

Macro5520B

Operation Manual

REV 1.0

ampère

Revision History

REV	Date	Contents	Person in charge
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1. Overview

Macro5520B (M5520B) is an ISA bus card mounting MWSC-101 that controls slave devices, which are operated by the motionware, by means of binary communication. It is able to collectively control up to 16 slaves (PPMC-112, etc).

2. Specifications

Controller	MWSC-101CFP (made by Ampere)
Host side I/F	ISA (PC/AT)
I/O Address	Upper order 8 bits to be selected by DIP SW (A9~A2). 4 bytes are used.
Interruption	To be selected from IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 and 15 (a short circuit socked is used)
External I/F	RS-485 (terminated)
External I/F connector	D-SUB9 pin, RJ-45
Power supply	MC1, 5/2-G-3, 81 (made by Phoenix Contact) (Applicable connector: MC1, 5/2-ST-3, 81) Power consumption +5V 200mA (max)
Operative conditions	Temperature 0~60°C
	Humidity 30~85%
	Atmosphere Air which does not contain corrosive gas.
External size	PC/AT half size board

3. Block Diagram

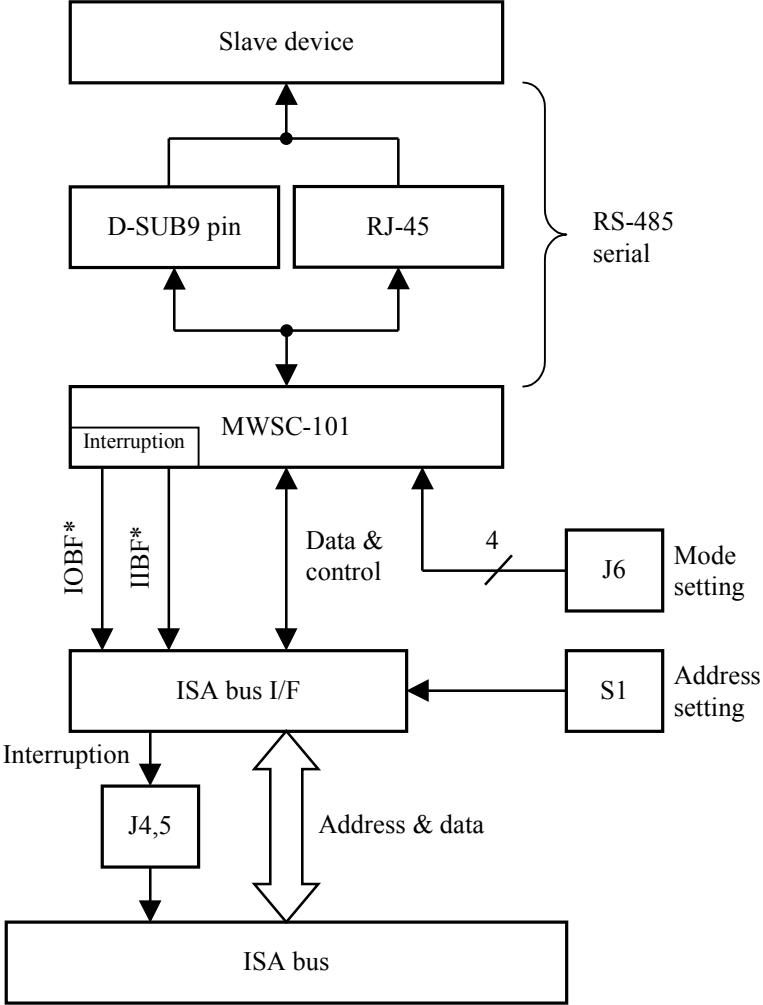
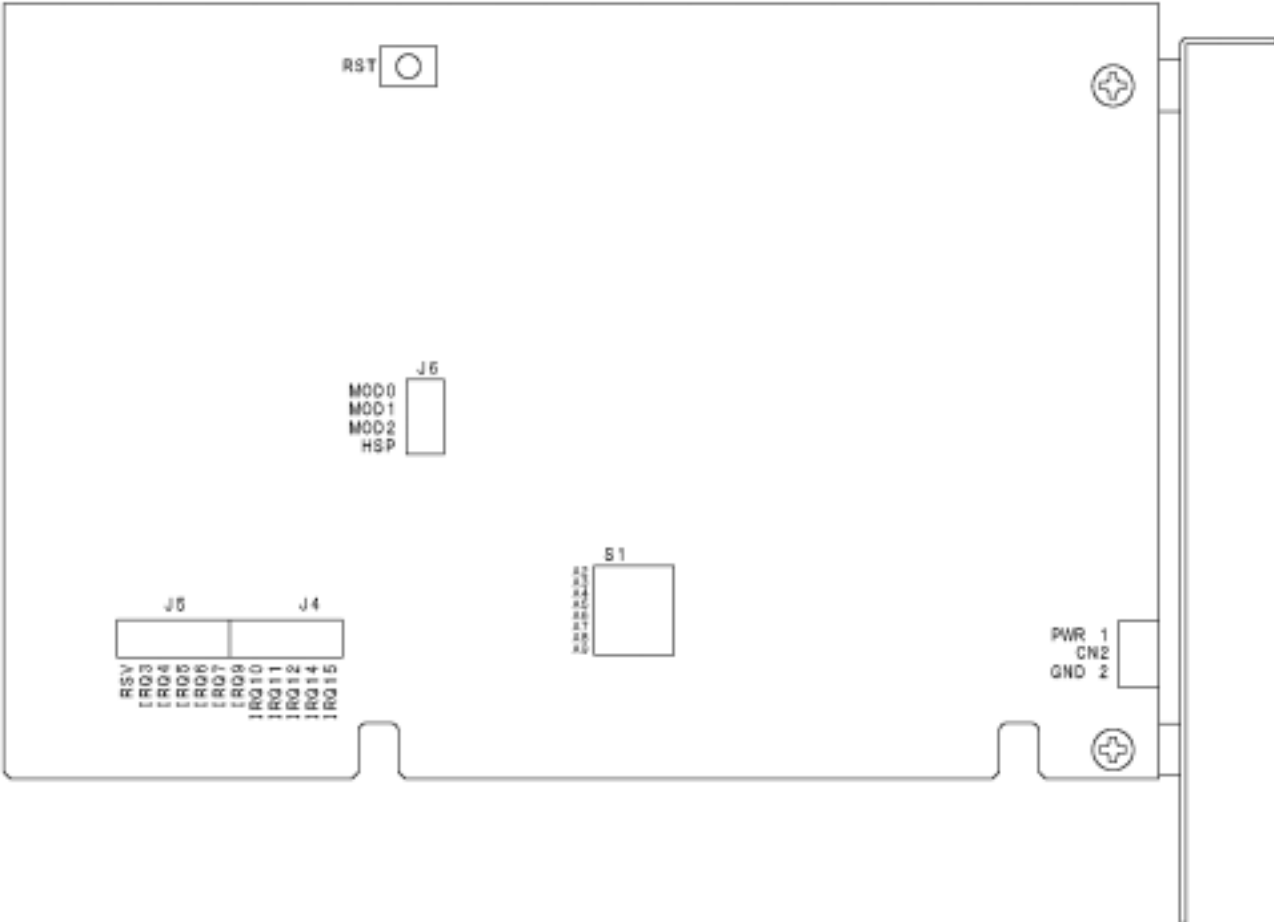


