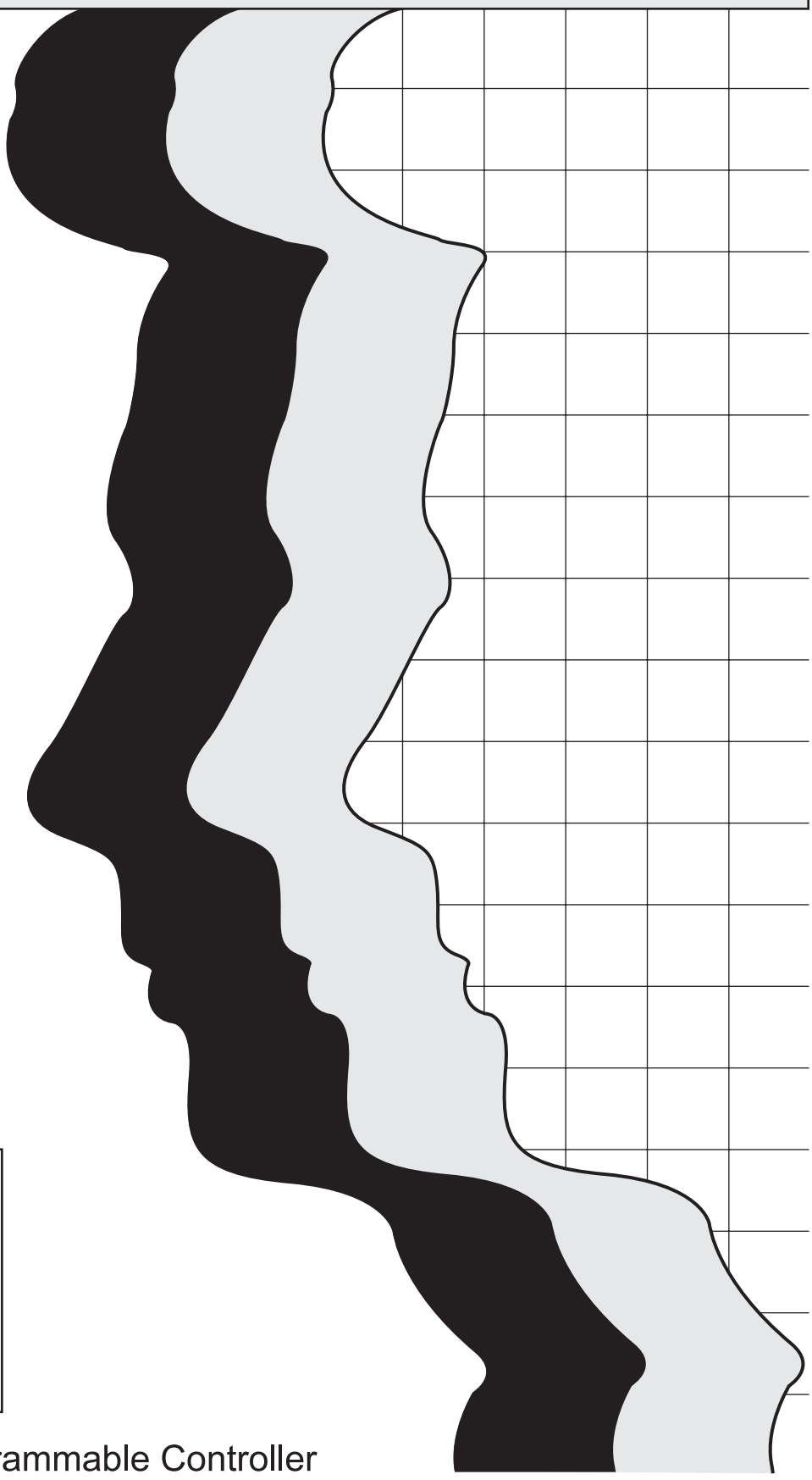
MITSUBISHI

Digital-Analog Converter Module type AJ65SBT-62DA

User's Manual



MELSEC

Mitsubishi Programmable Controller

• 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.
The precautions given in this manual are concerned with this product. 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

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller.
  Not doing so can cause an accident due to false output or malfunction.
  (1) The status of analog output depends on the setting of various functions that control the analog output. Exercise great caution when setting those functions.
  For details of analog output status, refer to Section 3.4.1 "Combinations of various functions" in the user's manual for the module.
  (2) Due to failure of the output element or internal circuit, normal output may not be obtained correctly.
  Configure an external circuit for monitoring output signals that could cause a serious accident.

⚠ 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.
- When a module is powered 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. Then, start controlling the external device.

[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.

[Wiring Precautions]

⚠ CAUTION
• 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.

[Startup and 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 the terminal screws can cause 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.

• 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 left of the back cover.

Print Date	* Manual Number	Revision
Oct., 2000	SH (NA)-080107-A	First printing
Mar., 2005	SH (NA)-080107-B	Program example correction Addition Section 2.3 Correction SAFETY PRECAUTIONS, About Manuals, Conformation to the EMC Directive and Low Voltage Instruction, Chapter 1, Section 2.1, 2.2, 3.1, 3.4.1, 3.6.5, 4.2, 4.7.2, 6.2, Appendix 2
Mar., 2006	SH (NA)-080107-C	Correction REVISIONS, Conformation to the EMC Directive and Low Voltage Instruction, Section 2.3
Oct., 2006	SH (NA)-080107-D	Correction SAFETY PRECAUTIONS, Section 4.3, Appendix 2
Dec., 2010	SH (NA)-080107-E	Addition CONDITIONS OF USE FOR THE PRODUCT Correction SAFETY PRECAUTIONS, Related Manuals, About Manuals, About the Generic Terms and Abbreviations, Chapter 1, Section 1.1, 2.2, 3.1, 3.2, 3.3, 3.3.1, 3.3.2, 3.4, 3.4.1, 3.5.2, 3.6.2, 4.2, 4.3, 4.4, 4.7, 4.8.2, 5.2, 5.3, 6.1, 6.2, Appendix1 Deletion Section 4.7.1

Japanese Manual Version SH-080088-F

INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A series general-purpose programmable controller.
Before using the product, please read this manual carefully to use it to its optimum.

CONTENTS

About Manuals

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

Related Manuals

Manual Name	Manual Number (Model Code)
CC-Link System Master/Local Module Type AJ61BT11/A1SJ61BT11 User's Manual Describes the system configuration, performance specifications, functions, handling, wiring and troubleshooting of the AJ61BT11 and A1SJ61BT11. (Optionally available)	IB-66721 (13J872)
CC-Link System Master/Local Module Type AJ61QBT11/A1SJ61QBT11 User's Manual Describes the system configuration, performance specifications, functions, handling, wiring and troubleshooting of the AJ61QBT11 and A1SJ61QBT11. (Optionally available)	IB-66722 (13J873)
CC-Link System Master/Local Module User's Manual Describes the system configuration, performance specifications, functions, handling, wiring and troubleshooting of the QJ61BT11. (Optionally available)	SH-080394E (13JR64)
type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A mode) Programming Manual (Dedicated Instructions) Explains the instructions extended for the AnSHCPU/AnACPU/AnUCPU/ QCPU-A (A mode). (Optionally available)	IB-66251 (13J742)
MELSEC-L CC-Link System Master/Local Module User's Manual Describes the system configuration, performance specifications, functions, handling, wiring and troubleshooting of the L26CPU-BT and LJ61BT11. (Optionally available)	SH-080895ENG (13JZ41)

Compliance with the EMC and Low Voltage Directives

(1) For programmable controller system

To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and Low Voltage Directives compliant) into other machinery or equipment, refer to the "EMC AND LOW VOLTAGE DIRECTIVES" chapter of the User's Manual for the CPU module used.

The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.

(2) For the product

For the compliance of this product with the EMC and Low Voltage Directives, refer to the "CC-Link module" section in the "EMC AND LOW VOLTAGE DIRECTIVES" chapter of the User's Manual for the CPU module used.

About the Generic Terms and Abbreviations

Unless otherwise specified, the following generic terms and abbreviations are used in this manual to describe Type AJ65SBT-62DA digital-analog conrerter module.

Generic Term/Abbreviation	Description
GX Developer	Product name of the software package for the MELSEC programmable Controllers.
GX Works2	
ACPU	Generic term for A0J2CPU, A0J2HCPU, A1CPU, A2CPU, A2CPU-S1, A3CPU, A1SCPU, A1SCPU-S1, A1SCPUC-24-R2, A1SHCPU, A1SJCPU, A1SJCPU-S3, A1SJHCPU, A1NCPU, A2NCPU, A2NCPU-S1, A3NCPU, A3MCPU, A3HCPU, A2SCPU, A2SCPU-S1, A2SHCPU, A2ACPU, A2ACPU-S1, A3ACPU, A2UCPU, A2UCPU-S1, A2ASCPU, A2ASCPU-S1, A2ASCPU-S30, A2USHCPU-S1, A3UCPU, A4UCPU
QnACPU	Generic term for Q2ACPU, Q2ACPU-S1, Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q3ACPU, Q4ACPU, Q4ARCPU
QCPU (A mode)	Generic term for Q02CPU-A, Q02HCPU-A, Q06HCPU-A
QCPU (Q mode)	Generic term for Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU, Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU.
LCPU	Generic term for L02CPU, L26CPU-BT.
Master station	Station that controls the data link system. One master station is required for each system.
Local station	Station having a programmable controller CPU and the ability to communicate with the master and other local stations.
Remote I/O station	Remote station that handles bit unit data only. (Performs input and output with external devices.) (AJ65BTB1-16D, AJ65SBTB1-16D)
Remote device station	Remote station that handles bit unit and word unit data only. (Performs input and output with external devices, and analog data exchange.)
Remote station	Generic term for remote I/O station and remote device station. (Controlled by the master station)
Intelligent device station	Station that can perform transient transmission, such as the AJ65BT-R2N (including local stations).
Master module	Generic term for AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11, QJ61BT11N, and QJ61BT11 when they are used as master stations.
Local module	Generic term for AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11, QJ61BT11N, and QJ61BT11 when they are used as local stations.
SB	Link special relay (for CC-Link) Bit unit information that indicates the module operating status and data link status of the master station/local station. (Expressed as SB for convenience)
SW	Link special register (for CC-Link) 16 bit unit information that indicates the module operating status and data link status of the master station/local station. (Expressed as SW for convenience)
RX	Remote input (for CC-Link) Information entered in bit units from the remote station to the master station. (Expressed as RX for convenience)
RY	Remote output (for CC-Link) Information output in bit units from the remote station to the master station. (Expressed as RY for convenience)
RWw	Remote register (Write area for CC-Link) Information output in 16-bit units from the master station to the remote device station. (Expressed as RWw for convenience)
RWr	Remote register (Read area for CC-Link) Information entered in 16-bit units from the master station to the remote device station. (Expressed as RWr for convenience)

Product Components

This product consists of the following.

Product Name	Quantity
Type AJ65SBT-62DA digital - analog converter module	1
Type AJ65SBT-62DA digital - analog converter module user's manual (hardware)	1

1 OVERVIEW

This user's manual explains the specifications, handling, programming methods and others of Type AJ65SBT-62DA digital-analog converter module (hereafter abbreviated to the "AJ65SBT-62DA") which is used as a remote device station of a CC-Link system. The AJ65SBT-62DA is a module designed to convert digital values (16-bit signed BIN data) from outside the programmable controller into analog values (voltages or currents).

1.1 Features

This section gives the features of the AJ65SBT-62DA.

(1) High accuracy

This module performs D/A conversion at the accuracy of ±0.4% relative to the maximum value of the analog output value at the operating ambient temperature of 0 to 55°C, or at ±0.2% relative to the maximum value of the analog output value at the operating ambient temperature of 25±5°C.

(2) Output range selectable per channel

You can choose the analog output range per channel to change the I/O conversion characteristics.

(3) High resolution of 1/±4000

By changing the output range, you can choose and set the resolution to either 1/4000 or 1/±4000 (when the -10 to +10V range or user range setting 1 is selected) to provide high-resolution analog values.

(4) Setting of analog output hold or clear at STOP of programmable controller CPU

You can specify whether to hold or clear the analog value which is being output from each channel of the unit when the programmable controller CPU has entered the STOP mode or the AJ65SBT-62DA has stopped D/A conversion due to error occurrence.

(5) Smaller than the conventional D/A converter module

This module is 60% smaller in installation area and 38% less in volume than the conventional CC-Link D/A converter module (AJ65BT-64DAV/DAI).

(6) Up to 42 modules connectable

You can connect up to 42 AJ65SBT-62DA modules to one master station.

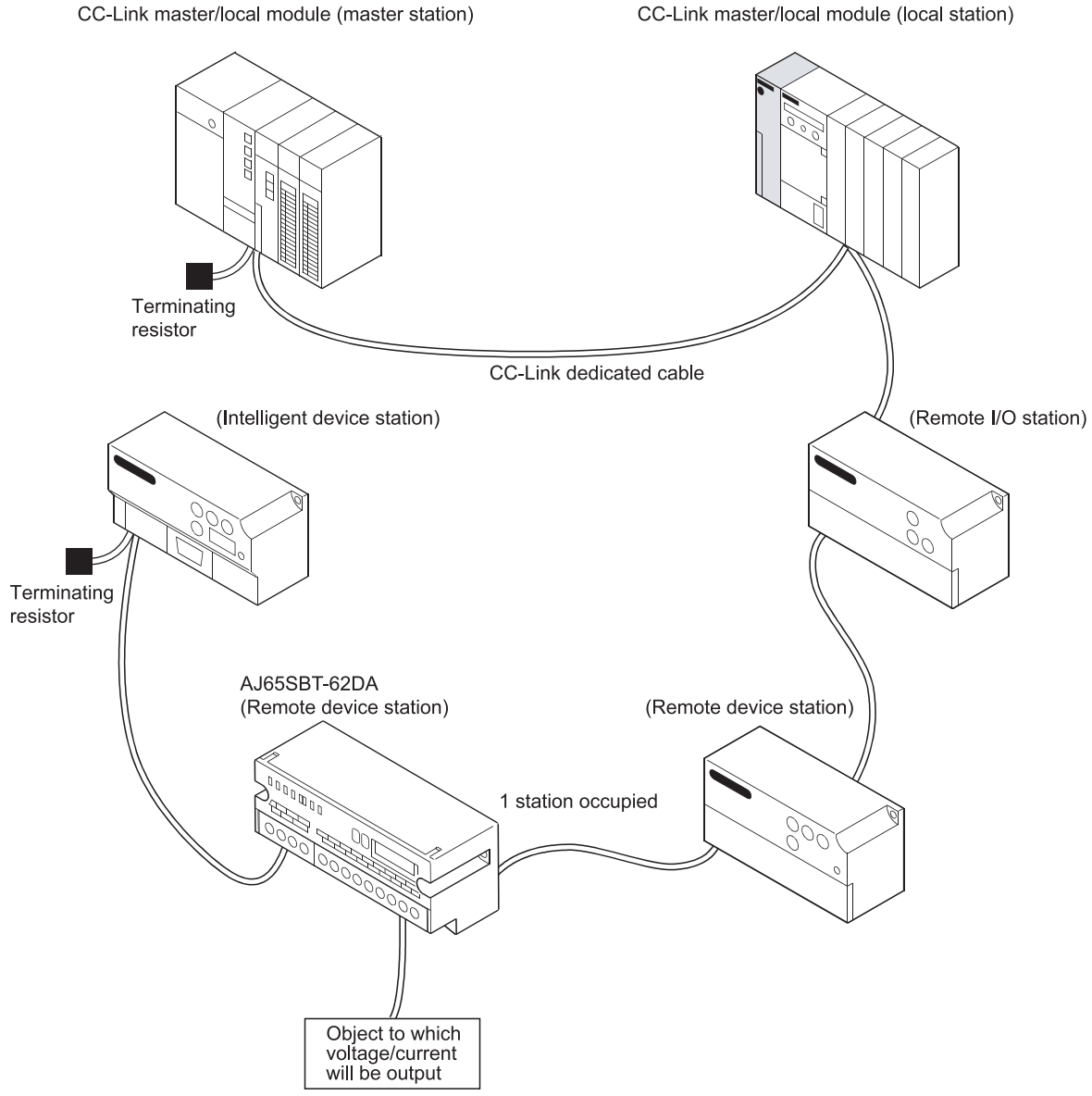
MEMO

2 SYSTEM CONFIGURATION

This chapter describes the system configuration for use of the AJ65SBT-62DA.

2.1 Overall Configuration

The overall configuration for use of the AJ65SBT-62DA is shown below.



2.2 Applicable System

This section explains the applicable system.

(1) Applicable master modules

For available master modules, visit the CC-Link Partner Associations (CLPA) website at:
http://www.cc-link.org/

REMARK

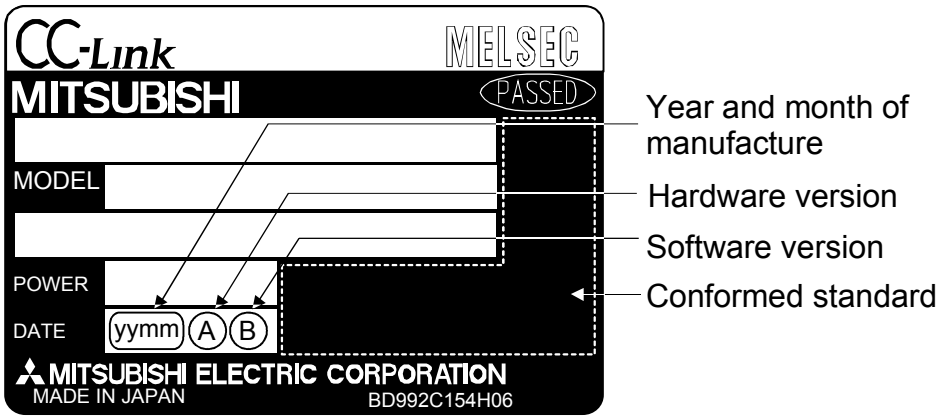
Check the specifications of the master module before use.

