



Wired Production Control Indicator

21UD Series

Communication Specification V1.60

Please use this Instruction manual correctly on reading well.
Please keep it carefully to be able to read immediately, when required.

[21UD] Notational Conventions for Series Model

	① Machine types		② Items		③ Communicati on		④ Display type		⑤ LED color
21	***	—	***	—	***	—	***	—	*
	UD		2		None		123		G
	UD5		3		485		523		R
	UDW		4		429		124		
	UD5W						524		
	UDE						152		
	UDEW						15		
							12		
							52		
							23		
							24		
							1523		
							1524		

Small production control display type is below

[21UDS-3-485-***-R]

[21UDS-3-429-***-R]

- ①Machine type : UD→Large-sized 4-digit Single side,
 UD5→Large-sized 5-digit Single side,
 UDW→Large-sized 4-digit Double side,
 UD5W→Large-sized 5-digit Double side,
 UDE→Middle-sized 5-digit Single side,
 UDEW→Middle-sized 5-digit Double
- ②Item : 2 - 4 items
- ③Communication:None
 429→Specific small-current radio wave
 (Communication distance inside about 120m)
 485→Wire-type
- ④Display type :1→Target 2→Actual 3→Advancement 4→Accomplishment rate
 5→Plan
- ⑤LED color : G →Green, R →Red
 * For the Middle-sized type, only red color is available.

To use this product in safety and comfort,

(Be sure to read)

Thank you very much for purchasing our product.

This operation manual contains the precautions necessary for preventing an accident caused by the use in an improper ways.

Read it carefully while thoroughly understanding the meanings of pictorial symbols.



Warning

Using in an improper way while ignoring this pictorial symbol might cause a serious human injury.



Caution

Using in an improper way while ignoring this pictorial symbol might cause a human injury or physical damage.

- The type of precautions that should be observed, are classified using the following pictorial symbols.



This pictorial symbol indicates a "Reminder" to attract an attention.



This pictorial symbol indicates a "Prohibition" to prohibit a certain action.



Caution

- For the usage to be commonly applied in all the models:

- Avoid using in a place with a plenty of humidity or dust. Otherwise, absorbing a dust or water contents may cause machine trouble, fire or electrical shock.





- For handling this machine:

- This is the electronic device or wireless radios composed of the precision parts. Do not overhaul/remodel. It may cause accident or machine trouble.













Warning

■ For handling this machine:

● Do not use this product for the application needing the high reliability related to human lives.	
● Do not use this product in a place where it is uncertain about whether or not radio waves reach.	



■ For handling the power source:

Be sure to observe the following precautions to prevent the AC adapter and Power cord from being heated, damaged or ignited.

● Do not approximate the AC adapter and Power cord to a fire, or do not put them into a fire. The AC adapter and Power cord can be broken or ignited, resulting in an accident.	
● You can use the AC adapter and main body only with the specified power voltage to protect them from the damage and fire accident.	
● Do not use the AC adapter and main body in a wettable atmosphere. It may cause accidents or troubles such as heating, igniting or electrical shock.	
● Do not touch the AC adapter, main body, Power cord and Plug outlet with wet hands. It may cause an electrical shock.	
● Do not damage the Power cord. A short-circuit or heating may cause a fire or electrical shock.	
● Do not use the Power plug with dust being adhered. A short-circuit or heating may cause a fire or electrical shock.	
● Do not give a strong impact onto the AC adapter. It may cause an accident or machine failure.	
● If you find out deformed AC adapter, do not use it. It may cause an accident or machine failure.	
● do not use this product in a place where flammable gas can be generated. It may cause a fire accident.	
● Never overhaul the AC adapter. It may cause an accident or machine failure.	

■ When trouble happens during use:

Since it may cause a fire or electrical accident, disconnect a power plug, and immediately ask outlet store or our company to repair.

● When smoke or abnormal odors are generated, stop using, immediately disconnect a power plug, and ask outlet store or our company to repair.	
● Once the Power cord is damaged, do not use it. Using it as is may cause a fire or electrical accident.	

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1. General Description

This manual is applied to 「Wired Production Control Indicator 21UD series Display with communication function Communication Specification」

Moreover, this manual is explained only the communication part.

Please see 「Wired Production Control Indicator 21UD Manual」 about a basic method of handling.

Moreover, please see 「Wired Production Control Indicator software for the collection Setting MAKE plus Manual」 about the Widows software for the collection setting.

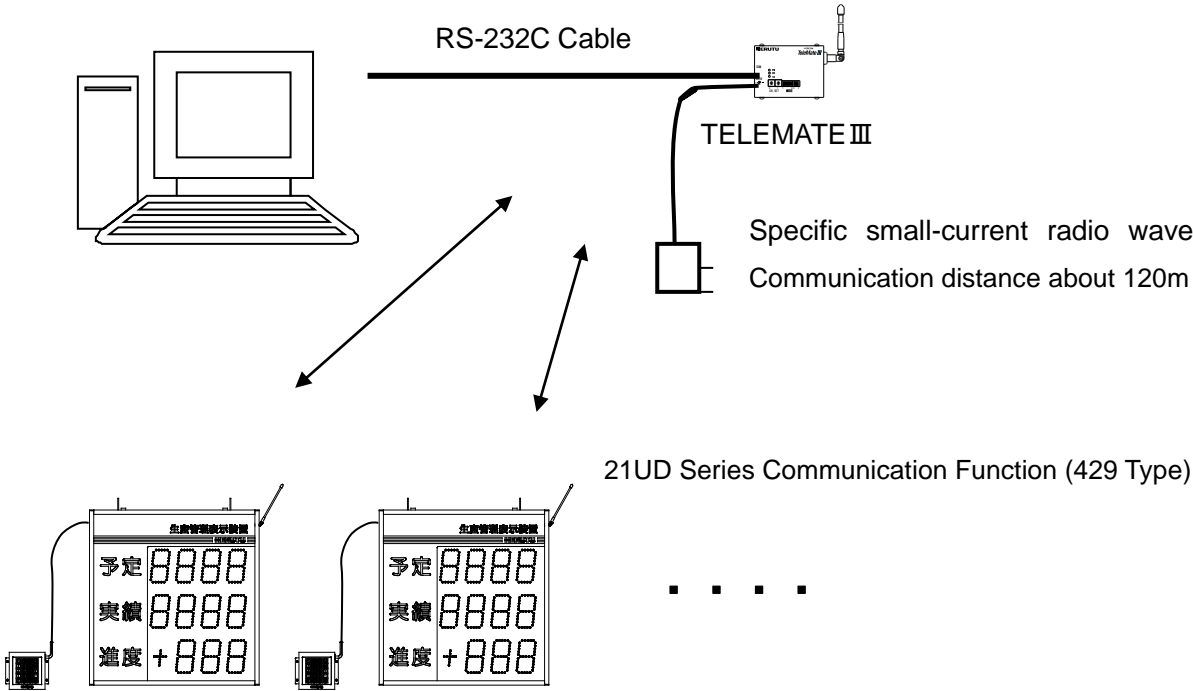
There are two kinds of display devices with the Communication Function. (the Wired type and the Wireless type) The Wired type connects the display with daisy chain connection (one after another). The communication up to 1.2km or less in the total extension is possible. The Wireless type can communicate about 120m in the room. (Change by the environment)