Fig. 3-1: M5520B Block diagram

4. Placement of Switches and Jumpers



5. Setting of Switches and Jumpers

5.1 Setting of Base Address on ISA bus (S1)

The base address of M5520B on the ISA bus is set by 1~8 of the DIP switch S1. A9~A2 of the DIP switch correspond to A9~A2 of the ISA bus by way of positive logic, so the switch ON represents "0" and OFF represents "1". It can be mapped to the I/O space of the ISA bus, using 4 bytes. Set the address to the one which the main unit or the peripheral equipment is not using. Table 5-1 shows the examples of the setting for the base address of 300h and 18h, and Table 5-2 shows the offset addresses of the registers.

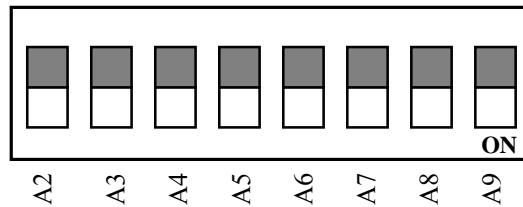


Fig. 5-1: Setting of address switch

Table 5-1: Examples of setting

A9	A8	A7	A6	A5	A4	A3	A2	Base addresses to be set
OFF	OFF	ON	ON	ON	ON	ON	ON	300h
ON	ON	ON	ON	ON	OFF	OFF	ON	18h

Table 5-2: Offset addresses of registers

Offset addresses	R/W	Register name	Remarks
+ 0h	R/W	Data register	MWSC-101
+ 1h	R	Status register	
	W	Command register	
+ 2h	R/W	MCR	M5520B control register
+ 3h	—	Reserve	

Note) See the operation manual for MWSC101 for explanation of each register.

5.2 Selection of Interruption Request Signal

When MWSC-101 on M5520B outputs an interruption signal, set the interruption level to be output to the ISA bus with J4 and 5. Short the interruption level to be used with the short circuit socket. It makes no sense to short it with RSV.