(2) Restrictions on use of CC-Link dedicated instructions (RLPA, RRPA)

The CC-Link dedicated instructions may not be used depending on the programmable controller CPU or master module used
For details of the restrictions, refer to the A series master module user's manual, and the Programing Manual type AnSHCPU/AnACPU/AnUCPU/QCPU (A mode) (Dedicated Instructions).
This module does not allow the use of the dedicated instructions other than RLPA and RRPA.
Refer to Section 5.5 for a program example using the dedicated instructions (RLPA, RRPA).

2.3 Checking Hardware Versions

The hardware versions of the AJ65SBT-62DA can be checked on the DATE section on the rating plate, which is situated on the side of the module.



3 SPECIFICATION

This chapter provides the specifications of the AJ65SBT-62DA.

3.1 General Specification

Table 3.1 indicates the general specifications of the AJ65SBT-62DA.

Table 3.1 General specification

Item	Specification					
Usage ambient temperature	0 to 55°C					
Storage ambient temperature	-20 to 75°C					
Usage ambient humidity	10 to 90%RH, no condensation					
Storage ambient humidity	10 to 90%RH, no condensation					
Vibration durability	Conforming to JIS B 3502, IEC 61131-2		Frequency	Acceleration	Amplitude	Number of sweeps
		For intermittent vibration	5 to 9Hz	—	3.5mm (0.14 inches)	10 times in each X, Y, and Z direction
			9 to 150Hz	9.8m/s^2	—	
		For continuous vibration	5 to 9Hz	—	1.75mm (0.069 inch)	—
			9 to 150Hz	4.9m/s^2	—	
Shock durability	Conforming to JIS B 3502, IEC 61131-2 (147m/s^2, 3 times each in 3 directions)					
Usage environment	No corrosive gas					
Usage height *3	Less than 2000 m (less than 6562 ft.)					
Installation area	Within the control board					
Over-voltage category *1	Less than II					
Pollution level *2	Less than 2					

*1 Indicates the location where the device is connected from the public cable network to the device structure wiring area.
Category II applies to the devices to which the power is supplied from a fixed equipment.
Surge withstand voltage for devices with up to 300V of rated voltage is 2500V.

*2 This is an index which indicates the degree of conductive object generation in the environment Pollution level 2 is when only non-conductive pollution occurs.
A temporary conductivity caused by condensation must be expected occasionally.

*3 Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m. Doing so can cause a malfunction.
When using the programmable controller under pressure, please contact your sales representative.

3.2 Performance Specification

Table 3.2 indicates the performance specifications of the AJ65SBT-62DA.

Table 3.2 Performance Specifications

<table>
<tr><td colspan="2">Item</td><td>AJ65SBT-62DA</td></tr>
<tr><td rowspan="2">Digital input</td><td>Voltage</td><td>16-bit signed binary (-4096 to 4095)</td></tr>
<tr><td>Current</td><td>16-bit signed binary (0 to 4095)</td></tr>
<tr><td rowspan="2">Analog output</td><td>Voltage</td><td>-10 to 10VDC (external load resistance: 2kΩ to 1MΩ)</td></tr>
<tr><td>Current</td><td>0 to 20mADC (external load resistance: 0 to 600Ω)</td></tr>
<tr><td>I/O characteristics, maximum resolution, accuracy[*1] (accuracy relative to maximum value of analog output value)</td><td colspan="2">
<table>
<tr><th></th><th>Digital input value</th><th>Analog output range</th><th>Accuracy
Ambient temperature 0 to 55°C</th><th>Accuracy
Ambient temperature 25±5°C</th><th>Max. resolution</th></tr>
<tr><td rowspan="4">Voltage</td><td rowspan="2">-4000 to 4000</td><td>-10 to 10V</td><td rowspan="2">±0.4%
(±40mV)</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">±0.4%
(±20mV)</td><td rowspan="3">±0.2%
(±10mV)</td><td>1.25mV</td></tr>
<tr><td>1 to 5V
User range setting 2
(0 to 5V)</td><td>1.0mV</td></tr>
<tr><td rowspan="3">Current</td><td rowspan="3">0 to 4000</td><td>0 to 20mA</td><td>5μA</td></tr>
<tr><td>4 to 20mA
User range setting 3
(0 to 20mA)</td><td rowspan="2">±0.4%
(±80μA)</td><td rowspan="2">±0.2%
(±40μA)</td><td rowspan="2">4μA</td></tr>
</table>
Factory setting is -10 to 10V.
</td></tr>
<tr><td colspan="2">Maximum conversion speed</td><td>1ms/1 channel</td></tr>
<tr><td colspan="2">Output short-circuit protection</td><td>Yes</td></tr>
<tr><td colspan="2">Absolute maximum output</td><td>Voltage: ±12V, Current 21mA</td></tr>
<tr><td colspan="2">Number of analog output points</td><td>2 channels/1 module</td></tr>
<tr><td colspan="2">CC-Link station type</td><td>Remote device station</td></tr>
<tr><td colspan="2">Number of occupied stations</td><td>1 station (RX/RY: 32 points each, RWr/RWw: 4 points each)</td></tr>
<tr><td colspan="2">Communication cable</td><td>CC-Link dedicated cable</td></tr>
<tr><td colspan="2">Dielectric withstand voltage</td><td>500VAC for 1 minute across all power supply and communication system terminals and all analog output terminals</td></tr>
<tr><td colspan="2">Isolation system</td><td>Across communication system terminals and all analog output terminals: Photocoupler isolated
Across power supply system terminals and all analog output terminals: Photocoupler isolated
Across channels: Non-isolated</td></tr>
<tr><td colspan="2">Noise immunity</td><td>By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency</td></tr>
<tr><td rowspan="2">External connection</td><td>Communication area, module power supply</td><td>7-point 2-piece terminal block [transmission circuit, module power supply, FG]
M3 x 5.2 Tightening torque: 0.59 to 0.88N·m
Applicable solderless terminals: 2 max.</td></tr>
<tr><td>I/O area</td><td>Direct-coupled, 18-point terminal block [analog output area]
M3 x 5.2 Tightening torque: 0.59 to 0.88N·m
Applicable solderless terminals: 2 max.</td></tr>
<tr><td colspan="2">Applicable wire size</td><td>0.3 to 0.75mm^2</td></tr>
<tr><td colspan="2">Applicable solderless terminals</td><td>RAV1.25-3 (conforming to JIS C 2805)
[Applicable wire size :0.3 to 1.25mm^2]
V2-MS3, RAP2-3SL, TGV2-3N
[Applicable wire size: 1.25 to 2.0mm^2]</td></tr>
<tr><td colspan="2">Module mounting screw</td><td>M4 screw × 0.7mm × 16mm or more (tightening torque range: 0.78 to 1.08N•m)
Can also be mounted to DIN rail</td></tr>
<tr><td colspan="2">Applicable DIN rail</td><td>TH35-7.5Fe, TH35-7.5Al (conforming to IEC 60715)</td></tr>
<tr><td colspan="2" rowspan="3">External power supply</td><td>24V DC (20.4V DC to 26.4V DC)</td></tr>
<tr><td>Inrush current: 8.2A, within 2.1ms</td></tr>
<tr><td>Current consumption: 0.16A (at 24VDC)</td></tr>
</table>

Item	AJ65SBT-62DA
Weight	0.20kg

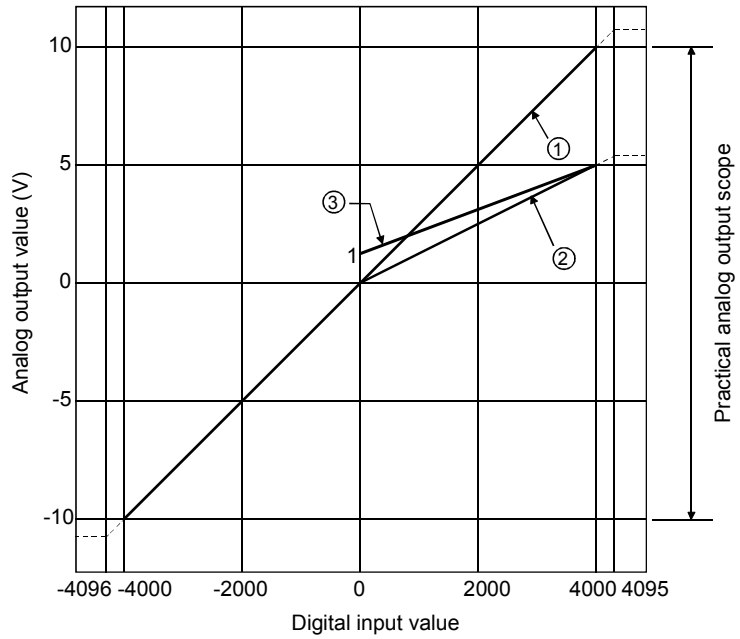
*1: For the details of the I/O conversion characteristic, refer to Section 3.3.

3.3 I/O Conversion Characteristics

An I/O conversion characteristic indicates an inclination of a straight line which connects an offset value and a gain value at the time when a digital value set from the programmable controller CPU is converted into an analog value (voltage or current output).
The offset value is an analog value (voltage or current) output when the digital value set from the programmable controller CPU is 0.
The gain value is an analog value (voltage or current) output when the digital value set from the programmable controller CPU is 4000.

3.3.1 Voltage output characteristics

The voltage output characteristic graph is shown below.



Number	Analog output Range Setting	Offset value	Gain value	Digital input value	Maximum resolution
1)	-10 to 10v	0V	10V	-4000 to 4000	2.5mV
2)	0 to 5V	0V	5V	0 to 4000	1.25mV
3)	1 to 5V	1V	5V		1.0mV
—	User range setting 1 (-10 to 10v)	0V	10V	-4000 to 4000	2.5mV
—	User range setting 2 (0 to 5v)	0V	5V	0 to 4000	1.0mV

Fig. 3.1 Voltage Output Characteristic

POINT

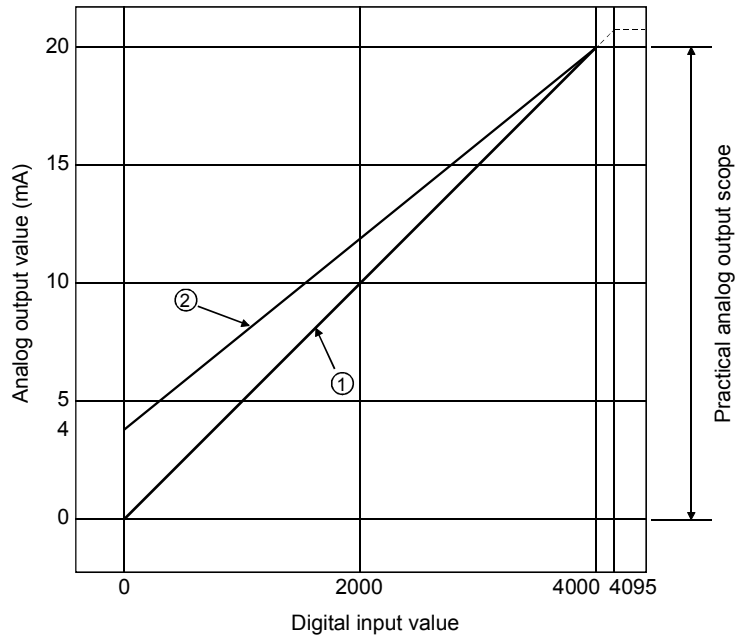
(1) Within the digital input and analog output scopes of each output range, the maximum resolution and accuracy are within the performance specification range. Outside those scopes, however, they may not fall within the performance specification range. (Avoid using the dotted line part in Fig. 3.1.)

(2) Set the offset and gain values of the user range setting within the range satisfying the following conditions.
   (a) Setting range when user range setting 1 is selected: -10 to 10V
   (b) Setting range when user range setting 2 is selected: 0 to 5V
   (c) (Gain value) > (Offset value)

   If you attempt to make setting outside the setting range of (a) or (b), the "RUN" LED flickers at 0.5s intervals.
   Set the values within the setting range.
   If you attempt to make setting outside the setting range of (c), the "RUN" LED flickers at 0.5s intervals.
   Make setting again.

3.3.2 Current output characteristics

The current output characteristic graph is shown below.



Number	Analog output Range Setting	Offset value	Gain value	Digital input value	Maximum resolution
1)	0 to 20mA	0mA	20mA	0 to 4000	5μA
2)	4 to 20mA	4mA	20mA		4μA
—	User range setting 3 (0 to 20mA)	0mA	20mA		

Fig. 3.2 Current Output Characteristic

POINT

(1) Within the digital input and analog output scopes of each output range, the maximum resolution and accuracy are within the performance specification range. Outside those scopes, however, they may not fall within the performance specification range. (Avoid using the dotted line part in Fig. 3.2.)

(2) Set the offset and gain values of the user range setting within the range satisfying the following conditions.
(a) Setting range when user range setting 3 is selected: 0 to 20mA
(b) (Gain value) > (Offset value)

If you attempt to make setting outside the setting range of (a), the "RUN" LED flickers at 0.5s intervals.
Set the values within the setting range.
If you attempt to make setting outside the setting range of (b), the "RUN" LED flickers at 0.5s intervals.
Make setting again.

3.3.3 Relationship between offset/gain setting and analog output value

How to calculate the analog output value:
The resolution of AJ65SBT-62DA can be set arbitrarily by modifying the setting of the offset value and gain value.
How to calculate the analog value resolution and the analog output value for a given digital input value when the settings of the offset value and gain value are changed is shown next.

(1) Resolution

Find the resolution with the following expression.

$$\text{(Analog resolution)} = \frac{\text{(Gain value) - (Offset value)}}{4000}$$

(2) Analog output value

Find the analog output value with the following expression.

(Analog output) = (Analog resolution) × (Digital input value) + (Offset value)

3.3.4 Accuracy

Accuracy is relative to the maximum value of the analog output value.
If you change the offset/gain setting or output range to change the output characteristic, accuracy does not change and is held within the range indicated in the performance specifications.

(1) Accuracy of voltage output

For voltage output, the maximum value of the analog output value changes with the range.
For example, accuracy is relative to 5V when the 0 to 5V range is selected.
Analog output is provided at the accuracy of within ±0.2% (±10mV) when the operating ambient temperature is 25±5°C, or within ±0.4% (±20mA) when the operating ambient temperature is 0 to 55°C.

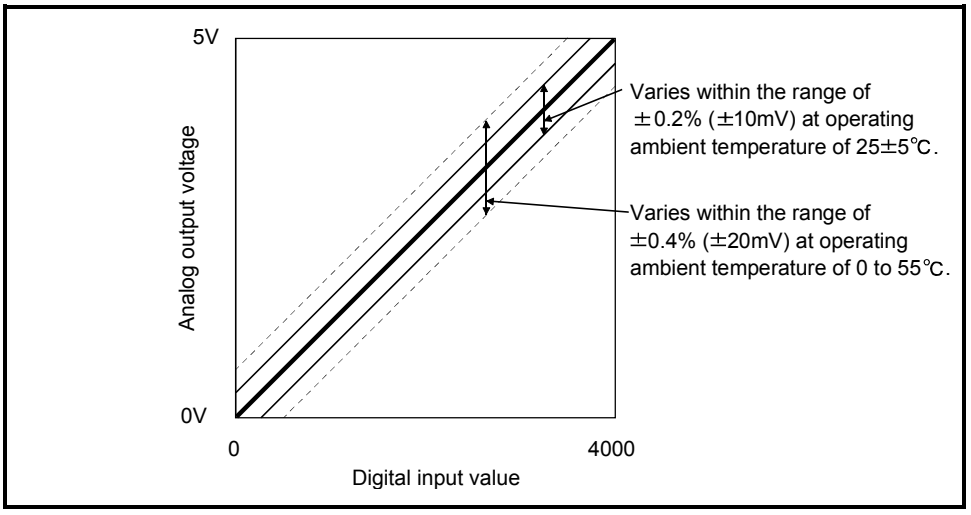


Fig. 3.3 Voltage Output Accuracy (When 0 to 5V Range Is Selected)

(2) Accuracy of current output

For current output, accuracy is relative to 20mA.
Analog output is provided at the accuracy of within ±0.2% (±40μA) when the operating ambient temperature is 25±5°C, or within ±0.4% (±80μA) when the operating ambient temperature is 0 to 55°C.

