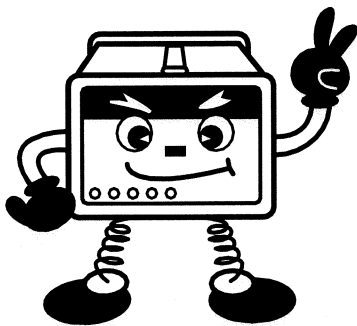


Handler Interface

(ZM2354 only)

6



The ZM2353 is not equipped with a handler interface.

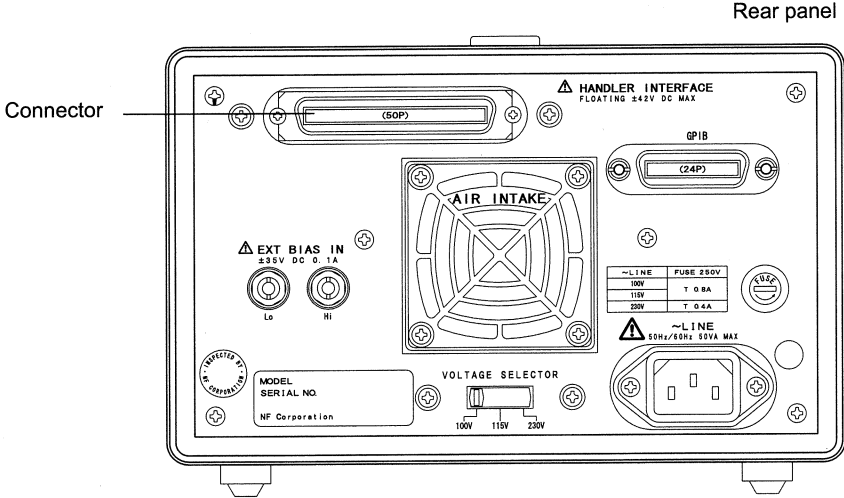
This chapter applies only to the ZM2354.

Handler interface

The handler interface can output result of judgment by maximum 21 classifications when the ZM2354 comparator functions are used. In addition, panel lock input, trigger input and memory select input are provided and all inputs and outputs are isolated from the enclosure. Further, it can issue a beep sound according to the result of judgment when measurement is complete.

Connecting handler interface I/O

Connector



The ZM2354 uses a 50-pin connector. Use the special connector (DDK 57-30500) or an equivalent item as the connection cable to the handler.

25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26

DDK 57-40500 equivalent REAR VIEW

Array of Connector Pins

Signal allotment to handler interface

PIN No.	Signal name	I/O	Description
1	--	--	To be connected to ground via 100 kΩ
2	--	--	To be connected to ground via 100 kΩ
3	BIN1	OUT	Judgment result for Bin 1
4	BIN2	OUT	Judgment result for Bin 2
5	BIN3	OUT	Judgment result for Bin 3
6	BIN4	OUT	Judgment result for Bin 4
7	BIN5	OUT	Judgment result for Bin 5
8	BIN6	OUT	Judgment result for Bin 6
9	BIN7	OUT	Judgment result for Bin 7
10	BIN8	OUT	Judgment result for Bin 8
11	BIN9	OUT	Judgment result for Bin 9
12	BIN10	OUT	Judgment result for Bin 10
13	BIN11	OUT	Judgment result for Bin 11
14	BIN12	OUT	Judgment result for Bin 12
15	BIN13	OUT	Judgment result for Bin 13
16	BIN14	OUT	Judgment result for Bin 14
17	--	OUT	Auxiliary output
18	LOCK	IN	Disable panel operation
19	TRIG	IN	Start measurement trigger
20	--	--	To be connected to ground via 100 kΩ
21	--	--	To be connected to ground via 100 kΩ
22	SET0	IN	Select memory (0)
23	SET1	IN	Select memory (1)
24	+5 V	--	+5 V output (output of 0.1 A max., in combination with pin 25)
25	+5 V	--	+5 V output (output of 0.1 A max., in combination with pin 24)
26	GND	--	Ground
27	GND	--	Ground
28	BIN15	OUT	Judgment result for Bin 15
29	BIN16	OUT	Judgment result for Bin 16
30	BIN17	OUT	Judgment result for Bin 17
31	--	OUT	Auxiliary output
32	BIN B	OUT	Judgment result for Bin B
33	--	OUT	Auxiliary output
34	BIN18	OUT	Judgment result for Bin 18
35	BIN19	OUT	Judgment result for Bin 19
36	BIN20	OUT	Judgment result for Bin 20
37	--	OUT	Auxiliary output
38	A NG	OUT	Wrong main parameter
39	B NG	OUT	Wrong sub parameter
40	--	OUT	Auxiliary output
41	STROBE	OUT	Judgment complete pulse
42	--	OUT	Auxiliary output
43	BUSY	OUT	Under measurement flag
44	EOM	OUT	Measurement complete signal
45	GND	--	Ground
46	GND	--	Ground
47	SET2	IN	Select memory (2)
48	SET3	IN	Select memory (3)
49	GND	--	Ground
50	GND	--	Ground

