

Ins. No. E-023-9-E

SMART COMMUNICATION UNIT MODEL EL 2310-08J

Applicable flowmeter: OVAL Coriolis Flowmeters

ALTI*mass*, ALTI*mass* II, MT9411, MT9431, MT9603, CoriMate II Separate-type Model

Compatible transmitter: ALTImass (PA0K), ALTImass II (PA2K)

Rack-mount type (PA5K), (MT9411-****B), (MT9431-****B), (MT9603-****B)

For the installation of application software "LinkTop" and the interface driver, refer to Ins. No. E-020IMC "Smart Communication Unit MODEL: EL2310 Software Installation Procedure Manual".

CONTENTS

1. SMART COMMUNICATION UNIT	
1.1 General	5
2. BEFORE YOU BEGIN	
2.1 Inspection Upon Receipt	5
2.2 Hookup with Associated Equipment and Devices	
2.3 PC Interface Adapter	7
3. EL2310 OPERATION	8
3.1 About LinkTop Screen	8
3.2 Starting the LinkTop and Connections	9
3.3 Terminating the Connection	11
3.4 Terminating the LinkTop	12
3.5 Menu: Process Variables (Processing Values Display)	
3.5.1 Processing value measurements (View field device variables)	13
3.5.2 Measurement of Internal Process Values (View sensor values)	
3.5.3 Chart Display and Logging (Chart and Recording)	14
3.5.4 Display of the transmitter writing state (Write protect)	
3.6 Menu: Setup (Settings)	
3.6.1 Transmitter variables (Field device variables)	
3.6.2 Output settings (Outputs)	
3.6.2.1 Selection of Input/Output Functions (I/O function select)	20
3.6.2.2 Analog and pulse assignment (Analog/Pulse Assign)	
3.6.2.3 Analog output 1 setting (Analog output 1)	
3.6.2.4 Analog output 2 setting (Analog output 2)	
3.6.2.5 Pulse output 1 setting (Pulse output 1)	
3.6.2.6 Pulse output 2 setting (Pulse output 2)	
3.6.2.7 Status output setting (Status output)	
3.6.2.8 Error output level settings (Error output)	
3.6.3 Status input setting (Status input)	
3.6.4 H/L alarm setting (H/L alarm)	
3.6.4.1 H/L alarm assignment (H/L alarm assign)	
3.6.4.2 H/L alarm parameter settings (H/L alarm parameters)	
3.6.5 Characterize sensor	
3.6.5.1 Sensor type	
3.6.5.2 Flow parameters	
3.6.5.3 Density parameters	
3.6.5.4 Density parameters (Extended)	
3.6.5.5 Zero factor	
3.6.6 Transmitter information settings (Device information)	34

3.6.7 Transmitter display settings (LCD)	36
3.6.7.1 Display order settings (Variables priority)	36
3.6.7.2 Display update frequency setting (Refresh LCD)	37
3.6.7.3 Display character size setting (Font)	38
3.6.7.4 Measurement value decimal point position settings (Decimal)	39
3.6.7.5 Display backlight time setting (Back light)	40
3.6.7.6 Display contrast setting (Contrast)	41
3.6.7.7 CD Reverse	42
3.6.8 Polling Address (Polling address)	42
3.6.9 Polling Address	43
3.7 Menu: Diagnosis/Service (Checking and Adjustment)	44
3.7.1 Transmitter self-diagnosis functions (Test/Status)	45
3.7.1.1 Self-diagnosis function 1 (Self diagnosis)	45
3.7.1.1.1 Transmitter internal state checks (Transmitter condition)	45
3.7.1.1.2 LCD test	46
3.7.1.2 Self-diagnosis function 2 (Installation)	47
3.7.1.2.1 Static device installation state check (Static)	47
3.7.1.2.2 Dynamic device installation state check (Dynamic)	48
3.7.2 Loop test (Loop test)	49
3.7.2.1 Analog output 1 loop test (Fix Analog 1)	49
3.7.2.2 Analog output 2 loop test (Fix Analog 2)	51
3.7.2.3 Pulse output 1 loop test (Fix Pulse 1)	51
3.7.2.4 Pulse output 2 loop test (Fix Pulse 2)	53
3.7.2.5 Status output loop test (Fix Status output)	53
3.7.2.6 Status input loop test (Fix Status input)	54
3.7.3 Transmitter adjustment function (Calibration)	55
3.7.3.1 Automatic zero point adjustment (Auto zero)	55
3.7.3.2 Density calibration	58
3.7.3.2.1 Two-point Density Calibration	58
3.7.4 Analog output adjustment (Trim Analog)	59
3.7.4.1 Analog output 1 adjustment (Trim Analog 1)	59
3.7.4.2 Analog output 2 adjustment (Trim Analog 2)	61
3.7.5 Cumulative total display and control (Counter/Totalizer control)	61
3.7.5.1 Cumulative total 1 display and control (Counter/Totalizer control 1)	62
3.7.5.2 Cumulative total 2 display and control (Counter/Totalizer control 2)	62
3.8 Menu: Maintenance	63
3.8.1 Log and transmitter internal temperature display (Maintenance transmitter)	64
3.8.1.1 Error log display (Error log)	64
3.8.1.2 Transmitter internal temperature log display (Transmitter temperature log)	65
3.8.1.3 Transmitter internal temperature display (Transmitter temperature)	66
3.8.1.4 Transmitter elapsed time display (History)	67
3.8.2 Device Reset	68

3.9 Menu: Window	
3.10 Menu: File	69
3.10.1 Database	69
3.10.1.1 Opening files	
3.10.1.2 Downloading	70
3.10.2 Print and save file	72
3.11 Menu: Help	74
3.12 Troubleshooting	74
3.12.1 If there is no response	
3.12.2 If it is not possible to connect to the flowmeter	74
3.12.3 Input errors	75
3.12.4 Error and status display list	76
4. PRODUCT CODE EXPLANATION	79
5. GENERAL SPECIFICATIONS	80

The indications **NOTE**, **CAUTION**, and **WARNING** shown throughout this manual are to draw your attention to specific items:

➡ NOTE

Notes are separated from the general text to bring user's attention to important information.

ACAUTION

Caution statements call attention to user about hazards or unsafe practices that could result in minor personal injury or property damage.

Warning statements call attention to user about hazards or unsafe practices that could result in serious personal injury or death.

1. SMART COMMUNICATION UNIT

1.1 General

Described in this manual are the operating instructions to use the Smart Communication Unit Model EL2310 which operates in the Microsoft operating system Windows environment.

The EL2310 is a communication terminal designed for use in combination with a personal computer (hereinafter referred to as PC) and any one of the OVAL Coriolis series flowmeters to set up, alter, adjust, or read out parameters and variables, through interactive communications, locally at the point of measurement or from a terminal in a remote location. Using a Windows PC at hand, you can monitor multiple windows on its screen.

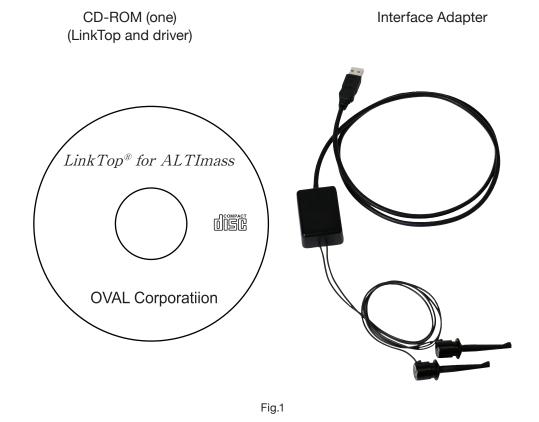
%: The EL2310 operates on the application software "LinkTop" furnished.

2. BEFORE YOU BEGIN

2.1 Inspection Upon Receipt

*Be sure you have the following items.

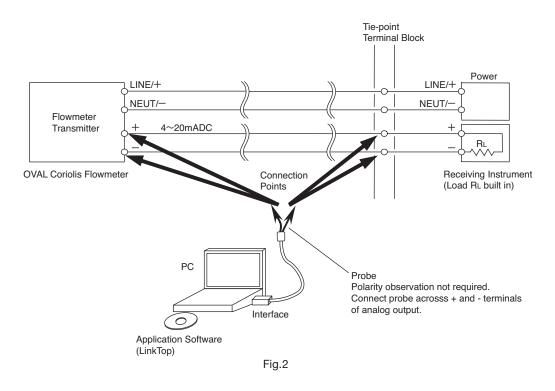
Remove the products from the EL2310 carton and make sure you have all the components required.



NOTE: For the installation of "LinkTop" and the interface driver, refer to "Installation Procedure Manual".

2.2 Hookup with Associated Equipment and Devices

Equipment set-up with associated equipment and devices are shown in Fig. 2.



NOTE: In Fig. 2, the customer is to supply the PC that meets the following requirements:

OS: Windows 7 to 11 (32bit/64bit) Japanese version / English version

- ◇RAM: 1GB or larger.
- ◇Hard disk: 10MB or larger

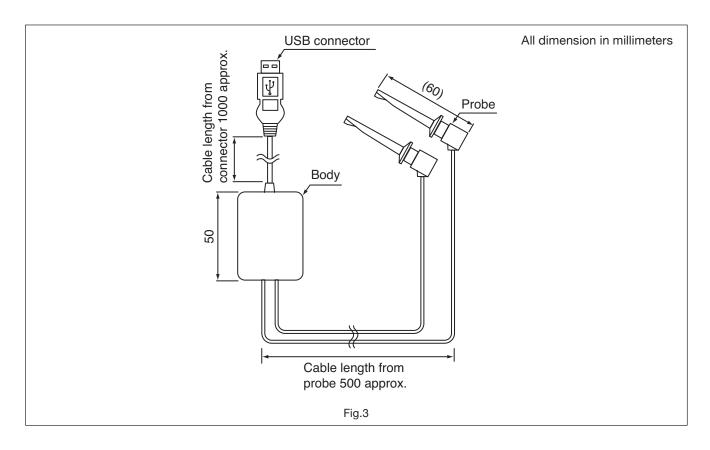
◇Provision of USB port

The load resistance RL in the receiving instrument shown in the figure above must be 250Ω or more, with the upper limit of 600Ω .

If the receiving instrument does not have a built-in RL, use it with an external RL connected in series.

2.3 PC Interface Adapter

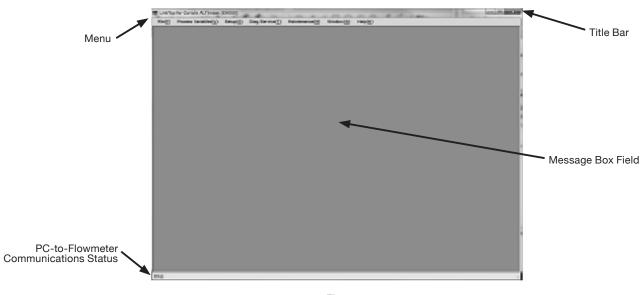
Comprised of components as shown in Fig. 3, it converts the flowmeter transmitter signal (Bell 202) into the USB signal.



3.EL2310 OPERATION

3.1 About LinkTop Screen

Fig. 4 shows how the LinkTop window looks.