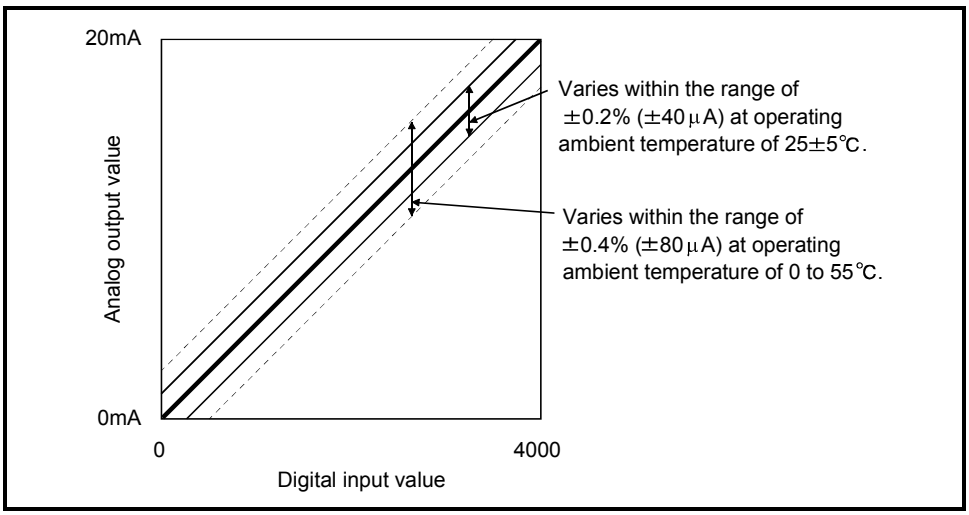


Fig. 3.4 Current Output Accuracy

3.3.5 Conversion speed

Conversion speed indicates time required to read the digital output value written to the buffer memory, perform D/A conversion, and then output the specified analog value.
Conversion speed per channel of the AJ65SBT-62DA is 1ms.
Due to the data link processing time of the CC-Link system, there is a transmission delay until the D/A conversion value is read actually.
For the data link processing time, refer to the user's manual of the master module used.

Example) Data link processing time taken in the asynchronous mode when the master module is the QJ61BT11 (normal value)

[Calculation expression]

SM+LS×1+remote device station processing time
SM: Scan time of master station sequence program
LS : Link scan time
Remote device station processing time: (Number of channels used+1*) × 1ms
*: Internal processing time of AJ65SBT-62DA

3.4 Function

Table 3.3 lists the functions of the AJ65SBT-62DA.

Table 3.3 AJ65SBT-62DA Function List

<table>
<tr><th>Item</th><th>Description</th><th>Refer to</th></tr>
<tr><td>D/A output enable/disable function</td><td>Specify whether the D/A conversion value is output or the offset value is output per channel.
Note that the conversion speed is constant independently of the output enable/disable setting.</td><td>Section 3.5.2</td></tr>
<tr><td>D/A conversion enable/disable function</td><td>Specify whether D/A conversion is enabled or disabled per channel.
The sampling cycle can be shortened by setting the unused channel to D/A conversion disable.</td><td>Section 3.6.3</td></tr>
<tr><td>Output range changing function</td><td>You can set the analog output range per channel to change the I/O conversion characteristics.
Select the output range setting from among the following 8 types.
<table>
<tr><th>Output Range</th><th>Set Value</th></tr>
<tr><td>-10 to 10V</td><td>0_H</td></tr>
<tr><td>0 to 5V</td><td>1_H</td></tr>
<tr><td>1 to 5V</td><td>2_H</td></tr>
<tr><td>0 to 20mA</td><td>3_H</td></tr>
<tr><td>4 to 20mA</td><td>4_H</td></tr>
<tr><td>User range setting 1 (-10 to 10V)</td><td>5_H</td></tr>
<tr><td>User range setting 2 (0 to 5V)</td><td>6_H</td></tr>
<tr><td>User range setting 3 (0 to 20mA)</td><td>7_H</td></tr>
</table></td><td>Section 3.6.4</td></tr>
<tr><td>Function to specify hold or clear of the analog output when the programmable controller CPU is in the STOP status (HOLD/CLEAR setting)</td><td>Specify per channel whether to hold or clear (output the offset value) the analog value which is being output from each channel when the programmable controller CPU has entered the STOP status or the AJ65SBT-62DA has stopped D/A conversion due to error occurrence.</td><td>Section 3.6.4</td></tr>
<tr><td>Offset/gain setting</td><td>You can make offset/gain setting per channel without potentiometers to change the I/O conversion characteristics freely.</td><td>Section 4.4</td></tr>
</table>

3.4.1 Combinations of various functions

You can set the analog output as indicated in Table 3.4 by combining the HOLD/CLEAR setting (RWwm+3), CH. □ analog output enable/disable flag (RYn0, RYn1) and Analog output enable/disable setting (RWwm+2).
Make setting according to your system application.

Table 3.4 Analog output status combination list

Setting combination / Execution status	Analog output enable/ disable setting (RWwm+2)	Enable (1)			Prohibit (0)
	CH. □ analog output enable/disable flag (RYn0, RYn1)	Enable (ON)		Prohibit (OFF)	Enable or disable
	HOLD/CLEAR setting (RWwm+3)	HOLD	CLEAR	HOLD or CLEAR	HOLD or CLEAR
Analog output status when the programmable controller CPU is in the RUN status		Output of the analog value after D/A conversion from the digital value specified by the programmable controller CPU		Offset value	0V/0mA
Analog output status when the programmable controller CPU is in the STOP status		Analog value before the programmable controller CPU stop is retained	Offset value	Offset value	0V/0mA
Analog output status at programmable controller CPU stop error		Analog value before the programmable controller CPU stop is retained	Offset value	Offset value	0V/0mA
Analog output status at occurrence of AJ65SBT-62DA digital value setting error		Output of the maximum or minimum analog value		Offset value	0V/0mA
Analog output status when the "L RUN" LED turns off/"L.ERR" LED turns on		The analog value before the "L RUN" LED turns off is retained.	Offset value	Offset value	0V/0mA
Analog output status when the "L ERR." LED flickers		Output of the analog value after D/A conversion from the digital value specified by the programmable controller CPU		Offset value	0V/0mA
Analog output status in initial processing completion status after power-reset		Output of the analog value after D/A conversion from the digital value specified by the programmable controller CPU		Offset value	0V/0mA
Analog output status at occurrence of AJ65SBT-62DA output range setting error		0V/0mA	0V/0mA	0V/0mA	0V/0mA
Analog output status at occurrence of AJ65SBT-62DA watchdog timer error		0V/0mA	0V/0mA	0V/0mA	0V/0mA

POINT

When the QnACPU is used, using "Y" as the remote output (RY) refresh device of the automatic refresh parameter may not hold the analog value even for the HOLD setting.
For the HOLD setting, use "M" or "B" as the remote output (RY) refresh device.

3.5 Remote I/O Signals

This section describes the assignment and functions of the remote I/O signals.

3.5.1 Remote I/O signal list

Remote inputs (RX) mean the input signals from the AJ65SBT-62DA to the master module, and remote outputs (RY) mean the output signals from the master module to the AJ65SBT-62DA.
In communications with the master station, the AJ65SBT-62DA uses 32 points of the remote inputs (RX) and 32 points of the remote outputs (RY). Table 3.5 indicates the assignment and names of the remote I/O signals.

Table 3.5 Remote I/O Signals List

Signal Direction: AJ65SBT-62DA → Master Module		Signal Direction: Master Module → AJ65SBT-62DA	
Remote input (RX)	Name	Remote output (RY)	Name
RXn0 to RXnB	Reserved	RYn0	CH.1 analog output enable/disable flag
RXnC	E^2PROM write error flag		
RXnD	Reserved		
RXnE			
RXnF	Test mode flag	RYn1	CH.2 analog output enable/disable flag
RX (n+1) 0 to RX (n+1) 7	Reserved	RYn2 to RY (n+1) 7	Reserved
RX (n+1) 8	Initial data processing request flag	RY (n+1) 8	Initial data processing complete flag
RX (n+1) 9	Initial data setting complete flag	RY (n+1) 9	Initial data setting request flag
RX (n+1) A	Error status flag	RY (n+1) A	Error reset request flag
RX (n+1) B	Remote READY	RY (n+1) B to RY (n+1) F	Reserved
RX (n+1) C to RX (n+1) F	Reserved		

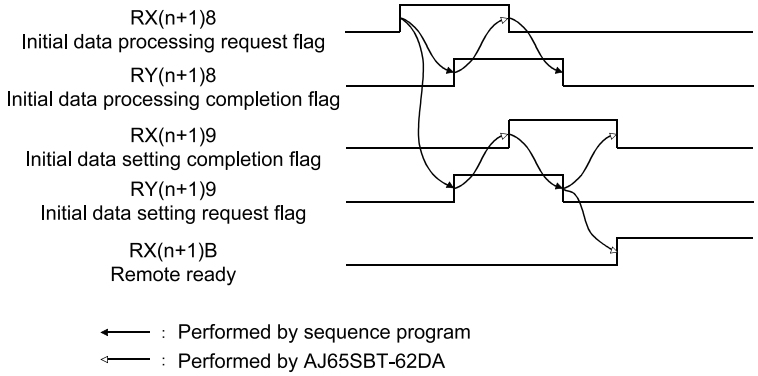
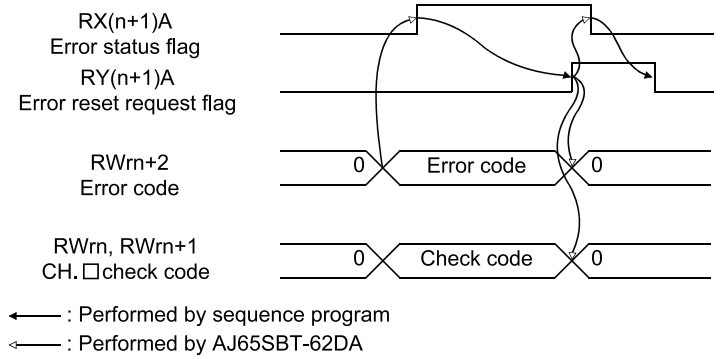
POINT

The reserved devices given in Table 3.5 are used by the system and cannot be used by the user.
If the user has used (turned on/off) any of them, we cannot guarantee the functions of the AJ65SBT-62DA.

3.5.2 Functions of the remote I/O signals

Table 3.6 explains the functions of the remote I/O signals of the AJ65SBT-62DA.

Table 3.6 Remote I/O Signal Details (1/2)

Device No.	Signal Name	Description
RXnC	E^2PROM write error flag	Turns on the number of E^2PROM write times exceeds its limit (1000,000 times per channel). If this flag has turned on, this module itself has failed (hardware fault) and therefore this flag cannot be reset (turned off) by the error reset request flag.
RXnF	Test mode flag	Turns on in the test mode. (Used for interlock to prevent wrong output during offset/gain setting.)
RX (n+1) 8	Initial data processing request flag	After power-on, the initial data processing request flag is turned on by the AJ65SBT-62DA to request the initial data to be set. Also, after the initial data processing is complete (initial data processing complete flag RY (n+1) 8 ON), the flag is turned off. 
RX (n+1) 9	Initial data setting complete flag	When the initial data setting request (RY (n+1) 9 ON) is made, the flag turns on after the initial data setting completion is done. Also, after the initial data setting is complete, the initial setting complete flag turns off when the initial data setting request flag turns off.
RX (n+1) A	Error status flag	Turns on at occurrence of the output range setting error, digital value setting error or E^2PROM write error (RXnC). Does not turn on at occurrence of the watchdog timer error. (The "RUN" LED goes off.) 
RX (n+1) B	Remote READY	Turns on when initial data setting is completed after power-on or at termination of the test mode. (Used for interlocking read/write from/to the master module.)

n: Address allocated to the master module by station number setting.

Table 3.6 Remote I/O Signal Details (2/2)

Device No.	Signal Name	Description
RYn0 to RYn1	CH. □ analog output enable/disable flag	D/A conversion value output enable flag for channel 1 or 2. Turn on this flag to enable the D/A conversion value of the corresponding channel to be output. Turn off when you want to disable the output of the D/A conversion value. Processed on the leading edge of ON/OFF.
RY (n+1) 8	Initial data processing complete flag	Turns on after initial data processing completion when initial data processing is requested after power-on or test mode operation.
RY (n+1) 9	Initial data setting request flag	Turns on at the time of initial data setting or changing.
RY (n+1) A	Error reset request flag	Turning on this flag resets (turns off) the error status flag (RX(n+1)A) and also clears (to 0000_H) the error code (RWrn+2) and CH. □ check code (RWrn, RWrn+1) in the remote register. However, since the E^2PROM write error flag (RXnC) cannot be reset, the error status flag remains on, too.

n: Address allocated to the master module by station number setting.

3.6 Remote Register

The AJ65SBT-62DA has a remote resister for data communication with the master module. The remote register allocation and data structures are described below.

3.6.1 Allocation of the remote register

The allocation of the remote register is shown in Table 3.7.

Table 3.7 Allocation of the remote register

Transfer Direction	Address	Description	Default Value	Refer to
Master → Remote	RWwm	CH. 1 digital value setting	0	Section 3.6.2
	RWwm+1	CH. 2 digital value setting	0	
	RWwm+2	Analog output enable/disable setting	0	Section 3.6.3
	RWwm+3	Output range/HOLD/CLEAR setting	0	Section 3.6.4
Remote → Master	RWrn	CH. 1 check code	0	Section 3.6.5
	RWrn+1	CH. 2 check code	0	
	RWrn+2	Error code	0	Section 3.6.6
	RWrn+3	Reserved	0	—

m, n: The address set for the master station in the station number setting.

POINT

Do not execute read or write to the remote register that is not allowed to use. When a read or write is executed, the functions of the AJ65SBT-62DA is not guaranteed.

3.6.2 CH. □ digital value setting (Addresses RWwm, RWwm+1)

(1) This area is used to write the digital value for the D/A conversion from the programmable controller CPU.

(2) The digital value at all channels become “0” in the following conditions:
(a) After the power is turned on, when the remote READY (RX(n+1)B) is turned on.

(3) The digital value that may be set is a 16-bit signed binary within the setting range which matches the output range setting.
If a value beyond the range of the digital value resolution is set, the data in Table 3.8 is applied for the D/A conversion.
In addition, the checking code is stored in the check code storage area (addresses RWrn, RWrn+1).

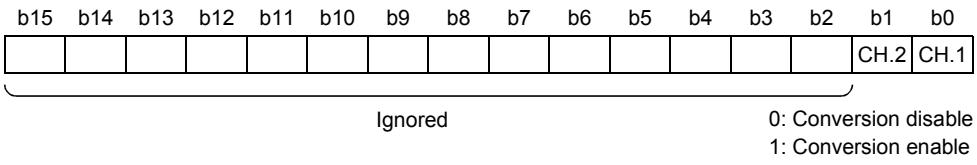
Table 3.8 Available setting range of the digital value

Output Range	Available setting range	Digital value for the D/A conversion when the value beyond the range is set
-10 to 10V User range setting 1	-4096 to 4095 (Practical scope: -4000 to 4000)	4096 or more: 4095 -4097 or less: -4096
0 to 5V 1 to 5V User range setting 2 0 to 20mA 4 to 20mA User range setting 3	-96 to 4095 (Practical scope: 0 to 4000)	4096 or more: 4095 -97 or less: -96

3.6.3 Analog output enable/disable setting (Address RWwm+2)

(1) Set whether D/A conversion is enabled or disabled per channel.

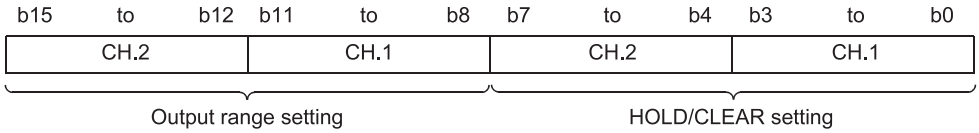
(2) The default setting is conversion disable for all channels.



3.6.4 Output range/HOLD/CLEAR setting (Address RWwm+3)

(1) Make output range setting using the 8 upper bits (b8 to b15) of address RWwm+3.
Make HOLD/CLEAR setting using the 8 lower bits (b0 to b7) of address RWwm+3.

(2) The default settings are -10 to 10V and CLEAR.

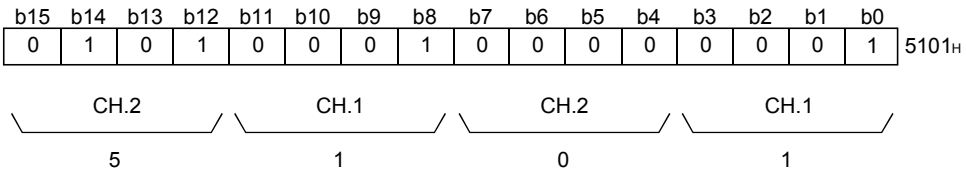


0_H: -10 to 10V
1_H: 0 to 5V
2_H: 1 to 5V
3_H: 0 to 20mA
4_H: 4 to 20mA
5_H: User range setting 1 (-10 to 10V)
6_H: User range setting 2 (0 to 5V)
7_H: User range setting 3 (0 to 20mA)

0_H : CLEAR
1 to F_H: HOLD

Example

Set 5101H when setting channel 1 to "0 to 5V" and "HOLD" and channel 2 to "User range setting 1" and "CLEAR".



3.6.5 CH. □ check code (Addresses RWrn, RWrn+1)

(1) This area is used to check if the digital value is within or out of the setting range. One of the following checking codes is stored when the digital value lower or higher than the setting range is set.

Check code	Description
000F$_H$	A digital value which exceeds the setting range was set.
00F0$_H$	A digital value which is below the setting range was set.
00FF$_H$	The digital value less than the setting range and the digital value more than the setting range were set before the error reset request. For example, the 00FF$_H$ check code is stored if a digital value exceeding the valid range is written, and then, without the check code being reset, a digital value that falls short of the valid range is written.

(2) The check code once stored is not reset even if the set value is set to within the valid setting allowed range.

(3) The storage area or the check code is reset by turning on the error reset request flag (RY (n+1)A).

