V8.37 or later

Operation manual

Ultrasonic level meter

HD1200

Read and fully understand the contents of this Operation Manual before operating the product.

Keep this manual so that you can check the contents anytime.

HONDA ELECTRONICS CO.,LTD.

Table of Contents

Precautions for safe operation

Use the product according to the information as shown below in order to prevent any injury to you or others and prevent the damage to any property.

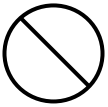
WARNING

This symbol indicates the item that could lead to the serious injury or death if ignored.

CAUTION

This symbol indicates the item that could lead to the slight injury or damage to the property if ignored.

Indication example



means “Prohibited action”.

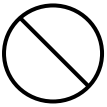
means “Action must be taken”.

Follow the contents below in order to use the product.

WARNING

Turn off the power and contact the seller of the product to ask for the repair of product in case that any malfunction such as the fume from the product is seen.

CAUTION



Do not modify the product at all.
It could cause the electrical shock due to the part of the product where the high voltage is applied.
Contact the seller of the product for the repair.

Precautions for others

- Do not use the product in the location where any other ultrasonic device in order to prevent the unwanted operation due to the mutual interference.
- Avoid any big shock to the product or drop of the product.

Introduction

Thank you for purchasing the ultrasonic level meter, HD1200.

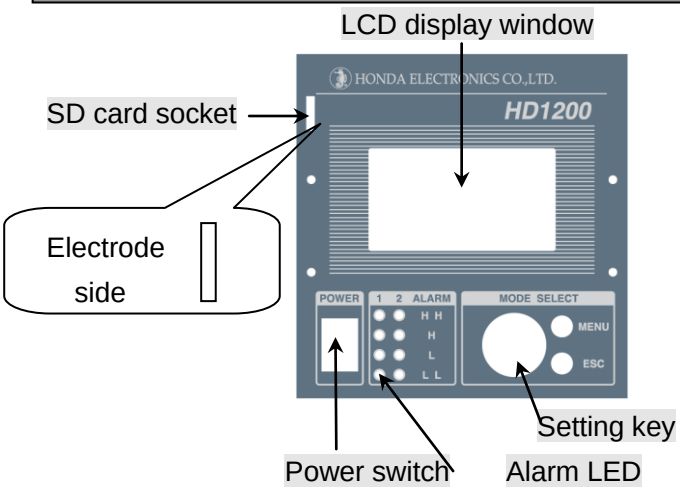
- This manual contains information and precautions for the proper use of the product. Read and fully understand the contents of this manual before operating the product. Note that Honda Electronics Co., Ltd. accepts absolutely no responsibility for liability in any injury, damage, lost profit or any claims made by any third party resulting from the use or operation of the product in a manner not shown in this manual.
- Keep this manual so that you can check the contents anytime.
- The contents of this manual are subject to change without notice.
- This manual has been carefully drawn up, however, please contact us immediately in case you find any inconsistency or error in this manual.
- Copying all or part of this manual without our permission is strictly prohibited. Moreover, the use of this manual done by anyone except as an individual without our permission is strictly prohibited by copyrights laws.
- We are not responsible for any injury or damage caused by the measurement result from the product.

Configurations

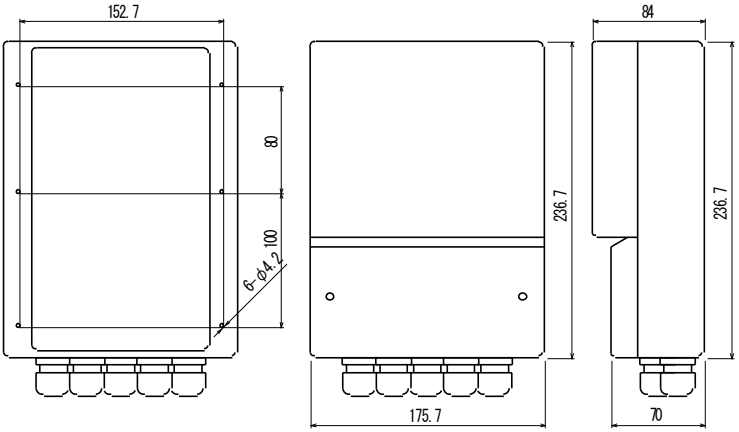
Make sure that all of followings are provided. Contact the seller of the product if anything is missing.

HD1200 main unit	**1**
Ultrasonic sensor	**1 or 2 (Depending on order)**
Operation manual	**1**

Name of each part of main unit

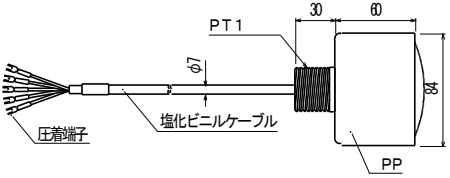


Dimensions

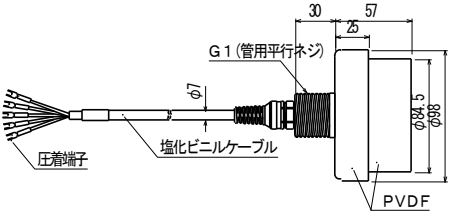


Main unit

TS40-5



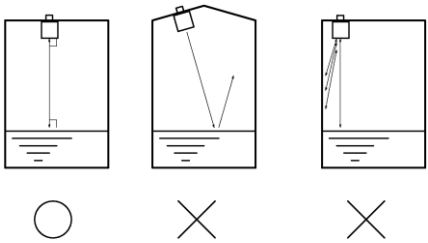
TS40T-5



Installation

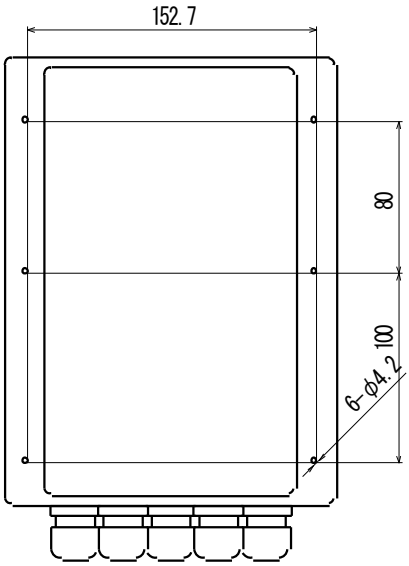
Sensor installation for TS40-5 and TS40T-5

- Install the ultrasonic sensor horizontally on the top of the tank.
- Screw in the 1-inch screw of the sensor to install it.



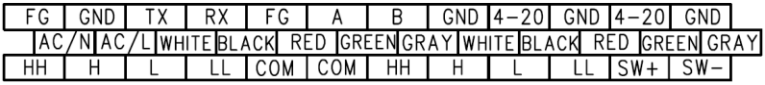
- Install the sensor so that the sensor surface is parallel to the surface of the liquid.
- If the installed sensor is closed to the side wall of the tank or an equivalent, unnecessary reflection wave is detected and the incorrect measurement occurs.
- Do not use unnecessary force to screw in the sensor.
- Prevent the sensor from the direct sun.
- Do not install the multiple sensors in the same tank.
  (Incorrect measurement occurs due to the mutual interference.)

Main unit installation



Secure with M4 screws.
Screw pitch
152.7 * 80
152.7 * 100
152.7 * 180

Wiring



Explanation of the terminal

1) Connect the power supply, 100 - 240VAC.

AC/N	AC/L
B1	B2

2) Connect FG terminal to ground.

F.G.
A1

3) Connect the ultrasonic sensor to CH1 or CH2.

CH1					CH2				
WHITE	BLACK	RED	GREEN	GRAY	WHITE	BLACK	RED	GREEN	GRAY
B3	B4	B5	B6	B7	B8	B9	B10	B11	B12

4) Wirings for ALARM

CH1 ALARM					CH2 ALARM					PULSE OUT	
HH	H	L	LL	COMMON	COMMON	HH	H	L	LL	SW+	SW-
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12

HH and COMMON are short-circuited by relay.