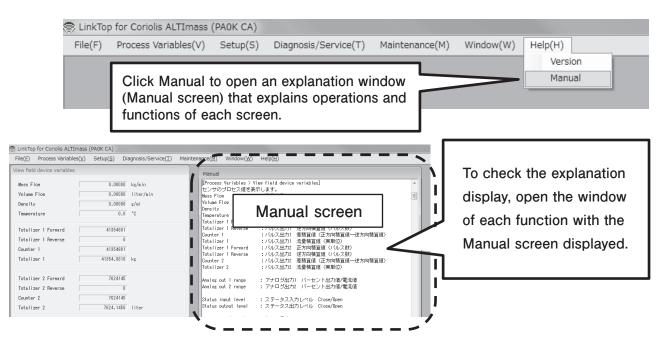




The state of communications is indicated at bottom left of the screen by :

 \bigcirc During communications : SEND, RECEIVE WAIT

- \bigcirc Communications interrupted : IDLE
- \bigcirc When communication is completed : CLOSE
- NOTE: You can display an explanation window (Manual) on the screen to check the explanation of the function.



3.2 Starting the LinkTop and Connections

- ① Hook up the flowmeter transmitter, interface adapter, and "LinkTop" preinstalled PC as shown in Fig. 2.
- ② To get the LinkTop up and running, click "Start" at lower left of the PC screen and click "LinkTop for Coriolis ALTImass (E) " from "Program".
- ③ Click "Port settings (I)" in "File (F)" at the top-level menu of screen.

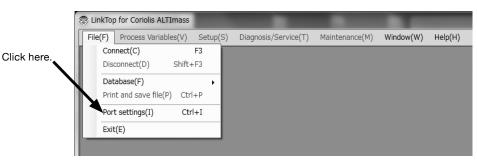


Fig.6

④ Set up the port.

Select COM \square of the corresponding communication port from "Port" drop-down list.

(represents the port number connected to the communication interface. If the corresponding communication interface port number is unknown, open Windows Device Manager and find the port number by viewing the list of "Port (COM and LPT)".)

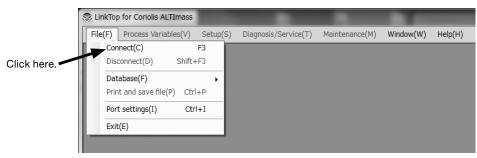
Then select "HART" from "Speed" drop-down list, unless otherwise required.

Click "OK" to complete the setting.





(5) On the screen as shown in Fig. 7, click "Connect (C) F3" in "File (F)" at the top-level menu of screen.



(6) "Polling address" setting screen appears. The standard "Polling address" of a flowmeter is "0".
 After you select "0", click "OK" to initiate the connection.

Connect		
	Connect to flow	meter(transmitter).
	Polling address	0
	OK	Cancel
	Fi	ig.9

As you click "OK" and start the connection process, a message box like the one in Fig. 10 appears.
 A bar graph in the middle of message box indicates progress of connection process.

	Connecting	
Polling ad	idress:0	
OK		Cancel

Fig.10

When the connection process begins, the transmitter connected is automatically identified and the transmitter name appears in the title bar. In addition, "SEND, RECEIVE WAIT" is displayed at the lower left of the screen where the communication status is shown.

(8) Upon completion of connections, a message box like the one in Fig. 11 appears. Click "OK" button. If an error/status has occurred, a pop-up window appears to show the error/status that has occurred as shown in Figure 12.

Connect	Connect X
PAOK CA This PC has connected with flowmeter(transmitter). Polling address:0	The following error/status has occurred. Pickoff Signal Error Temperature Connect Error Pickoff Connect Error Transmitter Warm Up
OK	ОК
Fig.11	Fig.12

(9) When connection is complete, of the menus at the top-level menu of screen, certain items that had been dimmed and unable to select become available (menu characters turned black).

😪 LinkTo	p for Coriolis ALTImass	Clean .					_ • ×
File(E)	Process Variables(⊻)	Setup(<u>S</u>)	Diag/Service(T)	Maintenance(<u>M</u>)		Help(H)	
😞 LinkTop	p for Coriolis ALTImass	(CAXXX)					- • ×
File(E)	Process Variables(⊻)	Setup(S)	Diag/Service(I)	Maintenance(M)	Window(W)	Help(<u>H</u>)	
					Fig.13		

3.3 Terminating the Connection

To terminate connection between the flowmeter transmitter and LinkTop, follow the procedure given below:

① Click on "File (F)" at top-level menu on the screen as shown in Fig. 14, and select "Disconnect (D) Shift + F3".

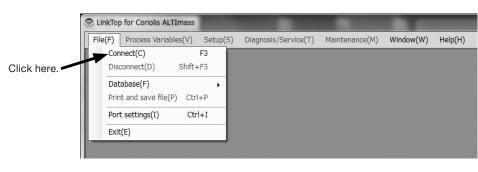
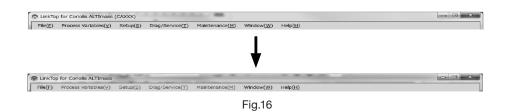


Fig.14

- (2) At the message box as shown in Fig. 15, click on "OK". This brings the connection between the flowmeter and LinkTop to come to an end.
- 3 Clicking on "Cancel" abandons the process of terminating the connection.

Disconnec	t	
E	it connection with	flowmeter(transmitter).
	OK	Cancel
	Fi	a.15

④ When connection is terminated, part of the menu becomes inactive (indicated in gray) as shown in Fig. 16.



3.4 Terminating the LinkTop

To exit the LinkTop, click on "File (F)" > "Exit (E)" at the top-level menu. A message box as shown in Fig. 17 appears. If you are sure to exit the LinkTop, click on "OK" button. Clicking on "OK" button will cause the application window to disappear from the desktop.

To abort the terminating process, click on "Cancel".



3.5 Menu: Process Variables (Processing Values Display)

"Process Variables" menu can be used to confirm flowmeter's process variables (instantaneous flow rate, fluid density, fluid temperature, total flow, and analog output), chart display, and the state of Write Protect mode.

For the actual screen, refer to Fig. 18.

🔵 LinkTop	o for Coriolis ALTImass (F	РАОК СА)	in long to H			
File(F)	Process Variables(V)	Setup(S)	Diagnosis/Service(T)	Maintenance(M)	Window(W)	Help(H)
	View field device v	ariables				
	View sensor values	5				
	Chart and Recordir	ng	•			
	Write protect					

Fig.18

3.5.1 Processing value measurements (View field device variables)

- (1) Click on "Process Variables (V)" > " View field device variables" at the top-level menu.
- ② The following window will be displayed (Fig. 19). Items displayed differ depending on the model.

iew field device variable	S	
Mass Flow	0.00000	s/sec
Volume Flow	0.00000	liter/hr
Density	0.00000	g/ml
Temperature	0.0	°C
Totalizer 1 Forward	4975724	
Totalizer 1 Reverse	0	
Counter 1	4975724	
Totalizer 1	4975724.0000	g
Totalizer 2 Forward	0	
Totalizer 2 Reverse	0	
Counter 2	0	
Totalizer 2	0.0000	g
Analog output 1	0.0	x
	4.00	mA
Analog output 2	0.0	x
	4.00	mA
Temperature (outer)	-	°C
Drive frequency	50.000	Hz
		Cancel

Fig.19

- ③ If there is some kind of problem with the flowmeter transmitter, then an error message will be displayed in the window under the process value measurement window. For details, refer to section 3.12.4, "Error and status display list".
- ④ To close the process value measurement window, click "Cancel".

3.5.2 Measurement of Internal Process Values (View sensor values)

Chart display of flow rate (mass and volume), density, and temperature as well as data recording can be carried out.

(1) Click "Process Variables (V)" > "View sensor values" in the menu at the top of the screen.

(2) The window shown below (Fig. 20) appears.

View sensor values		
Pickoff amplitude value Left pickoff	0.000	v
Right pickoff	0.000	
Drive frequency	50.000	Hz
Drive period	51200.2	us
Drive output	0.00	Y
	0	X
Phase difference	0.0	urad
Temperature		
Temperature	0.0	°C
Temperature (Outer)	-	°C
Temperature difference	-	°C
Raw density	0.00000	g/ml
		Cancel

③ Click "Cancel" to close the window for process value measurement.

Fig.20

3.5.3 Chart Display and Logging (Chart and Recording)

Chart display of flow rate (mass and volume), density, and temperature as well as data recording can be carried out.

① Click "Chart and Recording" in the menu at the top of the screen, and then click "Active" to display the toolbar as shown in Figure 21 at the top of the screen.



Fig.21

- ② Click 2 button on the tool bar or "Chart and Recording" "Interval" from menu. Then a window as shown in Fig. 19 appears, enabling setting of update interval of chart display and logging interval. Select the preferred interval from "1 Second", "2 Seconds", "3 Seconds", "5 Seconds", "10 Seconds", "30 Seconds", "1 Minute", "5 Minutes", "10 Minutes", and "1 Hour" and click "OK".
 - NOTE: If the logging interval is set faster than a certain value, the logging items will be limited (excluded items will be grayed out).

fass Flow Rate	Right Pickoff Amplitude
olume Flow Rate	Left Pickoff Amplitude
ensity	Temperature
rive Gain	Phase Difference
rive Frequency	Temperature (Outer)
· · · ·	3 Seconds
ОК	Cancel



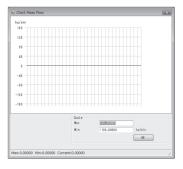
③ Click the "Mass Flow" button on the toolbar or "Chart and Recording" – "Chart" – "Mass Flow" in the menu to open the window shown in Figure 23 and display the Mass Flow chart.

To change the scale of the vertical axis, enter the desired values on "Max" and "Min" under "Scale", then click "OK".



Fig.23

4 A chart is generated according to update interval selected in 2 .





- ⑤ To hide the chart, click "Mass Flow" button on the tool bar or "Chart and Recording" "Chart"
 "Mass Flow" from menu again.
- (6) The following charts can be displayed by the same operation.
 - Volume Flow
 - Density
 - Temperature
 - Pickoffs
 - Drive Frequency
 - Drive Output
 - Phase Difference
- ⑦ Clicking on the tool bar or "Chart and Recording" "Recording" "Start" from menu shows a dialog box (Fig. 25). Select a disk and folder to create a file, and enter the file name, then click "Save". A CSV file is created and data logging begins.

Organize 🔻 Nev	v folder			800 -
	^ Name	*	Date modified	Туре
Libraries Documents Music Pictures Videos	ш	No items match you	r search.	
Win7E (C:)		m		
File <u>n</u> ame:	ALTImass.csv			
Save as type:	l og File (* csv)			

Fig.25

⑧ If you click the button with the square on the tool bar or "Chart and Recording" - "Recording" - "Stop" from menu, logging stops (terminating the writing process on a file) and the file is completed. Click "OK" on the following message box (Fig. 26).

Detail data logging
Saved the file.
ОК

Fig.26

④ A log file when logging interval is set to "5 Seconds" are shown in Fig. 27, where the value of the parameter is stored approximately every 5 seconds.

