

# User Manual

## Connection to Mitsubishi MelsecA

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# 1 Important Notes

## 1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.



### **Danger**

This symbol is used to refer to instructions which, if ignored or not carefully followed could result in personal injury.



### **Note**

This symbol indicates application tips or supplementary notes.



### **Reference to source of information**

This symbol refers to detailed sources of information on the current topic.

## 1.2 Safety Notes

- Read this manual carefully before using the operating device. Keep this manual in a place where it is always accessible to all users.
- Proper transportation, handling and storage, placement and installation of this product are prerequisites for its subsequent flawless and safe operation.
- This user manual contains the most important information for the safe operation of the device.
- The user manual, in particular the safety notes, must be observed by all personnel working with the device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

## 1.3 Intended Use

- The device is designed for use in the industry.
- The device is state-of-the-art and has been built to the latest standard safety requirements. However, dangerous situations or damage to the machine itself or other property can arise from the use of this device.
- The device fulfills the requirements of the EMC directives and harmonized European standards. Any modifications to the system can influence the EMC behavior.

## 1.4 Target Group

All configuration and programming work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.

## 2 Mitsubishi MelsecA

The Mitsubishi Melsec A protocol provides you random read and write access to all data of the controller.

All bit operands can also be accessed in bit-mode.

Connect the operating device to the AJ71C24 communication module of a controller of the An/AnA series.

### 2.1 Data Types

Direct access is possible to the following data types.

Table 2-1 Mitsubishi MelsecA data types

Type	Mnemonic	Access
Input Bit	BX	Bit Access
Input Word	WX	Word Access
Output Bit	BY	Bit Access
Output Word	WY	Word Access
Flag Bit	BM	Bit Access
Flag Word	WM	Word Access
Latch Flag Bit	BL	Bit Access
Latch Flag Word	WL	Word Access
Step Flag Bit	BS	Bit Access
Step Flag Word	WS	Word Access
Link Flag Bit	BB	Bit Access
Link Flag Word	WB	Word Access
Error Flag Bit	BF	Bit Access
Error Flag Word	WF	Word Access
Timer Contact Bit	BTS	Bit Access
Timer Contact Word	WTS	Word Access
Timer Coil Bit	BTC	Bit Access
Timer Coil Word	WTC	Word Access
Timer Actual Value Word	WTN	Word Access
Timer Actual Value Double-Word	DWTN	Double-Word Access
Counter Contact Bit	BCS	Bit Access
Counter Contact Word	WCS	Word Access
Counter Coil Bit	BCC	Bit Access
Counter Coil Word	WCC	Word Access

Table 2-1 Mitsubishi MelsecA data types

Type	Mnemonic	Access
Counter Actual Value Word	WCN	Word Access
Counter Actual Value Double-Word	DWCN	Double-Word Access
Data Register Word	WD	Word Access
Data Register Double-Word	DWD	Double-Word Access
Link Register Word	WW	Word Access
Link Register Double-Word	DWW	Double-Word Access
File Register Word	WR	Word Access
File Register Double-Word	DWR	Double-Word Access

## 2.2 Programming

### 2.2.1 Protocol parameters

With the protocol parameters, you can adapt the communication of the controller used.

#### 2.2.1.1 Baud Rate

This parameter specifies the communication rate.

Table 2-2 Baud rate

Configurable Values (Baud)	Default value
300	
600	
1200	
2400	
4800	
9600	X
19200	
38400	
57600	
76800	
115200	

**2.2.1.2 Parity**

This parameter specifies the parity used to control the communication.

Table 2-3 Parity

Configurable Values	Default Value
None	
Even	X
Odd	

**2.2.1.3 Handshake**

This parameter specifies the method used to control the communication.

Table 2-4 Handshake

Configurable values	Default Value
No Handshake	X
Hardware	
Software	

**2.2.1.4 Data Bits**

This parameter specifies the number of data bits.

Table 2-5 Data bits

Configurable Values	Default Value
5	
6	
7	
8	X

**2.2.1.5 Stop Bits**

This parameter specifies the number of stop bits.

Table 2-6 Stop bits

Configurable Values	Default Value
1	
1.5	
2	X

**2.2.1.6 Maximum Waiting Time For Response**

This parameter specifies how long the operating device waits for a response from the controller.