H and COMMON, L-COMMON, LL-COMMON are short-circuited in the same manner.

[Caution] Provide the surge protection in case the induced load is driven.

5) Wirings for 4-20mA output

CH1		CH2	
4-20mA	GND	4-20mA	GND
A9	A10	A11	A12

A11 and A12 are used for the output of the level difference between CH1 and CH2.

6) Wirings for RS-485

RS485			
F.G.	A(+)	B(-)	GND
A5	A6	A7	A8

Use the shielded twisted pair cable for RS-485 line. Connect the shield to FG, A5.

7) Wirings for RS232C　　115,200bit/sec　8bit　Parity/none

RS232		
GND	TX	RX
A2	A3	A4

Setting of the dip switch (SW1)

Setting of the terminating resistance of RS-485 and Profibus

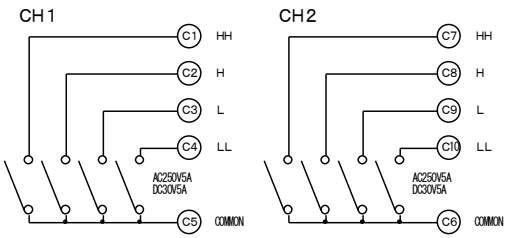
RS-485: 3 and 4 of SW1 should be ON.

Profibus: 1 and 2 of SW1 should be ON.

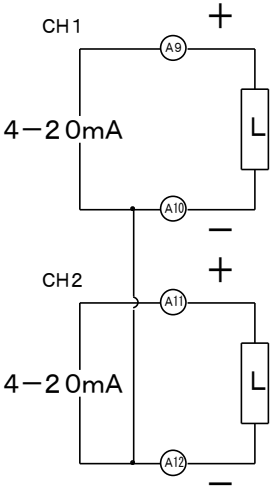
In case the multiple main units are connected, the terminating resistance Rt (100 ohms) of the main unit which is farthest from the host computer must be ON and those of others must be OFF.

1 and 2 of SW1 or 3 and 4 of SW1 must be ON or OFF at the same time.

ALARM SW (Relay contact output)



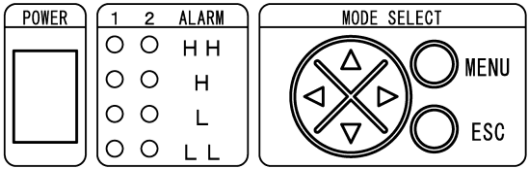
4-20mA output

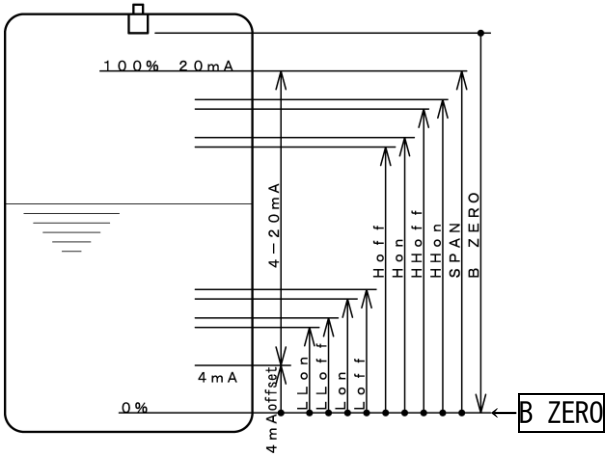


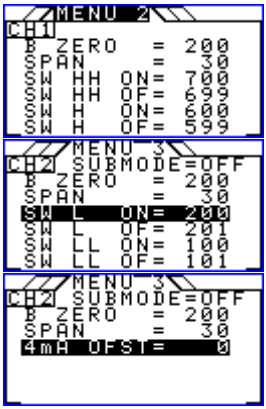
[Caution]

- Rating of ALARM output is 250 VAC 5A or 30 VDC 5A.
- Rating of Pulse output is 24 VDC 2.0A.
- A10 and A12 of 4-20mA are connected inside.
- Permissible load resistance and resolution of 4-20mA output:
  600 ohms or less and 1/4000

Settings to match the tank







CH1 settings (MENU2) **CH2 settings (MENU3)**

1) Press MENU key to display MENU.

2) Display MENU2 or MENU3 by → key and select the item by ↑ ↓ keys and change the setting by ← → keys.

Press MENU key to fix the setting and exit MENU.

To press ESC key not to change the setting and exit MENU.

3) B ZERO: Distance from the sensor surface to the tank bottom

This does not necessarily have to be the distance to the tank bottom as it is the distance to 0%.

4) SPAN: Setting of the distance for 0 - 100%

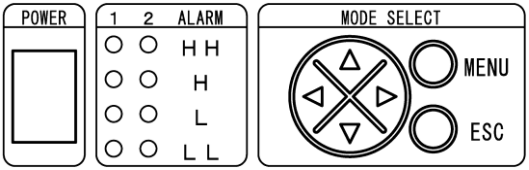
Set the distance from the tank bottom which is set by B ZERO to 100%.

5) SW HH-LL: Setting of the alarm switch level

Set the level for SW HH - LL.

Be aware of the relationship of ON and OFF.

5) 4mA OFST: Setting of 4mA offset



Basic key operations

Press MENU key to move to MENU display.

Select the item by ↑ ↓ keys and change the setting by ← → keys.

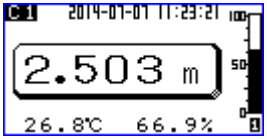
Press MENU key to exit MENU display.

How to read the LCD display screen

Select 1 display mode from the following 4 display modes.

DISPMODE A

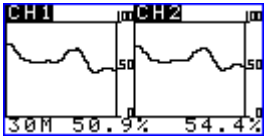
Refer to P12 and P13.



(Standard display)

DISPMODE B

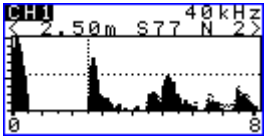
Refer to P14.



(Trend display)

DISPMODE C

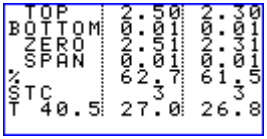
Refer to P15 to P18.



(Ultrasonic A mode display)

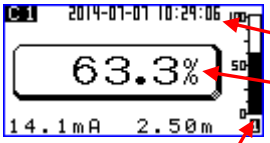
DISPMODE D

Refer to P19.



(Character display)

DISPMODE A (Standard display)

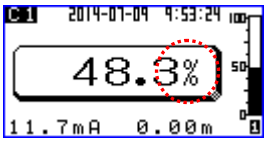


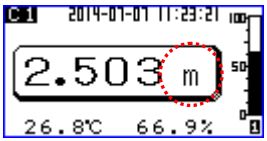
Date and time display

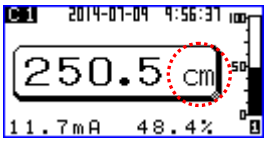
Main display: Numerical display of remaining amount in percentage terms, the distance or the level in the tank.

Graphic display of the remaining amount in the tank

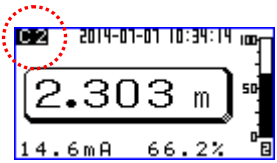
Select the unit, %, m or cm by ⇑ key.

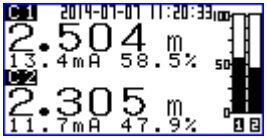






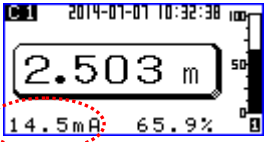
Select the channel, CH1, CH2 or CH1&CH2, by ⇐⇒ keys.





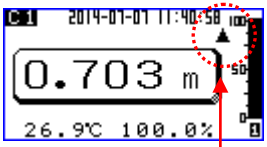
Select the temperature or 4-20mA the by ⇓ key.

4-20mA

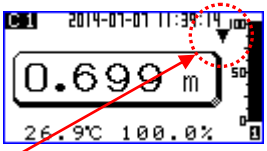


Current output display

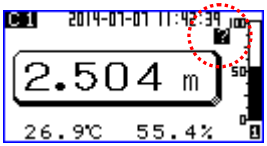
Rising the liquid level



Lowering the liquid level



Rising/Lowering the liquid level is indicated by the arrow.



