.5mm <sup>2</sup> (20AWG) [φ2.2 to 3.0], shielded wire 0.5mm <sup>2</sup> (20AWG)		
	One-touch connector for power supply and FG	0.66 to 0.98 mm <sup>2</sup> (18AWG) [φ2.2 to 3.0] Wire diameter 0.16 mm <sup>2</sup> or more		
	One-touch connector for analog I/O	φ1.0 to 1.4 (A6CON-P214), φ1.4 to 2.0 (A6CON-P220) [Applicable cable: 0.14 to 0.2 mm <sup>2</sup> ] φ1.0 to 1.4 (A6CON-P514), φ1.4 to 2.0 (A6CON-P520) [Applicable cable: 0.3 to 0.5 mm <sup>2</sup> ]		
Applicable DIN rail	TH35-7.5Fe, TH35-7.5Al (conforming to JIS C 2812)			
	CC-Link connector type metal installation fitting: A6PLT-J65V1			
External power supply	24VDC (20.4 to 26.4VDC, ripple factor within 5%)			
	Inrush current: 4.2A, within 1.2ms			
	Current consumption: 0.10A (When 24VDC)			
Weight	0.17kg			

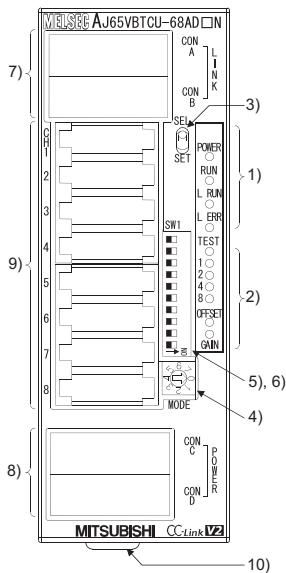
\*1: digit indicates digital value.

\*2: Current value indicates value of instant input current that does not break module inner electrical resistance.

Point
A/D conversion needs to be powered on 30 minutes prior to operation for compliance to the specification (sccuracy).

### 3. NAMES AND SETTING OF PARTS


The name of each part in the AJ65VBTCU-68ADV/ADIN is shown.




[Pin layout and signals name]

Pin arrangement	Pin No.	Signal name
CONA, B	1	DA
	2	DB
	3	DG
	4	NC
	5	SLD
CON1 to 8	1	CH□ V+/I+ <sup>*1</sup>
	2	CH□ V-/I- <sup>*1</sup>
	3	NC
	4	SLD
CONC, D	1	FG
	2	+24V (UNIT)
	3	24G (UNIT)
	4	AG
	5	FG1
*1: □ indicates the connector number. (For CON1, the value in □ is 1.)		
<p>CONA: 5 4 3 2 1</p> <p>CONB: 5 4 3 2 1</p> <p>CON1: 4 3 2 1</p> <p>CON2: 4 3 2 1</p> <p>CON3: 4 3 2 1</p> <p>CON4: 4 3 2 1</p> <p>CON5: 4 3 2 1</p> <p>CON6: 4 3 2 1</p> <p>CON7: 4 3 2 1</p> <p>CON8: 4 3 2 1</p> <p>CONC: 5 4 3 2 1</p> <p>COND: 5 4 3 2 1</p> <p>A module view from the top</p>		