The ground of the handler interface is different from the ground of the enclosure; it is DC-isolated.

Auxiliary output is always inactive.

Cable

For connection with the handler, use a shielded twist pair wire as short as practicable. Be sure to connect one of the twist pair wire to the grounding terminal. If the wire is very long or noise is high, then take measures to prevent malfunction as follows:

- Raise the signal level (voltage) to 15 V in order to increase the noise allowance.
- Change cable arrangement to prevent malfunction or measurement variation.

Processing of ground

The handler interface and the ZM2354 are DC-isolated in the following range:

Voltage between two ground terminals: within ± 42 V

It may happen that connection of the handler to the ground of the ZM2354 would make the system stronger against noise, depending on the conditions, but normally, the shield of the cable should be connected to the ground (or the case) of either the handler or the ZM2354.

If the handler uses photocoupler for communication:

Connect the shield of the cable to the ground of the handler.

If the handler uses photocoupler for communication:

For the purpose of reinforcing the AC insulation, connect the shield of the cable to the ZM2354 if the handler uses a photocoupler for sending and receiving.

The connector shell of the handler interface is connected to the signal ground of the handler interface, and it is isolated from the ground of the ZM2354.

CAUTION

Do not apply voltage exceeding ± 42 V between the enclosure and the ground of handler interface. Application of excessive voltage may damage the ZM2354 or the handler.

Setup before starting

Confirmation of connection cable

Before turning on the power supply, do not fail to ensure the cable is connected to the handler interface connector on the rear panel.

Panel LOCK

If the user wants to return settings back to those of just before the last power turning off when the power supply is turned on, or if the user wants to protect settings from accidental change, then set the LOCK signal to the low level.

If the ZM2354 is powered with the LOCK signal set to the low level, the settings just before the last power turning off will be read out from the memory, and moreover, the zero correction value will be returned to the original value.



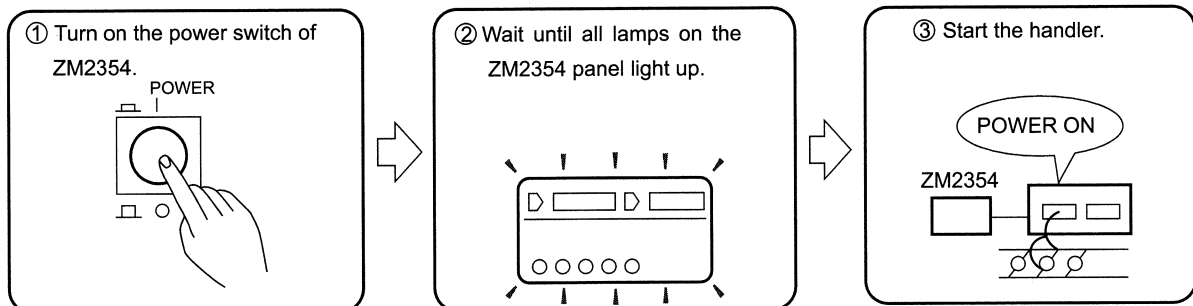
Be careful!

Note that zero correction value may change over time. If zero correction is not carried out for an extended time, measurement error will increase. Be sure to regularly check the variation of zero point or carry out zero correction.

Starting


Turning power on

Observe the following procedure to start operation if the ZM2354 is to be used with the handler connected.



This procedure is intended to ensure the output of the handler interface will be stabilized when a certain period of time has passed after power turning on.

Starting the handler interface

The user presses  ^{Δ/%/BIN}, and the Bin lamps of Display A light up, and the system gets ready for comparator measurement, when the handler interface also starts up. In a measurement status with the comparator not used, all output signals of the handler interface remain inactive and also the beeper is inoperative.

