MITSUBISHI

Digital-Analog Converter Module Type AJ65VBTCU-68DAVN

User's Manual
(Hardware)

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-68DAN-U-HW
MODEL CODE	13JP20
IB(NA)-0800252-F(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".

⚠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

- Install a safety circuit external to the programmable controller that keeps the entire system safe even when there are problems with the external power supply or the programmable controller.
  Otherwise, trouble could result from erroneous output or erroneous operation.
  (1) The status of analog output changes depending on the setting of various functions that control the analog output. Take sufficient caution when setting for those functions.
  For details of analog output status, refer to Section 3.4.1 "Combinations of various functions" in the User's Manual.
  (2) Normal output may not be obtained due to malfunctions of output elements or the internal circuits.
  So build an external monitoring circuit that will monitor any single outputs that could cause serious trouble.

⚠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.
- At power ON/OFF, voltage or current may instantaneously be output from the output terminal of this module. In such case, wait until the analog output becomes stable to start controlling the external device.

[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.
  Not doing so can cause a 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.
- 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. ● 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.

● 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)-0800252-A	First edition
Jul., 2005	IB(NA)-0800252-B	Partial correction SAFETY PRECAUTIONS
Dec., 2006	IB(NA)-0800252-C	Partial correction Chapter 3, Chapter 8
Dec., 2010	IB(NA)-0800252-D	Addition CONDITIONS OF USE THE PRODUCT Partial correction SAFETY PRECAUTIONS, About Manuals, Section 2.1, Chapter 3, Section 5.2, 6.2, Chapter 7
Dec., 2011	IB(NA)-0800252-E	Addition SAFETY PRECAUTIONS (Chinese)
Jun., 2012	IB(NA)-0800252-F	Partial correction Section 5.1

CONTENTS

MANUAL

The following manuals are also related to this product.
Order them if necessary.

Detailed Manual

Manual name	Manual number (Model code)
Digital-Analog Converter Module type AJ65VBTCU-68DAVN User's Manual	SH-080402E (13JR66)

Related Manuals

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).

1. OVERVIEW

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

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

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

2. SPECIFICATION

2.1 Performance specifications

The performance specifications of the AJ65VBTCU-68DAVN are shown below.
For general specifications, refer to detailed manual.

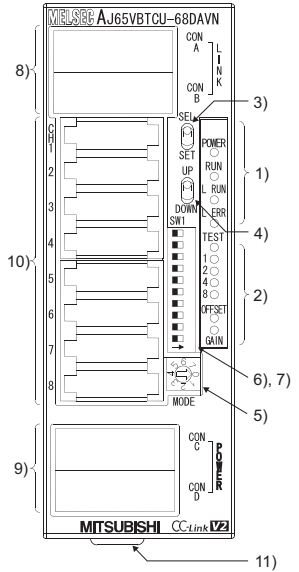
<table>
<tr><td>Item</td><td colspan="5">AJ65VBTCU-68DAVN</td></tr>
<tr><td>Protection class</td><td colspan="5">IP1XB</td></tr>
<tr><td>Digital input</td><td colspan="5">16-bit signed binary (-4096 to 4095)</td></tr>
<tr><td>Analog output</td><td colspan="5">-10 to 10VDC (external load resistance: 2kΩ to 1MΩ)</td></tr>
<tr><td>I/O characteristics, maximum resolution, accuracy (accuracy relative to maximum value of analog output value)</td><td colspan="5"><table>
<tr><td rowspan="2">Digital Input Value</td><td rowspan="2">Analog Output Range</td><td colspan="2">Accuracy</td><td rowspan="2">Max. Resolution</td></tr>
<tr><td>Ambient temperature 0 to 55°C</td><td>Ambient temperature 25±5°C</td></tr>
<tr><td rowspan="2">-4000 to 4000</td><td>-10 to 10V</td><td rowspan="2">±0.3% (±30mV)</td><td rowspan="2">±0.2% (±20mV)</td><td rowspan="2">2.5mV</td></tr>
<tr><td>User range setting 1 (-10 to 10V)</td></tr>
<tr><td rowspan="3">0 to 4000</td><td>0 to 5V</td><td rowspan="3">±0.3% (±15mV)</td><td rowspan="3">±0.2% (±10mV)</td><td>1.25mV</td></tr>
<tr><td>1 to 5V</td><td rowspan="2">1.0mV</td></tr>
<tr><td>User range setting 2 (0 to 5V)</td></tr>
</table></td></tr>
<tr><td>Maximum conversion speed</td><td colspan="5">1ms/channel</td></tr>
<tr><td>Output short-circuit protection</td><td colspan="5">Provided</td></tr>
<tr><td>Absolute maximum output</td><td colspan="5">±12V</td></tr>
</table>