Table 2-7 Maximum waiting time for response

Configurable Values	Default Value
50 ms to 65535 ms	1000 ms

### 2.2.1.7 Delay until Connection Set-Up

This parameter specifies the waiting time after which the operating device starts the communication.

Table 2-8 Delay until connection set-up

Configurable Values	Default Value
0 s to 20 s	2 s

### 2.2.1.8 Mitsubishi CPU Type

This parameter indicates the CPU type which is used in the connected controller.

Table 2-9 Mitsubishi CPU type

Configurable Values	Default Value
An-CPU	X
AnA-CPU	

## 2.2.2 Input Syntax

The following image illustrates the structure of the input syntax for variables in the programming software.

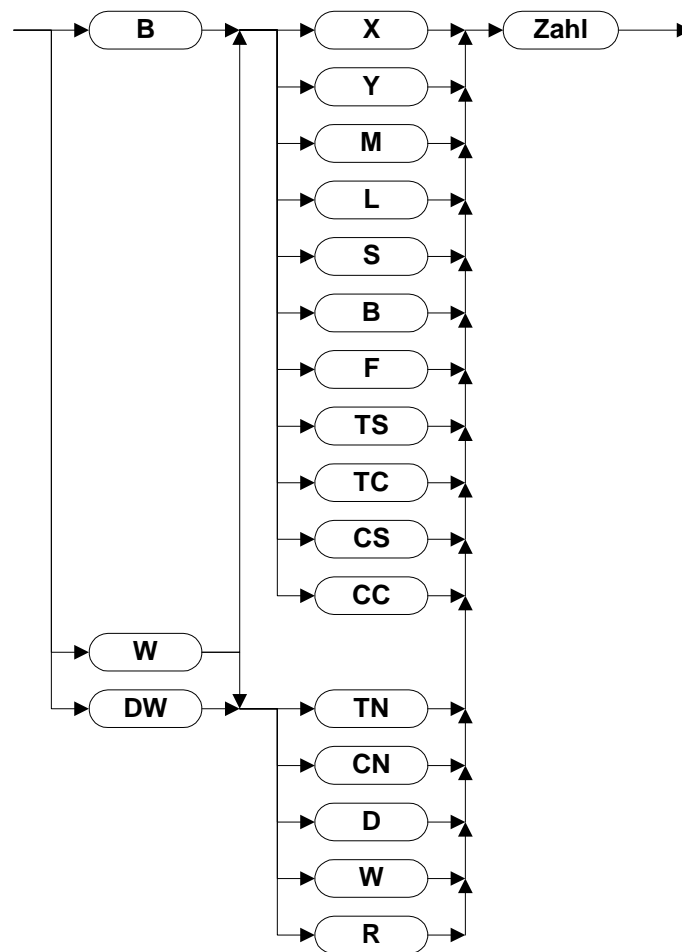


Figure 2-1 Syntax diagram

### 2.2.3 Physical Connection

Plug-in connectors on the operating device for connection to the controller.