The input signals of handler interface, LOCK, TRIG, SET0, SET1, SET2 and SET3 are active even in the measurement status without using the comparator.

Setting the measurement conditions

Setting from panel

To make setting from the panel, first release the LOCK signal of the handler interface. If the LOCK signal is active (at low level), the user cannot do any operation other than error releasing. Setting of measurement conditions and zero correction (OPEN button and SHORT button) are disabled too.

If the LOCK signal is active (at high level) when the ZM2354 is powered, settings just before the last power-off will be read including zero correction values.

Operation through GPIB

Setting of measurement conditions through GPIB will not be disabled by the LOCK signal.

Setting of beeper

The user can select beep sounding on judgment completion by changing the parameter of selection of beep [bEEP] in the system menu.

 See "Selection of beep when comparator is used" in Chapter 7 "System Menu".

Display B	Description
0	Beep OFF
1	Beep ON for BIN 1 to 20
2	Beep ON for BIN A NG
3	Beep ON for all cases

Setting of indications

By changing the parameter on the selection of display, [diSP], in the system menu, the user can select which to be shown on Displays A and B with comparator being used, the measurement or the upper and lower limit values of the bin number that has been judged.

 See "Selection of indications when comparator is used" in Chapter 7 "System Menu".

Display B	Description
0	Measurements are shown.
1	Upper and lower limit values of the BIN number are shown that has been judged.

Setting of width of strobe signal

The user can change the pulse width of strobe signal.

By changing the value of selection of strobe width in the system menu, the pulse width of strobe signal can be changed.


 See "Pulse width of strobe signal" in Chapter 7 "System Menu".

The pulse width of strobe signal can be changed in the range of 1 ms to 19999 ms (in resolution of 1 ms).

Selection of output signal polarity

The user can select the signal level, low or high, if the output of the handler interface is active.

By changing the parameter of output polarity in the system menu, low or high level can be selected.

 See "Selection of output signal polarity of handler interface" in Chapter 7 "System Menu".

Display B	Description
Lo	Low level when active (negative logic)
Hi	High level when active (positive logic).



Signal output

Types of signals

- BIN1 to BIN20: Bin judgment

Only bin signal classified according to the resulting judgment of measurement selected on Display A will be activated.

- A NG: Wrong main parameter

If the result does not fall in any of the range of Bin 1 to Bin 20 by the above bin judgment, this signal will be activated. However, if the range of Bin 1 is set such that "Lower limit \geq Upper limit", then this signal will not be activated.

- BIN B: Judgment of sub parameter

If the result falls in the judgment range (set by BIN B) of sub parameter (Display B), this will be activated. Judgment will be made on the measurement selected by Display B. If the selected items of Display B are any of **FREQ**, **LEVEL**, **BIAS**, **RANGE** and **REF** (set value), then judgment will not be made and the item is always inactive.

- B NG: Wrong sub parameter

If the result does not fall in the judgment range of sub parameter (Display B), this will be activated.

However, if the range of Bin 1 is set such that "Lower limit \geq Upper limit", or if the selected items of Display B are any of **FREQ**, **LEVEL**, **BIAS**, **RANGE** and **REF** (set value), then this signal will not be activated.

- STROBE: Judgment complete flag

When measurement and judgment are over, and output of signals of BIN1 to BIN20, A NG, BIN B, B NG have been stabilized, this will be activated.

The pulse width is specified by the STROBE width in the system mode.

- BUSY: Under measurement flag

This signal will be activated only when the test piece is connected. If this is inactivated, the current test piece will be changed to the next one (the same as the BUSY lamp on the front panel).

- EOM: Measurement complete signal

This is activated for the period from start of to measurement to judgment completion.

When BUSY is activated, this is also activated at the same time, and this is inactivated at the same time when STROBE is activated.

Signal level

An output signal is output from open collector, at TTL level and of negative logic.

It can directly drive a logic IC of TTL and CMOS. In addition, it can also drive a relay up to 24 V.