? is indicated in case the ultrasonic reflection echo cannot be detected and measurement error happens.

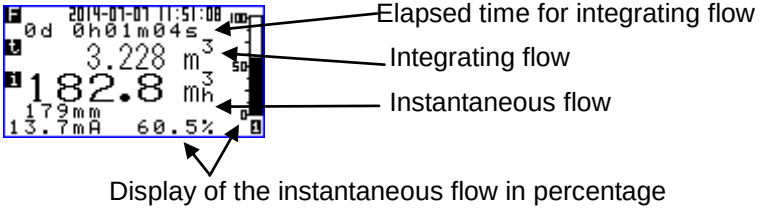
DISPMODE A (Flowmeter standard display)

Flowmeter display

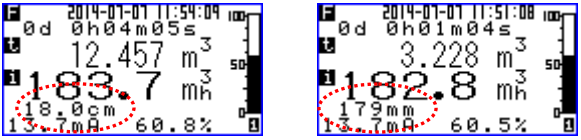
F (Flow) is displayed in case the flowmeter function is worked.

t (Total flow): Integrating flow

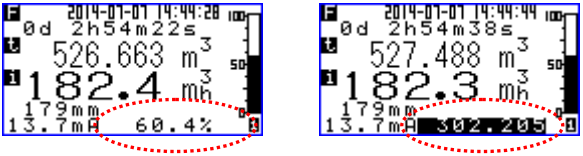
i (Instantaneous flow): Instantaneous flow



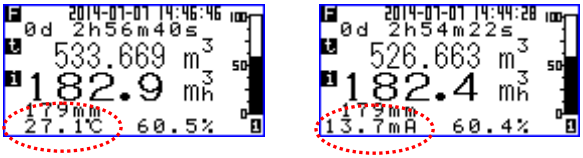
Select cm or mm as the unit of the overflow level at UNIT of MENU1.



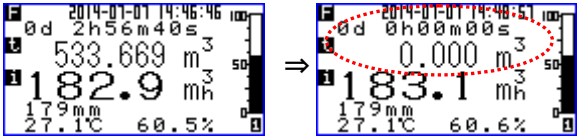
Select % or Max. setting flow by ↑ key.



Select the temperature or the current output value by ↓ key.



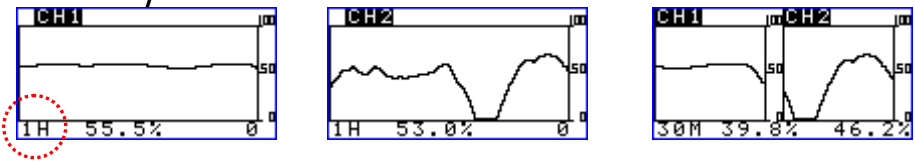
Hold down ESC key for 2 seconds to reset the integrating flow and the elapsed time for the integrating flow.



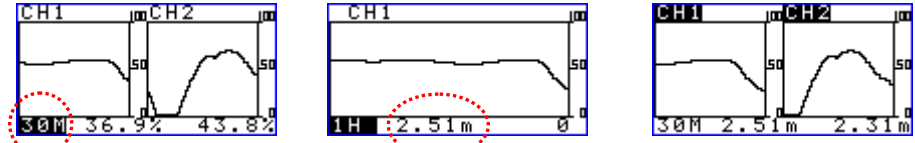
DISPMODE B (Trend display)

Graphic display of the ratio of the remaining amount

Select CH1, CH2 or CH1&CH2 by ← → keys.



Time graph



Time graph

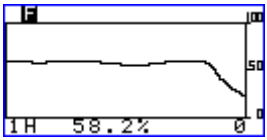
Distance or the ratio of remaining amount

How to change the time graph

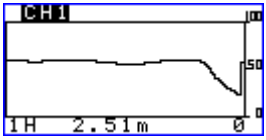
Select the time display by ↑ ↓ keys.

Select the time graph from 5 min. to 48 hours by ← → keys.

Flowmeter



Level meter



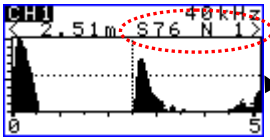
Ratio of the instantaneous flow is displayed in case the flowmeter function is used.

[Caution] Select distance or the ratio of the remaining amount by the main display of DISPMODE A.

DISPMODE C (Ultrasonic A mode display)

Ultrasonic reflection echo is displayed.

Select CH1 or CH2 by ← → keys, select the item by ↑ ↓ keys and change the setting value by ← → keys.

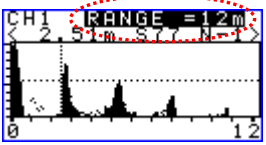


Ultrasonic A mode display: Ultrasonic reflection echo is displayed.

(S= Signal intensity, N= Noise value)

Threshold level line

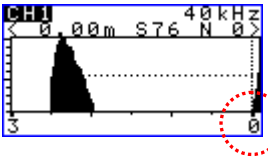
Display range (RANGE)



Range of the displayed range is displayed.

Setting range: 1 - 20m

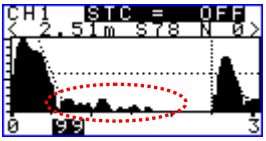
The range is depending on the frequency of the sensor.



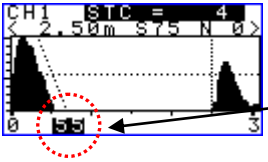
If “bottom” is selected at MENU 1, B ZERO is the basing point of scale.

If top is selected at MENU 1, the sensor surface is the basing point of the scale.

STC



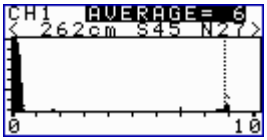
The sensitivity of the position where is close to the sensor is decreased and the undesired reflections from such position is cleared.



OFF ⇔1 ⇔2 ⇔3 ⇔… ⇔ 1 0

Distance of the reverb signal

Averaging (AVERAGE)

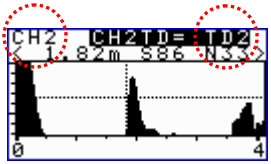


In case the ultrasonic reflection echo is not stable due to the fluctuation of the liquid surface and etc., set AVERAGE to the larger value.

Setting range: 1 – 30

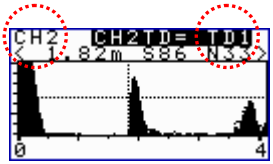
[Caution] The larger the setting value of AVERAGE is, the slower response speed is.

Selection of ultrasonic sensor of CH2



Select either TD1 or TD2 as the sensor for CH2.

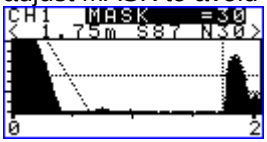
Normally, select TD2.



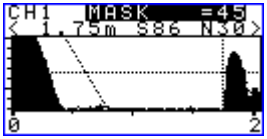
Ex) TD1 is selected in case both CH1 and CH2 are used with 1 sensor simultaneously.

Reverberation mask setting

In case the distance of the reverb signal prevent the measurement,
adjust MASK to avoid the incorrect measurement.



MASK = 30 cm (Default value)



MASK = 45 cm

MASK = 70 cm

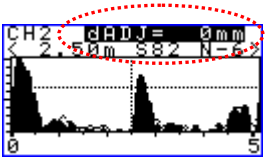
[Caution] Dead zone from the sensor is 70 cm.

Frequency setting

12⇔21⇔30⇔40⇔50⇔Variable

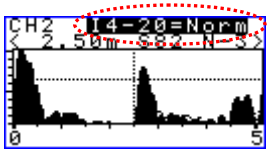
Press ESC key at Variable to set the frequency at 1kHz step from 10kHz to 60kHz.