<table>
<tr><th colspan="2">Item</th><th>AJ65VBTCU-68DAVN</th></tr>
<tr><td colspan="2">Number of analog output points</td><td>8 channels/module</td></tr>
<tr><td colspan="2">CC-Link station type</td><td>Remote device station
(Ver.1 remote device station, Ver.2 remote device station)</td></tr>
<tr><td colspan="2">Number of occupied stations</td><td>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)</td></tr>
<tr><td colspan="2">Communication cable</td><td>Ver.1.10 compatible CC-Link dedicated cable:
FANC-110SBH, FA-CBL200PSBH, CS-110</td></tr>
<tr><td colspan="2">Isolation specifications</td><td>
<table>
<tr><th>Specific isolated area</th><th>Isolation method</th><th>Dielectric withstand voltage</th><th>Insulation resistance</th></tr>
<tr><td>Across communication system terminals and all analog input terminals</td><td>Photocoupler isolation</td><td rowspan="2">500V AC for 1 minute</td><td rowspan="2">5MΩ or higher, measured with 500V DC insulation resistance tester</td></tr>
<tr><td>Across power supply system terminals and all analog input terminals</td><td>Transformer isolation</td></tr>
<tr><td>Between channels</td><td>Not isolated</td><td>-</td><td>-</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Noise durability</td><td>By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency</td></tr>
<tr><td colspan="2">External wiring system</td><td>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)
<Sold separately>
Online connector for communication : A6CON-LJ5P
Online connector for power supply : A6CON-PWJ5P</td></tr>
<tr><td rowspan="3">Applicable wire size</td><td>One-touch connector for communication</td><td>Communication line : Ver. 1.10 compatible CC-Link dedicated cable
0.5mm^2 (20AWG) [ϕ2.2 to 3.0], shielded wire 0.5mm^2 (20AWG)</td></tr>
<tr><td>One-touch connector for power supply and FG</td><td>0.66 to 0.98 mm^2 (18AWG) [ϕ2.2 to 3.0]
Wire diameter 0.16 mm or more</td></tr>
<tr><td>One-touch connector for analog I/O</td><td>ϕ1.0 to 1.4 (A6CON-P214), ϕ1.4 to 2.0 (A6CON-P220)
[Applicable cable : 0.14 to 0.2 mm^2]
ϕ1.0 to 1.4 (A6CON-P514), ϕ1.4 to 2.0 (A6CON-P520)
[Applicable cable : 0.3 to 0.5 mm^2]</td></tr>
<tr><td colspan="2" rowspan="2">Applicable DIN rail</td><td>TH35-7.5Fe, TH35-7.5Al (conforming to JIS C 2812)</td></tr>
<tr><td>CC-Link connector type metal installation fitting : A6PLT-J65V1</td></tr>
<tr><td colspan="2" rowspan="3">External supply power</td><td>24V DC (20.4V DC to 26.4V DC, ripple factor within 5%)</td></tr>
<tr><td>Inrush current : 4.3A, within 1.2ms</td></tr>
<tr><td>Current consumption 0.15A (When 24V DC)</td></tr>
<tr><td colspan="2">Weight</td><td>0.16kg</td></tr>
</table>

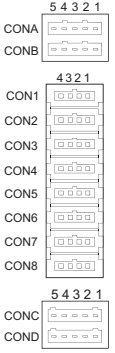
Point
D/A conversion needs to be powered on 30 minutes prior to operation for compliance to the specification (sccuracy).