- Maximum rating:

Pull-up voltage: 30 V

Sink current: 48 mA

- TTL load

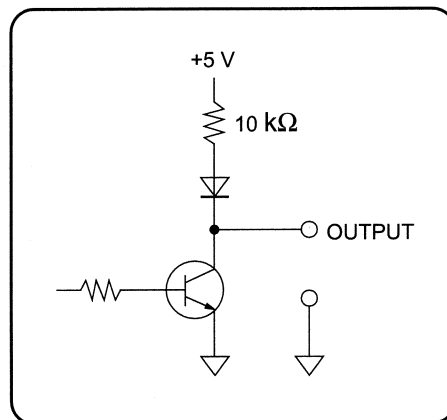
10 standard TTLmax

- High-level output voltage under no load

≥ 3.6 V (Load ≥ 100 k Ω)

Output circuit of handler interface

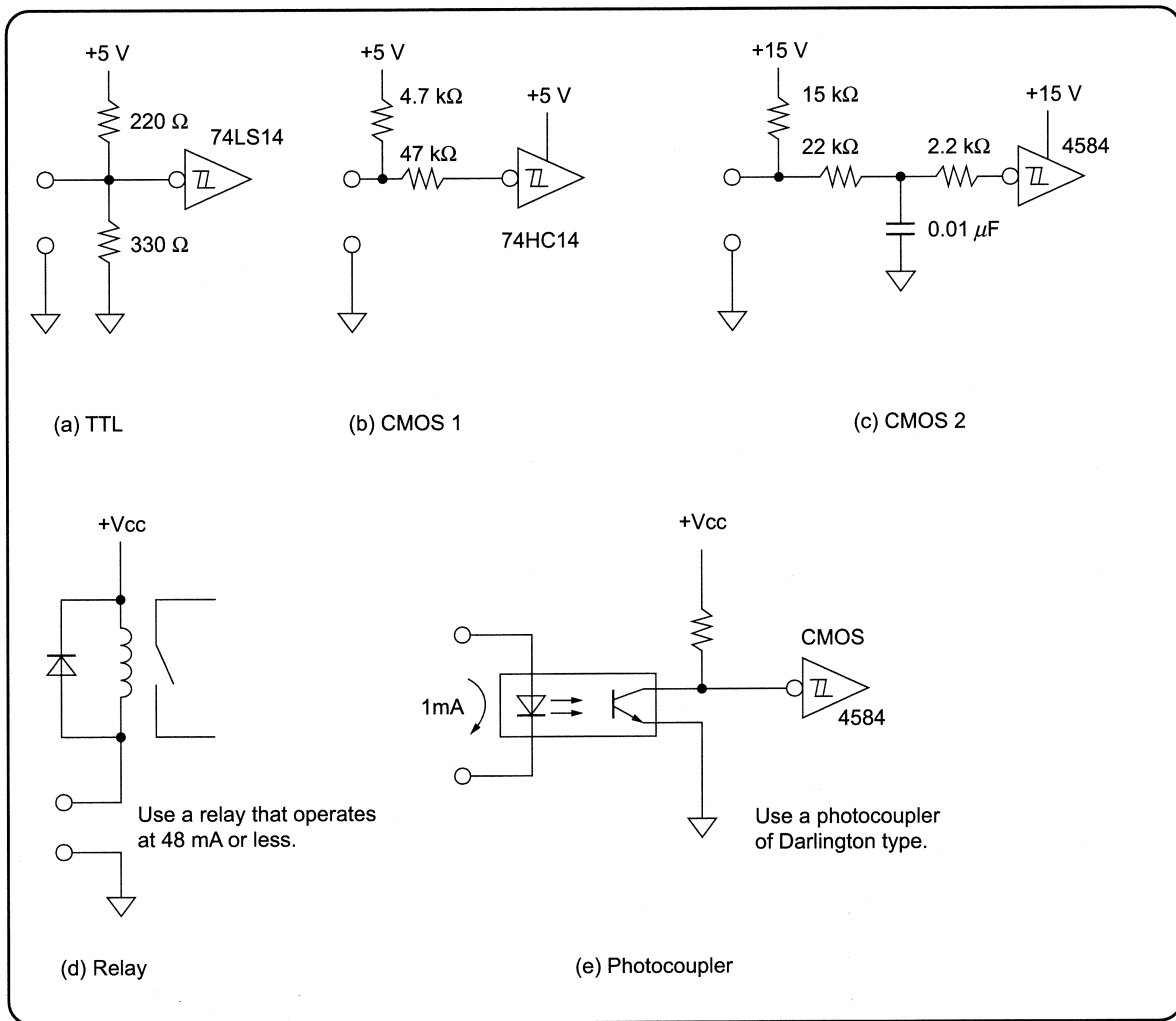
The diagram below shows an output circuit of handler interface.



Output Circuit of Handler Interface

Exemplary reception circuit

The diagram below shows an example of circuit to receive signals on handler side.