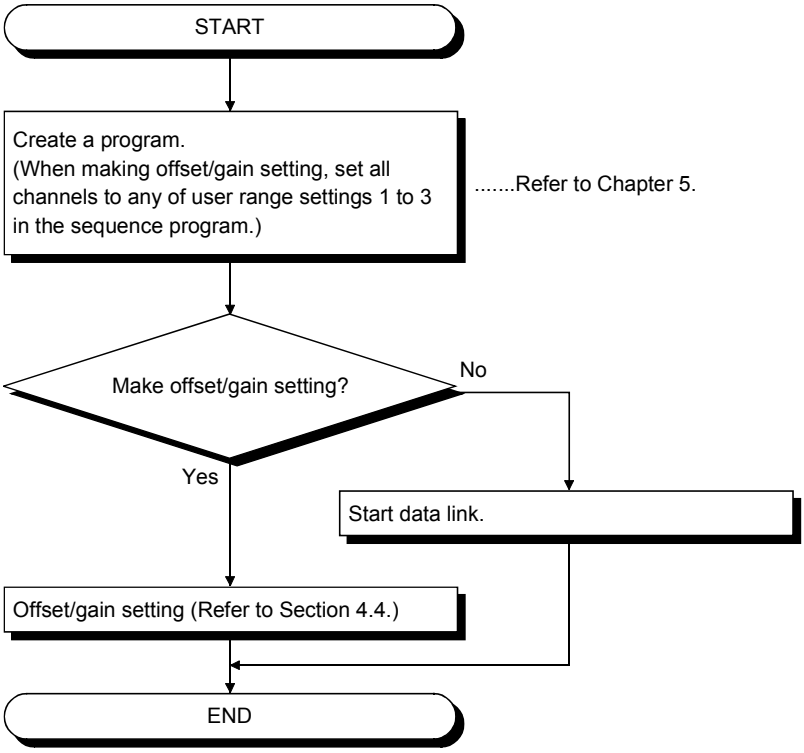
3.6.6 Error code (Address RWrn+2)

If an error occurs (the RUN LED flickers) when data is written to the AJ65SBT-62DA, the corresponding error code is stored into the remote register (address RWrn+2) of the AJ65SBT-62DA.
Refer to Section 6.1 for details of the error codes.

4 SETUP AND PREPARATION BEFORE OPERATION

4.1 Pre-Operation Procedure

This section explains the preparatory procedure for operating the AJ65SBT-62DA.



4.2 Precautions When Handling

The precautions when handling the AJ65SBT-62DA are described below:

⚠CAUTION

- Do not touch any terminal while power is on. Doing so may cause malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.
- Do not directly touch any conductive part of the module. Doing so can cause malfunction or failure of the module.
- Do not drop or apply strong shock to the module. Doing so may damage the module.
- 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.

⚠CAUTION

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

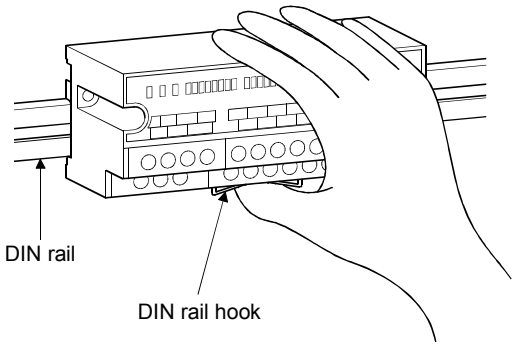
(1) Tighten the screws such as module installation screws with the following torque:

Screw location	Tightening torque range
Module installation screw (M4 screw)	0.78 to 1.08N•m
Terminal block terminal screw (M3 screw)	0.59 to 0.88N•m
Terminal block installation screw (M3.5 screw)	0.68 to 0.98N•m

(2) A protective film is attached on the module's surface for the purpose of scratch prevention during transportation.
Prior to use, be sure to remove it.

(3) When using the DIN rail adapter, install the DIN rail by making sure of the following:
  (a) Applicable DIN rail models (conforming to the IEC 60715)
  TH35-7.5Fe
  TH35-7.5Al
  (b) DIN rail installation screw interval
  When installing the DIN rail, tighten the screws with less than 200mm (7.87 inch) pitches.

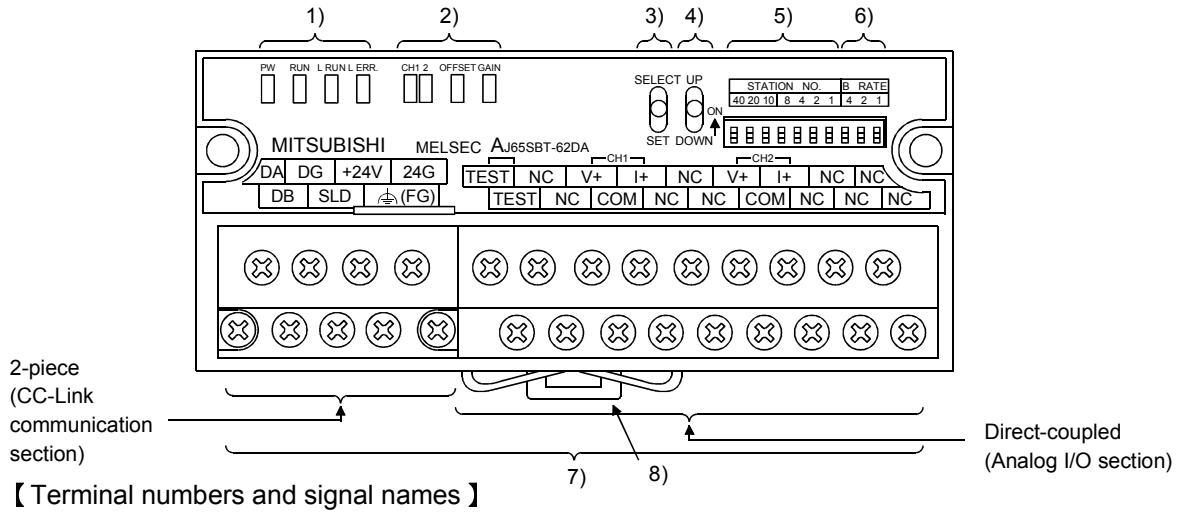
(4) When mounting the AJ65SBT-62DA to the DIN rail, press with your finger the centerline of the DIN rail hook at the bottom of the module until it clicks.



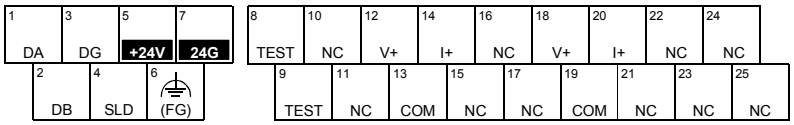
(5) Refer to the Master Module user's manual for the name, specification, and manufacturers of supported cables for the use with AJ65SBT-62DA.

4.3 Name of Each Part

The name of each part in the AJ65SBT-62DA is shown.



【Terminal numbers and signal names】

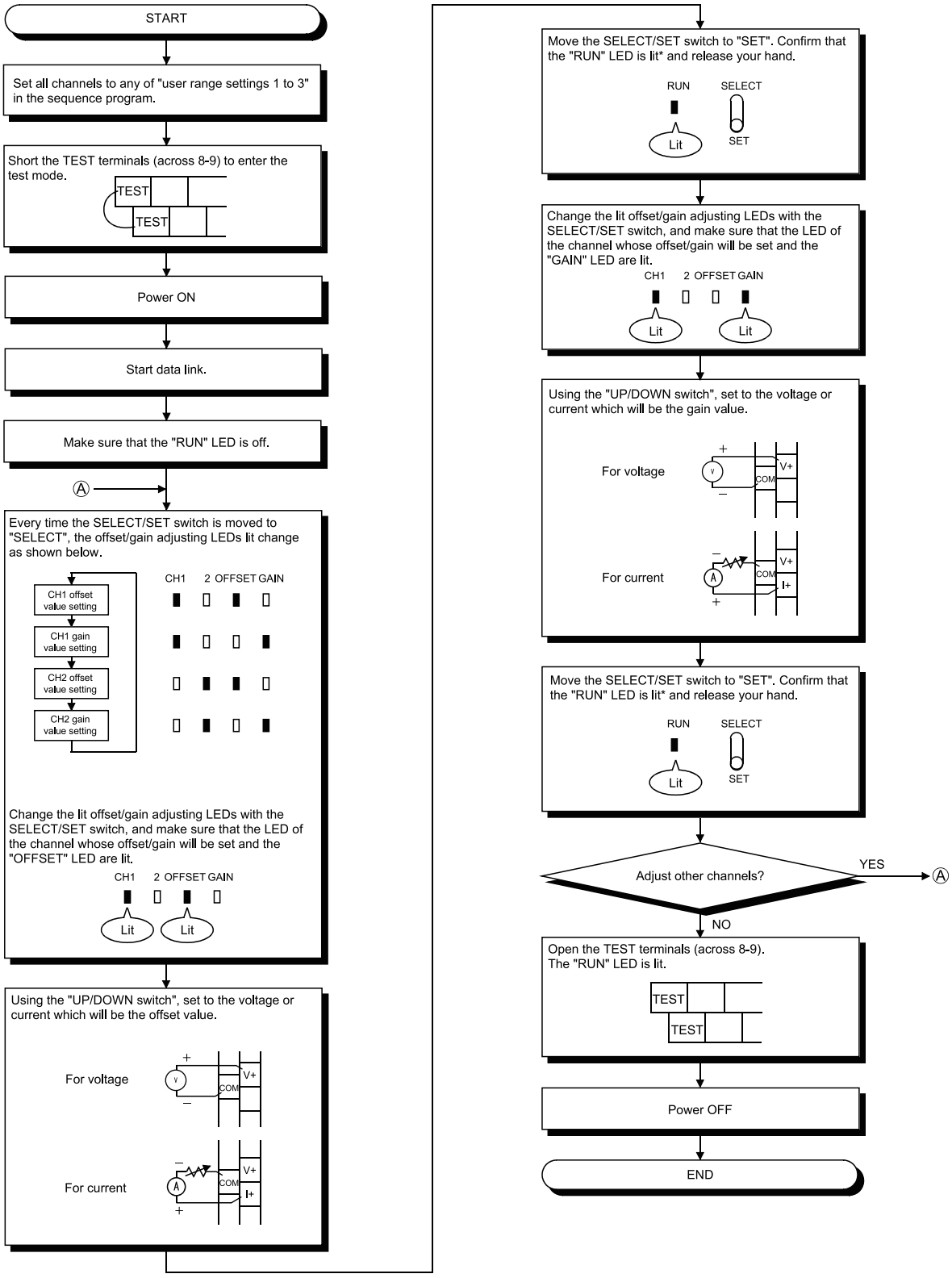


Number	Name and appearance	Description		
1)	Operation status display LED	PW LED	ON: Power supply on OFF: Power supply off	
		RUN LED	Normal mode	On : Normal operation Flashing : 0.1s intervals indicate an output range setting error. 0.5s intervals indicate a digital value setting error. Off : 24VDC power supply shutoff or watchdog timer error occurred.
			Test mode	On : Indicates that the SELECT/SET switch is in the SET position. Flashing : 0.1s intervals indicate that the output range setting is not any of "user range settings 1 to 3". 0.5s intervals indicate that you attempted to make offset/gain setting outside the setting range. 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 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 termination resistor or the module or CC-Link dedicated cable is affected by noise. Off : Indicates normal communications.	
2)	Offset/gain adjusting LEDs	CH□ OFFSET GAIN	Normal mode	Normally OFF.
			Test mode	The LEDs lit change every time the SELECT/SET switch is moved to SELECT. (Refer to Section 4.4.)
3)	SELECT/SET switch	Used to make offset/gain setting in the test mode.		

<table>
<tr><th>Number</th><th>Name and appearance</th><th>Description</th></tr>
<tr><td>4)</td><td>UP/DOWN switch</td><td>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>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></td></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.</td></tr>
<tr><td>7)</td><td>Terminal block</td><td>Used to connect the module power supply, transmission and I/O signals.</td></tr>
<tr><td>8)</td><td>DIN rail hook</td><td>Used to mount the module to the DIN rail.</td></tr>
</table>

4.4 Offset/Gain Setting

When changing the I/O conversion characteristics, follow the procedure below.



POINT

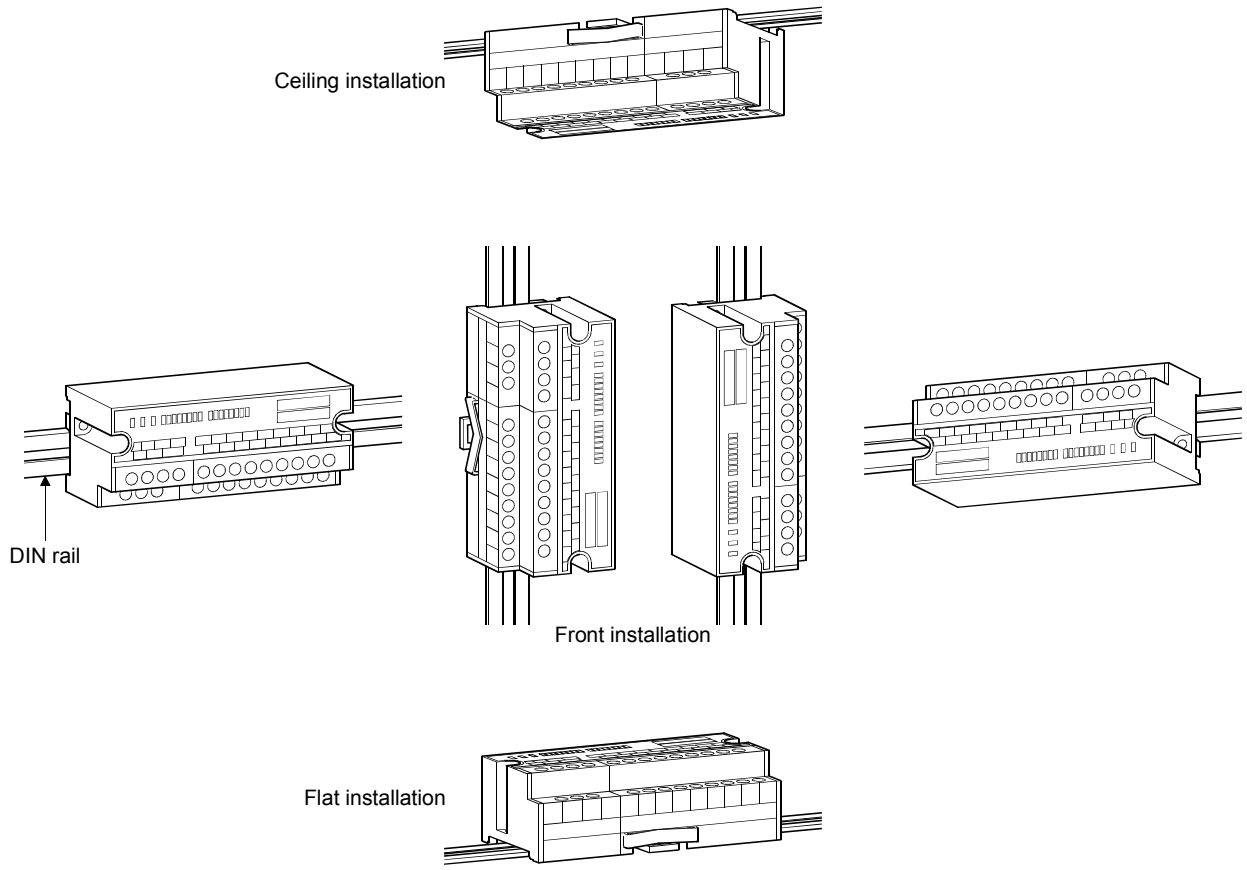
(1) Set the offset and gain values in the actual usage state.
(2) The offset and gain values are stored on E^2PROM in the AJ65SBT-62DA and are not cleared at power-off.
(3) Shorting the TEST terminals to enter the test mode and executing initial settings will start D/A conversion on all channels. To judge the test mode, use the test mode flag as an interlock.
(4) Make offset/gain setting within the range indicated in POINT of Section 3.3.1 and Section 3.3.2. If setting is made outside this range, the maximum resolution/accuracy may not fall within the performance specifications range.
(5) When making offset/gain setting (in the test mode), set all channels to any of "user range settings 1 to 3".
Setting any other range will result in an error and flicker the "RUN" LED at 0.1s intervals.
Refer to Section 3.6.4 for output range setting.

4.5 Section Number Setting

The station number setting of the AJ65SBT-62DA determines the buffer memory addresses of the master module where the remote I/O signals and read/write data are stored.
For details, refer to the user's manual of the master module used.

4.6 Facing Direction of the Module Installation

The AJ65SBT-62DA module may be installed in any of six directions.
(There are no restrictions on the facing directions.)
Also, a DIN rail may be used for installation.