3. NAMES AND SETTING OF PARTS

The name of each part in the AJ65VBTCU-68DAVN is shown.



[Pin layout and signals name]



A module view from the top

Pin No.		Signal name
CONA,B	1	DA
	2	DB
	3	DG
	4	NC
	5	SLD
CON 1 to 8	1	CH☐ V+ *1
	2	NC
	3	CH☐ COM *1
	4	NC
CONC,D	1	FG
	2	+24V (UNIT)
	3	24G (UNIT)
	4	NC
	5	NC

*1: ☐ indicates the connector number. (For CON1, the value in ☐ is 1.)

<table>
<tr><th>No.</th><th>Name and appearance</th><th colspan="3">Description</th></tr>
<tr><td rowspan="5">1)</td><td rowspan="5">Operation status display LED</td><td>POWER</td><td colspan="2">ON : Power supply on
OFF : Power supply off</td></tr>
<tr><td rowspan="2">RUN</td><td>Normal mode</td><td>On : Normal operation
Flickering: 0.1s intervals: Output 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.</td></tr>
<tr><td>Test mode</td><td>On : Indicate 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.</td></tr>
<tr><td>L RUN</td><td colspan="2">On : Normal communication
Off : Communication cutoff (time expiration error)</td></tr>
<tr><td>L ERR.</td><td colspan="2">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.</td></tr>
<tr><td rowspan="2">2)</td><td rowspan="2">Offset/gain adjusting LEDs</td><td rowspan="2">TEST
CH□
OFFSET
GAIN</td><td>Normal mode</td><td>Normally OFF.</td></tr>
<tr><td>Test mode</td><td>TEST : ON
The OFFSET/GAIN/ CH□ LEDs lit change every time the SELECT/SET switch is moved to SELECT.</td></tr>
<tr><td>3)</td><td>SELECT/SET switch</td><td colspan="3">The switch to be used for making the offset/gain settings during test mode.</td></tr>
<tr><td>4)</td><td>UP/DOWN switch</td><td colspan="3">Used to adjust the offset value and gain value of the channel specified by the SELECT/SET switch.</td></tr>
<tr><td>5)</td><td>Mode select switch (Factory-set to "0")</td><td colspan="3">The switch to be used for selecting the mode among Ver.□ remote device station (Ver.□-compatible slave station)/Normal mode/Test mode
<table>
<tr><th colspan="2">AJ65VBTCU-68DAVN</th></tr>
<tr><td>Ver.1 remote device station (Ver.1-compatible slave station)</td><td>0: Normal mode
1: Test mode (User range setting 1)
2: Test mode (User range setting 2)</td></tr>
<tr><td>Ver.2 remote device station (Ver.2-compatible slave station)</td><td>3: Normal mode
4: Test mode (User range setting 1)
5: Test mode (User range setting 2)</td></tr>
<tr><td>-</td><td>6 to 7: Use prohibited</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Name and appearance</th><th>Description</th></tr>
<tr><td>6)</td><td>Transmission speed setting switches
 
</td><td>
<table>
<tr><th rowspan="2">Set Value</th><th colspan="3">Setting Switches</th><th rowspan="2">Transmission Speed</th></tr>
<tr><th>4</th><th>2</th><th>1</th></tr>
<tr><td>0</td><td>OFF</td><td>OFF</td><td>OFF</td><td>156kbps</td></tr>
<tr><td>1</td><td>OFF</td><td>OFF</td><td>ON</td><td>625kbps</td></tr>
<tr><td>2</td><td>OFF</td><td>ON</td><td>OFF</td><td>2.5Mbps</td></tr>
<tr><td>3</td><td>OFF</td><td>ON</td><td>ON</td><td>5.0Mbps</td></tr>
<tr><td>4</td><td>ON</td><td>OFF</td><td>OFF</td><td>10Mbps</td></tr>
</table>
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.</td></tr>
<tr><td>7)</td><td>Station number setting switches
 