An Example of Reception Circuit on Handler Side

Input signal

Trigger

- TRIG: Trigger

This signal is a trigger to start measurement. It has a pulse width (at Lo level) $\geq 100 \mu\text{s}$. Since the trigger signal is neglected as long as the strobe signal is active, give the next trigger when the strobe signal has finished.

- LOCK: Panel lock

This signal disables panel operation (except error releasing). It does not disable setting through the GPIB.

- SET0, SET1, SET2, and SET3: Select memory signal

These signals read measurement conditions stored in the memory from the handler interface. Selection signals are a 4-bit input.

Signal level

- TRIG

TTL level, negative logic (triggered at low level)

Low level input voltage = -1.5 V to $+0.8 \text{ V}$

High level input voltage = $+2.4 \text{ V}$ to $+30 \text{ V}$

(Current of 2mA max flows in when $+5 \text{ V}$ is exceeded.)

Low level input current = -0.33 mA

(Negative sign means outward flow.)

- LOCK

Negative logic (becomes locked at low level)

Low level input voltage = -1.5 V to $+0.8 \text{ V}$

High level input voltage = $+3.5 \text{ V}$ to $+30 \text{ V}$

Low level input current = about -3 mA (at input voltage = 0 V)

- SET0, SET1, SET2, and SET3

Low level input voltage = -1.5 V to $+0.8 \text{ V}$

High level input voltage = $+3.5 \text{ V}$ to $+30 \text{ V}$

Low level input current = about -3 mA (at input voltage = 0 V)

Since the terminal for input signal has been pulled up to $+5 \text{ V}$ by a resistor, a high level is obtained if the input signal terminal is kept open.

Not only TTL but also the open collector and the mechanical contact can work as a driving signal.

Selection of memory

The relationship between the memory number for selection and the input signal of SET0, SET1, SET2 and SET3 is shown below.

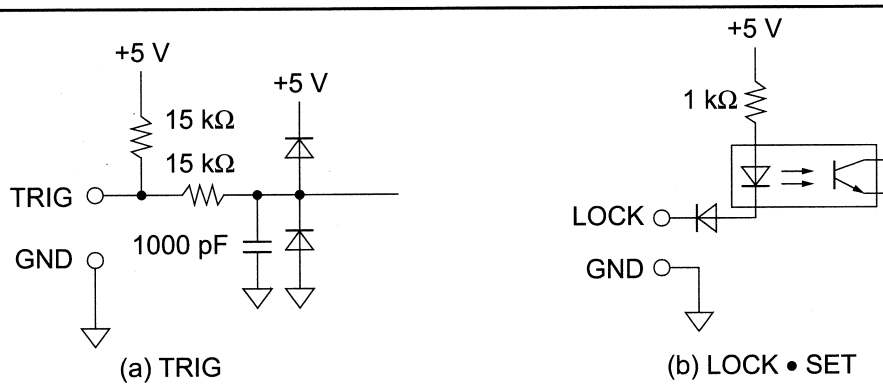
SET3	SET2	SET1	SET0	Memory number to be selected
Hi	Hi	Hi	Hi	None selected
Hi	Hi	Hi	Lo	Memory number 1
Hi	Hi	Lo	Hi	Memory number 2
Hi	Hi	Lo	Lo	Memory number 3
Hi	Lo	Hi	Hi	Memory number 4
Hi	Lo	Hi	Lo	Memory number 5
Hi	Lo	Lo	Hi	Memory number 6
Hi	Lo	Lo	Lo	Memory number 7
Lo	Hi	Hi	Hi	Memory number 8
Lo	Hi	Hi	Lo	Memory number 9
Combinations other than the above				None selected

(Hi and Lo stand for high level and low level, respectively.)

If "None selected" is set for the memory numbers selected via the SET0 to SET3 input signals, settings in the ZM2354 do not change.