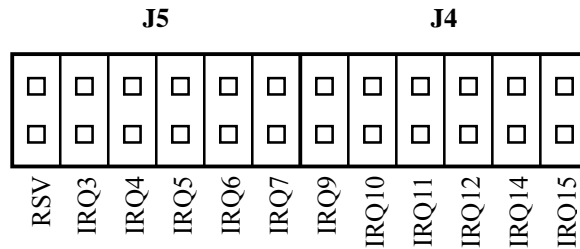


Fig. 5-2: Setting of interruption jumpers

5.3 Setting of MWSC-101 (J6)

J6 is used to make various settings to be used in MWSC-101. For the setting, the short is made "0" and the open is made "1".

See MWSC operation manual for the details.

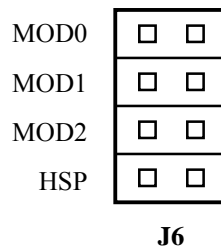


Fig. 5-3

5.3.1 Setting of Transmission Rate (MOD0, 1)

MOD0 and 1 are used to select the transmission rate of the motionware. For the setting, the short is made "0" and the open is made "1".

Table 5-3: Transmission rate

MOD1	MOD0	Transmission rate
0	0	Error
0	1	31.25kbpS
1	0	62.5kbpS
1	1	125kbpS

5.3.2 Setting of Operation Mode (MOD2)

Conditions to control the occurrence of error return values from MWSC-101 are set. For the setting, the short is made "0" and the open is made "1".

Table 5-4: Setting of error interruption

MOD2	Setting
0	When acknowledgement is received or an error occurs.
1	Only when a communication error occurs.

5.3.3 Specifying High Speed Protocol (HSP*)

Whether or not to execute the checksum during the communication between the slaves is set. For the setting, the short is made "0" and the open is made "1". It is necessary to make the setting of PPMC and PIOC of the slave side the same.

Table 5-5:

HSP*	Content
0	Does not wait for checksum.
1	Waits for checksum.

5.4 MCR

This board is equipped with the registers, capable of reading and writing, to control the setting of the board. The composition is as follows.

Table 5-6:

MCR	Bit 7~2	Bit 1	Bit 0
Content	Reserve	Interruption mode	Board reset control

Here, although any specific function is not assigned to the bit for Reserve, it is possible to set a value there. However, as it is the register reserved for the extension in the future, do not use it.

5.4.1 Board Reset Control

M520B is reset by the reset signal of the ISA bus, bit 0 of the MCR and by pressing the RST switch. The reset signal of the bus and the switch also reset the MCR.

To cancel the reset, make the value 0. However, it is asked to make the reset time of the MWSC more than 1.25uS. Setting of the MCR is as follows.

Table 5-7:

Bit 0	Content
0	Operation (default)
1	MWSC reset

5.4.2 Interruption Mode

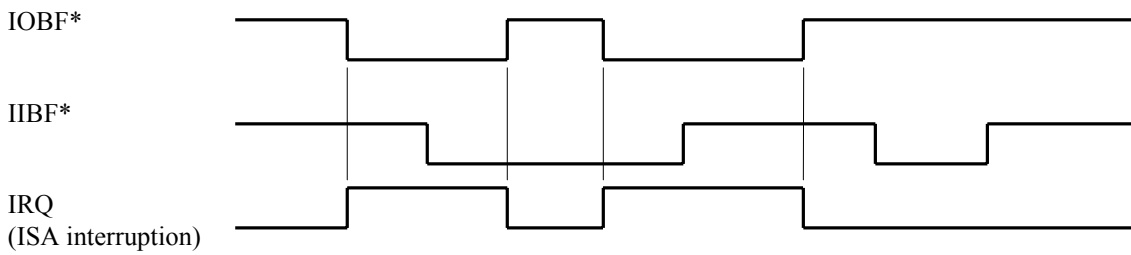
This board has 2 kinds of interruption output pattern following the setting of bit 1 of the MCR, as shown below. If the MCR bit 1 is "0", only IOBF* is output, if the bit 1 is "1", IOBF* and IIBF* are summed by means of OR for output. The default of the bit 1 is "0".

The timing is shown below.