2. Function Settings

2-1. Wireless Type

At a wireless communication

The wireless communication unit is installed in the display device internally. A wireless modem (TELEMATE3) is needed when communicating with the host computer(as RS-232).



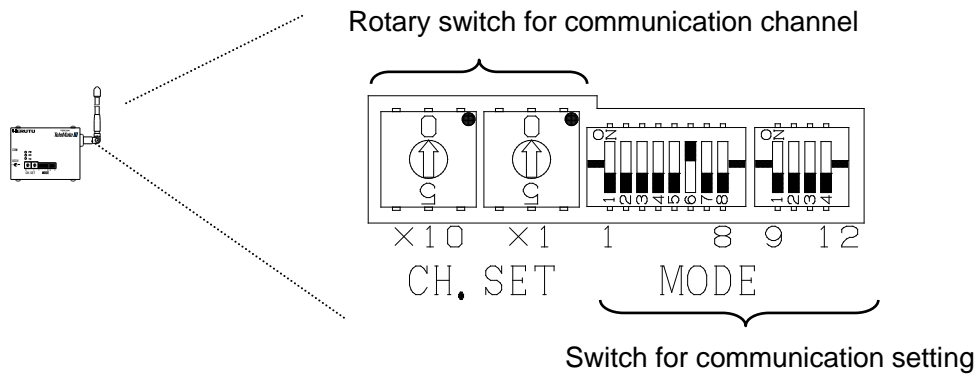
●Setting of personal computer side wireless modem

Wireless modem 【TELEMATEⅢ】 is connected with the personal computer that communicates the wireless with the display device. The communication channel of the display device is set to the same channel. The communication becomes possible.

The group of {PC ⇔Display N Set (Max30Set)} when there are two or more groups. The communication channel is set to a channel different so as not to interrupt. (Please separate five channels even if it is few.)

The channel of TELEMATEⅢ is matched to the communication channel of a display device side wireless modem. Moreover, please do the communication setting with the dip switch.

Switch No	Function	OFF	ON	
1	Stop bit	2bit	1bit	
2	Parity bit	No	Yes	
3	Data length	8bit	7bit	
4	Effective parity	Even	Odd	
5	Flow control	Yes	No	
6	DTR Line logic	Normal	Reverse	
7 8	Transmitting and receiving switch	7	8	Setting
		OFF	OFF	Automatic switch
		OFF	ON	External switch
		ON	OFF	Command switch
		ON	ON	Only transmitting
9	Test data transmission	No	Yes	
10	OFF			
11				
12				



※Please see "TELEMATE3 manual" for details.

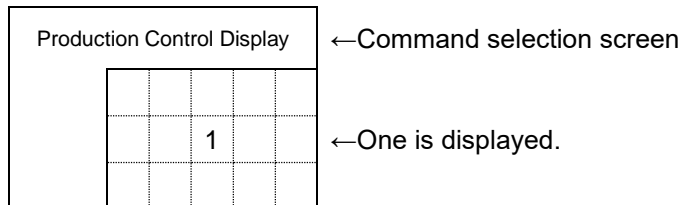
●Setting of display

A wireless channel and the equipment number for the wireless modem built into

The display device are set. A wireless channel and the equipment number can be set by the function setting of the display device. Please see 【 21UD Manual 】 about a detailed content of the function setting.

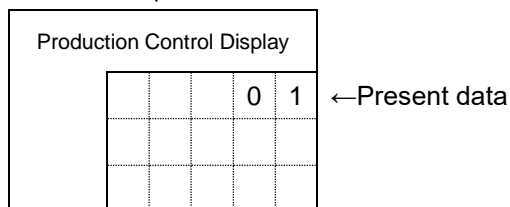
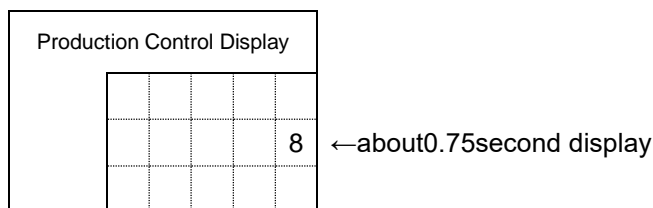
①Turn on the power switch with [F1] being pressed.

Keep pressing [F1] key for about 2 seconds until after [Command selection screen] appears

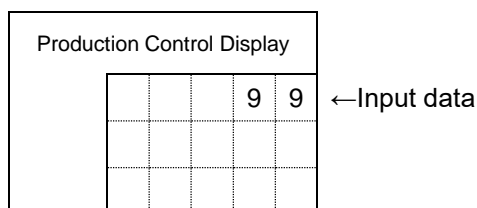


Setting the equipment No. Command 【8】

①Select [8]key, and press [ENT] key . The equipment No selection screen appears. If there is no need to change the setting contents, press [ENT] key to return to the Command selection screen.



②Input data.



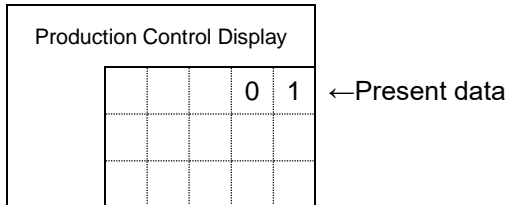
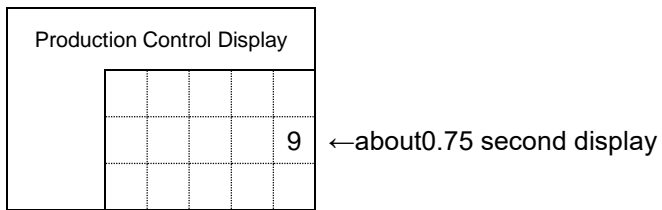
Equipment number setting data 01~99

③Here, press [ENT] to set the equipment No, and Command selection screen comes back. If you have inadvertently set a wrong , press [CLR] key to return into the status of ① or overwrite the correct equipment No to modify.