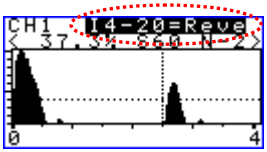
Distance correction

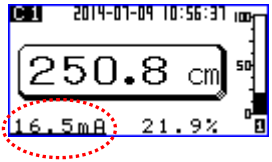


Distance correction can be done from -99 to 100mm.

Inversion of 4-20 mA current output







Inversion of the output current can be done.

4mA ⇒20mA 20mA ⇒4mA

In case the output current is inverted, the underline is indicated under the displayed current value.

Defense function

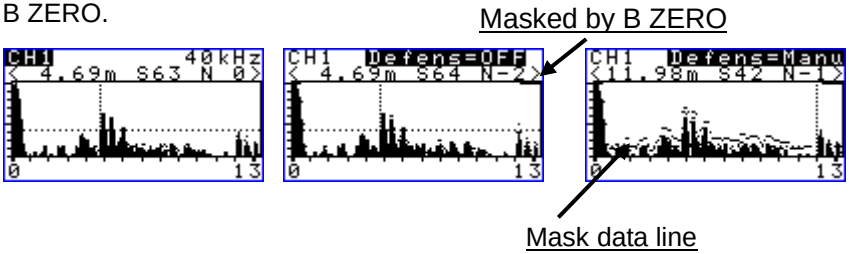
This is the function to mask the undesired reflections from the object which don't move at all in the manhole pump system and etc.

Such undesired reflections is masked in case **MANU** ⇔**OFF** ⇔**TRAC** is set.

MANUAL setting

50 cm above from B ZERO is memorized as the masked range in case the setting is changed from OFF to MANU.

Set MANU under the condition that the liquid level is within 50 cm above from B ZERO.



Tracking setting

Set TRAC from OFF irrespective of liquid level.

The moving liquid level is detected.

[Principle]

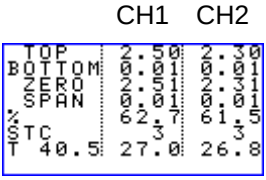
Mask data is updated at fixed intervals and moving liquid level is excluded from the masked object.

While the mask data is updated, the measurement error happens because all of echoes are masked.

[Caution] In case the undesired reflections and reflections from the measurement object are overlapped, the measurement error happens.

DISPMODE D (Character display)

The detailed information is displayed.



TOP : Measurement distance from the surface of the ultrasonic sensor

BOTTOM: Measurement level from B ZERO.

ZERO : B ZERO setting value

SPAN : Setting value of 100% level

% : Measurement ratio of the remaining amount

STC : STC setting value

T : Temperature inside of the tank
(The left one is the temperature inside of HD1200 main unit.)

Reset and system reset

All the settings of HD1200 main unit can be reset in the following procedures at DISPMODE D.

Press ESC and MENU keys simultaneously to restart HD1200 main unit.

Press ESC, MENU and ← keys simultaneously to initialize HD1200 main unit. (Approx. 1 min. will be taken to initialize HD1200 main unit.)

Menu setting

Press MENU key to display MENU.

Press MENU key to exit MENU.

If there is no key operation for 3 min., at MENU display, the exit from MENU is done automatically.

MENU has MENU 1 to MENU 5 as follows.

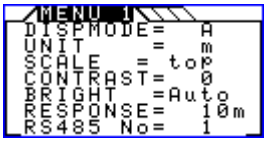
Press ← → keys to select the desired MENU.

Press ESC key not to change the setting and exit MENU.

While MENU is displayed, the ultrasonic measurement is continued.

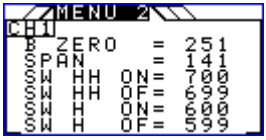
MENU 1

Refer to P21 to P24.



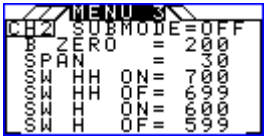
MENU 2

Refer to P25 and P26.



MENU 3

Refer to P25 and P26.

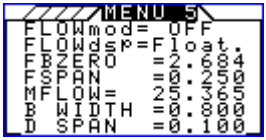


MENU 4

Refer to P27 and P28.

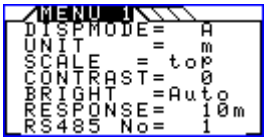
MENU 5

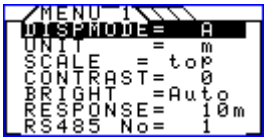
Refer to P29 to P34.



MENU 1

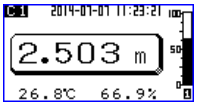
Select the parameter which setting should be changed by ↓ key.



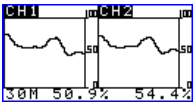


Select the desired DISPMODE from A to D by ← → key.

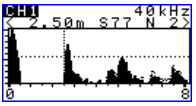
DISPMODE A



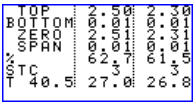
DISPMODE B



DISPMODE C



DISPMODE D



UNIT : Select m or cm.

(In case the flowmeter function is used, m means mm as the unit of the overflow level.)

SCALE : Select top or bottom.

Basing point of the measurement can be selected.

top : The sensor surface is the basing point.

bottom : The tank bottom is the basing point.

CONTRAST : Select from -10 to 10.

LCD contrast can be adjusted. Standard setting is 0.

BRIGHT : Select from OFF, AUTO or ON.

Setting of LCD backlight can be set.

AUTO : Backlight is ON for 10 min. after the power activation, and OFF after that.
Backlight is ON for 1 hour after any key operation, and OFF after that.

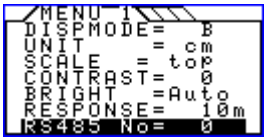
RESPONSE : Select from 1000m/min (faster) to 0.01m/min (slower).

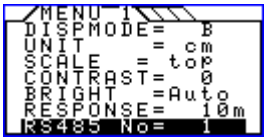
The setting of the following speed against the change of the measurement distance can be done.

RS485No. : Select from 0 to 99 as ID No. of RS485 (PROFIBUS).

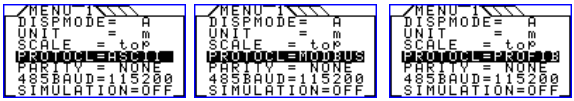
If RS485 is not used, set to 0.

Up to 32 main units can be concatenated even though the setting range is 1 to 99.





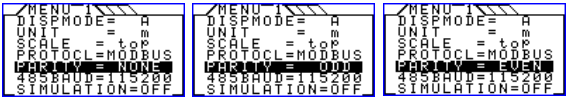
PROTOCOL :



Select ASCII, MODBUS or PROFIBUS according to the host computer.

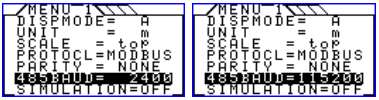
MODBUS is RTU mode.

RS485PARITY :



Select NONE, ODD or EVEN as PARITY according to the host computer.

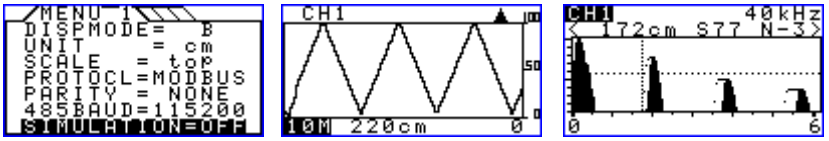
RS485BAUD :



Select from 2400 to 115200 as the baud rate of RS485 according to the host computer. (Unit: bps)

SIMULATION : Select OFF, On1, On2, On3, On4, On1m, On2m, On3m or On4m.

The setting of the simulation function by the spurious echo can be done for the test purpose.4-20mA, relay and the communication output can be changed according to the spurious echo.



The spurious echo moves within the range of SPAN, 0 - 100% as above.

The spurious measurement distance is updated approx. every 2 seconds and the spurious distance is changed as follows depending on the SIMULATION setting.

On1: 2cm, On2: 4cm, On3: 8cm, On4: 16cm

In case the parameter which “m”(On1m, On2m, On3m or On4m) is set, the measurement and the simulation are affected each other.

This function works to test each output.

[Caution] The simulation function becomes invalid once the power is turned off.