</td><td>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.
The switches are all factory-set to OFF.
Always set the station number within the range 1 to 64.
You cannot set the same station number to two or more stations.
Setting any other number than 1 to 64 will result in an error, flickering the "L ERR." LED.
<table>
<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>
<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>
</table>
(Example) To set the station number to "32", set the switches as indicated below.
<table>
<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>
<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>
</table>
Confirm the station number setting switch numbers on the seal located on the side face of the connector for analog I/O.</td></tr>
<tr><td>8)</td><td>One-touch connector for communication</td><td>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.</td></tr>
<tr><td>9)</td><td>One-touch connector for power supply and FG</td><td>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.</td></tr>
</table>

No.	Name and appearance	Description
10)	One-touch connector for analog I/O	One-touch connector for analog I/O Connect a one-touch connector plug when wiring.
11)	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.

4. LOADING AND INSTALLATION

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 90%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

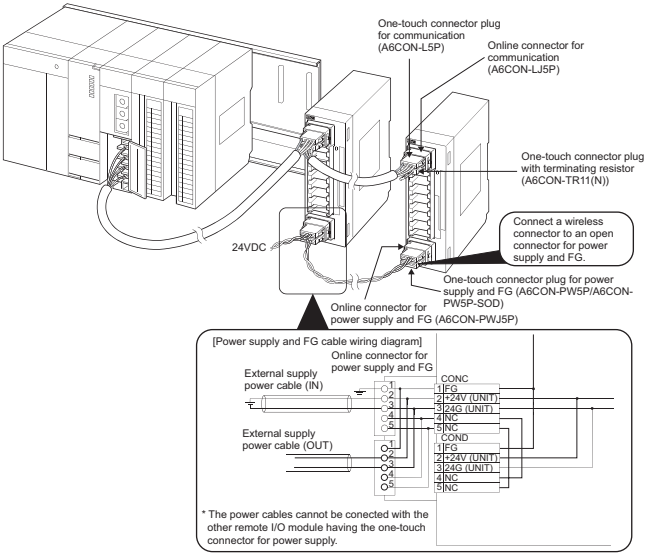
5.1 Instructions for handling the CC-Link dedicated cables

Do not handle the CC-Link dedicated cables roughly as described below. Doing so can damage the cables.

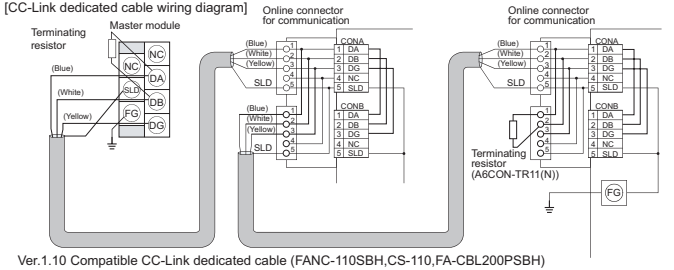
- Compact with a sharp object.
- Twist the cable excessively.
- Pull the cable hard. (more than the permitted elasticity.)
- Step on the cable.
- Place an object on the top.
- Scratch the cable's protective layer.

5.2 Connection of the CC-Link dedicated cables

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



[CC-Link dedicated cable wiring diagram]



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".

6. WIRING

6.1 Wiring precautions

To obtain maximum performance from the functions of AJ65VBTCU-68DAVN and improve the system reliability, an external wiring with high durability against noise is required.
The precautions when performing external wiring are as follows:

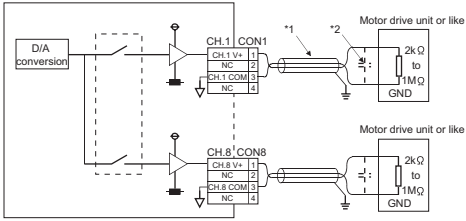
(1) Use separate cables for the AC and AJ65VBTCU-68DAVN external input signals, in order not to be affected by the AC side surge or conductivity.