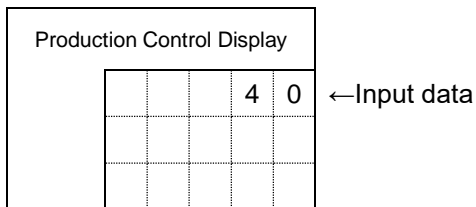
Setting the Wireless channel Command 【9】

① Press [9] key, and Wireless channel setting screen appears.

If there is no need to change the setting contents, press [ENT] key to return to the Command selection screen.



② Input data.



Wireless channel setting data 01~40

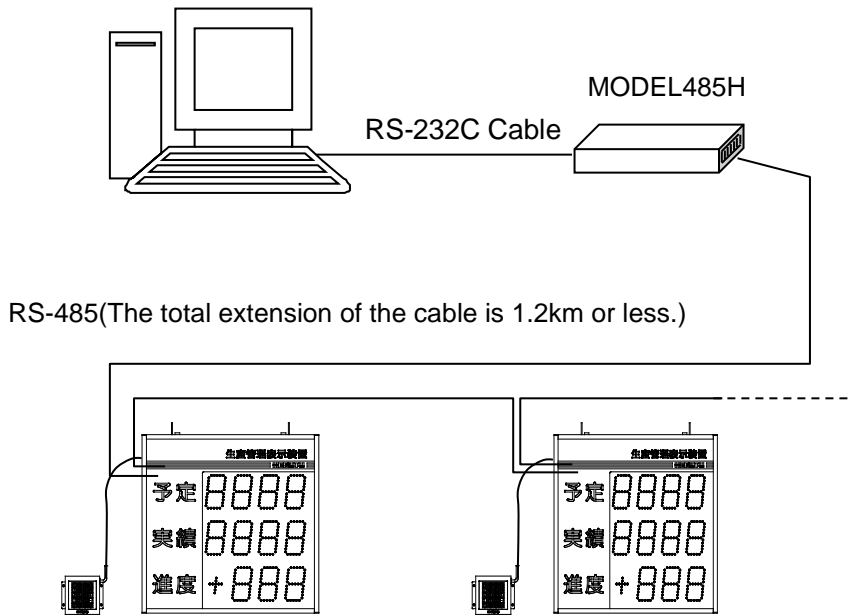
③ Here, press [ENT] to set the wireless channel, and Command selection screen comes back. If you have inadvertently set a wrong , press [CLR] key to return into the status of ① or overwrite the correct channel No to modify.

2-2. Wire Type

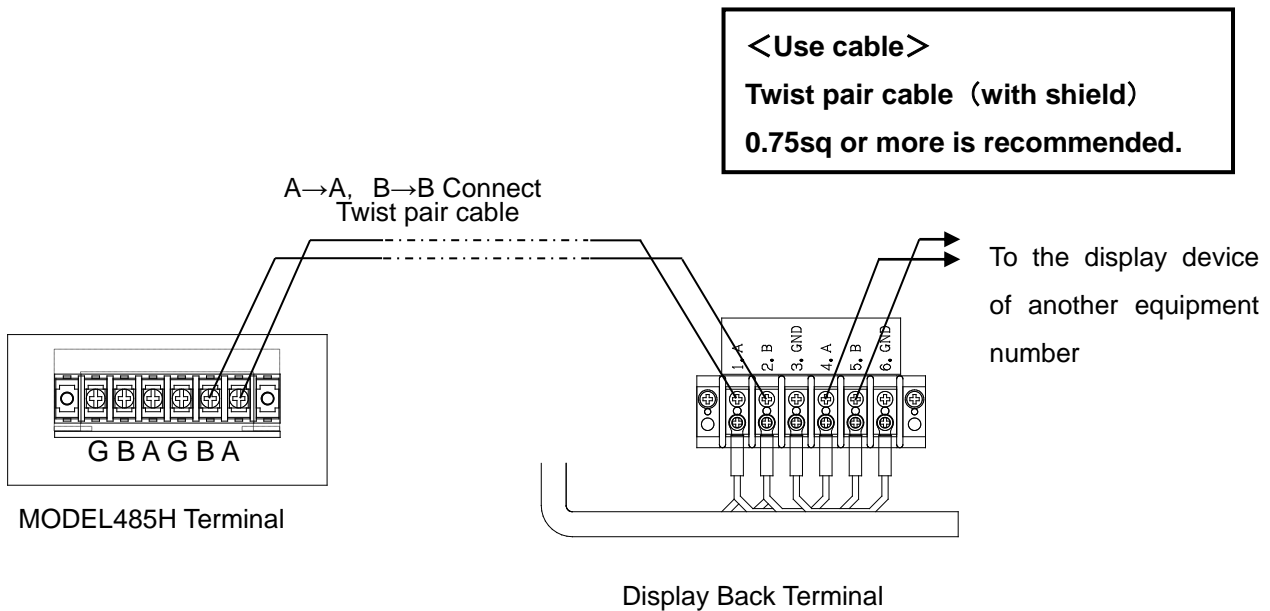
At a wire communication

The RS-485 communication unit is installed in the display device internally.

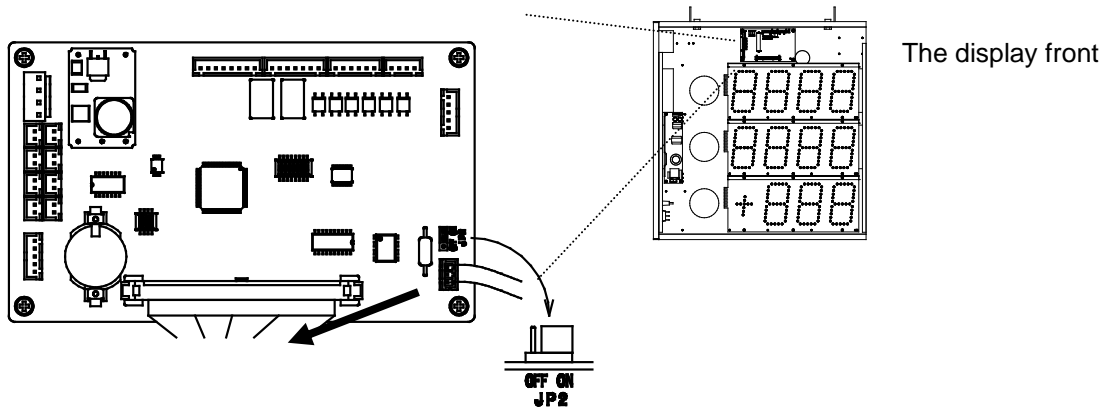
RS-232C/RS-485 transformation modem (MODEL485H) is needed when communicating with the host computer (as RS-232).