[Caution] On the simulation function, SPAN of CH2 is that of CH1 and it

cannot be that of CH2.

SD card data storage function

Folder name File name

A) ECHO_CH1 EC140511.BIN Ultrasonic echo data

B) ECHO_CH2 EC140511.BIN Ultrasonic echo data

C) LOG_DATA LD140511.CSV Measurement log data

The data can be read out by Excel® and etc.

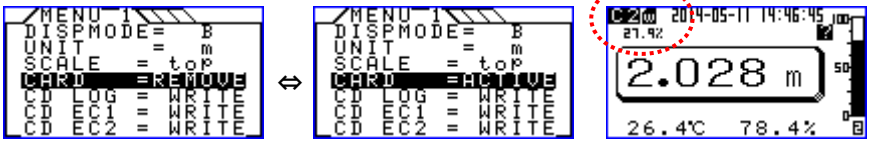
D) LIFT_DAT LIFT1532.CSV Measurement log data

The data can be read out by Excel® and etc.

Always insert SD card into the slot whenever A), B) or C) is done.

Insert SD card into the slot when the data is copied in case D) is done

After SD card is inserted into the slot, change the setting of the necessary item from Idle to WRITE by → key and change the setting of CARD to ACTIVE. Change the setting of CARD to REMOVE to remove SD card.



While the data is written into SD card, W and the card utilization are displayed on the normal display.

[Caution] Do not turn off the power or remove SD card from the slot while the data is written into SD card.
If SD card is removed while the date is written into SD card, HD1200 main unit is abended and restarted.

Contents of LOG_DATA and LIFT_DAT are the same as those of the data of RS232C on P35.

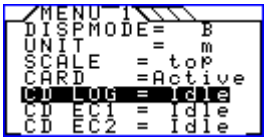
Copy of D) LIFT_DAT, the measurement log data

The measurement log data stored in the flash memory inside of HD1200 main unit can be copied into SD card.

CARD = REMOVE ⇒CARD = ACTIVE CD LOG = Idle ⇒CD LOG = Copy

Select Copy by ← key to start to copy the data into SD card.

It takes approx. 1 min. to copy the data into SD card.



For 1 hour after the power on, the measurement log data is stored into the flash memory at 1-minute intervals.

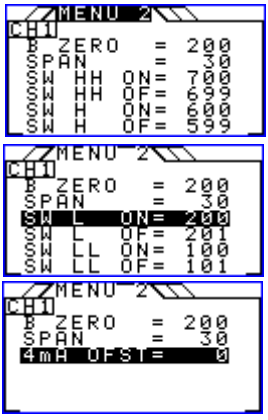
After that, the data is stored at 1-hour intervals.

The data for 1.5 year can be stored at the maximum. After the data for 1.5 year is stored, the date of 1.5 year range is updated.

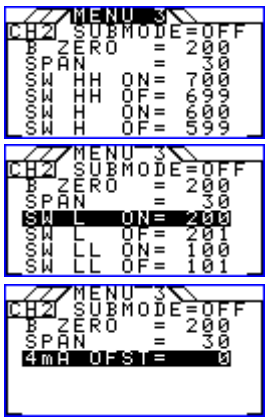
If the power of HD1200 is often restored, the data range is shortened.

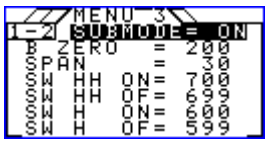
[Caution] If the power on of HD1200 is done many times, the period of the data storage will be shorter than 1.5 year.

MENU 2



MENU 3





MENU 2 is the page for CH1 setting.

MENU 3 is the page for CH2 setting.

The displayed value is displayed in the selected unit, cm or m.

SUBMODE : Select ON or OFF.

Select ON to enable to the difference measurement between CH1 and CH2.

In case ON is selected, select bottom at SCALE at MENU 1.

Use the terminals of CH2 for SUBMODE output.

B ZERO : Select from 30 – 2030cm or 0.30 – 20.30m.

Set the distance from the sensor surface to the tank bottom or the dam bottom.

The setting value is depending on the frequency.

SPAN : Select from 0 – 20000cm or 0.00 – 20.00m.

Set the measurement range or the max. over flow level from the tank bottom.

The setting value is depending on the frequency.

The range is equal to the range of 4-20mA output.

[Caution]: In case 4mA OFST is set to 0, the range calculated by subtracting the setting value of 4mA OFST from the range of SPAN is the range of 4-20mA output.

SW HH ON/OF : Select from 0 - 2000cm or 0.00 - 20.00m.

Set the level from the tank bottom which ALARM HH must be ON/OFF.

SW H ON/OF : Select from 0 - 2000cm or 0.00 - 20.00m.

Set the level from the tank bottom which ALARM H must be ON/OFF.

SW L ON/OF : Select 0 - 2000cm or 0.00 - 20.00m

Set the level from the tank bottom which ALARM L must be ON/OFF.

SW L ON/OF : Select from 0 - 2000cm or 0.00 - 20.00m

Set the level from the tank bottom which ALARM LL must be ON/OFF.

[Caution] Relay mode is determined by the settings of ON and OFF.

[Caution] ON and OFF are switched frequently, the difference between ON and OFF must be larger in order to provide the hysteresis.

4mA OFST : Select 0 - a value which is the setting value of SPAN or less.

In case 4mA OFST is set to 0, the tank bottom is the level of 4mA output.

[Caution] In case 4mA OFST is set to 0, the range calculated by subtracting the setting value of 4mA OFST from the range of SPAN is the range of 4-20mA output.

MENU 4

PASSWORD : Select 2357 to operate everything.

Password can be set.

Except 2357, the control can be restricted.

4-20SET : Select from normal or i4mA to i20mA.

Connection test of 4-20mA output can be done.

In case i4mA is set, 4mA is output from HD1200 main unit forcibly.

In case i20mA is set, 20mA is output from HD1200 main unit forcibly as well.

Normal ⇔i4mA ⇔i8mA ⇔i12mA ⇔i16mA ⇔i20mA

Both current outputs of CH1 and CH2 are output at the same time.

Once the exit from MENU is done, the setting of 4-20SET returns to normal.

ERR CON : Select from hold, i4fix or i20fix.

The current output in case the measurement error happens can be specified.

Hold : The current of the previous measurement value before the measurement error happens is hold and output.

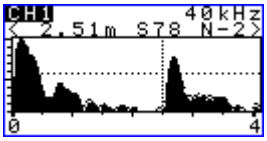
i4fix : 4mA is output in case the measurement error happens.

i20fix : 20mA is output in case the measurement error happens.

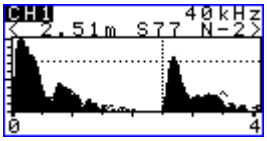
THRESHO : Select from -4dB to -36dB.

Setting of the threshold level can be done.

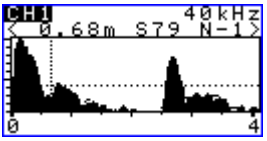
-20dB



-4dB



-36dB



The signal which lower than the setting of the threshold level is not detected as the signal from the measurement object.

In case the multiple reflection is detected and as the signal from the measurement object and the 2 or 3 times of the actual distance is shown as the measured distance, decrease the value of the threshold level.

In case the undesired reflection is detected as the signal from the measurement object and the distance which is shorter than the actual distance, increase the value of the threshold level.

The default setting is -20dB.

232BAUD : Select the baud rate of RS232 from 2400, 4800, 9600, 19200, 38400, 57600, 115200. (Unit: bit/sec)

The default value is 115200 bit/sec.

RLYtest : Select from normal, ALLoff, ALLon or CH1HH to CHLL.

The individual test of the relay and contact point can be done.

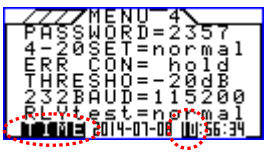
Status of the relay and LED is changed irrespective of measured value.

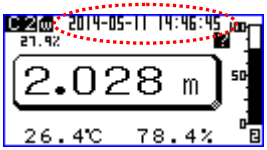
Once the exit from MENU is done, the setting of RLYtest returns to normal.