(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.

(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 Module connection example



*1 Use a two-core twist shielded line for the wiring.
*2 If noise or ripples occur in the external wiring, connect a 0.1 to 0.47μF capacitor (25V or higher voltage-resistant product) to the input terminals of the external device.

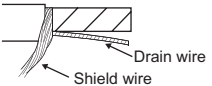
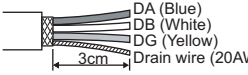
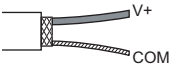
Point
• Do not insert the one-touch connector plug for I/O of the one-touch connector type/connector type compact remote I/O unit into the one-touch connector for analog I/O accidentally. Doing so can cause the module to be damaged.

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-68DAVN Digital-Analog User's Manual for more information on the types and specifications of the one-touch connector plugs which conform to the AJ65VBTCU-68DAVN.

(1) Cable termination work

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

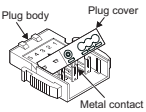
<table>
<tr><td colspan="2">Communication cable termination work</td></tr>
<tr><td>1. Cut the outer insulation layer.
  </td><td>2. Separate the shield and drain wire and cut the shield.
 
</td></tr>
<tr><td>3. Cut the aluminum tape and Braid.
 
</td><td>4. Stretch the drain wire and twist it from the base. (3cm in length, 7 times or more)
 
</td></tr>
<tr><td colspan="2">Termination work for analog output cable</td></tr>
<tr><td>1. Cut the outer insulation layer.
  </td><td>2. Cut the ends of shielded wires to make them adequate in length.
 
</td></tr>
</table>

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) Checking the plug cover

Check whether the plug cover is installed in the plug.



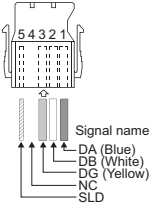
Caution:
Before inserting the cable, do not push the plug cover into the plug. Once insulation-displaced, the plug cannot be reused.

(3) Inserting the cable

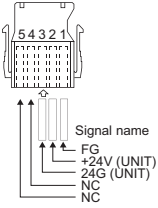
Lift the back of the plug cover and insert the cable until it makes contact with the plug.

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

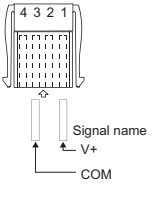
<For communication>



<For power supply and FG>



<For analog output>



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.

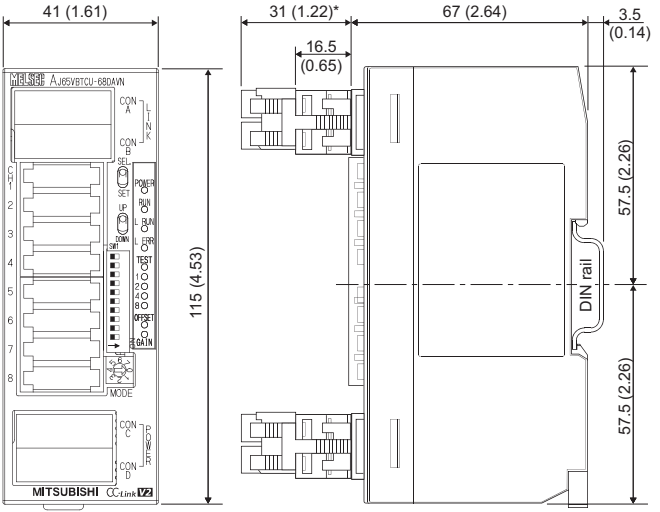
(4) Insulation displacement of plug cover

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 below.

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



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

Unit: mm (inch)

Memo

Memo

Memo

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