21UD Series Communication Function (485 Type)

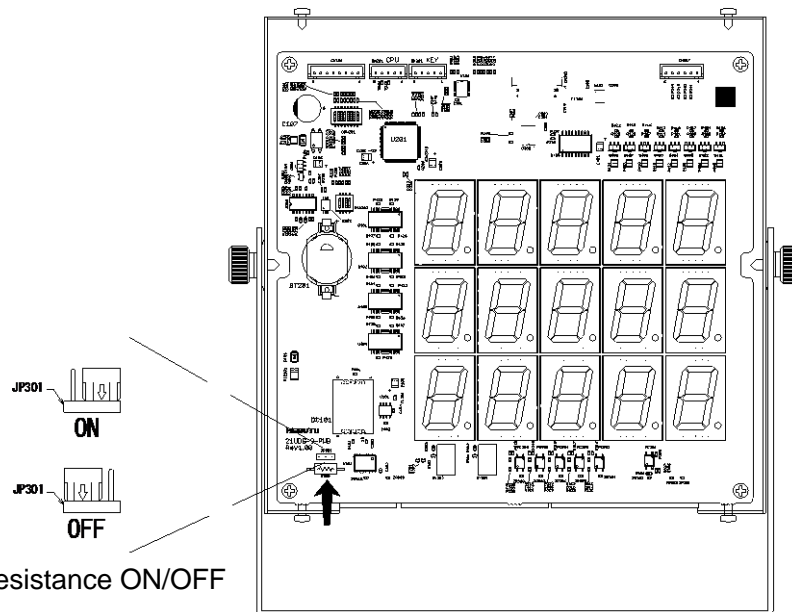


For the RS-485 line, the terminating resistance should be set at both ends of line. Turn on the terminating resistance for the Indicator unit connected at end using a daisy chain. To turn on/off the terminating resistance, use the jumper switch on the CPU board inside the Indicator unit.



Jumper 2(JP2) Terminating resistance ON/OFF

■In case of 21UDS



Jumper301(JP301)Terminal resistance ON/OFF

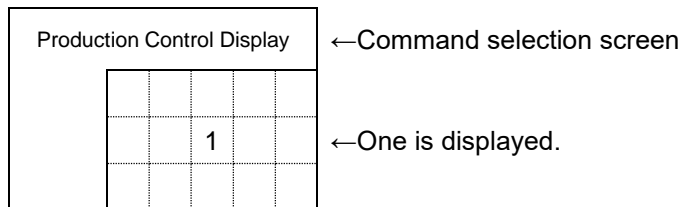
●Setting the Display

The equipment number is set to the display. The equipment number can be set by the function setting of the display.

(Please see manual of each product about a detailed content of the function setting.)

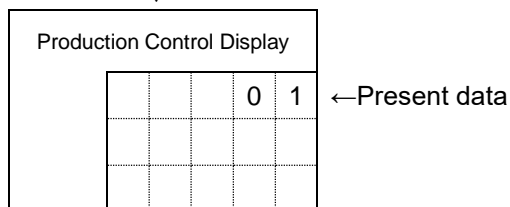
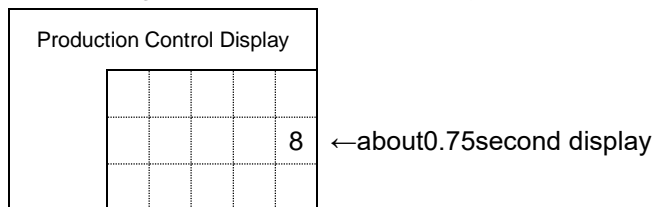
①Turn on the power switch with [F1] being pressed.

Keep pressing [F1] key for about 2 seconds until after [Command selection screen] appears

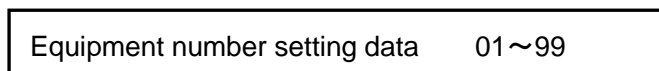
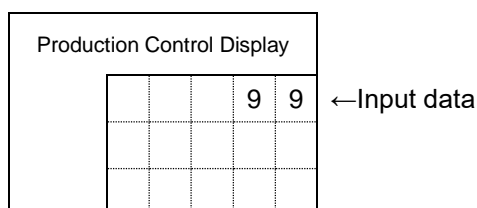


Setting the equipment No. Command 【8】

①Select [8]key, and press [ENT] key . The equipment No selection screen appears. If there is no need to change the setting contents, press [ENT] key to return to the Command selection screen.



② Input data



③Here, press [ENT] to set the equipment No, and Command selection screen comes back. If you have inadvertently set a wrong equipment No, press [CLR] key to return into the status of ① or overwrite the correct equipment No to modify.

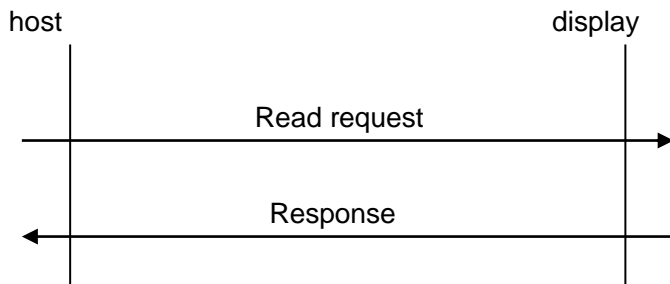
3. Communication

3-1. Communication procedure

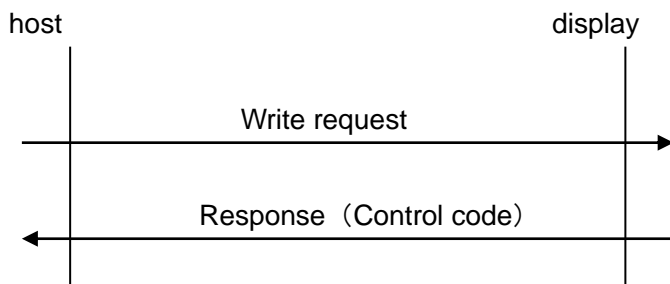
The communication procedure of the display is shown in the figure below.