TIME : Time correction can be done.

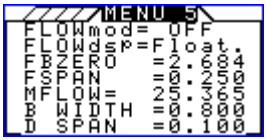
Select the number which should be corrected by ← → keys and press ESC key. Change the number by ← → keys and the number of second can be set to HH:MM:00 by ESC key.

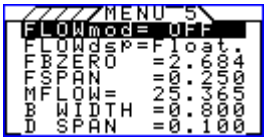
(When ESC is pressed at HH:MM:01-29, the time will be HH:MM:00, and when ESC is pressed at HH:MM:30-59, the time will be HH:MM+1:00.)





MENU 5



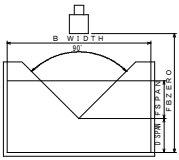


FLOWmod : Select from OFF, 90ang1, AngleV, 60angV or Square1 to Square4.

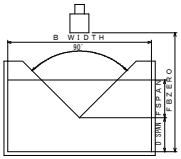
Level meter function: Select OFF for the level meter function.

Flowmeter function: Select from 90ang1, AngleV, 60angV or Square1 to Square4 for the flowmeter function according to the dam type.

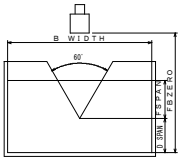
90ang1 for the right-angle triangular dam, JISB8302



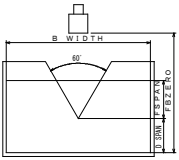
AngleV for the selected angle triangular dam



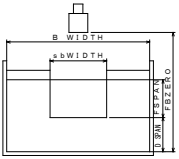
to



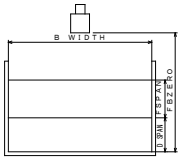
60angV for 60 deg triangular dam, JISB8302



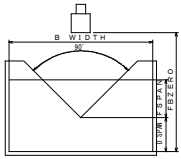
Squar1 for the square dam, JISB8302



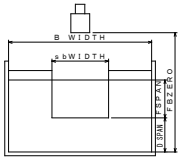
Squar2 for the full width dam, JISB8302



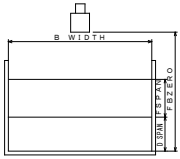
90ang2 for the right-angle triangular dam



Squar3 for the square dam



Squar4 for the full width dam



Select the one from the followings for the application of the parshall flume type flowmeter.

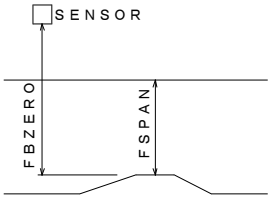
PF-1: 1 inch, PF-2: 2 inches, PF-3: 3 inches

PF-6: 6 inches, PF-9: 9 inches, PF-10: 1 foot,

PF-15: 1.5 feet, PF-20: 2 feet, PF-30: 3 feet

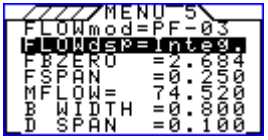
PF-40: 4 feet, PF-50: 5 feet, PF-60: 6 feet

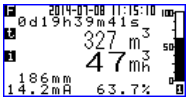
PF-70: 7 feet, PF-80: 8 feet



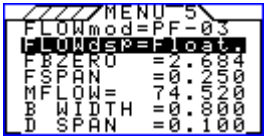
FLOWdsp : Select the unit for the flowmeter function.

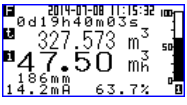
Integer display of flow(m^3)

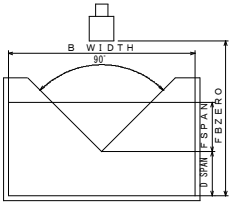




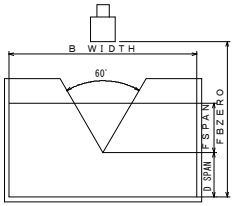
Decimal point display of flow(m^3)







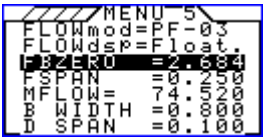
Right-angle triangular dam



60 deg triangular dam

FBZERO : Set the distance from the sensor surface to the bottom.

Setting range: 300 – 500 (Unit: mm)



FSPAN : Set the max. depth in case of the max. height of overflow Setting range: 50 - 3000 (Unit: mm)

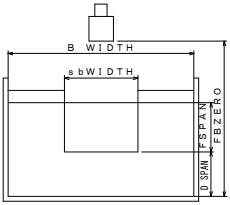
The setting of MFLOW depends on the setting of FSPAN.

B WIDTH : Set the width of the flow channel.

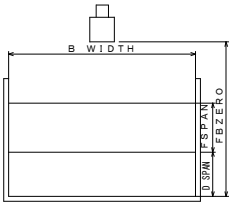
Setting range: 400 – 32000 (Unit: mm)

D SPAN : Set the distance from the bottom of the flow channel to the lower edge of the dam.

Setting range: 1 – 3500 (Unit: mm)

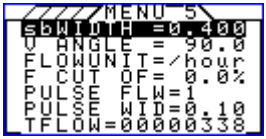


Square dam



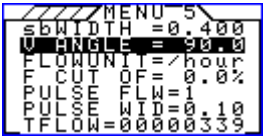
Full width dam

sbWIDTH : Set the width of the cutout of square dam.



V ANGLE : Set the arbitrary degree of the triangular dam in case Angle V is selected.

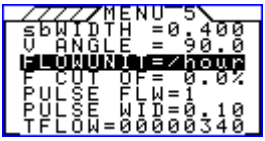
Setting range: 45.0 – 100.0 (Unit: degree)



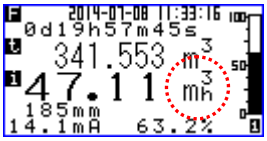
FLOWUNIT : Set the unit of the instantaneous flow.

m^3/sec ⇔ m^3/min ⇔ m^3/hour ⇔ m^3/day

sec

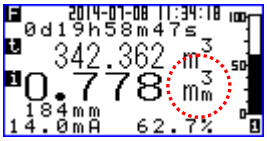


min



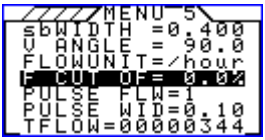
hour

day



F CUT OF : Set the cutoff of the flow.

Setting range: 0.0 – 10.0% of the max. setting flow

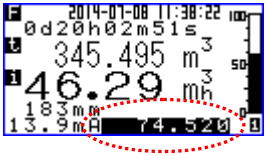


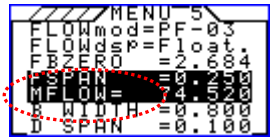
Flow which is less than the setting of F CUT OF is shown as 0(no flow).

In this case, 4mA is output as the current output.

Confirmation of the max. setting flow (MFLOW)

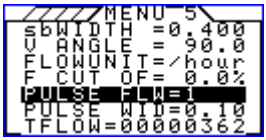
Press ↑ key to show the max. setting flow from % display.





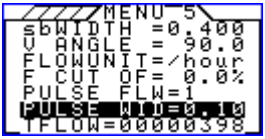
PULSE FLW : Set the flow of 1 pulse of the pulse output.

Select from 1000m^3, 100m^3, 10m^3, 1m^3, 0.1m^3, 0.01m^3 or 0.001m^3.



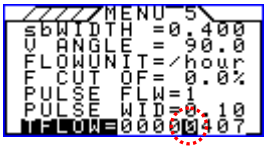
PULSE WID : Set the width of 1 pulse of the pulse output as the time of the output pulse output.

Setting range: 0.01 – 2.0 (Unit: sec)

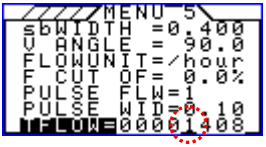


TFLOW : Set the desired value as the integrated flow.

Select the digit of value to be change by ← → keys and press ESC to change the value by ← → keys.