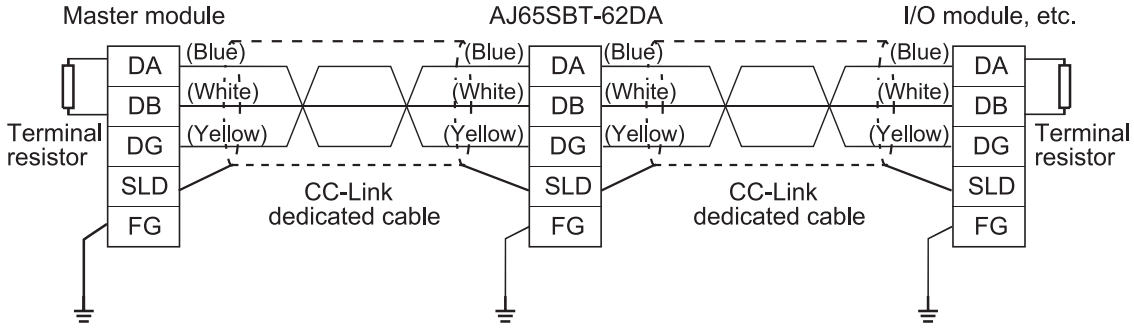


4.7 Data Link Cable Wiring

This section explains the wiring of the CC-Link dedicated cable used for connection of the AJ65SBT-62DA and master module.

4.7.1 Connection of the CC-Link dedicated cables

Connect the CC-Link dedicated cable between the AJ65SBT-62DA and master module as shown below.



4.8 Wiring

This section provides the instructions for wiring the AJ65SBT-62DA and its wiring with external equipment.

4.8.1 Wiring precautions

To obtain maximum performance from the functions of AJ65SBT-62DA and improve the system reliability, an external wiring with high durability against noise is required. The precautions when performing external wiring are as follows:

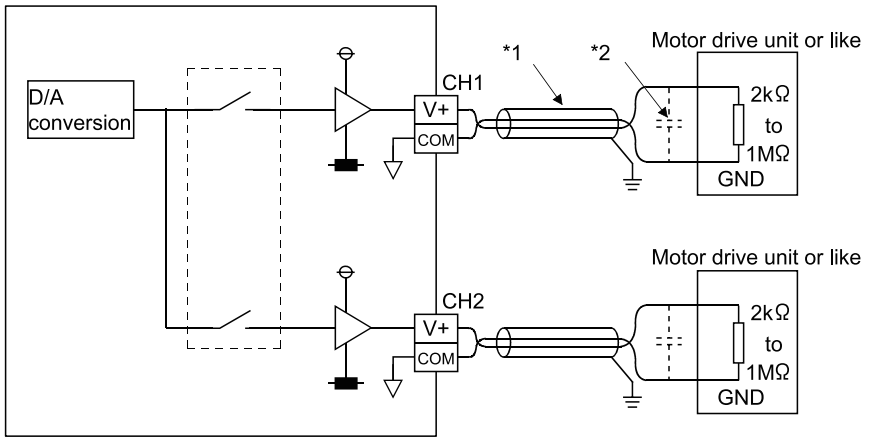
(1) Use separate cables for the AC and AJ65SBT-62DA external output signals, in order not to be affected by the AC side surge or conductivity.

(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.

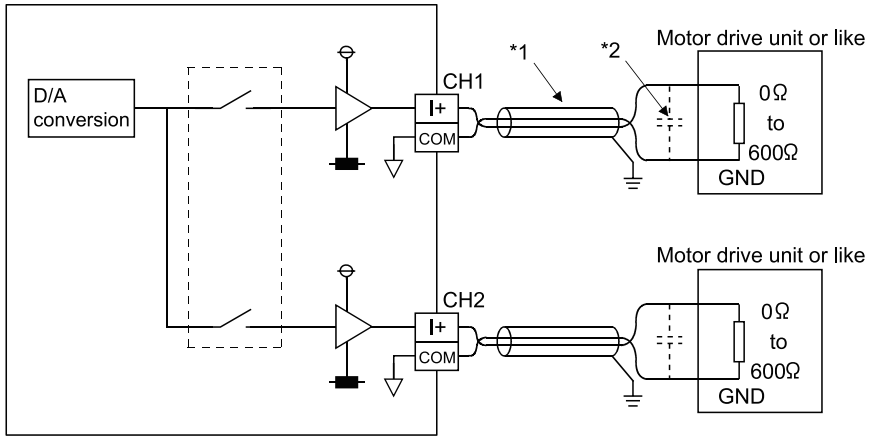
4.8.2 Wiring of module with external equipment

(1) For voltage output



*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.

(2) For current output



*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
D/A conversion values are fluctuated by self-heating within approx. 30 minutes after power is turned ON.

4.9 Maintenance and Inspection

There are no special inspection items for the AJ65SBT-62DA module, but follow the inspections items describes in the programmable controller CPU User's Manual so that the system can always be used in the best condition.

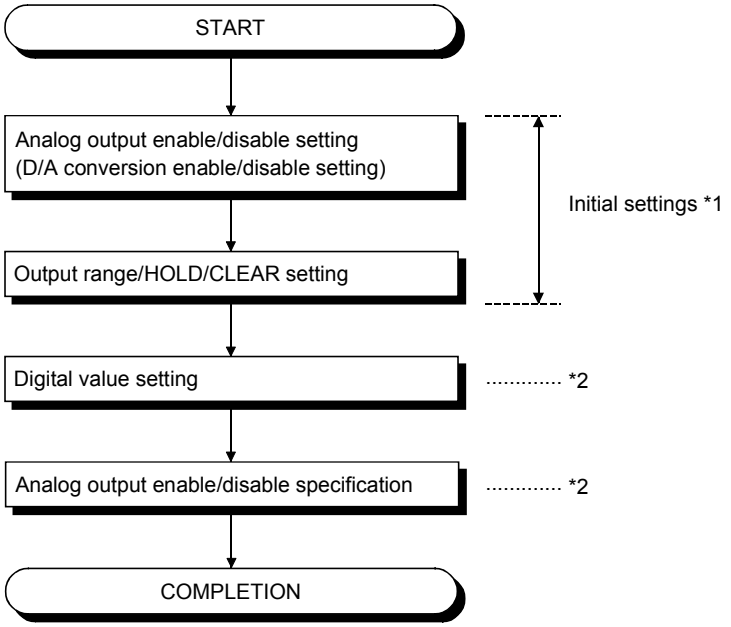
MEMO

5 PROGRAMMING

The programming procedure, basic read/write programs, and program examples for the AJ65SBT-62DA are described.
When applying any of the program examples introduced in this chapter to the actual system, verify the applicability and confirm that no problems will occur in the system control.
Refer to the user's manual of the master module used for the master module, to Section 3.6 for the remote registers, and to the AnSHCPU/AnACPU/AnUCPU/QCPU (A mode) Programming Manual (Dedicated Instructions) for details of the dedicated instructions.

5.1 Programming Procedure

Create programs for executing the digital-analog conversion of the AJ65SBT-62DA in the following procedure.

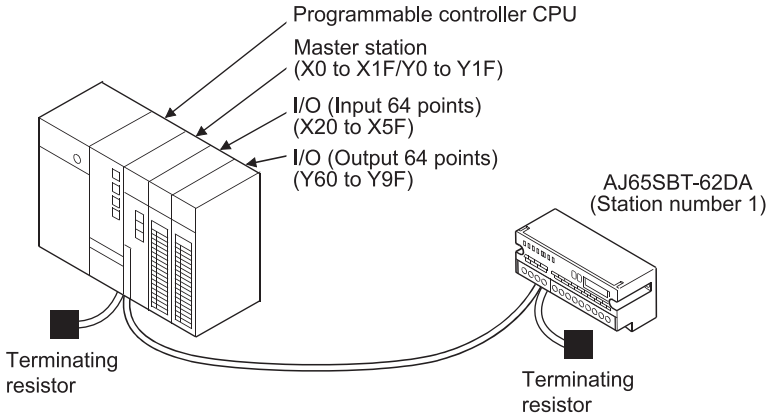


*1 When using the QCPU (Q mode), you can use the remote device station initialization procedure registration function to make settings. When using the ACPU, QCPU (A mode) or QnACPU, use the sequence program to make settings.
*2 The remote device station initialization procedure registration function cannot be used to make settings.
Use the sequence program to make settings.

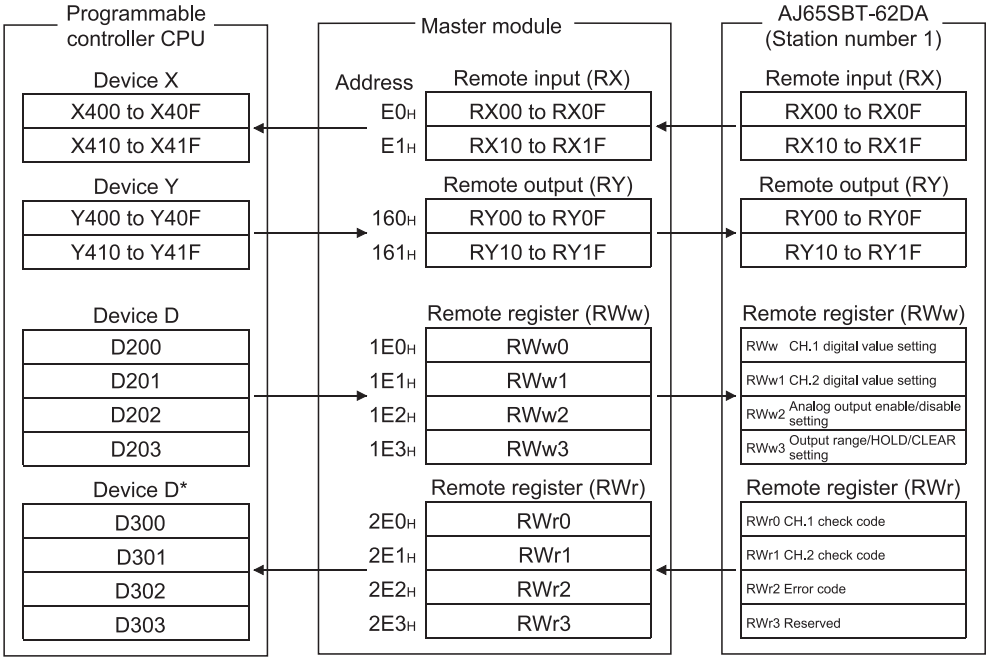
5.2 Conditions of Program Example

The program examples in this chapter are created under the following conditions.

(1) System configuration



(2) Relationships between programmable controller CPU, master module and AJ65SBT-62DA



* In the program example (refer to Section 5.5) that uses the RRPA instruction (automatic refresh parameter setting) with the ACPU/QCPU (A mode), RWr0 to RWr3 are assigned to D456 to D459.

POINT
Some CPU modules may not accept the devices used in the program example in this chapter. For the setting ranges of the devices, refer to the user's manual of the CPU module used. For the A1SCPU, for example, devices X100, Y100 and later are unusable. Use such devices as B and M.

(3) Initial settings

Setting Item	Settings
Analog output enable/disable setting (RWw2)	Channels 1, 2: enable
Output range/HOLD/CLEAR setting (RWw3)	Channel 1: 0 to 5V, CLEAR Channel 2: user range setting 1, CLEAR

(4) Other settings

Setting Item	Settings
CH.1 digital value (RWw0)	500
CH.2 digital value (RWw1)	1000
CH.1 analog output enable/disable flag (RY00)	Enable
CH.2 analog output enable/disable flag (RY01)	Enable

5.3 Program Example for Use of the QCPU (Q mode)

The program examples in this section are created under the following conditions.
GX Developer is used to set the network and automatic refresh parameters.
Using the remote device station initialization procedure registration function facilitates initial settings.

(1) Parameter setting

(a) Network parameter setting

	1
Start I/O No	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.1 mode)
All connect count	1
Remote input(RX)	
Remote output(RY)	
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	
Special register(SW)	
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word)		
						Send	Receive	Automatic
1/1	Remote device station	single	Exclusive station 1	32 points	No setting			

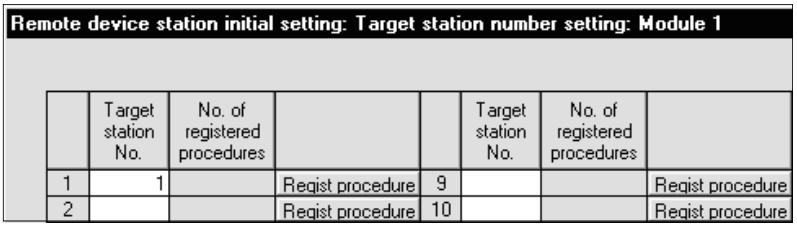
(b) Automatic refresh parameter setting

	1
Start I/O No	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.1 mode)
All connect count	1
Remote input(RX)	X400
Remote output(RY)	Y400
Remote register(RWr)	D300
Remote register(RWw)	D200
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

(2) Initial setting by remote device station initialization procedure registration

(a) Setting the target station number

Set the station number to which initial setting will be made.
Set the target station number to "1".



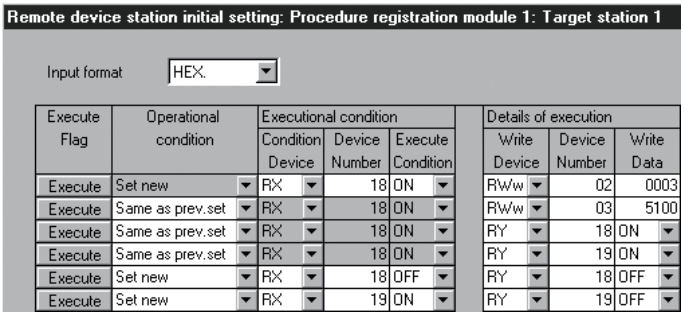
(b) Setting the procedure registration

When the initial data processing request flag (RX18) turns on and the remote device station initialization procedure registration (SB0D) is set, the following data are registered to the AJ65SBT-62DA.

Procedure Execution Condition	Execution
Initial data processing request flag (RX18) turns on	Analog output enable/disable setting: channenls 1, 2: enable (RWw2 :0003H)
	Output range/HOLD/CLEAR setting : channel 1: 0 to 5V, CLEAR : channel 2: user range setting 1, CLEAR (RWw3: 5100H)
	Initial data processing completion flag (RY18) is turned on.
	Initial data setting request flag (RY19) is turned on.
Initial data processing request flag (RX18) turns off	Initial data processing completion flag (RY18) is turned off.
Initial data setting completion flag (RX19) turns on	Initial data setting request flag (RY19) is turned off.

(c) Setting results

The setting results are shown below.



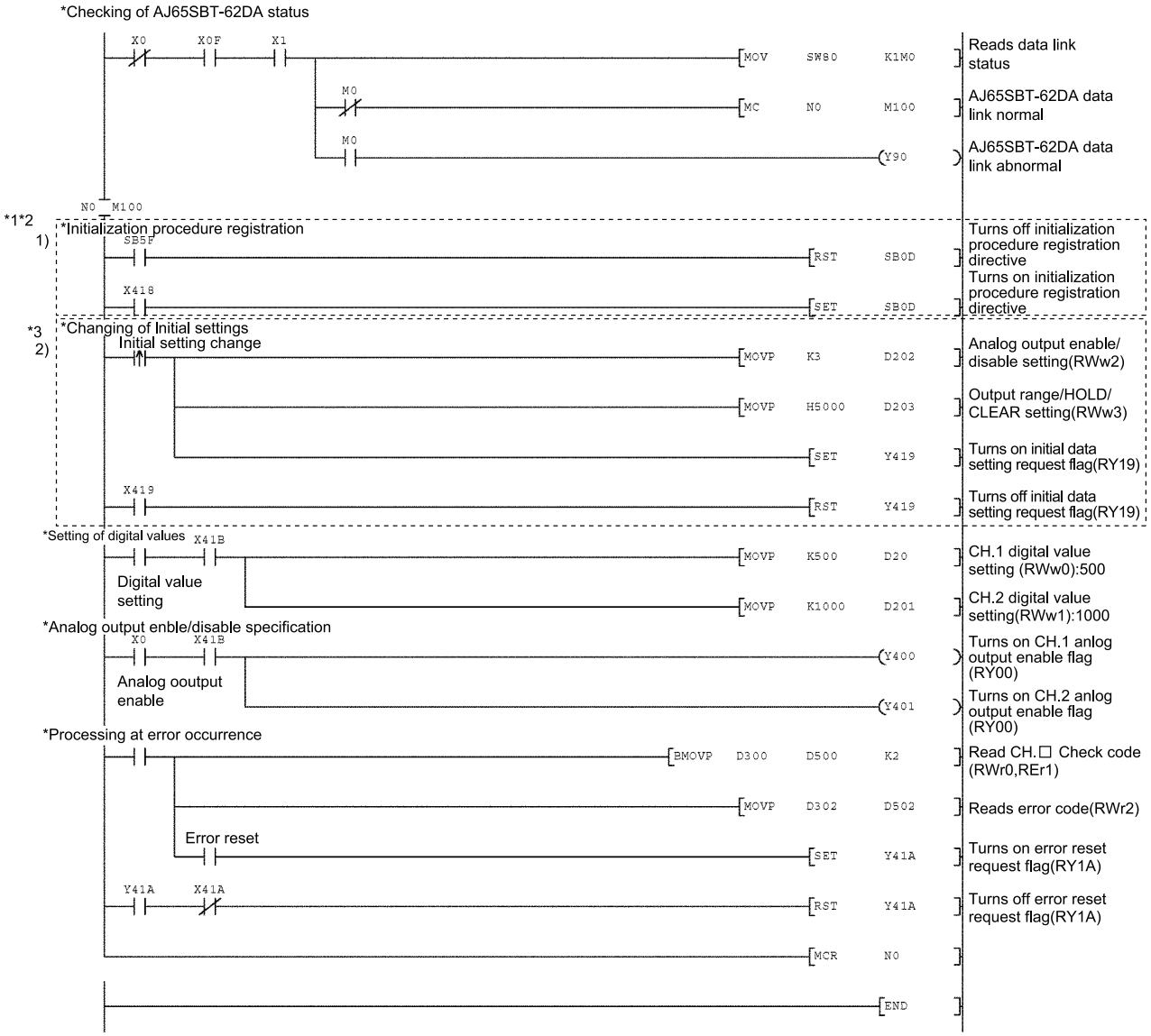
POINT

(1) If the remote device station initialization procedure registration directive (SB000D) is turned off after the initial processing, all RY signals that were turned on within the initial procedure registration turn off. Hence, turn on the "CH. □ analog output enable/disable flag (RYn0, RYn1)" in the sequence program.