【Normal operation】

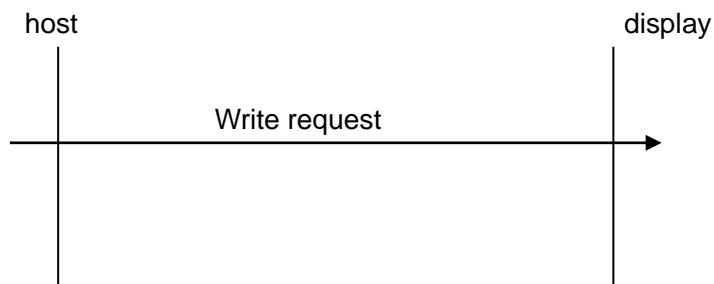
Read



Write (There is a response.)



Write (There isn't a response.) When ID is "00"



3-2. Communication protocol

	Cable specification (RS-485)	Wireless specification
Communication method	Half duplex	
Baud rate	4800bps	1200bps
Start	1bit	
Data	8bit	
Stop	2bit	
Parity	NONE	

3-3. Communication format

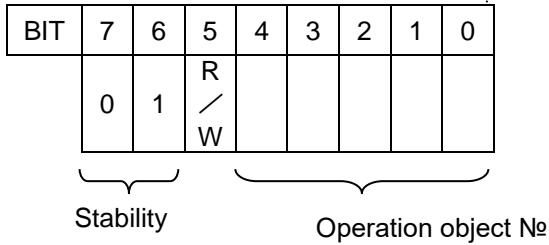
Dummy Byte (3~4)	STX (1)	ID (1)	Operation part (1)	Data Part (Variable)	CR (1)	LF (1)	BCC (2)
---------------------	------------	-----------	--------------------------	-------------------------	-----------	-----------	------------

*Please add dummy byte (FFH) to the head by 3~4 byte.

Item	Content	Number of bytes
STX	Start Byte (02H)	1
ID	"00"~"99" However, at "00" is common ID	2
Operation	It detailed explains by another paragraph.	2
Data	Data attached to each command	Variable
End mark	CR LF (0DH 0AH)	2
BCC	Range of calculation STX~CR To LF CRC-CCITT (Divisor 11021H, Generation polynomial $X^{16} + X^{12} + X^5 + 1$)	2

<Operation Part>(40H~7FH)

STX (1)	ID (2)	Operation part (1)	Data Part (Variable)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-------------------------	-----------	-----------	------------



BIT		Content
7	0	Stability
6	1	Stability
5	R/W	R : 0 read flag W : 1 write flag
0-4	Operation object №	0 : Tact 1 : Time 2 : Working hour 3 : Working hour pattern 4 : Clear time 5 : Pre-scale 6 : Advancement judging + side, - side 7 : Tact reservation 8 : Reservation № 9 : Display light On/Off a : Display type b : Clear c : Present value d : Set state (Only read)

<Control code>

The operation part of the control code response is described to the following.

(Display→host)

At receiving control code

ACK (06H)

BIT	7	6	5	4	3	2	1	0
	0	0	0	0	0	1	1	0

NAK (15H)

BIT	7	6	5	4	3	2	1	0
	0	0	0	1	0	1	0	1

CAN (18H)

BIT	7	6	5	4	3	2	1	0
	0	0	0	1	1	0	0	0

} When the display is busy and operates a manual command

When data is returned (Response to read)

BIT	7	6	5	4	3	2	1	0
	0	1	0					

Operation object№

(The content that the host set is returned.)

Please refer to an attached code table for the communication error return code.

<Data Part>

It becomes variable with the operation object No of the operation.

The data part is all ASCII.

Operation objectNo	Content	Data Part	Number of data
0	Tact	5 digits "00000"~"99999"	5
1	Time	4 digits "0000"~"2359"	4
2	Working hour	Section 2 digits + {Start time 4 digits +End time 4 digits} xNumber of sections Number of sections Read 0~20 Write 1~20 EX)"2400" is set at 0:00AM.	MAX 162
3	Working hour pattern	1digit'1'~'6'	1
4	Clear time	Time4digitsxThree times	12
5	Pre-scale	5 digits "00001"~"99999"	5
6	Advancement judging +, -	{ +4digits} + { -4digits}	10
7	Tact reservation	Reservation2digits + { Set up time3digits + Tact5digits+Number of production5digits} xNumber of reservation Number of reservation Read 0~20 Write 1~20	MAX 262
8	Tact reservationNo	2digits"01"~"20"	2
9	Display light On/Off	'0' : turn on '1' : turn off	1
a	Display type	1digit '0'~','	1
b	Clear	'0' : Clear button1time '1' : Clear button 2 times	1
c	All Read	Content flag byte + number of each items (The following reference)	MAX 26
d	Set state	The following reference	4

Tact — Operation object No.0 (Read&Write)

<Read> Operation part=40H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	0	0	0

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (5)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"00000"~"99999" (5)
	0	1	0	0	0	0	0	0	

<Write> Operation part=60H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (5)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"00000"~"99999" (5)
	0	1	1	0	0	0	0	0	

Response for a Read display→host

The response from the host becomes a control code. (P11 reference)

Time — Operation object No.1 (Read & Write)

<Read> Operation part=41H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	0	0	1

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (4)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"0000"~"9999" (4)
	0	1	0	0	0	0	0	1	

<Write> Operation part=61H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (4)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"0000"~"9999" (4)
	0	1	1	0	0	0	0	1	

Response for a Read display→host

The response from the host becomes a control code. (P11 reference)

Working hour — Operation object No.2 (Read&Write)

<Read> Operation part=42H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	0	1	0

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (Max162)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"Section2 digits+ {Start time 4 digits +End time 4 digits} xNumber of sections (MAX162)
	0	1	0	0	0	0	1	0	

<Write> Operation part=62H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (Max162)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"Section2 digits+ {Start time 4 digits +End time 4 digits} xNumber of sections (MAX162)
	0	1	1	0	0	0	1	0	

Response for a Read display→host

The response from the host becomes a control code.