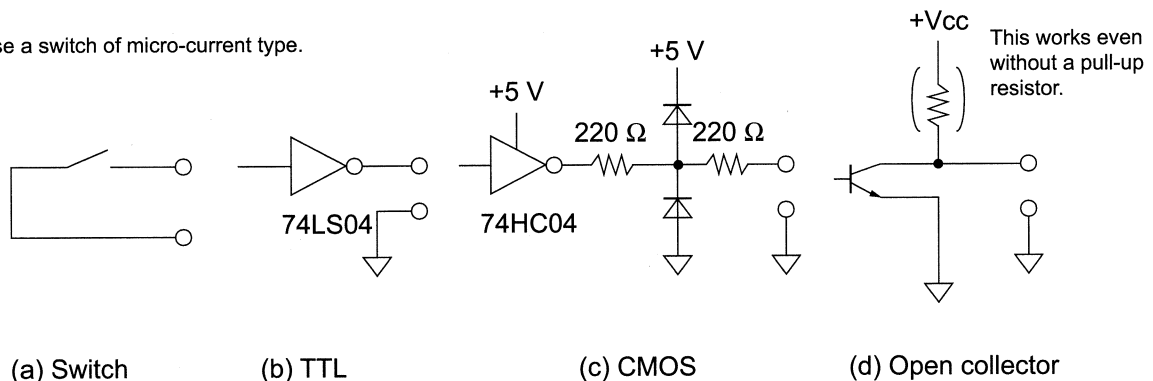
To change the selection signal of the memory, do this only after the measurement is finished and when a strobe signal has been output. If the signal is changed during the measurement, the measurement will be suspended and it will be changed to the selected memory.

Input circuit of handler interface



Input Circuit of Handler Interface

Use a switch of micro-current type.



Typical Driving Circuit on Handler Side

Trigger

Trigger

The manual trigger (for starting measurement) when the handler interface is used is a logic sum of the following signals:

- TRIG button on the panel
- Trigger-corresponding command (GET, "TG") of the GPIB
- TRIG input of handler interface

With an automatic trigger, the above three signals are invalid and measurement will be continued.

TRIG button

This is enabled only when it is local and the LOCK signal is inactive.

GPIB command

GET and "TG" are valid only when they are remote.

Further, the LOCK signal does not disable operation through GPIB.

TRIG input

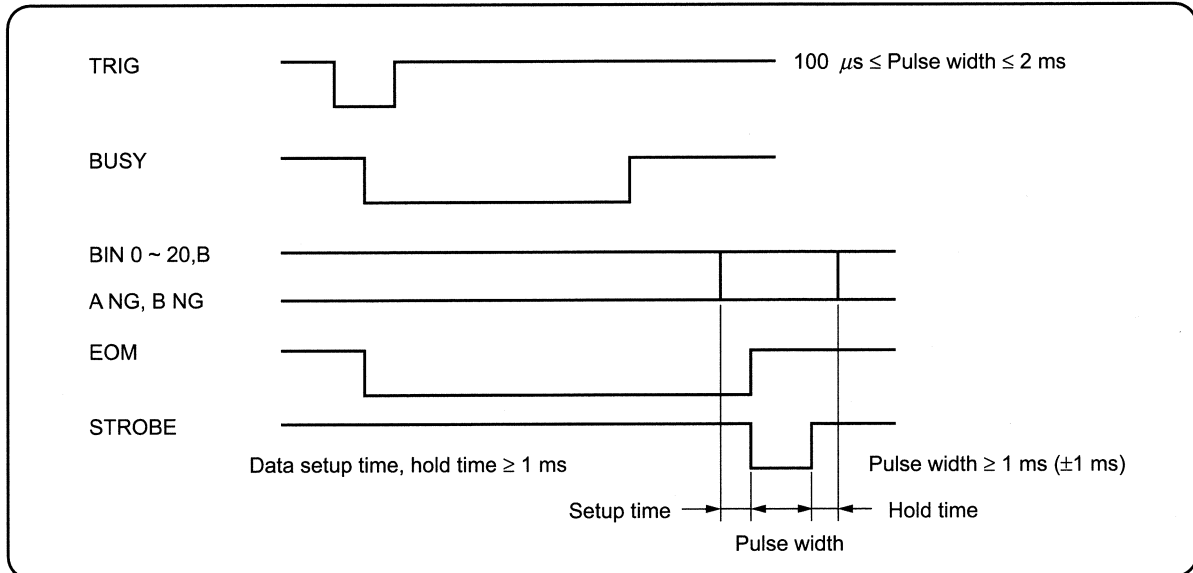
Measurement will be started at the falling edge from high level to low level of the TRIG input.

(The pulse width of low level must be 100 μ s or longer.)



Sequence of operation

The following diagram shows the standard timing when a handler interface is used.



Timing Chart



Note

Once a TRIG signal is accepted, next TRIG will not be accepted until the measurement is finished, judgment signal is output, and strobe signal has been output. Therefore, the next trigger must be input when the strobe signal has changed from active to inactive.