	A	В	C D	E	F	G	Н	I	J		L M	N	0	P	Q
Date		Time	Mass Flow Unit	Volume Flow	Unit	Density	Unit	Temperature	Unit	Temperature (outer) Ur	hit Left Pickoff (V)	Right Pickoff (V)	Drive Frequency (Hz)	Drive Output (V)	Phase Differential (urad)
201	9/6/4	11:02:45	0 kg/min	() liter/min	0	g/ml	-221		50 °C	() () 50) () –
201	9/6/4	11:02:50	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () -
201	9/6/4	11:02:55	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () -
201	9/6/4	11:03:00	0 kg/min	0) liter/min	0	g∕ml	-221	°C	50 °C	(50) () -(
201	9/6/4	11:03:05	0 kg/min	0) liter/min	0	g/ml	-221	°C	50 °C	() (50) () -(
201	9/6/4	11:03:10	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:03:15	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	(50) () -:
201	9/6/4	11:03:20	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) ()
201	9/6/4	11:03:25	0 kg/min	() liter/min	0	g∕ml	-221	°C	50 °C	(50) () -(
201	9/6/4	11:03:30	0 kg/min	0) liter/min	0	g/ml	-221	°C	50 °C	() (50) () -(
201	9/6/4	11:03:35	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () -:
201	9/6/4	11:03:40	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () -:
201	9/6/4	11:03:45	0 kg/min	() liter/min	0	g∕ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:03:50	0 kg/min	0) liter/min	0	g/ml	-221	°C	50 °C	(50) () –
5 201	9/6/4	11:03:55	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:04:00	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	(50) () –
201	9/6/4	11:04:05	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) (-3
201	9/6/4	11:04:10	0 kg/min	() liter/min	0	g∕ml	-221	°C	50 °C	() (50) () -(
201	9/6/4	11:04:15	0 kg/min	0) liter/min	0	g/ml	-221	°C	50 °C	() (50) () -(
201	9/6/4	11:04:20	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:04:25	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	(50) () -
201	9/6/4	11:04:30	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:04:35	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() () 50) () –
201	9/6/4	11:04:40	0 kg/min	0) liter/min	0	g/ml	-221	°C	50 °C	(50) () –
i 2011	9/6/4	11:04:45	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:04:50	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:04:55	0 kg/min	() liter/min	0	g∕ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:05:00	0 kg/min	0) liter/min	0	g/ml	-221	°C	50 °C	(50) () –
201	9/6/4	11:05:05	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) () –
201	9/6/4	11:05:10	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	(50) () –
201	9/6/4	11:05:15	0 kg/min	() liter/min	0	g/ml	-221	°C	50 °C	() (50) (-
201	9/6/4	11:05:20	0 kg/min	() liter/min	0	g∕ml	-221	°C	50 °C	() (50) () -
201	9/6/4	11:05:25	0 kg/min	0) liter/min	0	g/ml	-221	°C	50 °C	(0	50) () –

- Fig.27
- 10 If you click × button on the tool bar or "Chart and Recording" "Active" from menu, chart display and data logging are terminated.

3.5.4 Display of the transmitter writing state (Write protect)

① Click "Process Variables (V)" in the menu at the top of the screen, and then select and click "Write protect" to display the following window (Fig. 28).

Not write protected	
	Cancel
	Not write protected

Fig.28

"Write protect" indicates whether or not the transmitter is writeable.

- "Not write protected" (writeable): Parameters can be modified and various settings can be made.
- "Write protected" (not writeable): Parameters cannot be modified and various settings cannot be made.

(2) To close the transmitter write protect window, click "Cancel".

NOTE :

Switching between enable/disable of "write protect" needs to be done on the transmitter. Please refer to the instruction manual of the flowmeter for details.

3.6 Menu: Setup (Settings)

The "Setup" menu can be used to set the flowmeter's various parameter values, the transmitter's information, and so on.

If a "Diagnosis/Service" window is displayed on the screen, then it will not be possible to set the various parameters, transmitter information, and so on. Close these windows before making settings. For the actual screen, refer to Fig. 29.

Setup	Field device varaiables	
	Outputs	I/O function select *
		Analog/Pulse Assign
		Analog output1
		Analog output2
		Pulse output1
		Pulse output2 *
		Status output
		Error output
	Status input	
	H/L alarm	H/L alarm assign
		H/L alarm parameters
	Characterize sensor	Sensor type
		Flow parameters
		Density parameters
		Density parameters (Extended) *
		Zero factor
	Device information	
	LCD	Variables priority
		Refresh LCD
		Font
		Decimal
		Back light
		Contrast
		LCD Reverse *
	Key Polling address	 %1 Not displayed on PAOK. %2 Not displayed on PAOK (HARTE to
	Setup Item Tree	%2 Not displayed on PA0K (HART5 typ %3 Not displayed depending on the motion %4 Displayed only on PA0K.

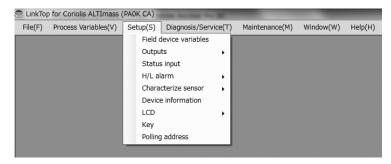


Fig.29

3.6.1 Transmitter variables (Field device variables)

- ① Click "Setup (S)" in the menu, and then select and click "Field device variables".
- (2) The following window will be displayed (Fig. 30).

Field device variables		
Flow		
Mass flow unit	g/sec 👻	
Volume flow unit	[liter/hr ▼	
Flow direction	Forward 👻	
Flow damping (Mass)	1.0	sec
Flow cutoff	0.000	x
Volume flow coefficient	1.00000	
Density		
Density unit	[g/ml ▼	
Density damping	4.0	sec
Slug low limit	0.000	g/ml
Slug high limit	2.000	g/ml
Slug duration	0	sec
Compensation	ON OFF	
Standard temperature	20.00	°C
Expansion coefficient	0.00024	
Settled density	ON OFF	
Density value	1.00000	g/ml
Temperature		
Temperature unit	°C	
Temperature damping	2.5	sec
	0	K Cancel

Fig.30

③ In the "Flow" section, the mass flow unit, volume flow unit, inflow direction, flow damping, flow cutoff, and volume flow compensation coefficient can be set.

The flow direction can be set to either "Forward" or "Reverse", whereby "Forward" means the direction indicated on the flowmeter unit with an arrow is treated as the "positive direction", and "Reverse" means the opposite direction of the arrow is treated as the "positive direction". Set the "Flow cutoff" as a percentage of the maximum allowable flow rate.

④ In the "Density" section, the density unit, density damping, gas multiphase flow detection, density compensation, and settled density can be set.

When measured density value exceeds "Slug low limit" or "Slug high limit", it is detected as gas multiphase flow, forcibly setting measured flow rate and output to "0". When "Slug low limit" is set to "0" and "Slug high limit" is set to "10", the gas multiphase flow detection function is turned "OFF". Also, if it is within the time set in "Slug duration", then the gas multiphase flow state will be ignored, and ordinary measurements will be continued.

When density compensation "Compensation" is set to "ON", the density and volume flow are converted based on the standard temperature (calculated with "Standard temperature" and "Expansion coefficient").

When settled density "Settled density" is set to "ON", then the value set with "Density value" is reflected in the volume flow.

- (5) In the temperature "Temperature" section, the temperature unit and temperature damping can be set.
- (6) After all settings are complete, click the "OK" button to display a message box (Fig. 31). Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output.

Field device variables	×	
Change of settings? <notice></notice>		
Change to the "MANUAL CONTROL".		
OK Cancel		
Fig.31		

⑦ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 32) to complete the setting process.

Field device variables	×
Setup was completed. <notice> Change to the "AUTOMATIC CONTROL".</notice>	
ОК	

Fig.32

3.6.2 Output settings (Outputs)

3.6.2.1 Selection of Input/Output Functions (I/O function select)

- (1) Click "Setup (S)" > "Outputs" > "I/O function select" in the menu.
- ② The following window appears. In this window, select input/output functions. If "Status output" is set for "Analog 2 function," the status output is performed by 4mA/20mA output.

% Operable functions differ depending on the model.

I/O function select		
Analog 1 function	Analog 1	
Analog 2 function	Analog 2	•
Pulse 1 function	Pulse 1	
Status IO function	Status input	•
	OK	Cancel



3.6.2.2 Analog and pulse assignment (Analog/Pulse Assign)

- (1) Click on "Setup (S)" > "Outputs" > "Analog/Pulse assign" in the menu.
- (2) The following window will be displayed (Fig. 34). Assign analog output 1 and 2 here, as well as pulse output 1 and 2.

% Items displayed differ depending on the model.

Analog/Pulse assign		
Analog output 1	Mass Flow	•
Analog output 2	Temperature	•
Pulse output 1	Mass Flow	•
Pulse output 2	Mass Flow	•
	OK	Cancel



③ Set each item assignment. Make your selections from the drop-down lists by clicking the triangles on the right side of each item, as shown in Fig. 35 and Fig. 36.

Analog/Pulse assign Analog output 1 Analog output 2 Pulse output 1 Pulse output 2	Mass Flow Mass Flow Volume Flow Density Temperature Drive output Mass Flow	OK Cancel
	Fig.35	
Analog/Pulse assign		

Analog output 1	Mass Flow	•
Analog output 2	Temperature	•
Pulse output 1	Mass Flow	•
Pulse output 2	Mass Flow Volume Flow	
		OK Cancel

Fig.36

④ Click the "OK" button after all settings are completed to display the message box (Fig. 37).

Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output.

When the pulse output assignment is modified, the cumulative total will be reset, and a confirmation message box will be displayed as shown in Fig. 38. To avoid resetting the cumulative total, click the "Cancel" button. If you do not mind resetting the total, click the "OK" button again.

Also note that if "Cancel" is clicked, settings will not be modified.

Analog/Pulse assign
Change of settings? <notice> Change to the "MANUAL CONTROL".</notice>
OK Cancel
Fig.37
Analog/Pulse assign
Analog/Pulse assign

Fig.38

(5) Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 39) to complete the setting process.

Also note that when the analog output assignment is changed, this can generate an alarm. In this case, the message box shown in Fig. 40 will be displayed.

Analog/F	ulse assi	gn				×
Setup	was com	pleted.				
<not) Change</not) 	CE> to the "	AUTOMA	TIC O	ONTR	ROL".	
					ок	
	F	Fig.39	9			



Fig.40

⑥ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.6.2.3 Analog output 1 setting (Analog output 1)

(1) Click on "Setup (S)" > "Outputs" > "Analog output 1" in the menu.

(2) The following window will be displayed (Fig. 41). Set analog output 1 here.

Analog output 1		
Assign Range values URV LRV	Mass Flow 5.00000 0.10000	g/sec g/sec
USL LSL	16666.7	
Lowcut Added damp Upper rate limit Lower rate limit	1.0 1.0 110.0 -10.0	X sec X X
	[OK Cancel



③ Set each item. USL (the sensor's upper limit) and LSL (the sensor's lower limit) indicate the input range of URV (20mA setting) and LRV (4mA setting), so use this as a rule of thumb when making your settings.

When "Lowcut" is set to "0.0%", the lowcut function is turned off. "0.0%" is the standard setting. If anything other than flow (mass or volume) is assigned, be sure to set 0.0%. Also note that when "Bi direction" is selected, the lowcut function will work in both positive and negative directions. Set output ranges for "Upper rate limit" and "Lower rate limit" (110% = 21.6mA, -10% = 2.4mA).

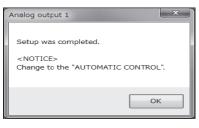
* The setting cannot be changed for some models.

④ Click the "OK" button after all settings are completed to display the message box (Fig. 42). Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output.

Analog output 1
Change of settings? <notice> Change to the "MANUAL CONTROL".</notice>
OK Cancel

Fig.42

(5) Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 43) to complete the setting process.





⑥ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.6.2.4 Analog output 2 setting (Analog output 2)

- (1) Click on "Setup (S)" > "Outputs" > "Analog output 2" in the menu.
- ② "Analog output 2" can be set by following the same procedures as described in 3.6.2.3 "Analog output 1", steps ② to ⑤.

3.6.2.5 Pulse output 1 setting (Pulse output 1)

- (1) Click on "Setup (S)" > "Outputs" > "Pulse output 1" in the menu.
- (2) The following window will be displayed (Fig. 44). Set pulse output 1 here.

Pulse output 1		
Frequency factor	62.0000	Hz
Rate factor	62.0000	g/sec
Lowcut	0.0	X
		OK Cancel



③ Set each item.