Number of sections Read"00"(30H30H)~"20"(32H30H)

Write "01"(30H31H)~"20"(32H31H)

※AM 0:00="2400"(32H34H30H30H)

Working hour pattern — Operation object No.3 (Read & Write)

<Read> Operation part=43H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	0	1	1

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	1digits '1'~'6' (1)
	0	1	0	0	0	0	1	1	

<Write> Operation part=63H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	1digits '1'~'6' (1)
	0	1	1	0	0	0	1	1	

Response for a Read display→host

The response from the host becomes a control code.

Clear time —Operation object No.4 (Read & Write)

<Read> Operation part=44H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	1	0	0

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (12)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	Time 4 digits×Three times (12)
	0	1	0	0	0	1	0	0	

<Write> Operation part=64H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (12)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	Time 4 digits×Three times (12)
	0	1	1	0	0	1	0	0	

Response for a Read display→host

The response from the host becomes a control code.

Pre-scale — Operation object No.5 (Read&Write)

<Read> Operation part=45H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	1	0	1

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (5)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"00001"~"99999" (5)
	0	1	0	0	0	1	0	1	

<Write> Operation part=65H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (5)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"00001"~"99999" (5)
	0	1	1	0	0	1	0	1	

Response for a Read display→host

The response from the host becomes a control code.

Advancement judging — Operation object No.6 (Read&Write)

<Read> Operation part=46H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	1	1	0

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (10)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"+0000—0000" (10)
	0	1	0	0	0	1	1	0	

<Write> Operation part=66H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (10)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"+0000—0000" (10)
	0	1	1	0	0	1	1	0	

Response for a Read display→host

The response from the host becomes a control code.

Tact reservation — Operation object No.7 (Read&Write)

<Read> Operation part=47H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	1	1	1

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (MAX262)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	Reservation2digits + { Set up time3digits + Tact5digits+Number of production5digits} ×Number of reservation(Max262) Number of reservation Read 0~20
	0	1	0	0	0	1	1	1	

<Write> Operation part=67H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (MAX262)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	Reservation2digits + { Set up time3digits + Tact5digits+Number of production5digits} ×Number of reservation(Max262) Number of reservation Write 1~20
	0	1	1	0	0	1	1	1	

Response for a Read display→host

The response from the host becomes a control code.

Tact reservation No —Operation object No.8 (Read & Write)

<Read> Operation part=48H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	1	0	0	0

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (2)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"01"~"20" (2)
	0	1	0	0	1	0	0	0	

<Write> Operation part=68H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (2)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"01"~"20" (2)
	0	1	1	0	1	0	0	0	

Response for a Read display→host

The response from the host becomes a control code.

Display light On/Off — Operation object No.9 (Read&Write)

<Read> Operation part=49H

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	1	0	0	1

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	'0' : turn on '1' : turn off (1)
	0	1	0	0	1	0	0	1	

<Write> Operation part=69H

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	---------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	'0' : turn on '1' : turn off (1)
	0	1	1	0	1	0	0	1	

Response for a Read display→host

The response from the host becomes a control code.

Display type — Operation object No. a (Read & Write)

<Read> Operation part=4aH

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	1	0	1	0

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	---------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	'0'~';' (1)
	0	1	0	0	1	0	1	0	

<Write> Operation part=6aH

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	---------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	'0'~';' (1)
	0	1	1	0	1	0	1	0	

Response for a Read display→host

The response from the host becomes a control code.

Operation object No. a : Data part of display type

Data	Content	Numeric mark	Numeric mark
'0'	target · actual · advancement	YJS	123
'1'	plan · actual · advancement	KJS	523
'2'	target · actual · accomplishment rate	YJT	124
'3'	plan · actual · accomplishment rate	KJT	524
'4'	target · plan · actual	YKJ	152
'5'	target · plan · actual · advancement	YKJS	1523
'6'	target · plan · actual · accomplishment rate	YKJT	1524
'7'	target · actual	YJ	12
'8'	plan · actual	KJ	52
'9'	actual · advancement	JS	23
' : '	actual · accomplishment rate	JT	24
' ; '	target · plan	YK	15

Clear — Operation object No. b (Write)

<Write> Operation part=6bH

host→display

STX (1)	ID (2)	Operation part (1)	Data Part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	'0' : as well as Clear button 1 time '1' : as well as Clear button 2 times (1)
	0	1	1	0	1	0	1	1	

Response for a Read display→host

The response from the host becomes a control code.

- ※ For the working hour of the function setting unused,
Both become it '0'And'1'as well as 1 time clear button operation.

Display data — Operation object No. c (Read & Write)

<Read> Operation part=4cH

host→display

STX (1)	ID (2)	Operation part (1)	Date (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	1	1	0	0

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (MAX26)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	----------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	“Data flag part + Data part” (MAX26)
	0	1	0	0	1	1	0	0	

<Write> Operation part=6cH

host→display

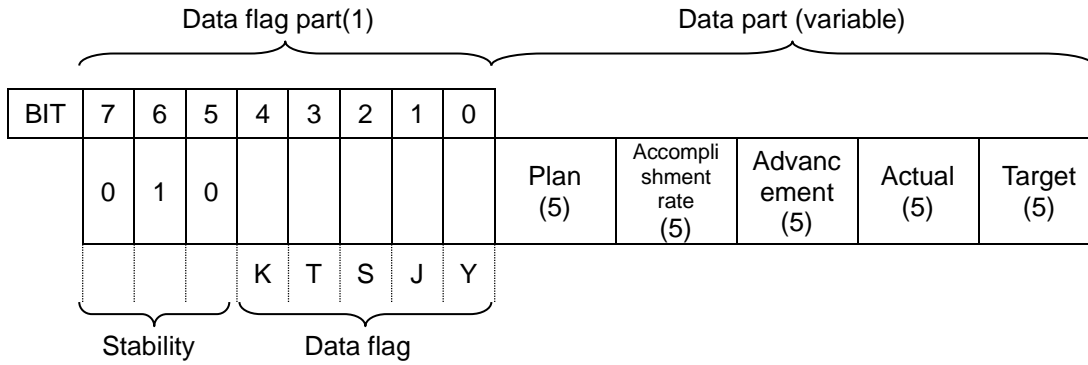
STX (1)	ID (2)	Operation part (1)	Data Part (MAX26)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	----------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	“Data flag part + Data part” (MAX26)
	0	1	1	0	1	1	0	0	

Response for a Read display→host

The response from the host becomes a control code.