(2) When the initial setting (analog output enable/disable setting (RWwm+2) or Output range/HOLD/CLEAR setting (RWwm+3) has been changed, the remote device station initialization procedure registration function cannot be used. Change the initial setting in the sequence program.

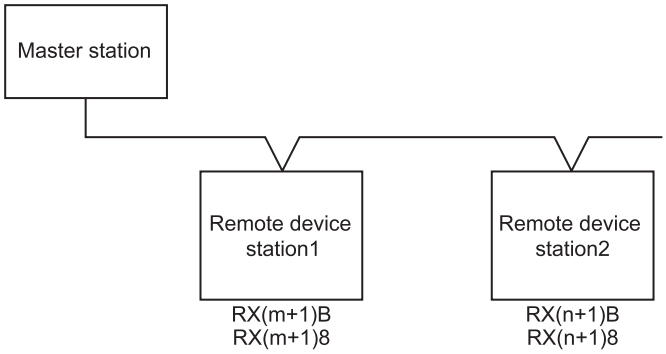
(3) For the case where the remote device station initialization procedure registration function is not used but a sequence program is used to make setting, refer to the user's manual of the used master module.

(3) Program example

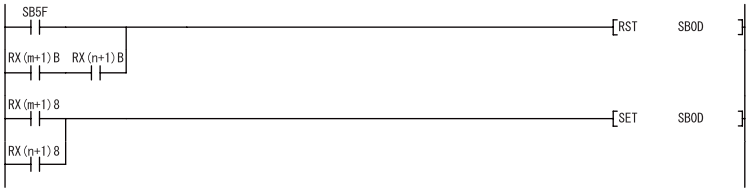


*1 When making remote device station initialization procedure registration to multiple stations, correct the program within the dotted line 1) as shown below.

[System configuration]



[Corrected program]



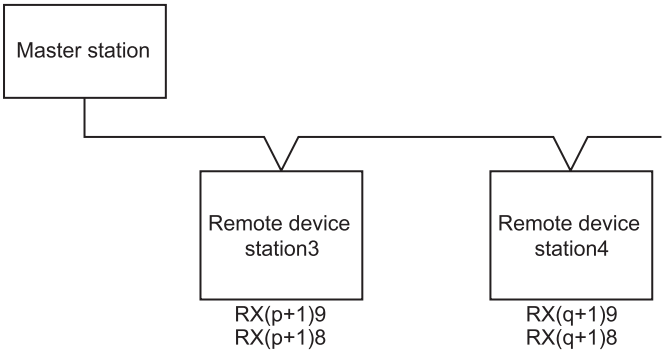
- RX(m+1)B and RX(n+1)B are remote READY.
- RX(m+1)8 and RX(n+1)8 are initial data processing request flags.

Insert the remote READY and initial data processing request flags for all the stations, to which the remote device station initialization procedure registration has been made, into the program.

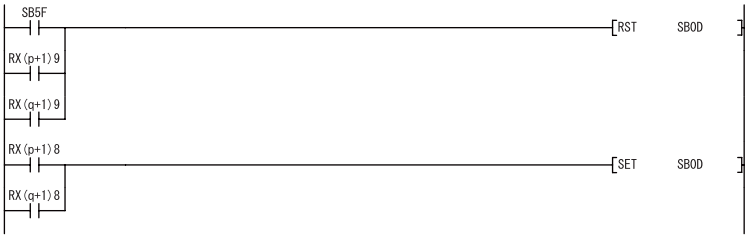
[Usage in combination with other remote device stations]

(1) Depending on the remote device stations to be used, the program enclosed by the dotted line 1) has two programming patterns as shown in the above and the below figures.
(To check which pattern can be used, refer to the manual for the remote device to be used.)

[System configuration]



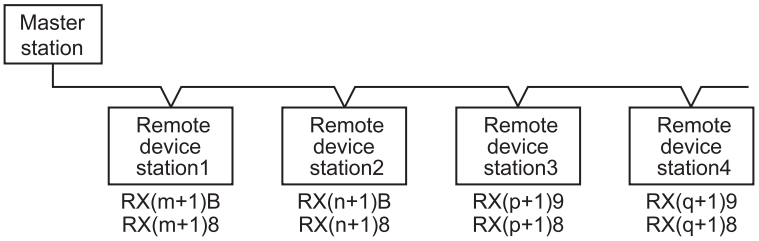
[Corrected program]



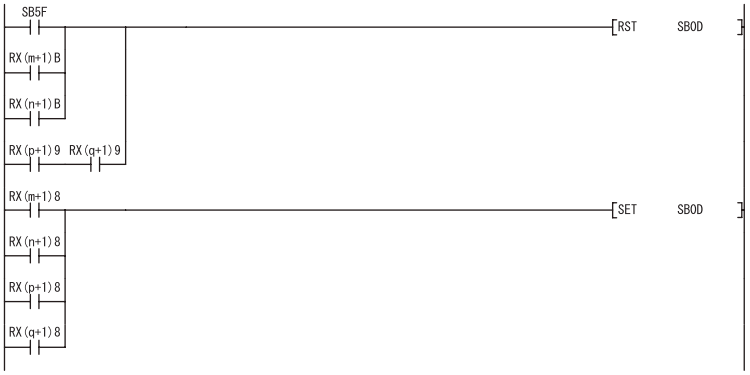
- RX(p+1)9 and RX(q+1)9 are initial data setting completion flags.
- RX(p+1)8 and RX(q+1)8 are initial data processing request flags.

(2) When using the program enclosed by the dotted line 1) in combination with other remote device stations, correct the program as shown below.

[System configuration]



[Corrected program]



Note that the master module can register the initialization procedure of only the specified station out of the multiple remote device stations.
The master module supporting this function is the QJ61BT11N which serial No's first 5 digits is 08032 or later.
Fro details, refer to the CC-Link System Master/Local Module User's Manual, "CHAPTER 4 FUNCTIONS"

*2 Before the communication program is executed with remote device stations, the program enclosed by the dotted line 1) enables the initial setting by using the SB0D (remote device station initialization procedure registration instruction) and SB5F (completion status of remote device station initialization procedure). Initialization processing can't be made only by the parameter setting of GX Developer.

*3 The program enclosed by the dotted line 2) is necessary only when the initial settings are changed.

5.4 Program Example for Use of the QnACPU

GX Developer is used to set the network and automatic refresh parameters.

(1) Parameter setting

(a) Network parameter setting

	1
Start I/O No.	0000
Type	Master station
All connect count	1
Remote input(RX)	
Remote output(RY)	
Remote register(RWr)	
Remote register(RWw)	
Special relay(SB)	
Special register(SW)	
Retry count	3
Automatic reconnection station count	1
Wait master station No.	0
PLC down select	Stop
Scan mode setting	Asynchronously
Delay information setting	0
Station information setting	Station information

StationNo.	Station type	Exclusive station count	Reserve/invalid station select	Intelligent buffer select(word)		
				Send	Receive	Automatic
1/ 1	Remote device station	Exclusive station 1	No setting			

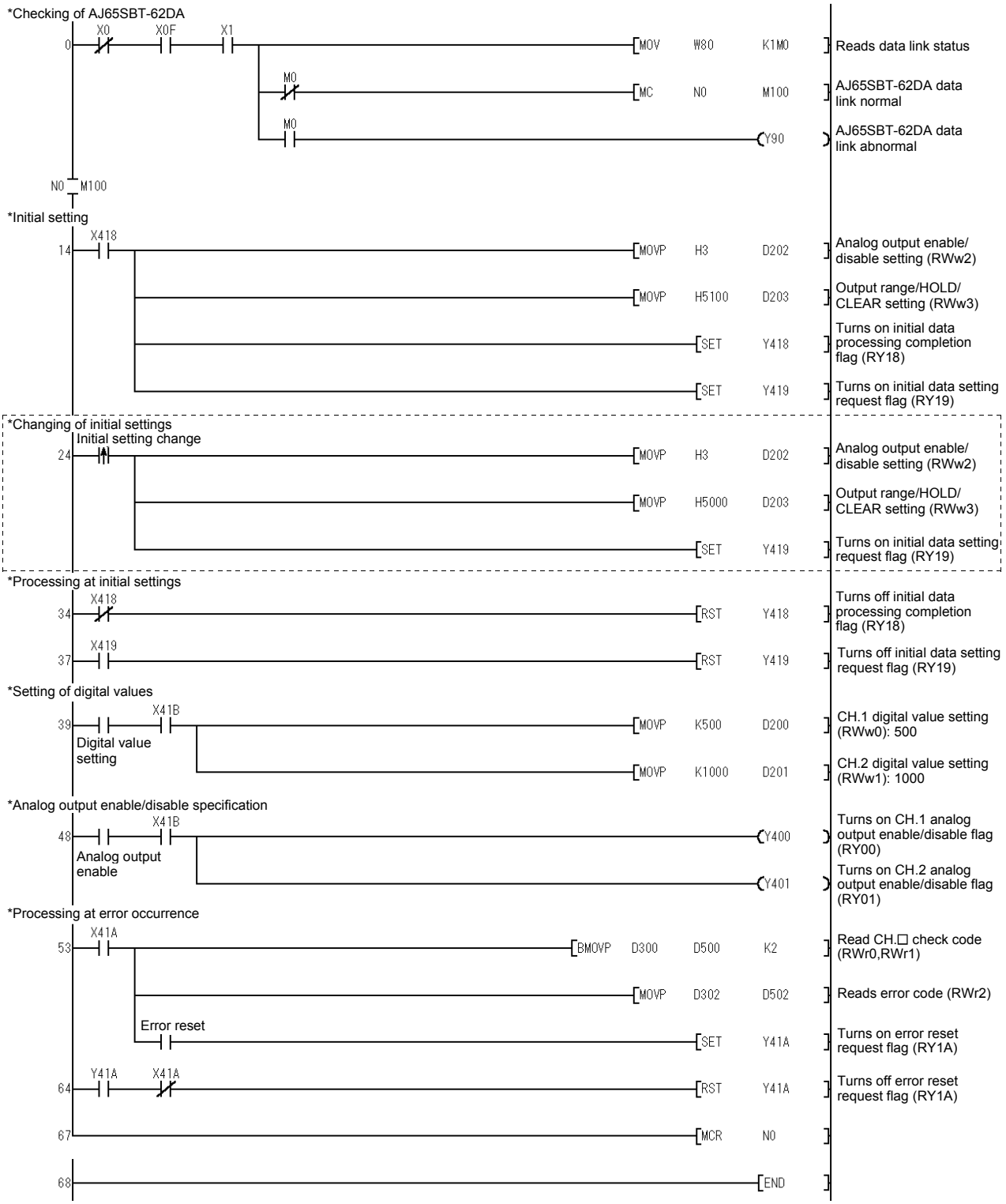
(b) Automatic refresh parameter setting

	1
Start I/O No.	0000
Type	Master station
All connect count	1
Remote input(RX)	X400
Remote output(RY)	Y400
Remote register(RWr)	D300
Remote register(RWw)	D200
Special relay(SB)	B0
Special register(SW)	W0
Retry count	3
Automatic reconnection station count	1
Wait master station No.	0
PLC down select	Stop
Scan mode setting	Asynchronously
Delay information setting	0
Station information setting	Station information

POINT

When the QnACPU is used, using "Y" as the remote output (RY) refresh device of the automatic refresh parameter may not hold the analog value even for the HOLD setting.
For the HOLD setting, use "M" or "B" as the remote output (RY) refresh device.

(2) Program example

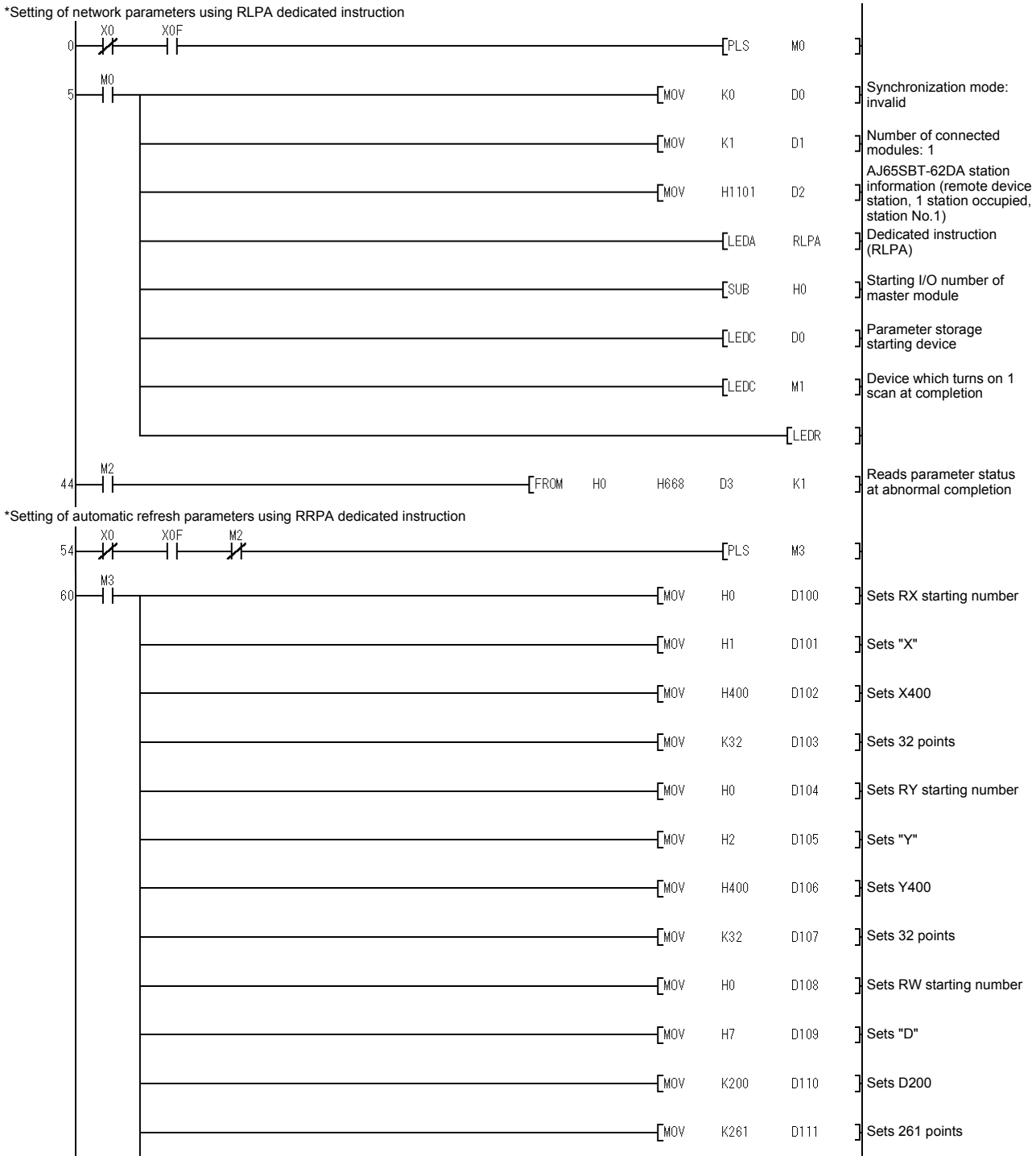


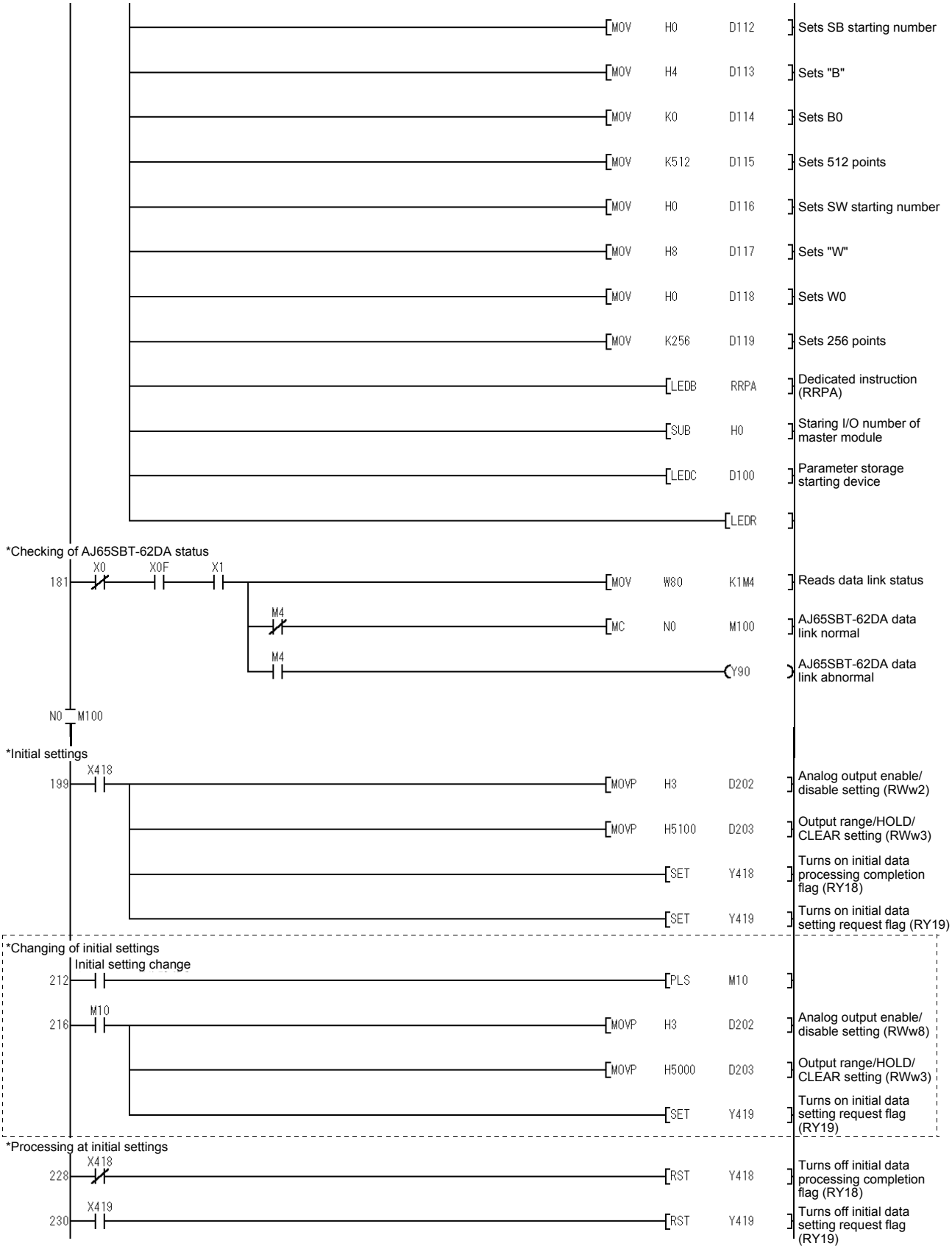
* The program enclosed by the dotted line is necessary only when the initial settings are changed.