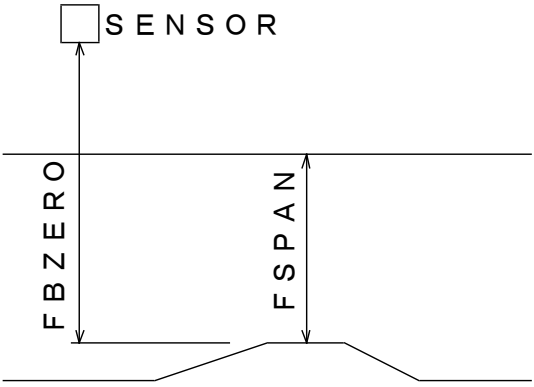
Press ESC key and change the value by ← → keys.



Parshall flume setting

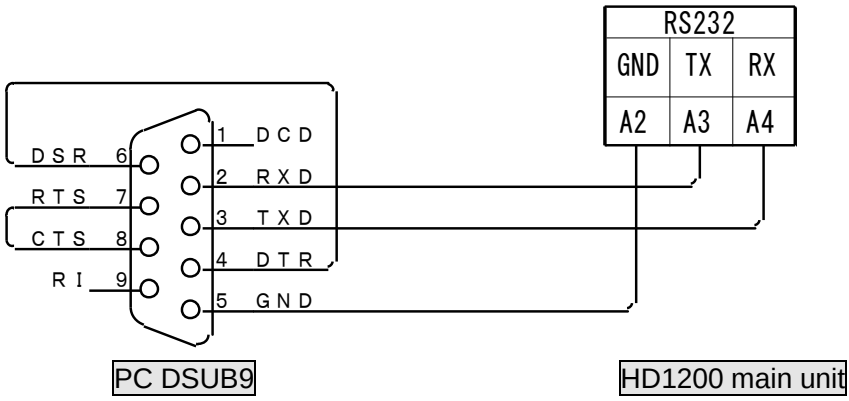
FBZERO : Setting of the distance in case of the min. flow

FSPAN : Setting of the distance in case of the max. flow



Connection to the computer (RS232C)

Connection diagram to the compute



Use the terminal software to monitor the data.

115200 bit/sec 8 but PN STOP 1

The data is output as follows.

$,25.6,25.2,41.5,250.9,250.4,55.7,57.7,-1,-2, ...

Number 1 2 3 4 5 6 7 8 9 10

... 222,W0,2,1399820401,97621,

11 12 13 14 15

1	Start code	9	CH1 noise level
2	CH1 sensor temperature	10	CH2 noise level
3	CH2 sensor temperature	11	Internal system data
4	Internal temperature of the main unit	12	
5	Distance from CH1 sensor	13	
6	Distance from CH2 sensor	14	
7	CH1 ultrasonic reflection level	15	
8	CH2 ultrasonic reflection level		

The data is sent once per approx. 2 sec. (Depending on the frequency)

Communication to the computer (RS485)

Specifications of RS485

	ASCII	MODBUS (RTU)
Electric characteristic	Compliant with EIA RS485	
Communication method	Two-wire and half-duplex (Polling/Selecting method)	
Synchro system	Asynshronous communication method	
Transmission rate	Selectable from 2400, 4800, 9600, 19200, 38400, 57600 or 115200.	
Start bit	1 bit	1 bit
Data length	7 bit	8 bit
Parity	Even parity	Selectable parity
Stop bit	2 bit	1 bit
Delimiter	CR+LF	Silent interval for 3.5 characters
Character code	ASCII code	Binary code
Transmission control procedure	No control sequence	
Number of concatenated unit	32 units including the host	
Unit ID	Selectable from 1 to 99.	
Max. cable length	1200m in total	
Error check	BCC checksum	CRC
Response speed	Within 3 sec. at the max.	Within the time for 10 characters

Initial setting of RS485

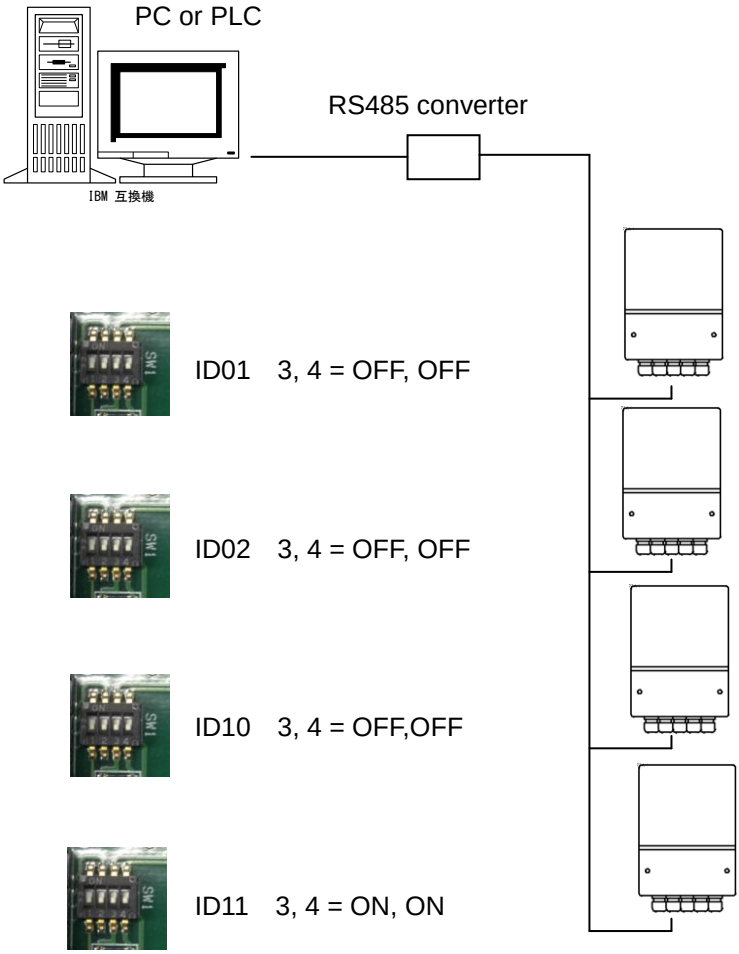
Initial setting of unit ID of HD1200 main unit is 0.

Select from 1 to 99 as the unit ID when RS485 is used as the communication method.

Recommended setting for MODBUS

Protocol	MODBUS
Response speed	115200 bps
Parity	NONE
Unit ID	1 - 99

Interface



Hook up A(+) terminal of main unit which is hooked up to the host PC to A(+) terminals of other units.

Hook up B(-) terminal of main unit which is hooked up to the host PC to B(-)of other units.

Set No. 3 and No. 4 of dip switch of terminated unit to ON (Termination resister: ON). Set No.3 and No.4 of others to OFF (Termination resister: OFF)

Communication format of RS485 ASCII

ASCII code

STX = 02H

ETX = 03H

EOT = 04H

ENQ = 05H

ACK = 06H

LF = 0AH

CR = 0DH

Establishment of communication

Example) In case ID1 and ID10 are used.

Establishment of communication (Specify ID by the host.)	Response to the establishment (Response from the main unit)
ENQ 1 CR LF	ACK 1 CR LF
ENQ 1 0 CR LF	ACK 1 0 CR LF

Opening of communication

Opening of communication	Response to opening of communication
EOT CR LF	None

Transmission and receipt of data

Format of transmitted data	Format of response data
STX 1, NORM ETX CB CR LF HEX 20312C4E4F524D03	STX 1, ? ? ?, . . . ETX BCC CR LF

Send and reply

Send and reply are started with “STX”.