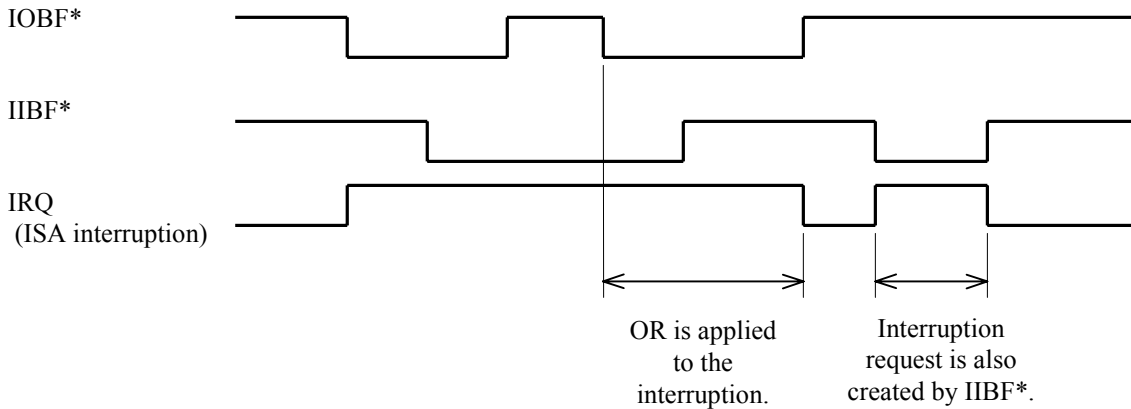
Table 5-8:

Bit 1	Content
0	Only IOBF* is output (M5520A compatible) (Default)
1	IOBF* and IIBF* are output after OR.

MCR bit 1 is 0:



MCR bit 1 is 1:



6. Power Supply

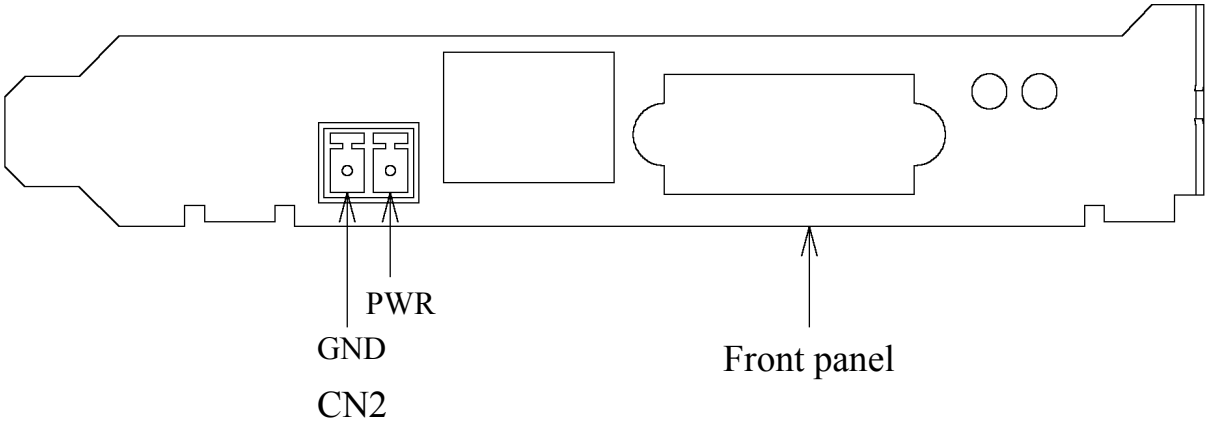
The power for RS-485 driver/receiver of M5520B is supplied from outside. This is because it is most probable that 24V or 12V is being used somewhere in the system and it is safer to separate the power supply for the personal computer from the system of the slave side.

6.1 Power Supply Connector

M5520B has two ways to supply power to RS-485. One is the way to supply the power from CN2 and the other is the way to use pins 1, 4, 5 and 6 from D-SUB9 pin.

If RJ-45 is selected as a communication cable, the power is supplied from CN2. In case of D-SUB9 pin, either selection is possible.

The connector is illustrated below.



7. Communication Connector

D-SUB9 pin (male) and RJ-45 to communicate with the slave are attached to the panel side.

Table 7-1: D-SUB9 pin signal table

No.	Signal name	Remarks
1	+ 24V, + 12V	
2	TX -	MWSC send -
3	RX -	MWSC receive -
4	GND	
5	GND	
6	+ 24V, + 12V	
7	TX +	MWSC send +
8	RX +	MWSC receive +
9	NU	No used

The assignment of RJ-45 connector pin of M5520B is different from the one that is corresponding to the motion control, such as M8014. Therefore, it is necessary to change the wiring. The wiring diagram is shown below.

Table 7-2: RJ-45 signal table

No.	Signal name	Remarks
1	TX +	MWSC send +
2	TX -	MWSC send -
3	NU	
4	GND	
5	RX +	MWSC receive +
6	RX -	MWSC receive -
7	NU	
8	GND	

Wiring diagram (example)