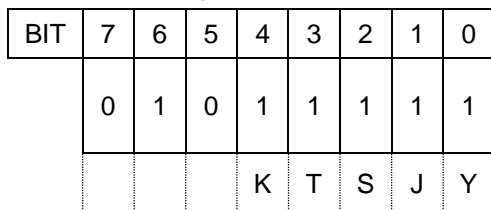
The data part is composed by one byte in the data flag and the data part (variable).



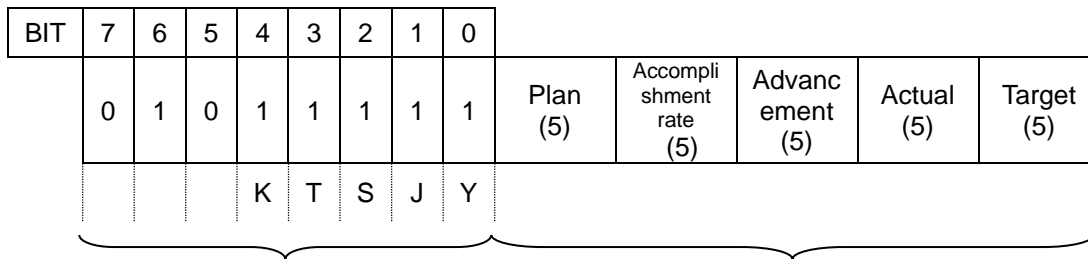
- K : Plan ("00000"~"99999")
- T : Accomplishment rate ("00000"~"99999")
- S : Advancement (code '+' or '-' + "0000"~"9999")
- J : Actual ("00000"~"99999")
- Y : Target ("00000"~"99999")

ex 1)

When you reading request all data from the display : Data Part (host→display)



Response for a Read : Data Part (display→host)



1byte Target5byte + . . . + Plan5byte Total 25byte

Ex2)

When you reading request Target and Actual : Data Part (host→display)

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0	0	1	1
				K	T	S	J	Y

Response for a Read : Data Part (display→host)

BIT	7	6	5	4	3	2	1	0		
	0	1	0	0	0	0	1	1	Actual (5)	Target (5)
				K	T	S	J	Y		

1byte

Target 5byte+Actual 5byte

Total 10byte

Ex3)

When you write Target in the display : Data Part (host→display)

BIT	7	6	5	4	3	2	1	0	
	0	1	0	0	0	0	0	1	Actual (5)
				K	T	S	J	Y	

1byte

Target5byte

※It becomes only one write processing item. The write of two or more items cannot be done at the same time.

※The data part becomes five digits for four digit type.

Please process it to disregard the most digits.

However, for advancement please process the second digit from the high rank disregarding it.

Set state — Operation object No. d (Read)

<Read> Operation part=4dH

host→display

STX (1)	ID (2)	Operation part (1)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	1	1	0	1

Response for a Read display→host

STX (1)	ID (2)	Operation part (1)	Data Part (4)	CR (1)	LF (1)	BCC (2)
------------	-----------	--------------------------	------------------	-----------	-----------	------------

BIT	7	6	5	4	3	2	1	0	"Type+Frag1+Frag2+ Flag3 (4)
	0	1	0	0	1	1	0	1	

The set up information of the display is composed of the data of four bytes.

Type	Flag1	Flag2	Flag3
1	1	1	1

Type : "0"~";" ASCII display

Flag1 :

BIT	7	6	5	4	3	2	1	0
	0	1						
			Tact Precision	Reservation	Total Display	Working Hour	Advancement Judgment	Digit 4/5

BIT	Flag 1	Content
5	Tact Precision	0.1 : "0" 0.01 : "1"
4	Reservation	No USE : "0" USE : "1"
3	Total Display	No USE : "0" USE : "1"
2	Working Hour	No USE : "0" USE : "1"
1	Advancement Judgment	No USE : "0" USE : "1"
0	Digit	5digit:"0" 4digit : "1"

Flag2:

BIT	7	6	5	4	3	2	1	0
	0	1	0	0	0			
						Display	Pre-scale	

BIT	Flag2	Content
2	Display	Turn on : "0" Turn off : "1"
0,1	Pre-scale	No USE : "0" Multiple : "1" Batch"2"

Flag3

BIT	7	6	5	4	3	2	1	0
	0	1						
			Plan count stop input	Terminal output	Plan stop output	Set up time output	Advancement judging output -	Advancement judging output +

BIT	Flag3	Content
5	Plan count stop input (Operation)	OFF : "0" ON : "1"
4	Terminal output	No USE : "0" USE : "1"
3	Plan stop output	OFF : "0" ON : "1"
2	Set up time output	OFF : "0" ON : "1"
1	Advancement judging output -	OFF : "0" ON : "1"
0	Advancement judging output +	OFF : "0" ON : "1"

4. After service and Warranty

If something is wrong. If you should find anything wrong with the machine when using it under normal conditions, check the warranty and repair regulations and contact the outlet store through which you purchased the product or our Sales Office. The latest warranty and repair regulations can be found on our website.

[Warranty Regulation]

This regulation (hereinafter referred to as the "Regulation") is for post-shipment warranty provided by HERUTU ELECTRONICS CORPORATION (hereinafter referred to as the "Company") so that you can use the Company's product you have purchased with confidence. The Regulation does not apply to special order products (custom products). In addition, purchased products shall be subject to the relevant manufacturer's warranty regulations, and the Regulation shall not apply.

Please note that in the event that the product you purchased comes with an instruction manual that describes the Company's old repair regulation, the latest Regulation will still apply.

1. Warranty period

Unless otherwise specified, the warranty period shall be "up to thirteen months from the date of shipment of the product by the Company". During the warranty period, the Company will replace the product with a new one or repair it free of charge in accordance with the provisions of the Regulation.

In addition, if a failure occurs during the warranty period due to the Company's responsibility and the product with the failure (hereinafter referred to as the "Product") is replaced with a new one or repaired free of charge, the warranty period of the Product will be "thirteen months from the date of initial shipment of the Product, or six months from the date of shipment of the Product that has been replaced or repaired, whichever comes later".

The warranty period for paid repairs shall be in accordance with the provisions of the Company's repair regulation.

2. Warranty scope

If a failure occurs during the warranty period due to the Company's responsibility, the Company will replace the product with a new one or repair it free of charge.