No.	Name and appearance	Description		
1)	Operation status display LED	POWER	ON : Power supply on OFF : Power supply off	
		RUN	Normal mode	On : Normal operation Flickering: 0.1s intervals: Input range setting error, mode select switch setting error. This module is used as the Ver.2 remote device station (Ver.2 compatible slave station) when the network parameter mode is set to remote network Ver.1 mode. 0.5s intervals: Average value setting (count, time) error. Mode select switch setting is changed after power-on. Off : 24VDC power supply shutoff or watchdog timer error occurred.
			Test mode	On : Indicates that the SELECT/SET switch is in the SET position. Flickering: 0.1s intervals: Mode select switch setting error 0.5s intervals: An attempt was made to make setting outside the setting range at the time of offset/gain setting. Off : Indicates that the SELECT/SET switch is in the SELECT or center position.
		L RUN	On : Normal communication Off : Communication cutoff (time expiration error)	
		L ERR.	On : Indicates that transmission speed setting or station number setting is outside the range. Flicker at fixed intervals: Indicates that transmission speed setting or station number setting was changed from that at power-on. Flicker at unfixed intervals: Indicates that you forgot fitting the terminating resistor or the module or CC-Link dedicated cable is affected by noise. Off : Indicates normal communications.	
2)	Offset/gain adjusting LEDs	TEST CH <input type="checkbox"/>	Normal mode Normally OFF	
		OFFSET GAIN	TEST:ON The OFFSET/GAIN/ CH <input type="checkbox"/> LEDs lit change every time the SELECT/SET switch is moved to SELECT.	
3)	SELECT/SET switch	Used to make offset/gain setting in the test mode.		

No.	Name and appearance	Description																																	
4)	Mode select switch (Factory-set to "0")	<p>The switch to be used for selecting the mode among Ver.□ remote device station (Ver.□-compatible slave station)/Normal mode/Test mode</p> <table border="1" data-bbox="252 176 914 489"> <thead> <tr> <th colspan="2" data-bbox="252 176 598 205">AJ65VBTCU-68ADV N</th> <th colspan="2" data-bbox="598 176 914 205">AJ65VBTCU-68ADIN</th> </tr> </thead> <tbody> <tr> <td data-bbox="252 205 381 321">Ver.1 remote device station (Ver.1-compatible slave station)</td> <td data-bbox="381 205 598 321">0: Normal mode 1: Test mode (User range setting 1) 2: Test mode (User range setting 2)</td> <td data-bbox="598 205 727 321">Ver.1 remote device station (Ver.1-compatible slave station)</td> <td data-bbox="727 205 914 321">0: Normal mode 1: Test mode (User range setting)</td> </tr> <tr> <td data-bbox="252 321 381 438">Ver.2 remote device station (Ver.2-compatible slave station)</td> <td data-bbox="381 321 598 438">3: Normal mode 4: Test mode (User range setting 1) 5: Test mode (User range setting 2)</td> <td data-bbox="598 321 727 438">Ver.2 remote device station (Ver.2-compatible slave station)</td> <td data-bbox="727 321 914 438">3: Normal mode 4: Test mode (User range setting)</td> </tr> <tr> <td data-bbox="252 438 381 489">-</td> <td data-bbox="381 438 598 489">6 to 7: Use prohibited</td> <td data-bbox="598 438 727 489">-</td> <td data-bbox="727 438 914 489">2, 5 to 7: Use prohibited</td> </tr> </tbody> </table>	AJ65VBTCU-68ADV N		AJ65VBTCU-68ADIN		Ver.1 remote device station (Ver.1-compatible slave station)	0: Normal mode 1: Test mode (User range setting 1) 2: Test mode (User range setting 2)	Ver.1 remote device station (Ver.1-compatible slave station)	0: Normal mode 1: Test mode (User range setting)	Ver.2 remote device station (Ver.2-compatible slave station)	3: Normal mode 4: Test mode (User range setting 1) 5: Test mode (User range setting 2)	Ver.2 remote device station (Ver.2-compatible slave station)	3: Normal mode 4: Test mode (User range setting)	-	6 to 7: Use prohibited	-	2, 5 to 7: Use prohibited																	
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5)	Transmission speed setting switches  	<table border="1" data-bbox="252 529 914 751"> <thead> <tr> <th data-bbox="252 529 401 594" rowspan="2">Set value</th> <th colspan="3" data-bbox="401 529 698 559">Setting switches</th> <th data-bbox="698 529 914 594" rowspan="2">Transmission speed</th> </tr> <tr> <th data-bbox="401 559 498 594">4</th> <th data-bbox="498 559 598 594">2</th> <th data-bbox="598 559 698 594">1</th> </tr> </thead> <tbody> <tr> <td data-bbox="252 594 401 623">0</td> <td data-bbox="401 594 498 623">OFF</td> <td data-bbox="498 594 598 623">OFF</td> <td data-bbox="598 594 698 623">OFF</td> <td data-bbox="698 594 914 623">156kbps</td> </tr> <tr> <td data-bbox="252 623 401 652">1</td> <td data-bbox="401 623 498 652">OFF</td> <td data-bbox="498 623 598 652">OFF</td> <td data-bbox="598 623 698 652">ON</td> <td data-bbox="698 623 914 652">625kbps</td> </tr> <tr> <td data-bbox="252 652 401 681">2</td> <td data-bbox="401 652 498 681">OFF</td> <td data-bbox="498 652 598 681">ON</td> <td data-bbox="598 652 698 681">OFF</td> <td data-bbox="698 652 914 681">2.5Mbps</td> </tr> <tr> <td data-bbox="252 681 401 710">3</td> <td data-bbox="401 681 498 710">OFF</td> <td data-bbox="498 681 598 710">ON</td> <td data-bbox="598 681 698 710">ON</td> <td data-bbox="698 681 914 710">5.0Mbps</td> </tr> <tr> <td data-bbox="252 710 401 751">4</td> <td data-bbox="401 710 498 751">ON</td> <td data-bbox="498 710 598 751">OFF</td> <td data-bbox="598 710 698 751">OFF</td> <td data-bbox="698 710 914 751">10Mbps</td> </tr> </tbody> </table> <p data-bbox="246 758 928 860">Always set the transmission speed within the above range. The switches are all factory-set to OFF. Making any other setting than the above will result in an error flickering the "L ERR." LED. Confirm the transmission speed setting switch numbers on the seal located on the side face of the connector for analog I/O.</p>	Set value	Setting switches			Transmission speed	4	2	1	0	OFF	OFF	OFF	156kbps	1	OFF	OFF	ON	625kbps	2	OFF	ON	OFF	2.5Mbps	3	OFF	ON	ON	5.0Mbps	4	ON	OFF	OFF	10Mbps
Set value	Setting switches			Transmission speed																															
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4	ON	OFF	OFF	10Mbps																															