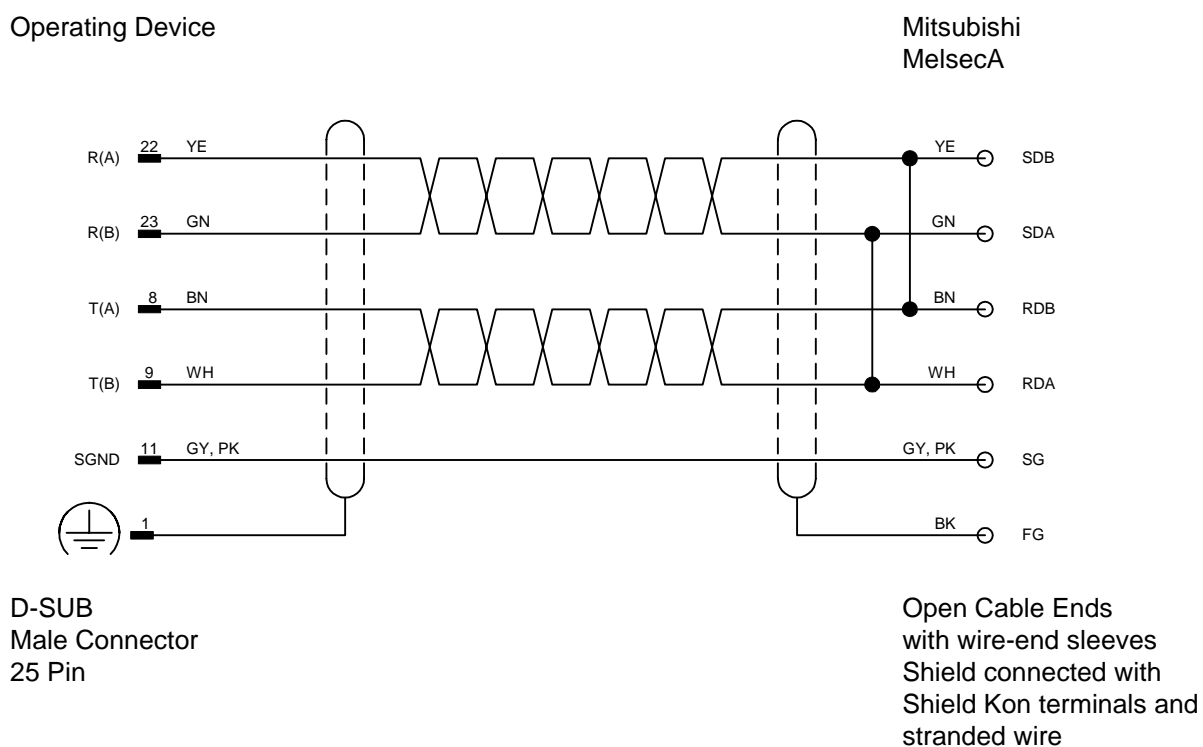
#### 2.2.3.1 Pin Assignment for Operating Devices with an Universal Interface

Table 2-10 Pin assignment RS485

Pin	Designation	Function
8	T(A)	Transmitted Data (-)
9	T(B)	Transmitted Data (+)
11	SGND	Signal Ground
22	R(A)	Received Data (-)
23	R(B)	Received Data (+)

#### 2.2.3.2 Cable SER1 RS485 - Mitsubishi MelsecA

The following cabling diagram applies to operating devices with an universal interface **only**.



You have to open the connections SDA-RDA and SDB-RDB for full duplex operation.

## 2.3 Error Messages

Error messages are displayed on the operating device along with a code and subcode. Error messages are composed as follows:

Communication Error  
 Code           XXXXX  
 Subcode       XXXXX  
 Retries        XXXXX

Table 2-11 Mitsubishi MelsecA error messages

Code	Subcode	Error Type	Possible Cause
1		Slave not ready	
2		Packets out of sequence	
3		Error in protocol frame	
5		CRC error	
6		Wrong parity	
9		Cyclic buffer overrun	Cyclic buffer too small
10		No cyclic data defined	
16		Receive buffer overrun	
40		System variable error	Undefined system variable
Error messages from the controller (AJ71C24)			
50		No function in RUN-mode	The respective DIP switch is not in ON position. To be able to write parameters, CPU must be in STOP mode.
51		Parity error	DIP switch for parity is not set correctly
52		Checksum error	DIP switch for checksum is not set correctly
53		Protocol error	Mode switch does not correspond to the required protocol format.
54		Runtime error	DIP switch for the number of stop bits is not set correctly
55		Data overrun	New data were transmitted before the preceding transmission was completed.
56		Character set error	Invalid operand address or requested service not available or wrong CPU type specified.
57		Character error	Characters transmitted do not correspond to the valid character set.

Table 2-11 Mitsubishi MelsecA error messages

Code	Subcode	Error Type	Possible Cause
58		Faulty access to CPU	This PLC type can not be used with the AJ71C24
66		Incorrect number assignment	The CPU number does not correspond to the value FFH.
67		Mode error	Faulty communication between AJ71C24 and the CPU.
68		Incorrect assignment of special module	An interactive special module equipped with its own buffer was configured improperly.
69		Incorrect step number in PLC program	A step control instruction is out of the range parameterized for the CPU or the sub-program to be executed is invalid.
74		Remote error	Remote RUN/STOP operation is not possible.
82		Data link error	An attempt was made to access a station to which communication has already been disconnected.
83		Data bus error at special module	Memory of a special module can not be accessed.

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