Even within the warranty period, the warranty does not apply in the following cases:

- A) In the event of failure or damage caused by improper handling by the customer, such as dropping or impact during transportation or movement by the customer
- B) In case of failure due to disassembly or modification of the main unit by the customer
- C) In case of natural disasters such as fires, earthquakes, floods, and in case of failure or damage due to abnormal voltage
- D) In case of failure caused by failure of equipment other than the Company's designated equipment connected to the Product
- E) In case of failure of the Product's accessories (AC adapter, antenna, connection cable, etc.)
- F) If damage is caused by the failure of consumables or limited-life parts included in the Product:
 1. Consumables: Batteries (rechargeable, batteries, dry batteries, button batteries, etc.), recording media (SD cards, etc.)
 2. Limited-life parts: Various switches (limit switches, push button switches, etc.) and various sensors
 3. Other items that are worn out or have a service life due to use

If consumables or limited-life parts fail, we will replace or repair the parts for a fee.

- G) In case of failure caused by handling contrary to the usage and precautions described in the instruction manual of the Product
- H) If repaired, adjusted, or improved by elsewhere other than the Company
- I) If the Company is unable to reproduce the failure

3. About repair of the Product

Please note that repairing the Product requires equipment such as measuring instruments and tools, so the Company will handle it as a pick-up repair service at the Company.

4. About the shipping cost for replacement or repair of the Product

Shipping charges for sending the Product to the Company or a distributor, as well as shipping charges for sending the Product that has been replaced or repaired by the Company or the distributor to the customer, will be borne by the Company or the distributor.

5. Disclaimer

The Company is not responsible for any direct or indirect damages or monetary loss caused by failure of the Product or its use.

6. Additional notes

Please note in advance that the information of the Product described on the Company's website and in the catalogs, instruction manuals, technical materials, and other materials provided by the Company are subject to change without notice to customers.

[Repair Regulation]

This regulation (hereinafter referred to as the "Regulation") shall be applied to paid repair service (hereinafter referred to as the "Service") provided by HERUTU ELECTRONICS CORPORATION (hereinafter referred to as the "Company"). The Regulation does not apply to special order products (custom products). In addition, purchased products shall be subject to relevant manufacturer's repair regulations, and the Regulation shall not apply.

Please note that in the event that the product you purchased comes with an instruction manual that describes the Company's old repair regulation, the latest Regulation will still apply.

1. Subject of the Regulation

The Service is provided for the Company's products that are "beyond the scope of the warranty specified in the warranty regulation" and "from the sales start date to the end date of the repair period (seven years from the production end date)". However, please note that the end date of the repair implementation period may be earlier depending on the availability and procurement status of repair parts.

2. Establishment of contract

The contract shall be established when the customer approves the quotation presented by the Company and issues an order form before the end of the repair implementation period.

3. Purpose of the Service

The Company will provide the Service for the purpose of repairing the function and performance of the Company's product used by the customer if it fails beyond the scope of the warranty specified in the warranty regulation. Please note that the Service requires equipment such as measuring instruments and tools, so the Company will handle it as a pick-up repair service at the Company.

4. Usage fee for the Service

The usage fee for the Service shall be the total of the following fees:

A) Repair service fee

The repair service fee is the total amount of technical fees, parts costs, other expenses incurred, and applicable taxes associated with repairing the Company's product (hereinafter referred to as the "Product for repair") that the customer wishes to repair.

B) Shipping fee (including the cost of packaging boxes)

The Company kindly asks that customers bear the shipping costs for sending the Product for repair to the Company and for returning it from the Company. However, in the event that the Product for repair is sent by payment on delivery by the customer, the shipping cost will be included in the Service charge.

5. Warranty period and scope of the Product for repair

The warranty period for the Product for repair is "up to six months from the date of repair completion". However, please note that failures other than the repaired parts (repaired places or replaced parts) are not covered by the warranty of the Product for repair. In addition, if a failure occurs due to the Company's responsibility within the warranty period, the Company will again repair the product free of charge.

6. Handling of repair parts

A) In order to provide the Service stably for a long time and to promote environmental protection, etc., the Company may use recycled parts or alternative parts at the time of repair at its discretion.

B) The Company may, at its own discretion, collect the removed parts for the purpose of recycling or analysis at the time of parts replacement through the regulation of the Service. Please note that the collected parts are the property of the Company and will be recycled, used or discarded at its discretion.

7. Estimate for the Service

The estimate for the Service is basically free of charge. However, if the Company is unable to reproduce the failure, it will not be able to carry out repairs and will not provide an estimate. If a technical investigation is required to reproduce the failure, the Company will estimate the cost of reproducing the failure.

8. Return of unrepaired product

If the Company does not estimate the cost of the Service due to reasons such as being unable to reproduce the failure, it will return the Product for repair to the customer.

In addition, if the customer does not place an order within three months from the date of creation of the quotation, or if the customer does not accept the quotation and the customer expresses an intention not to carry out the repair, the Company will assume that the customer has canceled the request for the Service, and the

Company will return the Product for repair to the customer without carrying out the repair.

In addition, if a shipping fee is incurred for returning the product, it will be borne by the customer.

9. Handling of personal information

The Company will properly handle personal information such as names and addresses being provided in accordance with the privacy policy posted on the Company's website.

10. Compensation for damages

- A) The responsibility of the Company for providing the Service shall be limited to the matters and contents specified in the repair regulation, and shall not include any damages incurred by the customer due to special circumstances (including loss of profits of the customer and damages based on claims for compensation made by third parties against the customer) and damages caused by the customer being unable to use the product due to a failure or defect of the Product for repair. However, this does not apply if the damage was caused by the Company's willful misconduct or gross negligence.
- B) Even if the Company is liable to the customer for damages in connection with the regulation of the Service, the Company's liability shall not exceed the amount equivalent to the value of the Product for repair, except in cases of willful misconduct or gross negligence on the part of the Company. The value of the Product for repair shall be calculated based on the residual value after depreciation or the price of products with equivalent performance sold in the market at the time of damage.

11. Additional notes

- A) The Company cannot restore stickers, LCD protective sheets, and coloring applied to the outer casing parts that you have attached yourself. In addition, if advertisement stickers were affixed at the time of sale, they cannot be newly prepared as repair parts when replacing the outer casing parts. After replacing the outer casing parts, the advertisement stickers will be returned without being affixed.
- B) Please note in advance that the information of the Product on the Company's website and in the catalogs, instruction manuals, technical materials, and other materials provided by the Company are subject to change without notice to customers.



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