No.	Name and appearance	Description																																																																																																														
6)	<p data-bbox="148 295 275 336">Station number setting switches</p> 	<p data-bbox="285 117 965 176">Use the switches in STATION NO. "10", "20" and "40" to set the tens of the station number. Use the switches in STATION NO. "1", "2", "4" and "8" to set the units of the station number.</p> <p data-bbox="285 180 591 198">The switches are all factory-set to OFF.</p> <p data-bbox="285 202 708 219">Always set the station number within the range 1 to 64.</p> <p data-bbox="285 224 961 263">Setting any other number than 1 to 64 will result in an error, flickering the "L ERR." LED. You cannot set the same station number to two or more stations.</p> <table border="1" data-bbox="291 270 954 612"> <thead> <tr> <th rowspan="2">Station number</th> <th colspan="3">Tens</th> <th colspan="4">Units</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 data-bbox="285 630 909 647">(Example) To set the station number to "32", set the switches as indicated below.</p> <table border="1" data-bbox="291 659 954 751"> <thead> <tr> <th rowspan="2">Station number</th> <th colspan="3">Tens</th> <th colspan="4">Units</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> <p data-bbox="285 765 965 805">Confirm the station number setting switch numbers on the seal located on the side face of the connector for analog I/O.</p>	Station number	Tens			Units				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			Units				40	20	10	8	4	2	1	32	OFF	ON	ON	OFF	OFF	ON	OFF
Station number	Tens			Units																																																																																																												
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7)	One-touch connector for communication	A one-touch connector for connection of the communication line When carrying out wiring, connect two optional one-touch connector plugs for communication at top and bottom.																																																																																																														
8)	One-touch connector for power supply and FG	A one-touch connector for connection of the module power supply line and FG. When carrying out jumper wiring, connect two optional one-touch connector plugs for power supply and FG at top and bottom.																																																																																																														
9)	One-touch connector for analog I/O	One-touch connector for analog I/O Connect a one-touch connector plug when wiring.																																																																																																														
10)	DIN rail hook	Used to mount the module to the DIN rail.																																																																																																														

**Point**

After power-on, do not change the mode select switch setting.  
If you change it midway during operation, the setting at power-on is valid.