Send; 1,NORM CB

Reply; 1, 26.6, 28.1, 42.4, 190, 182, 80.0, 81.0,70,60,27,27,s848,W7192, B9

IDNo,CH1TMP,CH2TMP,INTMP,CH1DIST,CH2DIST,CH1%,CH2%,CH1ECHOLEVEL,
CH2ECHOLEVEL,CH1NOISELEVEL, CH2NOISELEVEL,MEMORYFREE,MEMORYWRITE

Send; 1,PRAM 0B

Reply; 1,5,1, 6, 830, 800, 700, 600, 200, 100,1, 6, 830, 800, 700, 600, 200, 100,4, 59

Readout of setting parameters

IDNo,RESPONSE,CH1STC,CH1AVELAGE,CH1ZERO,CH1SPAN,CH1HH,CH1H,CH1L,CH1LL
CH2STC,CH2AVELAGE,CH2ZERO,CH2SPAN,CH2HH,CH2H,CH2L,CH2LL,THRESHOLD

Send; 1,SYSVER C6

Reply; 1,(c)Copyright HONDA ELECTRONICS CO.,LTD. '00/ 6/23 V2.0 6B

IDNo, System version

Send; 1,D_DUMP 95

LCD image data

Send; 1,ECHO1 0D

CH1 ultrasonic echo data

Send; 1,ECHO2 1D

CH2 ultrasonic echo data

Send; 1,PRAMW,5,1, 6, 830, 800, 700, 600, 200, 100,1, 6, 830, 800, 700, 600, 200, 100,4 C1

Write of setting parameters

IDNo,PRAMW,RESPONSE,CH1STC,CH1AVELAGE,CH1ZERO,CH1SPAN,CH1HH,CH1H,CH1L,CH1LL
,CH2STC,CH2AVELAGE,CH2ZERO,CH2SPAN,CH2HH,CH2H,CH2L,CH2LL,THRESHOLD

Send; 1,RESET 30

HD1200 is reset.

Send; 1,IRESET C4

HD1200 is reset and defaulted.

RS485 MODBUS communication format

1: In case of no incoming command for 3.5-character-time, HD1200 recognizes the completion of incoming command and the command processing is done.

2: Address can be selected from 1 to 99.

MODBUS RTU command message frame

START	ADDRESS	FUNCTION	DATA	CRC CHECK	END
3.5-character-time	8 bits	8 bits	N * 8 bits	16 bits	3.5-character-time

Correspondent command

03	Read Holding Register	Readout of holding register
04	Read Input Register	Readout of input register
06	Preset Single Register	Write of holding register
08	Diagnostics	Loop-back test

Command = 04 Readout of input register

Query

Slave Address	Function	Starting Address Hi Lo	No. of Points Hi Lo	CRC

Response

Slave Address	Function	Byte Count	Data n Hi Lo	Data n+1 Hi Lo	CRC

Read address	Content	Example	Readout value
0	CH1 distance	2000 mm	2000
1	CH2 distance	2000 mm	2000
2	CH1 level	3000 mm	3000
3	CH2 level	3000 mm	3000
4	CH1 %	100 %	10000
5	CH2 %	100 %	10000
6	CH1 noise value	30	30
7	CH2 noise value	30	30
8	CH1 signal intensity	80	80
9	CH2 signal intensity	80	80
10	CH1 sensor temperature	25.0 deg C	250
11	CH2 sensor temperature	25.0 deg C	250
12	Temperature inside of HD1200	25.0 deg C	250
13	Max. measured flow	100.0 m^3/h	100
14	Measured flow	20.0 m^3/h	20
15	Integrated flow	1000.0 m^3/h	1000
16	Overflow level	255 mm	255
17	Flow rate	100 %	10000
18	Integrated flow (high 16 bits)	1000.0 m^3/h	1000
19	Integrated flow (low 16 bits)		

Command = 03 Readout of holding register Command = 06 Write of holding register

Query(03,06)

Slave Address	Function	Starting Address Hi Lo	No. of Points Hi Lo	CRC

Response(03)

Slave Address	Function	Byte Count	Data n Hi Lo	Data n+1 Hi Lo	CRC

Response(06)

Slave Address	Function	Register Address Hi Lo	Preset Data Hi Lo	CRC

Read/Write address	Contents	Readout value (Example)	Write value range
0	RESPONSE	5	0-5
1	THRESHOLD	0	0-8
2	CH 1 STC	1	0-10
3	CH 1 AVERAGE	6	1-30
4	CH 1 BOTTOM ZERO	830	30-2030
5	CH1 SPAN	800	0-2000
6	CH1 SW HH ON	700	0-2000
7	CH1 SW HH OFF	699	0-2000
8	CH1 SW H ON	600	0-2000
9	CH1 SW H OFF	599	0-2000
10	CH1 SW L ON	200	0-2000
11	CH1 SW L OFF	201	0-2000
12	CH1 SW LL ON	100	0-2000
13	CH1 SW LL OFF	101	0-2000
14	CH1 4-20mA OFFSET	0	0-2000
15	CH2 STC	1	0-10
16	CH2 AVERAGE	6	1-30
17	CH2 BOTTOM ZERO	830	30-2030
18	CH2 SPAN	800	0-2000
19	CH2 SW HH ON	700	0-2000
20	CH2 SW HH OFF	699	0-2000
21	CH2 SW H ON	600	0-2000
22	CH2 SW H OFF	599	0-2000
23	CH2 SW L ON	200	0-2000
24	CH2 SW L OFF	201	0-2000
25	CH2 SW LL ON	100	0-2000
26	CH2 SW LL OFF	101	0-2000
27	CH2 4-20mA OFFSET	0	0-2000
28	B_WIDTH	800	400-7000
29	bb__WIDTH	400	150-5000
30	D_SPAN	100	1-3500
31	V_ANGLE	900	450-1000
32	FLOW MODE	6	0-22
33	FLOW UNIT	2	0-3
34	PULSE FLOW	3	0-6
35	PULSE WIDTH	10	1-200
36	LOW CUT OFF	0	0-100
37	FLOW ZERO	2000	300-5000
38	FLOW SPAN	200	50-3000
39	TOTAL FLOW RESET	0	When 1 is written, the integrated value is reset.

Specifications

Model No.		HD1200
Number of channels		2
Frequency		10 - 60kHz transducer dependant
Object to be measured		Liquid / Power
Resolution	Measurement	1mm
	Display	1mm
Accuracy		±0.25%F.S.
Data update cycle		Approx. 2sec transducer dependant
Power source	Voltage	100 - 240 VAC ±10%
	Power consumption	10VA
Display		LCD
Output	Alarm output	4 lines for each channel 250 VAC, 5A (Relay contact)
	4-20mA current output	Resolution 1/4000 RL(Max)=600Ω
Interface		RS-485 (Max transmission range: 1,200m) RS-232C (Max transmission range: 10m)
Communication		microSD™
Operating ambient temperature		-20 - +70℃
Material		ABS
Structure		IP66 equivalent
Dimensions(WxDxHmm)		176 x 84 x 237
Weight		1.8kg

Model No.	Sensor	
	TS40-5	TS40T-5
Frequency	40kHz	40kHz
Measurement distance range (1/2 for powder)	0.3 - 20m	0.3 - 15m
Sensor directivity angle	12° (-6dB) 8° (-3dB)	22° (-6dB) 16° (-3dB)
Operating ambient temperature	-20 - +70℃	
Material	Epoxy,PP	PVDF
Structure	IP68 equivalent	IP68 equivalent
Dimensions(WxDxHmm)	dia.84 x 90	dia.98 x 87
Sensor cord length	5m	
Weight	500g	860g
Sensor attachment screw (old JIS)	R1(PT1)	G1 (PF1)

Setting list

Setting (Unit: ☐ m or ☐ cm)

	CH 1	CH 2
B ZERO		
SPAN		
SW HH ON		
SW HH OF		
SW HH ON		
SW HH OF		
SW L ON		
SW L OF		
SW LL ON		
SW LL OF		
4mA OFST		
ERR CON		
THRESHO		
STC		
AVERAGE		
MASK		
FREQ		
dADJ		
Defens		

Flowmeter setting (Unit: ☐ m or ☐ cm）

FBZERO	
FSPAN	
MFLOW	
B WIDTH	
D SPAN	
sbWIDTH	
V ANGLE	
FLOW UNIT	
F CUT	
PULSE	
TFLOW	

After sales service

◆When the after sales service such the repair is required, please contact the seller of product with the detailed information about the malfunction.

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