- [Frequency factor] : Frequency factor setting for pulse output 1.
- [Rate factor] : Rate factor setting for pulse output 1.
- [Lowcut] : Lowcut value for pulse output 1 setting.

When "Lowcut" is set to "0.0%", the lowcut function is turned off. "0.0%" is the standard setting. When "Bi direction" is selected, the lowcut function will work in both positive and negative directions. ④ Click the "OK" button after all settings are completed to display the message box (Fig. 45).

Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output. When "OK" is clicked in Fig. 38, the cumulative total will be reset, and a confirmation message box will be displayed as shown in Fig. 46. To avoid resetting the cumulative total, click the "Cancel" button. If you do not mind resetting the total, click the "OK" button again.

Also note that if "Cancel" is clicked, settings will not be modified.

Pulse output 1				
Change of settings? <notice> Change to the "MANUAL CONTROL".</notice>				
OK Cancel				
Fig.45				
Pulse output 1				
Pulse output 1				
Counter&&Totalizer is reset. OK?				

(5) Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 47) to complete the setting process.

Pulse output 1	×
Setup was completed.	
<notice> Change to the "AUTOMAT</notice>	IC CONTROL".
	ОК
Fig.4	7

6 After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.
 To cancel the settings, click the "Cancel" button in any step from 2 to 4.

3.6.2.6 Pulse output 2 setting (Pulse output 2)

- (1) Click on "Setup (S)" > "Outputs" > "Pulse output 2" in the menu.
- (2) "Pulse output 2" can be set by following the same procedures as described in 3.6.2.5 "Pulse output 1", steps (2) to (5).

3.6.2.7 Status output setting (Status output)

- (1) Click on "Setup (S)" > "Outputs" > "Status output " in the menu.
- (2) The following window will be displayed (Fig. 48). Set the status output function here.

Status output		
Status output function	Bi direct	ion 👻
Status output error select		
Sensor failure	I ON	OFF
Transmitter failure	ON	OFF
Calibration failure	ON	© 0FF
Saturated alarm	ON	O OFF
Parameter alarm	ON	O OFF
Transmitter alarm	ON	O OFF
Slug flow alarm	ON (OFF
Calibration in progress	ON	O OFF
Fixed output	ON	OFF OFF
Drive out point	10	×
Status output logic	Positive	-
Status output override	OFF	•
		OK Cancel



③ Click the triangle on the right side of "Status output function" as shown in Fig. 49, and select the function to set for status output from the drop-down list.

St	atus output				
	Status output function Status output error select Sensor failure Transmitter failure Calibration failure	Error Sta No Functi Error Sta Bi direct H/L Alarm Drive Out	on tus ton		
	Saturated alarm Parameter alarm Transmitter alarm Slug flow alarm Calibration in progress Fixed output	 ON ON ON ON ON ON ON ON 	 OFF OFF OFF OFF OFF OFF OFF 		
	Drive out point Status output mode	100 Off Activ	/e 👻	×	Cancel

Fig.49

- ④ Status output is open drain output (equivalent to open collector output), and can be selected from 5 functions: "No function", "Error Status", "Bi direction", "H/L Alarm" and "Drive Out Alarm".
- "No function": No status output
- "Error Status": A function for switching status output when the item selected with "Status output error select" has an error status.
- "Bi direction": A function for switching the status output when the flow (mass and volume) enters bidirectional mode (the output increases with the flow, regardless of the flow direction) and the flow reverses.

If the "Flow direction" is "Forward", then the direction of the arrow on the flowmeter is treated as the "positive direction", and if it is "Reverse", then the opposite direction from the arrow on the flowmeter is treated as the "positive direction".

- "H/L Alarm": This function switches the status output when the item set with "H/L alarm assign" reaches a value set with "High alarm point" or "Low alarm point". The standard setting is "No Function".
- "Drive Out Alarm": This status output is used for maintenance purposes. It outputs an alarm when drive voltage exceeds "Drive out point".

To halt the status output function, select "No Function".

When "No Function" is selected, status output will be "OFF".

It is also possible to select the status output logic with "Status output mode (Status output logic)".

The standard setting is "OFF" (in other words, "Off active (Positive)" is selected).

⑤ To use status output as "H/L Alarm", select items as described in section 3.6.4.1 "H/L alarm assign" 3.6.4.2 "H/L alarm parameters".

Selection Item	Error Name	Details
Sensor failure	Sensor error	Occurs when the input from a sensor (drive or temperature) is outside the range, or when a measurement result (flow or density) is outside the acceptable range
Transmitter failure	Transmitter error	Occurs when there is an error in the transmitters internal data processing
Calibration failure	Calibration error	Occurs when "Auto Zero" cannot exit normally
Saturated alarm	Output saturation alarm	Occurs when the analog output is outside the range of 2.4mA or 21.6mA, or when the pulse output is 11kHz or higher
Parameter alarm	Parameter alarm	Occurs when a set parameter is outside the range
Transmitter alarm	Transmitter alarm	Occurs when an error occurs in the transmitters internal temperature
Slug flow alarm	Gas multiphase flow alarm	Occurs when the previously set density range is exceeded due to the interfusion of air bubbles or other causes
Calibration in progress	Calibration execution in progress	Occurs when calibration is being executed
Fixed output	Fixed output in progress	Occurs when analog output, pulse output, status output, and so on are in a fixed state

(6) The items in "Status output error select" are as described in this table:

Notes: 1. Click "ON" for the items to set to error output.

- 2. Error output is only valid if "Status output function" is set to "Error Status".
- 3. Status output is switched when one or more of the selected items is in error status.
- 4. For details regarding errors, refer to section 3.11.4 "Error and status display list".
- ⑦ "Drive out point" represents a threshold of drive output and is for maintenance purposes. By assigning drive output alarm on the status output, an alarm output can be generated when drive output exceeds the threshold.

[Reference] 100% is achieved when the drive output voltage (calculated value) is between 60V and 70V. Differences may occur depending on the frequency.

- ⑧ The "Status output override" setting assigns a status output to analog output 2. When "ON", analog output 2 becomes 4/20mA status output. (PA2K and PA5K only)
- ④ Click the "OK" button after all settings are completed to display the message box (Fig. 50). Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is in a state whereby it is not influenced by the flowmeter's output.

Statu	s output				x
Ch	ange of sett	tings?			
	OTICE> ange to the	"MANUAL	CON	TROL".	
		OK		Cancel	

Fig.50

10 Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 51) to complete the setting process.

Status output	×
Setup was completed.	
<notice> Change to the "AUTOM</notice>	ATIC CONTROL".
	ок

Fig.51

(1) After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 7 .

3.6.2.8 Error output level settings (Error output)

- (1) Click on "Setup (S)" > "Outputs" > "Error output" in the menu.
- (2) The following window will be displayed (Fig. 52). Set the analog and pulse output level for when errors occur here.

Downscale	-	
Zero(OHz)	-	
Lower scale	-	
11000.0	Hz	
	OK	Cancel
	Zero(OHz)	Zero(0Hz) Lower scale 11000.0

Fig.52

③ Select the output levels to set from the drop-down lists by clicking the triangles on the right side of the "Analog" and "Pulse" items, as shown in Fig. 53 and Fig. 54.

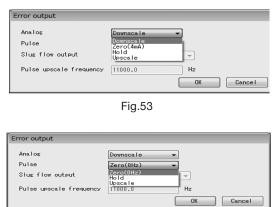


Fig.54

④ Output levels are as follows:

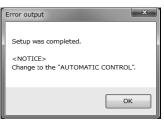
Output Level	Analog Output	Pulse Output
Downscale	2.4mA	
Zero (4mA, 0Hz)	4mA	0Hz
Hold	Maintains the final measurement	Maintains the final measurement
	value	value
Upscale	21.6mA	11kHz ※

- Note: The "Error output" functions when there is a "Sensor Failure", "Xmtr Failure", or "Parameter Alarm". For a description of error items, refer to section 3.12.4 "Error and status display list".
 ※ For some models, the frequency will be the one set in "Pulse upscale frequency."
- (5) Once all the settings are complete, click the "OK" button to display the message box (Fig. 55). Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output.

Error output
Change of settings? <notice> Change to the "MANUAL CONTROL".</notice>
OK Cancel

Fig.55

6 Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 56) to complete the setting process.





⑦ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.
 To cancel the settings, click the "Cancel" button in any step from ② to ⑤.

3.6.3 Status input setting (Status input)

- ① Click on "Setup (S)" >"Status input" in the menu.
- 2 The following window will be displayed (Fig. 57). Set the status input function here.

Status input		
Status input function Status input mode	No Function Short Active	•
		OK Cancel



③ Click the triangle on the right side of "Status input function" as shown in Fig. 58, and select the output level from the drop-down list.

Status input		
Status input function Status input mode	No Function No Function DX Signal Lock Auto Zero Reset Counter/Totalizer1 Reset Counter/Totalizer1 Reset Counter/Totalizer2	▼ Cance I



- ④ It is possible to select from the five functions"No Function", "0% Signal Lock", "Auto Zero", "Reset Counter/Totalizer 1, 2", "Reset Counter/Totalizer 1", and "Reset Counter/Totalizer 2" for status input.
 - "No Function": No status output.
 - "0% Signal Lock": A function for locking each output by forcing a 0% setting.
 - "Auto Zero": A remote zero point adjustment (remote zero) function.
 - "Reset Counter/Totalizer 1, 2": A function for resetting remote cumulative totals 1 and 2.
 - "Reset Counter/Totalizer 1": A function for resetting remote cumulative total 1.
 - "Reset Counter/Totalizer 2": A function for resetting remote cumulative total 2.

The standard setting is "No Function".

To halt the status input functions, select "No Function".

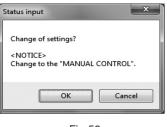
% The selection items differ depending on the model.

- (5) For the status input, it is possible to select from the following two types: A contact point input or B contact point input.
 - "Short Active (Normal Open)": A contact point input
 - "Open Active (Normal Close)": B contact point input

The standard selection is "Short Active (Normal Open)".

(6) After all settings are complete, click the "OK" button to display a message box (Fig. 59).

Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output





⑦ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 60) to complete the setting process.

Status input
Setup was completed. <notice> Change to the "AUTOMATIC CONTROL".</notice>
ОК
Fig.60

⑧ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 0 to 0 .

3.6.4 H/L alarm setting (H/L alarm)

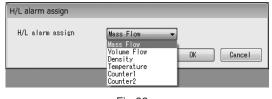
3.6.4.1 H/L alarm assignment (H/L alarm assign)

(1) Click on "Setup (S)" > "H/L alarm" > "H/L alarm parameters" in the menu.

2 The following window will be displayed (Fig. 61). Set the H/L alarm assignment here.

H/L alarm assign		
H/L alara assign	Mass Flow	T Cancel
	Fig.61	

③ Click the triangle on the right side of "H/L alarm assign" and select the assignment to set from the drop-down list as shown in Fig. 62.



- Fig.62
- ④ After all settings are complete, click the "OK" button to display a message box (Fig. 63).
- Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output.

H/L alarm assign
Change of settings? <notice> Change to the "MANUAL CONTROL".</notice>
OK Cancel
Fig 62



(5) Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 64) to complete the setting process.

Also note that when the assignment is changed, this can cause the "H/L Alarm Point Set Alarm" to occur. If this happens, the screen shown in Fig. 65 will be displayed after the change.

H/L alarm assign	×
Setup was completed <notice> Change to the "AUTC</notice>	
	ОК
Fig	.64

H/L alarm assign	×
Setup was completed. H/L Alarm Point Set Alarm is generated by a set value.	
<notice> Change to the "AUTOMATIC CONTROL".</notice>	
ОК	

Fig.65

⑥ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.6.4.2 H/L alarm parameter settings (H/L alarm parameters)

- ① Click "Setup (S)" > "H/L alarm" > "H/L alarm parameters" in the menu.
- 2 The following window will be displayed (Fig. 66). Set the H/L alarm parameters here.