5.5 Program Example for Use of the ACPU/QCPU (A mode) (dedicated instructions)

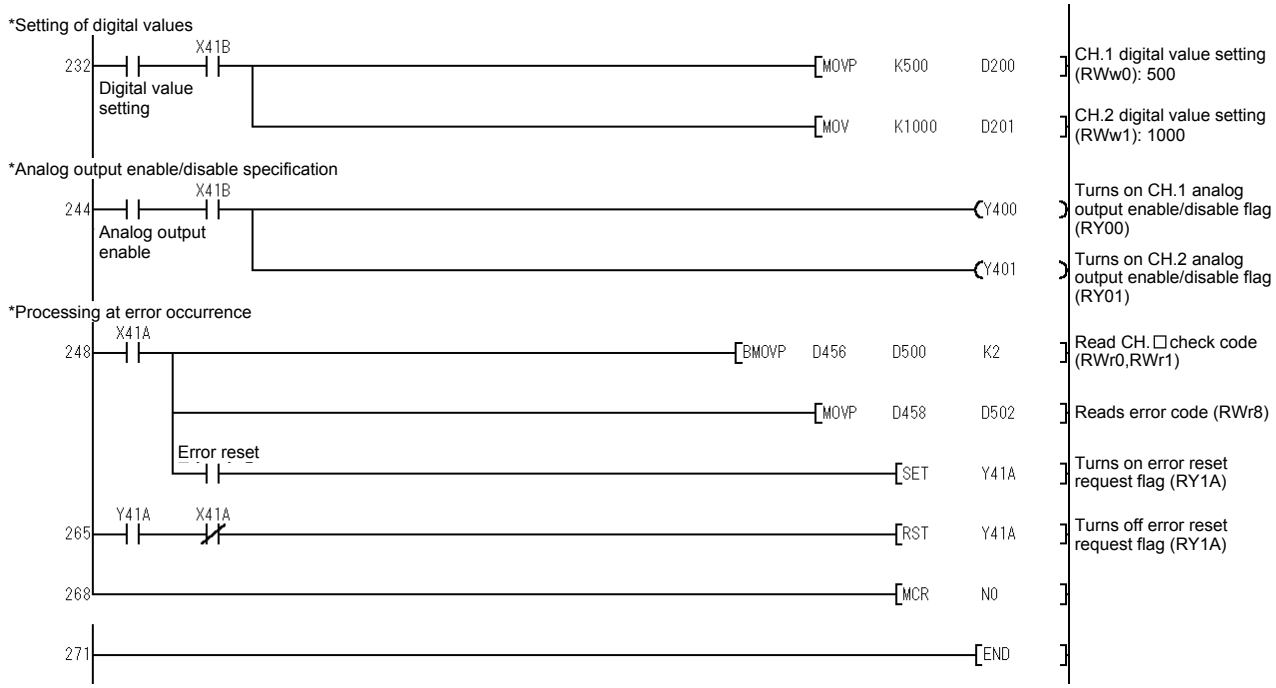
A sequence program is used to set the network and automatic refresh parameters.

(1) Program example





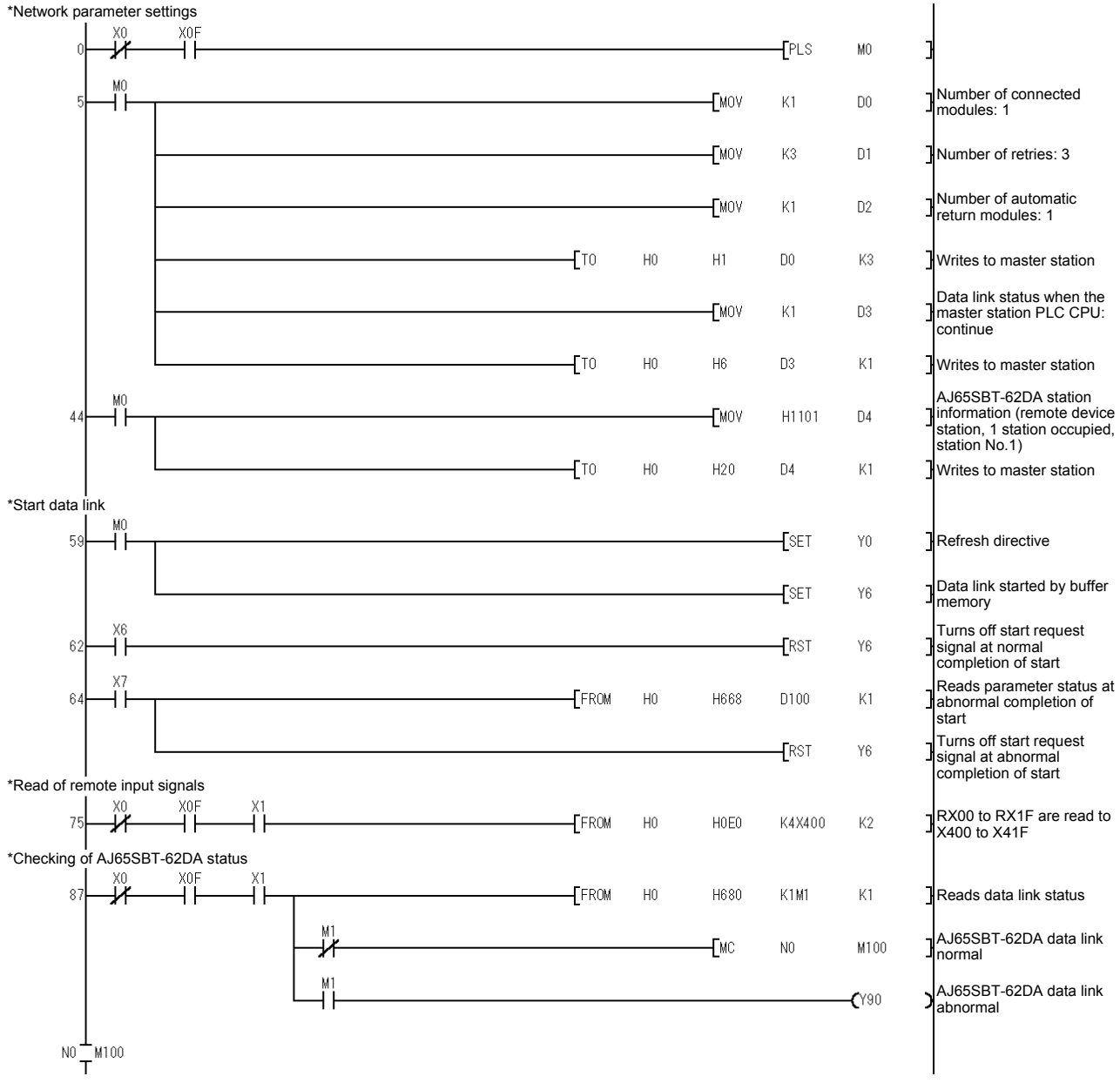
* The program enclosed by the dotted line is necessary only when the initial settings are changed.

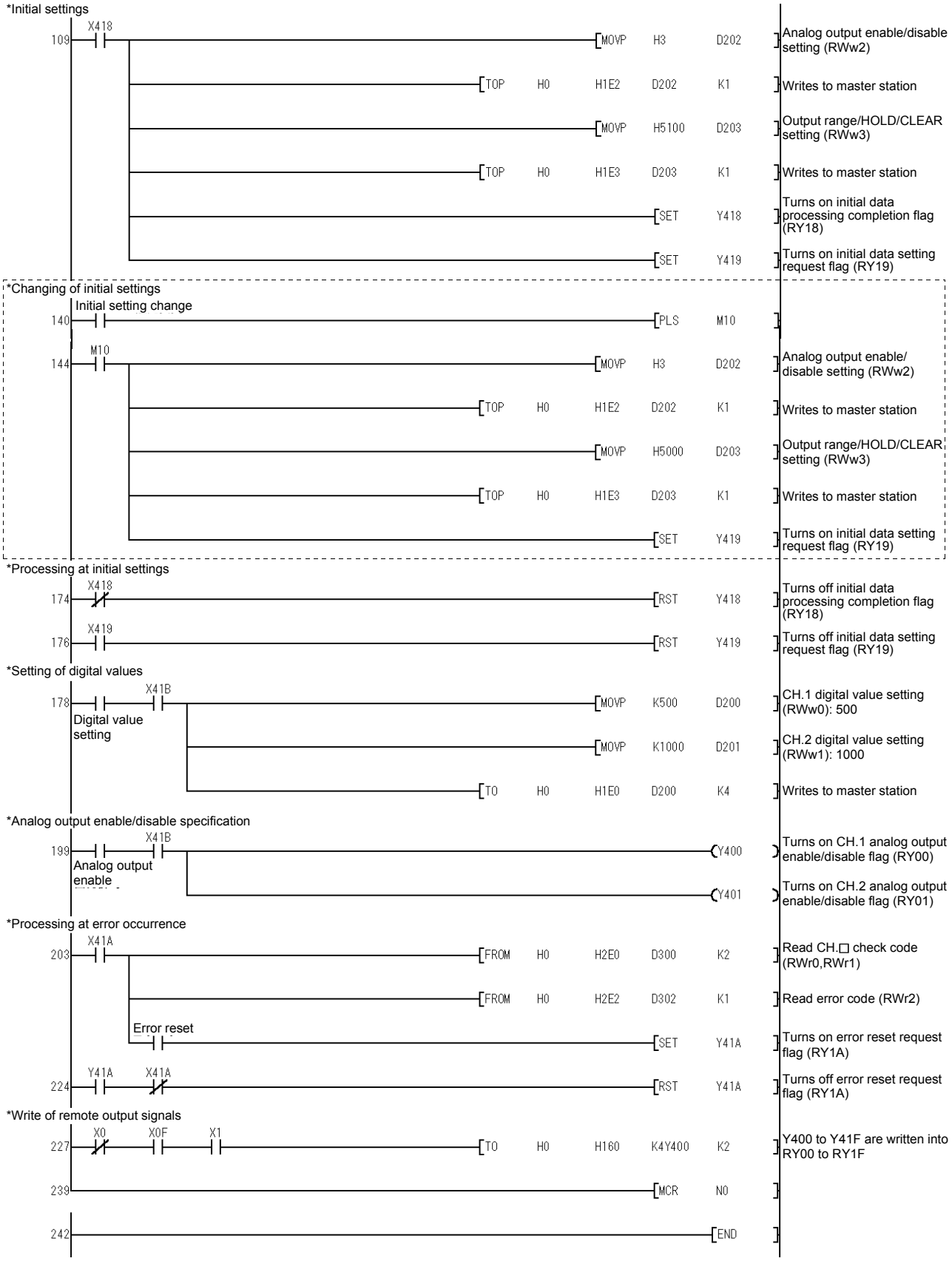

*Setting of digital values
X41B
232
Digital value setting
MOVP K500 D200
CH.1 digital value setting (RWw0): 500
MOV K1000 D201
CH.2 digital value setting (RWw1): 1000
*Analog output enable/disable specification
X41B
244
Analog output enable
Y400
Turns on CH.1 analog output enable/disable flag (RY00)
Y401
Turns on CH.2 analog output enable/disable flag (RY01)
*Processing at error occurrence
X41A
248
BMOVP D456 D500 K2
Read CH.□check code (RWr0,RWr1)
MOVP D458 D502
Reads error code (RWr8)
Error reset
SET Y41A
Turns on error reset request flag (RY1A)
Y41A X41A
265
RST Y41A
Turns off error reset request flag (RY1A)
268
MCR N0
271
END

5.6 Program Example for Use of the ACPU/QCPU (A mode) (FROM/TO instructions)

A sequence program is used to set the network parameters.

(1) Program example





* The program enclosed by the dotted line is necessary only when the initial settings are changed.

6 TROUBLESHOOTING

The details of the errors which may occur when using the AJ65SBT-62DA and troubleshooting are described.

6.1 Error Code List

When the data is written from the programmable controller CPU to the master module, and an error occurs (AJ65SBT-62DA "RUN" LED flashes), the error code is stored to the AJ65SBT-62DA remote register RWrn+2.

Table 6.1 Error Code List (Errors Detected by AJ65SBT-62DA)

Error Code (Hexadecimal).	Cause	Corrective Action
110 □	The set digital value is outside the setting range.	Correct the digital value to within the setting range.
200 □	The output range setting is outside the setting range.	Correct the output range setting to within the setting range.
	All channels are not set to any of "user range settings 1 to 3" at offset/gain setting (in the test mode).	When making offset/gain setting (in the test mode), set all channels to any of "user range settings 1 to 3".

The □ indicates the channel number where the error occurred.

(1) For the digital value setting error, the "RUN" LED flickers at intervals of 0.5s and D/A conversion is performed using the upper or lower limit value.
For the output range setting error, the "RUN" LED flickers at intervals of 0.1s and D/A conversion is not performed on all channels.

(2) When multiple errors occurred, the error code of the first error is stored, but the other errors are not stored.

(3) The error code reset is performed by turning on the error reset request flag (RY (n+1) A).

6.2 Using the LED Indications to Check Errors

This section explains how to check errors using the LED indications of the AJ65SBT-62DA.
Refer to the programmable controller CPU and master module user's manual for issues regarding the programmable controller CPU and master module.

(1) When the AJ65SBT-62DA "PW" LED is off

Check Item	Corrective Action
Is 24VDC power on?	Check the external power supply.
Is the voltage of the 24VDC power supply within the specified value?	Set the voltage value to within the range 20.4 to 26.4V.

(2) When the AJ65SBT-62DA "RUN" LED flickers

Check item	Corrective action
Is the LED flickering at 0.1s intervals in the normal mode?	1. Using the error code (RWrn+2), check the channel at which the output range setting error has occurred. 2. Make correction to the sequence program or GX Developer setting.
Is the LED flickering at 0.5s intervals in the normal mode?	1. Using the error code (RWrn+2), check the channel at which the digital value setting error has occurred. 2. Check the check code (RWrn, RWrn+1) of the channel at which the error has occurred. 3. Make correction to the sequence program.
Is the LED flickering at 0.1s intervals in the test mode?	Set all channels to any of "user range settings 1 to 3" in output range setting.
Is the LED flickering at 0.5s intervals in the test mode?	Change the offset/gain adjustment to within the available setting range.

(3) When the AJ65SBT-62DA "RUN" LED is off

Check item	Corrective action
Has the watchdog timer error occurred?	Using the link special registers (SW0084 to SW0087) of the master module, check the watchdog timer error and power on the AJ65SBT-62DA again. If the "RUN" LED is not lit after power is switched on again, the possible cause is a hardware fault. Contact your nearest Mitsubishi representative.
Has the TEST terminals (across 8-9) been shorted to enter the test mode?	After making offset/gain adjustment, open the TEST terminals (across 8-9).

(4) When the AJ65SBT-62DA "L RUN" LED is off
Communications are broken.
For details, refer to troubleshooting in the user's manual of the master module used.

(5) When the AJ65SBT-62DA "L ERR." LED flickers at fixed intervals

Check item	Corrective action
Has the station number or transmission speed setting switch position been changed during normal operation?	After correcting the setting switch setting, switch power on again.
Is the station number or transmission speed setting switch faulty?	If the "L ERR." LED has begun flickering though switch setting change was not made during operation, the possible cause is a hardware fault. Contact your nearest Mitsubishi representative.