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## **4. LOADING AND INSTALLATION**

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### **4.1 Precautions when handling**

The following is an explanation of handling precautions of the module.

- (1) Because the case of the module is made of resin, be careful not to drop it or expose it to strong impact.

### **4.2 Installation environment**

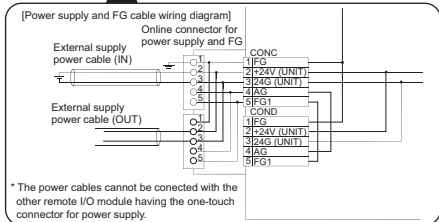
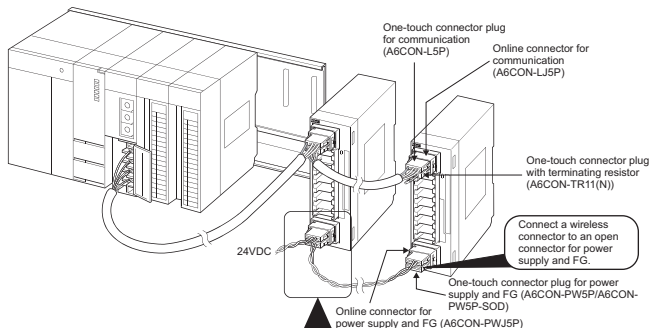
Never install the module in the following environments:

- (1) Locations where the ambient temperature is outside the range of 0 to 55°C.
- (2) Locations where the ambient humidity is outside the range of 10 to 99%RH.
- (3) Locations where dew condensation takes place due to sudden temperature changes.
- (4) Locations where there are corrosive and/or combustible gasses.
- (5) Locations where there is a high level of conductive power (such as dust and iron filings, oil mist, salt, and organic solvents).
- (6) Locations exposed to the direct rays of the sun.
- (7) Locations where strong power and magnetic fields are generated.
- (8) Locations where vibration and shock are directly transmitted to the main module.

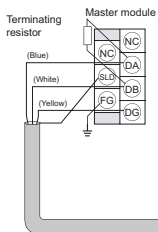
## 5. DATA LINK CABLE WIRING

### 5.1 Connection of the CC-Link dedicated cables

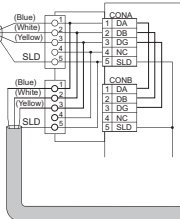
Connect the CC-Link dedicated cable between the AJ65VBTCU-68ADV/ADIN and master module as shown below.



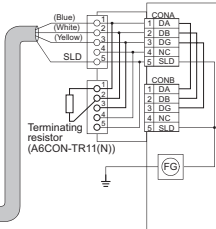
[CC-Link dedicated cable wiring diagram]



Online connector  
for communication



Online connector  
for communication



Ver.1.10 Compatible CC-Link dedicated cable (FANC-110SBH,CS-110,FA-CBL200PSBH)

Point

- On this unit, use the Ver. 1.10-compatible CC-Link dedicated cable (FANC-110SBH, CS-110, FA-CBL200PSBH).  
You cannot use the Ver. 1.10-compatible CC-Link dedicated cables of other than the above types, CC-Link dedicated cables and CC-Link dedicated, high-performance cables.
- The shield cable of the CC-Link dedicated cable should be connected to "SLD" in each module, and both ends should be grounded through "FG".