H/L alarm parameters		
H/L alarm type	High alarm 👻	
High alarm point	0.00000	g/sec
Low alarm point	0.00000	g/sec
Range values		
USL	508.33300	g/sec
LSL	-508.33300	g/sec
H/L alarm hysteresis	0.00000	g/sec
		OK Cancel



③ H/L alarm is a function that switches the status output when the item set with "H/L alarm assign" reaches a value set with "High alarm point" or "Low alarm point" (when the setting of "Status output function" is "H/L Alarm"). "H/L alarm type" includes the three types "High alarm", "Low alarm", and "H/L alarm".

Select the alarm type that matches your usage purpose.

- "High alarm": The status output is switched when the set item exceeds "High alarm point."
- · "Low alarm": The status output is switched when the set item falls below "Low alarm point."
- "H/L alarm": Switches the status output when either "High alarm point" or "Low alarm point" is reached.

(Supplementary Information)

If "H/L alarm hysteresis" is a value other than 0, then status output is switched when "High alarm point" is exceeded, or when the value goes under "Highalarm point - H/L alarm hysteresis". "Low alarm point" works the same way in that the status output is switched when the value goes under "Low alarm point", or when "Low alarm point + H/L alarm hysteresis" is exceeded.

④ Set each item. For the items with a triangle on the right side, click the triangle to make your selection from the drop-down list, as shown in Fig. 67. For the other items, directly input a numerical value.

H/L alarm parameters		
H/L alarm type High alarm point Low alarm point	High alarm High alarm Low alarm H/Lalarm	s/sec s/sec
Range values USL LSL	508.33300	g/sec g/sec
H/L alarm hysteresis	0.00000	g/sec
		OK Cancel



- (5) After all settings are complete, click the "OK" button to display a message box (Fig. 68).
- Click "OK" here to change the settings to the inputted values, and to reflect the changed setting values in the flowmeter's output. For the sake of safety, if the flowmeter's output is used to control valves or other such parts, then change that control loop to manual control so that the control loop is not influenced by the flowmeter's output.

H/L alarm param
Change of settings? <notice> Change to the "MANUAL CONTROL".</notice>
OK Cancel

Fig.68

6 Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 69) to complete the setting process.



⑦ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 5 .

3.6.5 Characterize sensor

3.6.5.1 Sensor type

The type of the sensor to be combined and the setting of the maximum measurement range can be checked.

3.6.5.2 Flow parameters

Adjustment parameters for the flow rate of the sensor to be combined can be checked.

3.6.5.3 Density parameters

Adjustment parameters for the density of the sensor to be combined can be checked.

3.6.5.4 Density parameters (Extended)

Extended adjustment parameters for the density of the sensor to be combined can be checked. % Some models do not have this item.

3.6.5.5 Zero factor

Zero-point adjustment values for the flow rate can be checked.

3.6.6 Transmitter information settings (Device information)

① Click the "Setup (S)" menu, and then select and click "Device information".

2 The following window will be displayed (Fig. 70). Set the transmitter information here.

Tag		
Long tag		
Descriptor	S025-1234-G	
Message	M613-12345	
Date	18 年 10 月 03 日	
Device ID	01808901	
Final assembly number	0	
Sensor serial number	00123456	
Sensor model	S025CSS	
Construction materials		
Flange	JIS 20K 👻	
Sensor material	SUS-316L	•
Device type code	130	
Revision numbers		
Universal revision	07	
Field device revision	01	
Software revision	1.0	
Main CPU revision	03.50	
LCD CPU revision	00.00	
I/O CPU revision	03.50	
Maintenance CPU revision	00.00	
DSP revision	03.05.00.00	
FlowCPU revision	00.00.00.00	
Hardware revision	8	
	F	0K Cancel



③ Set each item. For the items with a triangle on the right side, click the triangle to make your selection from the drop-down list, as shown in Fig. 71 and Fig. 72. For the other items, directly input a numerical value.

evice information		Device information	
Tag		Tag	
Long tag		Long tag	
Descriptor	S025-3446-G	Descriptor	S025-3446-G
Nessage	M613-53230 SF30-2245	Message	M613-53230 SF30-2245
Date	18 年 10 月 03 日	Date	18 年 10 月 03 日
Device ID	01808912	Device ID	01808912
Final assembly number	0	Final assembly number	0
Sensor serial number	00253446	Sensor serial number	00253446
Sensor model	S025CSS	Sensor wodel	S025CSS
Construction materials		Construction materials	
Flange	JIS 20K	Flange	JIS 20K 👻
Sensor material	JIS 10K JIS 20K	Sensor material	SUS-318L
Device type code	JIS 30K ANSI 150 ANSI 300	Device type code	SUS-316L Hastelloy Titanium
Revision numbers	ANSI 600 JPI 150	Revision numbers	Special
Universal revision	JPI 300 JPI 600	Universal revision	07
Field device revision	DIN(PN) 40 DIN(PN) 100	Field device revision	01
Software revision	Senitary Clamp Fitting Special	Software revision	1.0
Main CPU revision	03.50	Main CPU revision	03.50
LCD CPU revision	00.00	LCD CPU revision	00.00
I/O CPU revision	03.50	I/O CPU revision	03.50
Maintenance CPU revision	00.00	Maintenance CPU revision	00.00
DSP revision	03.05.00.00	DSP revision	03.05.00.00
FlowCPU revision	00.00.00	FlowCPU revision	00.00.00
Hardware revision	8	Hardware revision	8
	OK Cancel		OK Cance
	Fig.71		Fig.72

④ In the case of an item that is to be inputted directly, when the cursor is held over the input field, a description of the input restrictions will appear as shown in Fig. 73. Use this as a guide while making your setting.

Device information	
Tag	
Long tag	英数字 8桁
Descriptor	S025-3446-G
Message	M613-53230 SF30-2245
Date	18 年 10 月 03 日
Device ID	01808912
Final assembly number	0
Sensor serial number	00253446
Sensor model	S025CSS
Construction materials Flange	JIS 20K
Sensor material	
Sensor material	SUS-316L -
Device type code	130
Revision numbers	
Universal revision	07
Field device revision	01
Software revision	1.0
Main CPU revision	03.50
LCD CPU revision	00.00
I/O CPU revision	03.50
Maintenance CPU revision	00.00
DSP revision	03.05.00.00
FlowCPU revision	00.00.00
Hardware revision	8
	OK Cancel

Fig.73

(5) After all settings are complete, click the "OK" button to display a message box (Fig. 74).





6 Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 75) to complete the setting process.

De	evice information
	Setup was completed.
	ОК
Fig.75	

⑦ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 0 to 5 .

3.6.7 Transmitter display settings (LCD)

3.6.7.1 Display order settings (Variables priority)

- (1) Click "Setup (S)" > "LCD" > "Variables priority" in the menu.
- (2) The following window will be displayed (Fig. 76). Set the order to be used for displaying measurement values on the LCD here.

Variables priority	
Mass flow	1
Volume flow	2
Density	3
Temperature	4
Counter 1	5
Counter 2	6
Totalizer 1	7
Totalizer 2	8
Analog out 1	9
Analog out 2	10
	OK Cancel



③ If the LCD's "Font" setting is "Double Angle", then two items will be displayed at a time, starting with the first item. If the setting is "Normal", then three items will be displayed on the screen at a time, so pick the items you want to see first and assign the numbers accordingly. An item with the setting 0 is not displayed.

If a number is duplicated or skipped, then an input error will occur and the setting will not be possible.

④ After all settings are complete, click the "OK" button to display a message box (Fig. 77).

Var. priority	×
Change of settings?	
ОК	Cancel
Fig.7	······································

(5) Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 78) to complete the setting process.

Var. priority	
Setup was completed.	Ì
ОК	
Fig.78	

⑥ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

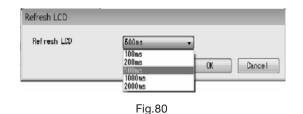
To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.6.7.2 Display update frequency setting (Refresh LCD)

- (1) Click "Setup (S)" > "LCD" > "Refresh LCD" in the menu.
- (2) The following window will be displayed (Fig. 79). Set the display update frequency for displaying measurement values on the LCD here.

Refresh LCD			
Refresh LCD	500ms	-	
		OK Cance	•
	Fig.79		

③ Click the triangle on the right side of "Refresh LCD" as shown in Fig. 80, and select the frequency to set from the drop-down list.



④ After the setting is complete, click the "OK" button to display a message box (Fig. 81).



Fig.81

(5) Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 82) to complete the setting process.

Refresh LCD X
Setup was completed.
ОК
Fig.82

(6) After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.6.7.3 Display character size setting (Font)

- ① Click "Setup (S)" > "LCD" > "Font" in the menu.
- (2) The following window will be displayed (Fig. 83). Set the size of characters to be used for measurement values displayed on the LCD here.

Font	
Font	Double Angle v
	Fig.83

③ Click the triangle on the right side of "Font" as shown in Fig. 84, and select the font to set from the drop-down list.

Font	
Font	Double Angle - Touble Angle Normal OK Cancel
	Fig.84

④ After the setting is complete, click the "OK" button to display a message box (Fig. 85).



(5) Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 86) to complete the setting process.

Font		x
Setup v	vas complet	ted.
	(ок
	Fig.86	

6 After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.6.7.4 Measurement value decimal point position settings (Decimal)

- (1) Click "Setup (S)" > "LCD" > "Decimal" in the menu.
- (2) The following window will be displayed (Fig. 87). Set the decimal point position to be used for measurement values displayed on the LCD here.

Decimal	
Mass flow	Auto 👻
Volume flow	Auto
Density	4th Decimal 👻
Totalizer 1	Auto
Totalizer 2	Auto
	OK Cancel
	Fig 97



③ Click the triangle on the right side of each item as shown in Fig. 88, and select the decimal points to set from the drop-down lists.





- ④ This can be used to set the decimal point position to a number between 0 and 4, or to automatic.
 - "Auto": If the value is less than 10, then the decimal part will be displayed up to the 5th position. If the value is 10 or greater and less than 100, then the decimal part will be displayed up to the 4th position; if it is 100 or greater and less than 1000, then the decimal part will be displayed up to the 3rd position; if it is 1000 or greater and less than 10000, then the decimal part will be displayed up to the 2nd position; and if it is 10000 or greater and less than 100000, then the decimal part will be displayed up to the 1st position. If the value is 100000 or greater, then it will be displayed as an integer.
 - "Integer": The value will always be displayed as an integer.
 - "1st Decimal": The value will be displayed up to the 1st position after the decimal point.
 - "2nd Decimal": The value will be displayed up to the 2nd position after the decimal point.
 - "3rd Decimal": The value will be displayed up to the 3rd position after the decimal point.

• "4th Decimal": The value will be displayed up to the 4th position after the decimal point. The standard setting is "Auto" for everything else.

(5) After all settings are complete, click the "OK" button to display a message box (Fig. 89).

Decimal	×
Change of settings?	
ОК	Cancel

Fig.89

⑥ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 90) to complete the setting process.



⑦ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 5 .

3.6.7.5 Display backlight time setting (Back light)

- ① Click "Setup (S)" > "LCD" > "Back light" in the menu.
- (2) The following window will be displayed (Fig. 91). Turn the back light on or off here, and set the length of time on.

ack light		
Back light	Sleep 5min	•
		OK Cance



③ Click the triangle on the right side of "Back light" as shown in Fig. 92, and select the time to set from the drop-down list.