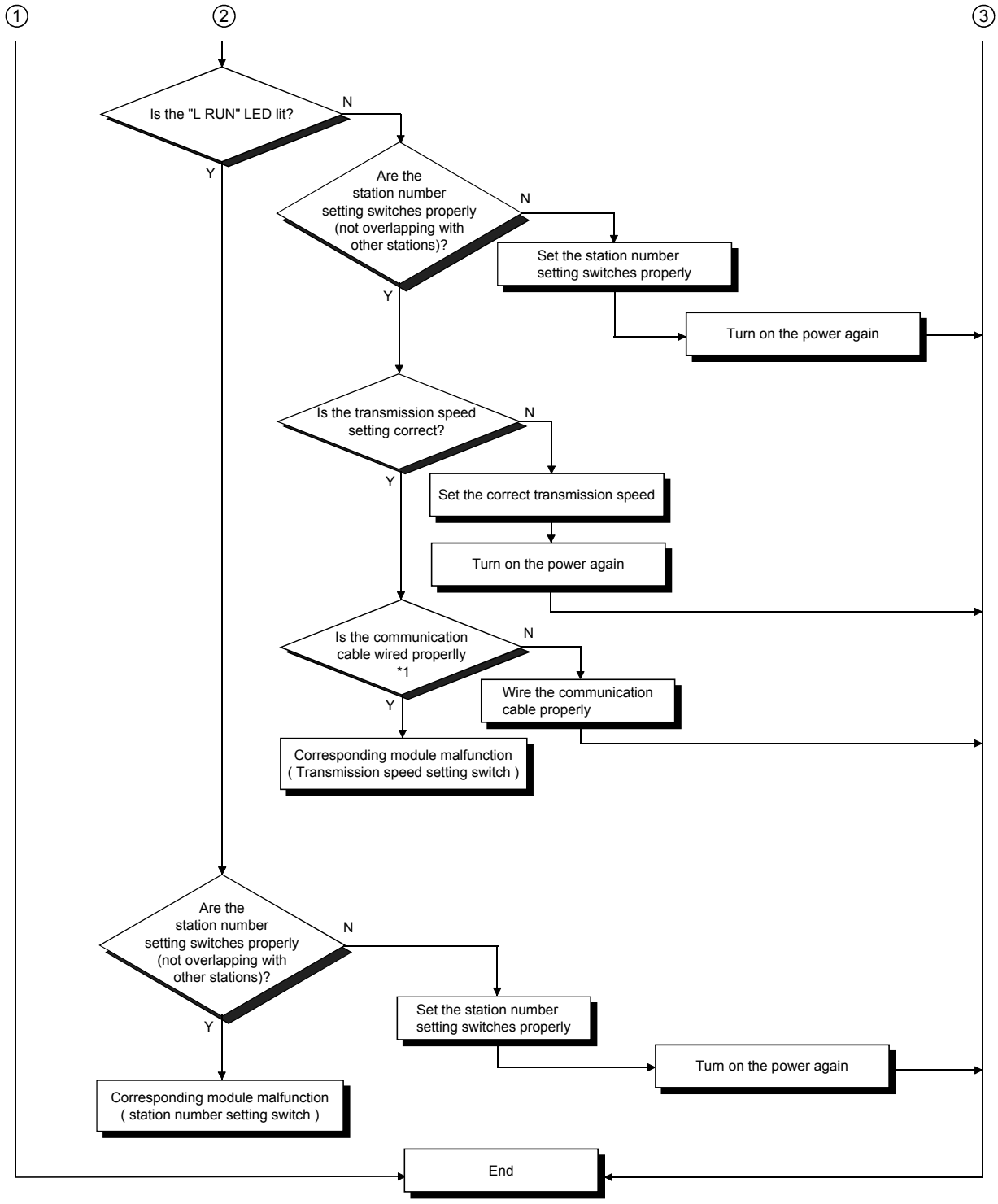
(6) When the AJ65SBT-62DA "L ERR." LED flickers at unfixed intervals

Check item	Corrective action
Have you forgotten fitting the terminal resistor?	Check whether the termination resistor is fitted. If it is not connected, connect it and switch power on again.
Is the module or CC-Link dedicated cable affected by noise?	Earth both ends of the shield wire of the CC-Link dedicated cable to the protective earth conductor via SLD and FG of the corresponding module. Earth the FG terminal of the module without fail. When carrying out wiring in piping, earth the pipe without fail.

(7) When the AJ65SBT-62DA "L ERR." LED is on

Check item	Corrective action
Are the station number and transmission speed correct?	Set the correct station number and transmission speed.

6.3 Troubleshooting for the Case where the "ERR." LED of the Master Station Flickers



*1Check for a short, reversed connection, wire breakage, terminal resistor, FG connection, overall distance and station-to-station distance.

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APPENDIX

Appendix1 Comparison between This Product and Conventional Product

(1) Comparison in performance between this product and conventional product
The following table gives performance comparison between the AJ65SBT-62DA and conventional product (AJ65BT-64DAV/DAI).

Performance Comparison between AJ65SBT-62DA and Conventional Product

<table>
<tr><td rowspan="2" colspan="2">Item</td><td colspan="3">Specifications</td></tr>
<tr><td colspan="2">AJ65SBT-62DA</td><td>AJ65BT-64DAV</td><td>AJ65BT-64DAI</td></tr>
<tr><td colspan="2"></td><td>Voltage output</td><td>Current output</td><td></td><td></td></tr>
<tr><td colspan="2">Digital input</td><td>-4096 to 4095</td><td>0 to 4095</td><td>-2048 to 2047</td><td>0 to 4095</td></tr>
<tr><td colspan="2">Analog output</td><td>Voltage: -10 to 10VDC
(external load resistance: 2kΩ to 1MΩ)</td><td>Current: 0 to 20mADC
(external load resistance: 0Ω to 600Ω)</td><td>Voltage: -10 to 10VDC
(external load resistance: 2kΩ to 1MΩ)</td><td>Current: 4 to 20mADC
(external load resistance: 0Ω to 600Ω)</td></tr>
<tr><td colspan="2">I/O characteristics
Maximum resolution</td><td colspan="2"><table><tr><td></td><td>Digital Input Value</td><td>Output Range</td><td>Max. Resolution</td></tr><tr><td rowspan="4">Voltage</td><td rowspan="2">-4000 to 4000</td><td>-10V to 10V</td><td rowspan="2">2.5mV</td></tr><tr><td>User range setting 1 (-10V to 10V)</td></tr><tr><td rowspan="3">0 to 4000</td><td>0 to 5V</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><tr><td rowspan="3">Current</td><td rowspan="3">0 to 4000</td><td>0 to 20mA</td><td>5μA</td></tr><tr><td>4 to 20mA</td><td rowspan="2">4μA</td></tr><tr><td>User range setting 3 (0 to 20mA)</td></tr></table></td><td colspan="2"><table><tr><td></td><td>Digital Input Value</td><td>Output Range</td><td>Max. Resolution</td></tr><tr><td>DAV</td><td>-2000 to 2000</td><td>-10V to 10V</td><td>5mA</td></tr><tr><td>DAI</td><td>0 to 4000</td><td>4 to 20mA</td><td>4μA</td></tr></table></td></tr>
<tr><td colspan="2">Output range changing</td><td colspan="2">Yes</td><td colspan="2">No</td></tr>
<tr><td colspan="2">Offset/gain setting</td><td colspan="4">Yes</td></tr>
<tr><td rowspan="2">Accuracy</td><td>Ambient temperature 0 to 55°C</td><td colspan="2">±0.4%
(accuracy relative to maximum value of analog output value)</td><td colspan="2">±1.0%
(accuracy relative to maximum value of analog output value)</td></tr>
<tr><td>Ambient temperature 25 ± 5°C</td><td colspan="2">±0.2%
(accuracy relative to maximum value of analog output value)</td><td colspan="2">—</td></tr>
<tr><td colspan="2">Max. conversion speed</td><td colspan="4">1ms/1 channel</td></tr>
<tr><td colspan="2">Output short-circuit protection</td><td colspan="4">Yes</td></tr>
<tr><td colspan="2">Number of analog output points</td><td colspan="2">2 channels/1 module</td><td colspan="2">4 channels/1 module</td></tr>
<tr><td colspan="2">Number of occupied I/O points</td><td colspan="2">1 station occupied
(RX/RY: 32 points each, RWr/RWw: 4 points each)</td><td colspan="2">2 stations occupied
(RX/RY: 32 points each, RWr/RWw: 8 points each)</td></tr>
<tr><td colspan="2">Connected terminal block</td><td colspan="2">7-point, 2-piece terminal block
(transmission, power supply)
Direct-coupled, 18-point terminal block
(analog output section) (M3 screw)</td><td colspan="2">27-point terminal block (M3.5 screw)</td></tr>
<tr><td colspan="2">Applicable wire size</td><td colspan="2">0.3 to 0.75mm^2</td><td colspan="2">0.75 to 2.00 mm^2</td></tr>
<tr><td colspan="2">Applicable crimping terminal</td><td colspan="2">RAV1.25-3.5</td><td colspan="2">RAV1.25-3.5, RAV2-3.5</td></tr>
<tr><td colspan="2">24VDC internal current consumption</td><td colspan="2">0.16A (at 24VDC)</td><td>0.18A (at 24VDC)</td><td>0.27A (at 24VDC)</td></tr>
<tr><td colspan="2">Weight</td><td colspan="2">0.20kg</td><td colspan="2">0.4kg</td></tr>
<tr><td colspan="2">Outline dimensions</td><td colspan="2">118(W) × 50(H) × 40(D) [mm]</td><td colspan="2">151.9(W) × 65(H) × 63(D) [mm]</td></tr>
</table>

APP

(2) Precautions for replacing the conventional product (AJ65BT-64DAV/DAI) with the AJ65SBT-62DA

In the existing system using the conventional product (AJ65BT-64DAV/DAI), the following instructions must be noted when changing the AJ65BT-64DAV/DAI for the AJ65SBT-62DA.

(a) Since the AJ65SBT-62DA occupies one station (the AJ65BT-64DAV/DAI occupies two stations), the station information setting in the network parameters must be changed.

(b) As the remote I/O signals and remote register settings are different between the two models, the program of the conventional model cannot be utilized.

(c) Because of the differences in shape and layout between the terminal blocks, you cannot use the terminal block of the conventional module as it is.

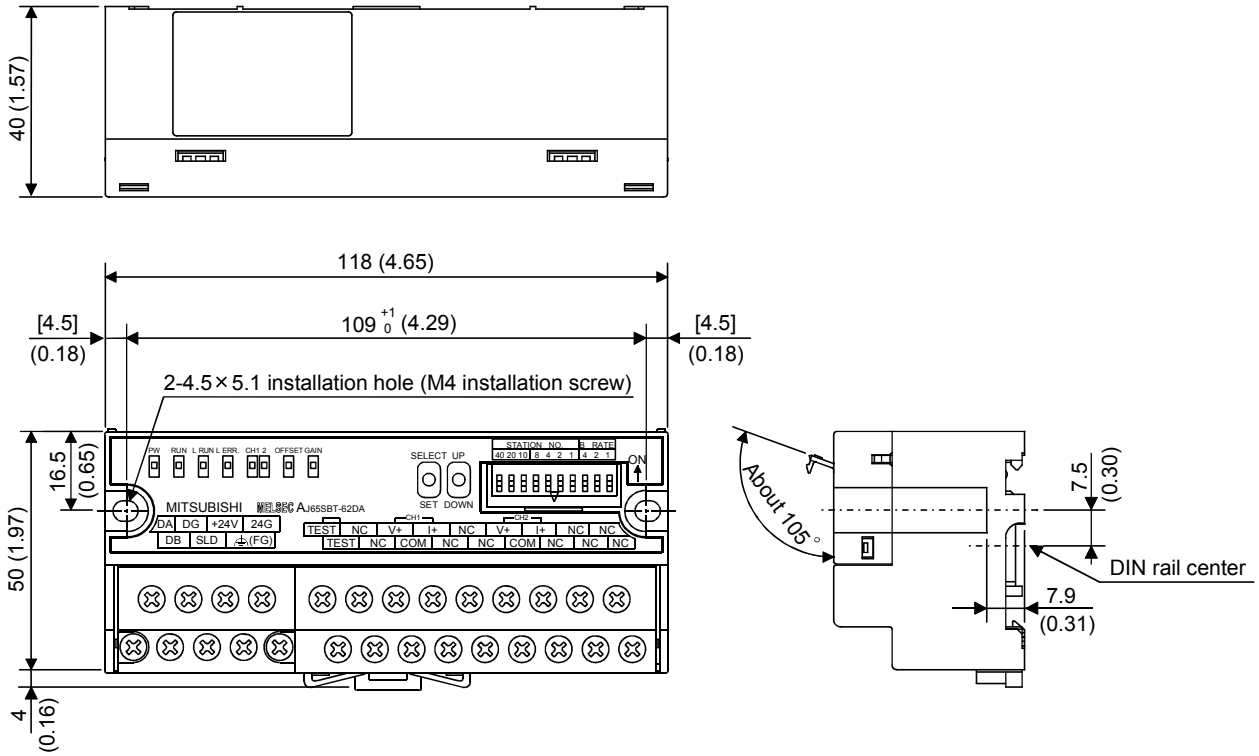
(d) The offset/gain setting method differs. For details, refer to Section 4.4.

(e) The ways to set the station number and transmission speed setting switches are different. For details, refer to Section 4.3.

Appendix2 External Dimensions

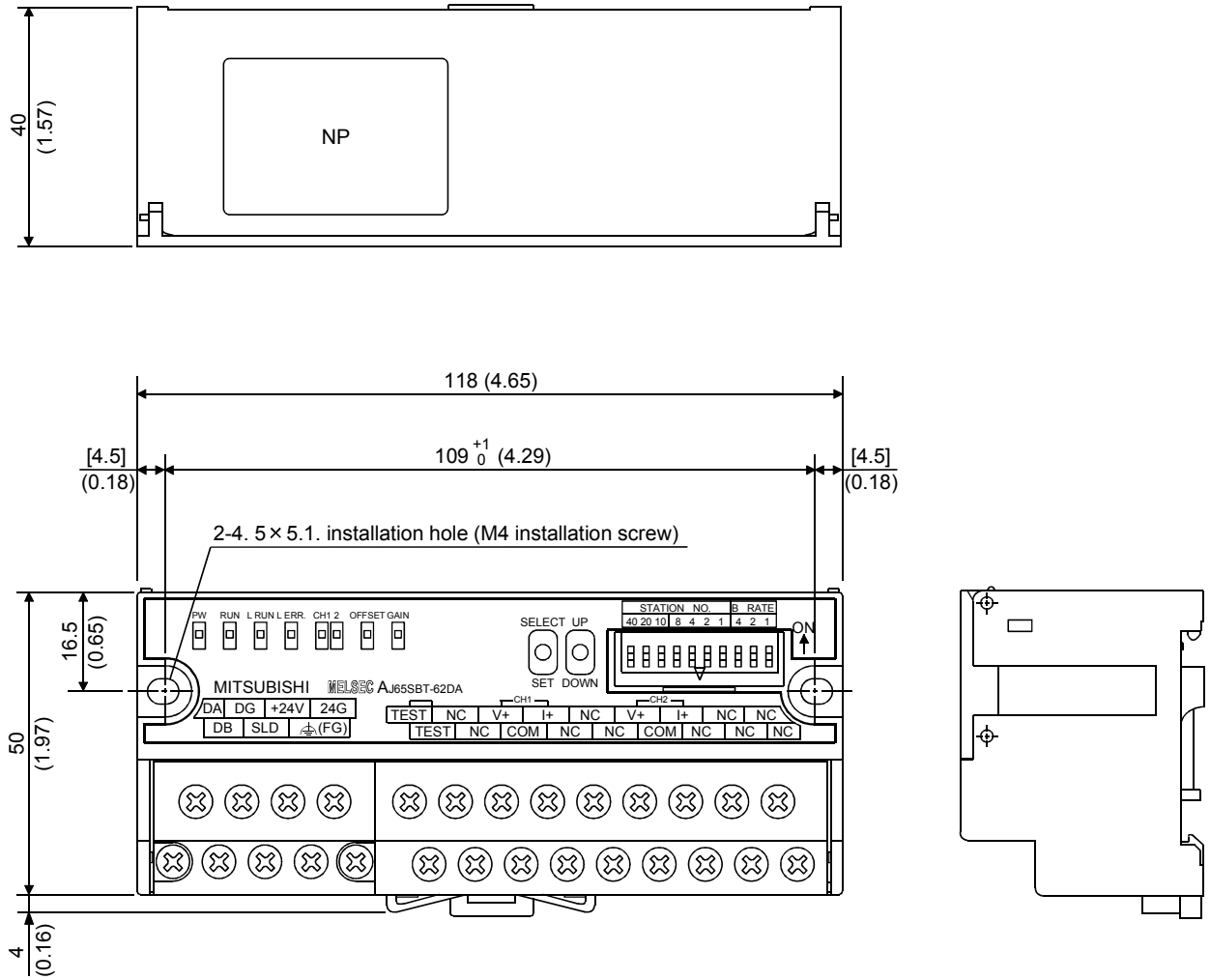
The external dimensions of the AJ65SBT-62DA is shown below.
The appearance of the AJ65SBT-62DA varies depending on the hardware version.
For checking method of the hardware version, refer to Section 2.3.

(1) Hardware version H or later



Unit: mm (inch)

(2) Hardware version G or earlier



Unit: mm (inch)

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

Digital-Analog Converter Module type AJ65SBT-62DA

User's Manual

MODEL	AJ65S-62DA-U-S-E
MODEL CODE	13JR19
SH(NA)-080107-E(1012)MEE	

MITSUBISHI ELECTRIC CORPORATION

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