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## 6. WIRING

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### 6.1 Wiring precautions

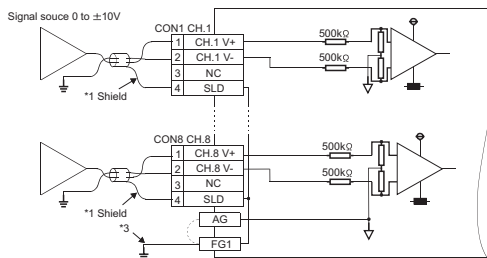
To obtain maximum performance from the functions of AJ65VBTCU-68ADV/ADIN and improve the system reliability, an external wiring with high durability against noise is required.

The precautions when performing external wiring are as follows:

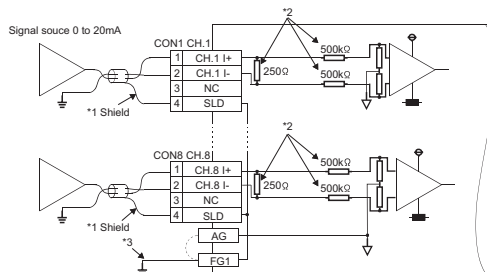
- (1) Use separate cables for the AC and AJ65VBTCU-68ADV/ADIN external input signals, in order not to be affected by the AC side surge or conductivity.
- (2) Do not bundle or place with load carrying wires other than the main circuit line, high voltage line or programmable controller. Noises, surges, or conductivity may affect the system.
- (3) Place a one-point grounding on the programmable controller side for the shielded line or shielded cable. However, depending on the external noise conditions, it may be better have a grounding externally.
- (4) Smoke and fire may occur when an overcurrent flows intermittently for a long period of time. To avoid this, configure a safety circuit, such as an external fuse, to protect the product.

## 6.2 Wiring of module with external equipment

### (1) AJ65VBTCU-68ADVN (For voltage input)



### (2) AJ65VBTCU-68ADIN (For current input)



\*1: Use a two-core twisted shield line for the power cable.

\*2: Indicates the AJ65VBTCU-68ADIN input resistor.

\*3: Always perform grounding for FG1. When there is a lot of noise, it may be better ground AG as well.

If the grounding wiring (grounding yes/no) is changed after the offset and gain are set, perform the setting of the offset/gain values again.

Point
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- Do not insert the one-touch connector plug for I/O of the one-touch connector type/connector type compact remote I/O unit into the one-touch connector for analog I/O accidentally.  
Doing so can cause the module to be damaged.
- In an unused channel, if terminals remain open, an erratic digital value may be output.

To prevent this, take any of the following measures.


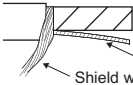
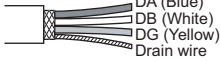
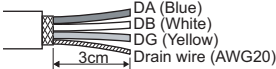
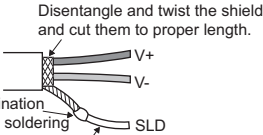
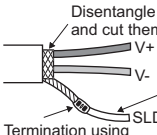
1. Select Prohibit in the A/D conversion enable/prohibit setting for the unused channel. Note that changing the setting from Enable to Prohibit will reduce the sampling cycle.
2. Short-circuit the input terminals (terminal V+ and V-) of the unused channel.
3. Connect the AG terminal to the GND terminal of the external device.

## 7. HOW TO WIRE THE ONE-TOUCH CONNECTOR PLUG

This section describes the way to wire the one-touch connector plug. Refer to the AJ65VBTCU-68ADV/N/ADIN Analog-Digital User's Manual for more information on the types and specifications of the one-touch connector plugs which conform to the AJ65VBTCU-68ADV/N/ADIN.

### (1) Cable termination work

Do the following work on the cable terminations of the communication and analog input cables that are inserted into the one-touch connector plugs.