Fig.92

- ④ Set the amount of time to keep the display screen's back light on here.
 - "Off": Back light remains in the off state.
 - "Sleep 5min": The back light turns off 5 minutes after the last key operation, or after it turns on.
 - "Sleep 10min": The back light turns off 10 minutes after the last key operation, or after it turns on.
 - "Sleep 20min": The back light turns off 20 minutes after the last key operation, or after it turns on.
 - "Sleep 30min": The back light turns off 30 minutes after the last key operation, or after it turns on. The back light behaves the same way when an error occurs. Note, however, that the red backlight will not turn completely off, and will blink.

Note: The red back light operates the same as if "Sleep 5min" were selected when "Off" is selected.

(5) After the setting is complete, click the "OK" button to display a message box (Fig. 93).



6 Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 94) to complete the setting process.

Ba	ack light
	Setup was completed.
	ОК
	Fig.94

⑦ After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 5 .

3.6.7.6 Display contrast setting (Contrast)

- ① Click "Setup (S)" > "LCD" > "Contrast" in the menu.
- (2) The following window will be displayed (Fig. 95). Set the contrast of displayed dots here.



Fig.95

③ Use the up/down switch on the right side of the window to set the numerical value. Range: 1 to 63

Higher values will result in a higher contrast.

④ After the setting is complete, click the "OK" button to display a message box (Fig. 96).



Fig.96

(5) Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 97) to complete the setting process.



(6) After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.6.7.7 LCD Reverse

The display screen can be reversed upside down. $\$ This function is available only for ALTImass $\$ I .

3.6.8 Transmitter key settings (Key)

- (1) Click "Setup (S)" > "Key" in the menu.
- (2) The following window will be displayed (Fig. 98). Set the sensitivity of transmitter keys and other items here.





- ③ Set each item. Click the up/down switches on the right side of items to change the numerical values. For other items, select "ON" or "OFF".
 - "Left key volume": Sensitivity setting for the transmitter's left-side keys.
 - "Right key volume": Sensitivity setting for the transmitter's right-side keys.
 - "Transmitter key protect": Function for restricting the modification of parameters from the transmitter side.
 - "Mis-operation prevention": Function for preventing erroneous transmitter key operations.

After all settings are complete, click the "OK" button to display a message box (Fig. 99).

Key	×
Change of settings?	
ОК	Cancel

Fig.99

④ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 100) to complete the setting process.

Setup was completed.	Γ
ОК	

Fig.100

(5) After the "OK" button is clicked, the item input window will appear again. Click the "Cancel" button to close the item input window.

To cancel the settings, click the "Cancel" button in any step from 2 to 3 .

3.6.9 Polling Address

- * Some models do not have this item.
- ① Click on "Setup (S)" > "Polling address" in the menu and the following window (Fig. 101) will appear.

0	
Enabled	•
	OK Cancel



② Enter the number for the item.

Setting Item	Description	Setting range
Polling address	Polling address (address for multi-drop) Default: 0 If multiple numbers of this flowmeter were to be connected on the same segment, set an address other than "0" and avoid duplicating address for each flowmeter.	0 to 63
Loop Current Mode	Enabled: 4-20mA analog output is enabled Disabled: Fixed at 4mA (Setting when multidrop is used) ※ Reflected only to the analog output 1.	Enabled Disabled

- ③ Click "OK" after entering the number. Then a message box (Fig. 102) appears. By clicking "OK", the new setting will be applied to the polling address.
- ④ If the setting is modified from the previous setting, a message box (Fig. 103) will appears. Click "OK" to complete setting.

Polling address	X
Change of settings?	
ОК	Cancel

Polling address
Setup was completed.
ОК

Fig.102

Fig.103

(5) To complete setting process, click "Cancel" on the item setting window.

3.7 Menu : Diagnosis/Service (Checking and Adjustment)

"Diagnosis/Service" can be used to diagnose the flowmeter transmitter, perform loop tests on each output, adjust output values, reset cumulative totals, and calibrate sensor input.

When the "Setup (S)" windows are displayed on the screen, it will not be possible to perform checks or adjustments. So, close them first.

Also note that other than "Loop test", the "Diagnosis/Service (T)" window cannot be displayed simultaneously with multiple windows (other than "Counter/Totalizer cntrl").

The actual screen is as shown in Fig. 104.

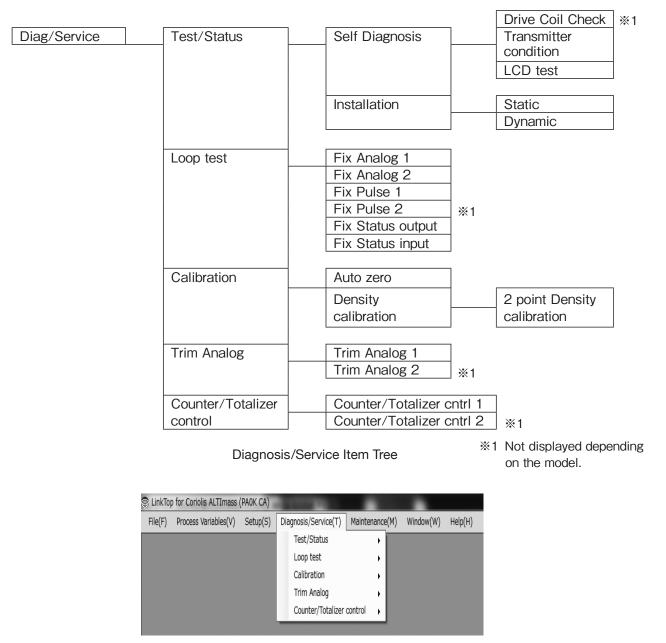


Fig.104

3.7.1 Transmitter self-diagnosis functions (Test/Status)

These functions are used to self-diagnose the flowmeter transmitter.

3.7.1.1 Self-diagnosis function 1 (Self diagnosis)

3.7.1.1.1 Transmitter internal state checks (Transmitter condition)

- ① Click "Diagnosis/Service (T)" > "Test/Status" > "Self diagnosis" > "Transmitter condition" in the menu.
- ② When the "OK" button is pressed after the process control loop is switched to manual according to the caution screen, the following window (Figure 105) appears. This window is used to check the internal state of the transmitter.

ransmitter condition		
DSP voltage	Temperature connect	
Input frequency	Pickoff connect	
Input phase difference	EEPROM	
Input amplitude	Data update	
Input temperature	Transmitter temperature	
	Drive coil	
	ОК	Cancel

Fig.105

Item	Description	How to handle when NG occurs
DSP voltage	Status of voltage inside transmitter	Check the status of the power supply again.
Input frequency	Status of input frequency	Check the connection status of the sensor and the transmitter.
Input phase difference	Status of input phase difference	Check the connection status of the sensor and the transmitter and the status of fluid.
Input amplitude	Status of input amplitude	Check the connection status of the sensor and the transmitter.
Input temperature	Status of input temperature	Check the connection status of the sensor and the transmitter.
Temperature connect	Connection status of temperature sensor	Check the connection status of the sensor and the transmitter.
Pickoff connect	Connection status of pickoff sensor	Check the connection status of the sensor and the transmitter.
EEPROM	Status of internal memory	The transmitter may be malfunctioning.
Data update	Communication status inside the transmitter	The transmitter may be malfunctioning.
Transmitter temperature	Temperature status inside the transmitter	The temperature of the transmitter is abnormal. Check the temperature of the installation environment.
Drive coil	Status of resistance value of drive coil	Check the connection status of the sensor and the transmitter.

% In case of abnormality, refer also to the instruction manual of the flowmeter. If the abnormality persists, please consult OVAL sales office or nearest representative.

③ Click the "OK" button to display a message box (Fig. 106).

This conducts checks, so if the output of the flowmeter is being used to control valves and so on, make sure to switch that control loop to manual control so that it is in a state whereby it is not affected by the output of the flowmeter.

mtr condi	tion	x
Start of S	elf test?	
<notice Change t</notice 	> o the "MANUAL	. CONTROL".
(OK	Cancel

Fig.106

④ Click "OK" to execute the checks. Once they are finished, a message box (Fig. 107) will be displayed. Click the "OK" button to complete the transmitter internal state check. The results are displayed as shown in Fig. 108.

mtr condition	
Self test was comple	eted.
<notice> Change to the "AUT</notice>	OMATIC CONTROL".
	ок

Kmtr condition	
Temp connect	OK
P.O. connect	OK
Drive coil	OK
EEPROM	OK
Data update	OK
Xmtr temp	OK
	OK Cancel
	Fig.108

- Fig.107
- ⑤ Click the "OK" button to return to the window from before the check, and then click the "Cancel" button to close the window.

Clicking "OK" here will start the transmitter internal state check over again.

3.7.1.1.2 LCD test

- (1) Click on "Diagnosis/Service (T)" > "Test/Status" > "Self diagnosis" > LCD test" in the menu.
- (2) The following window will be displayed (Fig. 109). This will test the LCD.

® Back light ⊘ LED ⊘ LCD	LCD test	
© LCD	🖲 Back light	
	© LED	
	© L00	
OK Cance I		OK Cance I



- "Back light": Tests the back light. The back light lights up in white for 3 seconds, in orange for 3 seconds, and is turned off for 3seconds. This process is repeated twice. During that, the green LED blinks.
- "LED": Tests the LED. Both the red and green lights up for 1.5 seconds and then are turned off for 1.5 seconds. This process is repeated six times. Note that the red and the green do not light up at the same time. The back light lights up in white and the LCD is not displayed.
- "LCD": Tests the LCD. All dots light up for 3 seconds and then are turned off for 3 seconds. This process is repeated twice. During that, the green LED blinks.
- ③ Click the "OK" button to display a message box (Fig. 110).

Start of LCD test?	LCD test		X
OK Cancel	Start of LC	D test?	
Cancer		ОК	Cancel



- ④ Click "OK" to start the test. Note that if another test is started during the execution of a test, then the first test will be cancelled and the new test will be given priority.
- (5) Click the "OK" button to return to the window from before the check, and then click the "Cancel" button to close the window.

Clicking "OK" here will start the LCD test over again.

3.7.1.2 Self-diagnosis function 2 (Installation)

3.7.1.2.1 Static device installation state check (Static)

- ① Click on "Diagnosis/Service (T)" > "Test/Status" > "Installation" > "Static" in the menu.
- ② The following window will be displayed (Fig. 111). This will check the static device installation state. Click "OK" after completely stopping the fluid.

Static	
Close the valve at the down stream, condition.	hold the Zero-flow
	OK Cancel



③ Click the "OK" button to display a message box (Fig. 112).

Static	x
Start of Self test?	
OK Cancel	



④ During the check, a progress bar will appear as shown in Fig. 113, allowing for the confirmation of the state of the check.

Static		
Close the valve at the down stream, condition.	hold the	Zero-flow
	OK	Cancel



(5) Click "OK" to execute the checks. Once they are finished, a message box (Fig. 114) will be displayed. Click the "OK" button to complete the static device installation state check. The results are displayed as shown in Fig. 115.

Static
Self test was completed.
ОК

Fig.114

Static									
	e the valve ition.	at the	down	stream,	hold	the	Zero	o-flow	
						OK		Cance	1
Best	conditi	on.							
			Fi	g.115					

Diagnosis results are as follows (phase difference received from the DSP is monitored for 30 seconds, and the difference between the maximum and minimum values is examined):

- "Best condition": 25µrad or less
- "Good condition": More than 25µrad and equal to or less than 75µrad.
- "Not so good condition": More than 75µrad and equal to or less than 150µrad.
- "Bad condition": More than 150µrad, or "Pickoff Signal Error, Drive Input Out of Range" occurred.
- ⑥ Click the "OK" button to return to the window from before the check, and then click the "Cancel" button to close the window.