Communication cable termination work	
<p>1. Cut the sheath.</p> 	<p>2. Separate the shield and drain wire and cut the shield.</p>  <p>Shield wire Drain wire</p>
<p>3. Cut the aluminum tape and braid.</p>  <p>DA (Blue) DB (White) DG (Yellow) Drain wire</p>	<p>4. Stretch the drain wire and twist it from the base. (3cm in length, 7 times or more)</p>  <p>DA (Blue) DB (White) DG (Yellow) Drain wire (AWG20) 3cm</p>
Analog input cable termination work	
Termination using soldering	Termination using crimping sleeves
<p>Disentangle and twist the shield and cut them to proper length.</p>  <p>V+ V- SLD</p> <p>Termination using soldering</p> <p>One-touch connector plug for analog I/O Connect the applicable cable (*1).</p>	<p>Disentangle and twist the shield and cut them to proper length.</p>  <p>V+ V- SLD</p> <p>Termination using crimping sleeves</p> <p>One-touch connector plug for analog I/O Connect the applicable cable (*1).</p> <p>Example: Butt joint</p>

\*1: For the applicable cable size, refer to the AJ65VBTCU-68ADV/N/ADIN Analog-Digital User's Manual.

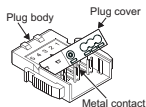
#### Point

- Where possible, round the tip that was cut with nippers or like. If the section of the cable to be inserted is not round, the cable may be caught at any point and not go far enough.
- Do insulation work as necessary on the area of the shield that will not be inserted into the one-touch connector plug.



(2) Check the plug cover

Check that the plug cover is attached to in the plug.



**Note:**

Do not push the plug cover into the plug body. Once pressed, the plug cannot be used any more.

(3) Insert the cable

Lift the end of the plug cover and insert the cable until it almost reaches the plug body (within 1mm from the other end of the plug cover).



Insert the signal cables into the one-touch connector plug as shown below.

<For communication>

<For power supply and FG>

<For analog input>



Signal name

DA (Blue)  
DB (White)  
DG (Yellow)  
NC  
SLD



Signal name

FG  
+24V (UNIT)  
24G (UNIT)  
AG  
FG1



Signal name

V+ / I+  
V- / I-  
NC  
SLD

**Point**

- Insert the cables far enough. Not doing so can cause an insulation displacement fault.
- The cable inserted may come out of the cover front. At this time, pull it back until the cable tip goes back into the plug cover.

(4) Insulation displacement of plug cover

Using pliers or like, push the plug cover into the plug to insulation-displace it.

After insulation displacement, make sure that the plug cover is securely installed in the plug as shown right.

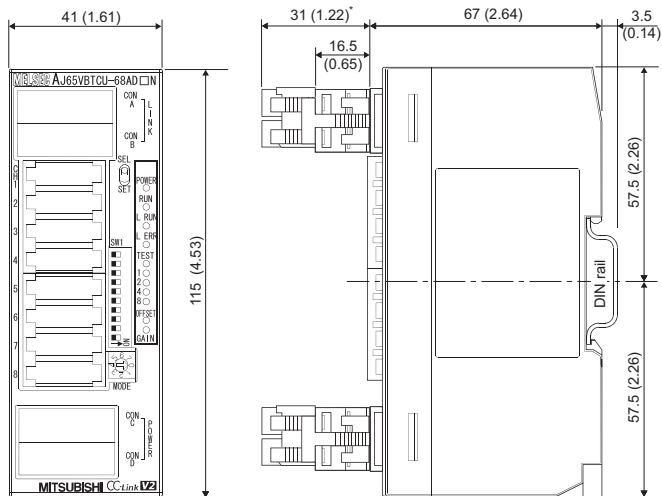


**Point**

- The plug cover and plug latches may not engage at the time of insulation displacement, raising the cover. Since the plug cover has not been insulation-displaced sufficiently in this state, push the cover into the plug until it is installed securely.

## 8. EXTERNAL DIMENSION DIAGRAM

[AJ65VBTCU-68ADV/N/ADIN]



\*: This section should be 14.5mm (0.57inch) when an online connector is not installed.

Unit: mm (inch)



## WARRANTY

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