Clicking "OK" here will start the static device installation state check over again.

3.7.1.2.2 Dynamic device installation state check (Dynamic)

- ① Click on "Diagnosis/Service (T)" > "Test/Status" > "Installation" > "Dynamic" in the menu.
- ② The following window will be displayed (Fig. 116). This will check the dynamic device installation state. After stabilizing the flow rate, click "OK."

hold the Zero-flow
OK Cancel



③ Click the "OK" button to display a message box (Fig. 117).



④ During the check, a progress bar will appear as shown in Fig. 118, allowing for the confirmation of the state of the check.

ynamic	
Close the valve at the down stream, condition.	hold the Zero-flow
	OK Cance

(5) Click "OK" to execute the checks. Once they are finished, a message box (Fig. 119) will be displayed. Click the "OK" button to complete the dynamic device installation state check. The results are displayed as shown in Fig. 120.



Close the valve at the down condition.	stream, hold the Zero-flow
	OK Cancel
Stable flow.	

Fig.120

Diagnostic results (Monitor the phase difference received from DSP for 30 seconds and check the difference between the maximum and minimum values.)

- "There is no flow quantitiy": When the flow rate is 0
- "Low flow": When the flow rate is too low
- "Stable flow": 1000µrad or less.
- "Not so stable flow": More than 1000µrad and equal to or less than 2000.
- "Unstable flow": More than 2000µrad, or "Pickoff Signal Error, Drive Input Out of Range" occurred.
- ⑥ Click the "OK" button to return to the window from before the check, and then click the "Cancel" button to close the window.

Clicking "OK" here will start the dynamic device installation state check over again.

3.7.2 Loop test (Loop test)

Simulated output is created.

3.7.2.1 Analog output 1 loop test (Fix Analog 1)

This test can be used to put analog output into a simulated output state, and to verify the output line with a loop test.

Since this creates simulated output regardless of the process state, if the flowmeter's output is used to control valves or other such parts, then for the sake of safety, change the control loop to manual control so that the control loop is not influenced by the flowmeter's output.

① When "Diagnosis/Service (T)" > "Loop test" > "Fix analog 1" in the menu are clicked, a message box (Figure 121) appears. Then, after confirming that the process control loop has been switched to manual, click the "OK" button.

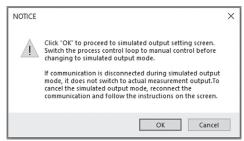
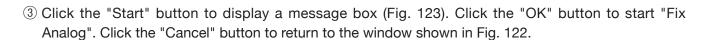


Fig.121

② The following window will be displayed (Fig. 122). Select the simulated output value and click the "Start" button. To pick another current value to output, select "Other" and click the "Start" button after inputting the analog value.

Click the "Cancel" button to exit "Fix Analog".





ix An	alog 1				x
<n(< th=""><th>t of Loo DTICE> nge to t</th><th>p test? he "MAN</th><th>UAL CO</th><th>NTROL".</th><th></th></n(<>	t of Loo DTICE> nge to t	p test? he "MAN	UAL CO	NTROL".	
		ОК		Cance	



④ Click the "OK" button to cause the set analog value to be outputted. While the simulated output value is being outputted, a message at the bottom of the window will indicate that the system is "creating simulated output", as shown in Fig. 124.

Click the "Stop" button to halt the simulated output.

۲	4mA				
0	20mA				
0	Other	4.00		mA	
			Start	Stop	Cancel



(5) After the "Stop" button is clicked, a message box (Fig. 125) will be displayed. Click the "OK" button.

Fix Analog 1
Loop test was completed.
<notice> Change to the "AUTOMATIC CONTROL".</notice>
ОК



⑥ Clicking the "OK" button would return the interface to the window shown in Fig. 122, so click the "Cancel" button to exit "Fix Analog".

3.7.2.2 Analog output 2 loop test (Fix Analog 2)

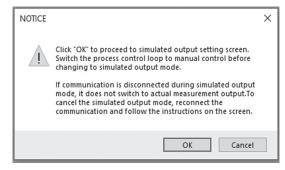
The analog output 2 loop test can be executed by following the same procedures as described in section 3.7.2.1 "Fix Analog 1", steps (1) to (5).

3.7.2.3 Pulse output 1 loop test (Fix Pulse 1)

This test can be used to put pulse output into a simulated output state, and to verify the output line with a loop test.

Since this creates simulated output regardless of the process state, if the flowmeter's output is used to control valves or other such parts, then for the sake of safety, change the control loop to manual control so that the control loop is not influenced by the flowmeter's output.

When "Diagnosis/Service (T)" > "Loop test" > "Fix Pulse" in the menu are clicked, a message box (Fig. 126) appears. Then, after confirming that the process control loop has been switched to manual, click the "OK" button.





② The following window will be displayed (Fig. 127). Select the simulated output value and click the "Start" button. To pick another pulse frequency to output, select "Other" and click the "Start" button after inputting the pulse frequency.

The indicator in the window turns green while the pulse is output and red while the pulse is stopped. The range of pulse frequency values that can be inputted is 0.1 to 11000 Hz.

Click the "Cancel" button to exit "Fix Pulse".

Click here and input a value to set any pulse frequency simulated output.	Fix Pulse 1			
	O Other	1000.0	нг 🔍	
	Target	0	pulses	
	Expected Output	0	pulses	
	Actual Output	0	pulses	
	Output Duration	0.00	sec	
		Start	Stop Cancel	

Fig.127

3 The number of simulated output pulses can be set in "Target." "0" indicates continuous output.

The expected number of outputs is displayed in "Expected Output."

(The expected number obtained by calculation may be different from the value set in "Target," but it is not abnormal.)

The approximate output duration is displayed in "Output Duration."

④ Click the "Start" button to display a message box (Fig. 128). Click the "OK" button to start "Fix Pulse". Click the "Cancel" button to return to the window shown in Fig. 127.

Fix Pulse 1	×
Start of Loop test? <notice> Change to the "MANUAL CONTROL".</notice>	
OK Cancel	

Fig.128

(5) Click the "OK" button to cause the simulated output value to be outputted. While the simulated output value is being outputted, a message at the bottom of the window will indicate that the system is "creating simulated output", as shown in Fig. 129.

Click the "Stop" button to halt the simulated output.

Fix Pulse 1							
<warning> Closing this window will stop override function. Pulse Output 1 will revert to live value.</warning>							
Set the Frequency and Duration.	Target to calculate Expec	ted Output and Output					
Frequency							
Other	1000.0	Hz O					
C Guildi	1000.0						
Target	0	pulses					
Expected Output	0	pulses					
Actual Output	0	pulses					
Output Duration	0.00	sec					
	Start	Stop Cancel					
Simulated output is prov	ided now						

Fig.129

⑥ If the output is executed with the number of pulses being specified in "Target," the screen shown in Figure 130 appears after the output is completed.

"Actual Output" is the actual number of pulses output. It may differ from "Expected Output" but it is not abnormal.

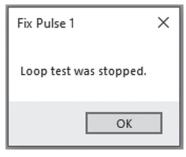


Fig.130

⑦ Clicking the "OK" button would return the interface to the window shown in Fig. 127, so click the "Cancel" button to exit "Fix Pulse".

3.7.2.4 Pulse output 2 loop test (Fix Pulse 2)

The pulse output 2 loop test can be executed by following the same procedures as described in section 3.7.2.3 "Fix Pulse 1", steps (1) to (6).

3.7.2.5 Status output loop test (Fix Status output)

This puts status output into a simulated output state, and conducts a loop test on the output line. Since this creates simulated output regardless of the process state, if the flowmeter's output is used to control valves or other such parts, then for the sake of safety, change the control loop to manual control so that the control loop is not influenced by the flowmeter's output.

① When "Diagnosis/Service (T)" > "Loop test" > "Fix Status output" in the menu are clicked, a message box (Figure 131) appears. Then, after confirming that the process control loop has been switched to manual, click the "OK" button.

NOTICE		×			
	Click "OK" to proceed to simulated output setting screen. Switch the process control loop to manual control before changing to simulated output mode.				
	If communication is disconnected during simulated output mode, it does not switch to actual measurement output.To cancel the simulated output mode, reconnect the communication and follow the instructions on the screen.				
	OK Cancel				
	Fig.131				

a following window will be displayed (Fig. 122). Select either "ON" or "OFF" for the e

⁽²⁾ The following window will be displayed (Fig. 132). Select either "ON" or "OFF" for the simulated output state, and then click the "Start" button.

Fix Status output	
Status output	ON (OFF
	Start Stop Cancel

Fig.132

③ Click the "Start" button to display a message box (Fig. 133). Click the "OK" button to start "Fix Status output".

Click the "Cancel" button to return to the window shown in Fig. 132.

Fix Status output	×
Start of Loop test? <notice> Change to the "MANUAL CONTROL".</notice>	
OK Cancel	

Fig.133

④ Click the "OK" button to cause the simulated output state to be outputted. While the simulated output is being outputted, a message at the bottom of the window will indicate that the system is "creating simulated output", as shown in Fig. 134.

Click the "Stop" button to halt the simulated output.

	Start Stop Cancel
Status output	🔿 ON 🔘 OFF

(5) After the "Stop" button is clicked, a message box (Fig. 135) will be displayed. Click the "OK" button.

Fix Status output	×
Loop test was completed. <notice> Change to the "AUTOMATIC CONTROL".</notice>	
ОК	



⑥ Clicking the "OK" button would return the interface to the window shown in Fig. 132, so click the "Cancel" button to exit "Fix Status output".

3.7.2.6 Status input loop test (Status input)

This displays the state of status input.

- ① Click "Diagnosis/Service (T)" > "Loop test" > "Status input" in the menu.
- ② A window will appear as shown in Fig. 136, displaying the current state of status input, either "Short" or "Open". After verifying the state, click the "Cancel" button and exit "Status input".

Status input		
Status input	Open	
		Cancel
	Fig.136	

3.7.3 Transmitter adjustment function (Calibration)

This is an flowmeter transmitter adjustment function.

3.7.3.1 Automatic zero point adjustment (Auto zero)

This adjusts the zero point of the flowmeter transmitter, on the flowmeter side.

- (1) Click on "Diagnosis/Service (T)" > "Calibration" > "Auto zero" in the menu.
- (2) The following window will be displayed (Fig. 137). Click the "OK" button after completely stopping the fluid.

Close the valve a condition.	t the down strea	am, hold the Zero-flow
Condition. Phase diff		
Mean		urad
Max		urad
Min		urad
	1	urau
)rive freq Mean		Hz
Max		Hz
Min		Hz
ſemp		
Mean		degC
Max		degC
Min		degC
Mean		V
Max		V
Min		V
R.P.O		
Mean		V
Max		V
Min		v
Drive output		
Mean		V
Max		V
Min		v

Fig.137

③ Click the "OK" button to display a message box (Fig. 138).

Auto zero X
Start of calibration?
<notice> Change to the "MANUAL CONTROL".</notice>
OK Cancel

Fig.138

④ Click the "OK" button to adjust the zero point. While this adjustment is occurring, a message at the bottom of the window will indicate that the system is "Adjusting. Please wait", as shown in Fig. 139.

to zero	
Close the valve at the d condition. Phase diff	own stream, hold the Zero-flow
Mean	urad
Max	urad
Min	urad
Drive freq	
Mean	Hz
Max	Hz
Min	Hz
Temp	
Mean	degC
Max	degC
Min	degC
L.P.O	
Mean	V
Max	V
Min	V
R.P.O	
Mean	V
Max	V
Min	V
Drive output	
Mean	V
Max	V
Min	V
	OK Cancel



⑤ Click "OK" to execute the zero point adjustment, then click "OK" again in the message box (Fig. 140) displayed when adjustment is complete to exit automatic zero point adjustment. The results are displayed as shown in Fig. 142.

Auto zero	×			
Calibration was completed.				
Change to the "AUTOMATIC	CONTROL".			
ОК				
Fig.140)			

If the zero-point adjustment fails, the screen shown in Fig. 141 appears and the "Auto Zero Failed" error occurs.

Review the installation environment and fluid conditions, and perform the zero-point adjustment again.

When the zero-point adjustment is completed, the "Auto Zero Failed" error status will be resolved.





condition.		
Phase diff Mean	0.0 5	urad
Max	101.9	urad
Min	94.2	urad
Drive freq		
Mean	146.419	Hz
Max	146.419	Hz
Min	146.418	Hz
Temp		
Mean	23.6	degC
Max	23.6	degC
Min	23.6	degC
L.P.O		
Mean	0.247	v
Max	0.247	V
Min	0.247	v
R.P.O		
Mean	0.251	V
Max	0.251	v
Min	0.250	v
Drive output		
Mean	0.35	V
Max	0.37	V
Min	0.33	v

Fig.142

⑥ Click the "OK" button to return to the window shown in Fig. 142, then click the "Cancel" button to exit "Autozero".

Adjust the zero point when the temperature of the process fluid is stable at the temperature at which it will be used.

Also, the sensor unit's internal process fluid must be in a completely halted state, or it will not be possible to accurately adjust the zero point adjustment.

3.7.3.2 Density calibration

3.7.3.2.1 Two-point Density Calibration

Calibrates density measurement with air and water (liquid). Density calibration requires a liquid of known density.

This product can be used in a state at the time of factory shipment, so usually no calibration is required.

- ① Click "Diagnosis/Service (T)" > "Calibration" > "Density calibration" > "2 point Density calibration" in the menu.
- 2 The screen shown in Fig. 143 opens.

Calibrate the calibration value [fa20kd] of air at 20°C in the item of "Air." (The density of air is fixed at 0.0012 g/ml.) Fill the sensor with air and execute "Calibration" to enter [fa20kd].

If the frequency and temperature are known in advance, enter the values in the items of "Frequency" and "Temperature" and execute "Apply" to enter the calculated value of [fa20kd].

When "Download" is executed, the calibration value is written to the transmitter.

③ Calibrate the calibration value [fw20] of liquid at 20°C in the item of "Water."

Fill the sensor with water (or liquid of known density), and enter the density of the liquid at the current temperature. Execute "Calibration" to enter the calibration value [fw20] and the density [Density (Water)] of the liquid, and the temperature [Calibration temperature] and the frequency [Calibration frequency] at the time of calibration.

If the frequency and temperature are known in advance, enter the values in the items of "Frequency" and "Temperature" and execute "Apply" to enter the value for [fw20] calculated from the entered values.

When "Download" is executed, the calibration value is written to the transmitter.

2 point Density calibration							
Density parameter			Air				
	Before change	After change	Density Frequency	0.0012	g/ml Hz	fa20kd [Hz]	
FKt	4.22000E-004		Temperature		*C		
FKdt	0.00000E+000		Tomportataro		Ŭ		
fw20kd [Hz]	147.952	147.952	fw20kd [Hz]	0			
fa20kd [Hz]	175.683	175.683	Ff I3rd	0			
Ff I3rd	0.00000	0.00000	ffl3rd20kd [Hz]	0			
ffl3rd20kd [Hz]	0.00000	0.00000	Ff I 4th	0			Calibration
Ffl4th	0.00000	0.00000	ffl4th20kd [Hz]	0			Apply Download
ffl4th20kd [Hz]	0.00000	0.00000					Hoppiy
DC1	0.00000E+000		Water				
DC2	0.00000E+000					f w20	
DC3	0.00000E+000		Density		g/ml Hz	twzu Density (Water)	
DC4	0.00000E+000		Frequency Temperature		нz °C	Calibration temperature	
Density (Water)	0.99730	0.99730	Temperature		·U	Galibration temperature	
fw20	150.000	150.000	fw20kd [Hz]	0		Calibration frequency	
Calibration temperature	20.00	20.00	Ff13rd	0		calibration frequency	
			ffl3rd20kd [Hz]	0			
Calibration frequency	150.000	150.000	Ff14th	0			Calibration
Frequency coefficient β	0.00000		ffl4th20kd [Hz]	0			
Trequency contribution p				, ,			Apply Download
A	26.25069						
В	47.62119						All Download
C	22.37050						
К	1.00000					P	rint Close

Fig.143

3.7.4 Analog output adjustment (Trim Analog)

This adjusts the output value of the flowmeter transmitter's analog output.

(The analog output has been adjusted at the time of shipment, so usually no adjustment is required.) This function is for adjusting the values by outputting analog values equivalent to 4mA and 20mA regardless of the processing state. If the flowmeter's output is used to control valves or other such parts, then for the sake of safety, change the control loop to manual control so that the control loop is not influenced by the flowmeter's output.

3.7.4.1 Analog output 1 adjustment (Trim Analog 1)

This adjusts the output value of the flowmeter transmitter's analog output 1.

① When "Diagnosis/Service (T)" > "Trim Analog" > "Trim Analog 1" in the menu are clicked, a message box (Fig. 144) appears. Then, after confirming that the process control loop has been switched to manual, click the "OK" button.

NOTICE		×			
	Click "OK" to proceed to simulated output setting screen. Switch the process control loop to manual control before changing to simulated output mode.				
	If communication is disconnected during simulated output mode, it does not switch to actual measurement output.To cancel the simulated output mode, reconnect the communication and follow the instructions on the screen.				
	OK Cancel				
	Fig.144				

② The following window will be displayed after the "OK" button is clicked (Fig. 145). Select the scale from

Setup the scale					
@ 4mA 20mA					
Other scale	4mA			V	
		1.0000			
	20mA		5.0000	٧	

4 to 20mA for adjusting analog 1, or select another scale (Other scale), then click the "OK" button.

Fig.145

When the 4 to 20mA scale is used for adjustment, a standard ammeter is inserted into the analog output 1 output loop, and adjustment follows the method described in steps (4) to (6).

When another scale is used, load resistance is inserted into the analog output 1 output loop, and adjustment follows the method described in steps B to 10 (this description covers the situation where RL=250 ohms will be inserted, with adjustment to both ends of the voltage value scale of 1 to 5V).

③ A message box (Fig. 146) will be displayed. Click the "OK" button to adjust analog output 1.





④ Select "4mA to 20mA" from the window shown in Fig. 147 and click the "OK" button to display the window shown in Fig. 145. Select whether to adjust 4mA or 20mA. This description assumes that 4mA will be adjusted first, followed by 20mA.

Input the value reading currently output on the ammeter and click the "OK" button.

	Trim Analog 1
Click here and select which to adjust.	Enter the reading Value of Milliammeter.
	OK Cancel



Once the value reading is sent, the transmitter will automatically make adjustments so that the output becomes 4mA. Verify that the connected ammeter indicates 4mA.

If another adjustment is necessary, input the value reading of the ammeter into this window again, and click the "OK" button.

- (5) To adjust 20mA, click the 20mA side of the window shown in Fig. 147, and adjust until the connected ammeter indicates 20mA, in the same was as with the 4mA adjustment.
- 6 Click the "Cancel" button to exit analog output value adjustment. Click the "OK" button when the "Adjustment is finished" message box appears as shown in Fig. 148.

Trim Analog 1
Adjusting was completed. <notice> Change to the "AUTOMATIC CONTROL".</notice>
ОК

Fig.148

⑦ Click the "Cancel" button to halt adjustment in progress, and follow the instructions that appear.

(8) When "Other scale" is selected in the window shown in Fig. 145, another scale can be inputted as shown in Fig. 149. When an analog value equivalent to 4mA output is inputted into the first field (the 4mA side), then a corresponding value is automatically inputted into the second field (the 20mA side).

There is no need to input	Trim Analog 1
a value into the second field. Inputting into the first field causes a value to be inputted into the second field as well.	Setup the scale. @ 4mA - 20mA @ Other scale 4mA 1.0000 V 20mA 5.0000 V
	OK Cancel

Analog output can be adjusted here for the 1 to 5V scale.

Click the "OK" button to start the adjustment. Connect a meter (standard voltmeter) to both ends of the load resistance RL.

(9) Select the 4mA side or the 20mA side for adjustment from the window that appears, as shown in Fig. 150. This description assumes that 4mA will be adjusted first, followed by 20mA.

Input the value reading currently output on the meter and click the "OK" button.

	Trim Analog 1
Click here and select which to adjust.	Enter the reading Value of Voltmeter.
	Fig.150

When a value reading is sent, the transmitter will make adjustments so that the output automatically becomes 4mA. Verify that the connected meter indicates 1V.

If another adjustment is necessary, input the value reading of the meter into this window again, and click the "OK" button.

- 1 To adjust 20mA, click the 20mA side of the window shown in Fig. 140, and adjust until the connected meter indicates 5V, in the same was as with the 4mA adjustment.
- ① Click the "Cancel" button to exit analog output value adjustment. Click the "OK" button when the "Adjustment is finished" message box appears as shown in Fig. 138.
- (2) Click the "Cancel" button to halt adjustment in progress, and follow the instructions that appear.

3.7.4.2 Analog output 2 adjustment (Trim Analog 2)

This adjusts the output value of the flowmeter transmitter's analog output 2. Analog output 2 can be adjusted by following the same method as described in section 3.7.4.1 "Trim Analog 1", steps (1) to (ar 0) .

3.7.5 Cumulative total display and control (Counter/Totalizer control)

Use this for functions such as displaying the cumulative totals, and starting, stopping, and resetting the count.

3.7.5.1 Cumulative total 1 display and control (Counter/Totalizer control 1)

① Click "Diagnosis/Service (T)" > "Counter/Totalizer control" > "Counter/Totalizer control 1" in the menu.

(2) The following window will be displayed (Fig. 151).

Totalizer 1 Forward	5390853
Totalizer 1 Reverse	0
Counter 1	5390853
Totalizer 1	5390853.0000 g



③ Cumulative totals include "Totalizer 1 Foward", "Totalizer 1 Reverse", "Counter 1", and "Totalizer 1".

 "Totalizer 1 Foward": This count is incremented whenever the flow goes in the direction set with "Flow direction"

(the positive direction).

 "Totalizer 1 Reverse": This count is incremented whenever the flow goes in the reverse direction, if "Bi direction"

is selected for "Status output func".

- "Counter 1": "Counter 1=Totalizer 1 Foward Totalizer 1 Reverse".
- "Totalizer 1": "Totalizer" is the total cumulative flow, which is calculated by multiplying the total count by the amount of flow in a single count.

Also note that if "Flow direction" is "Forward", the arrow on the flowmeter will be treated as the "positive direction", and if it is "Reverse", then the opposite direction of the arrow on the flowmeter will be treated as the "positive direction".

④ This window can be used to "Start", "Stop", or "Reset" the cumulative total. Note that "Start", "Stop", and "Reset" only affect the cumulative total, and do not work on the pulse output.
Selecting "Beset" will cause the window to appear as shown in Fig. 152

Selecting "Reset" will cause the window to appear as shown in Fig. 152.

Counter/Totalizer control 1	
Totalizer 1 Forward	0
Totalizer 1 Reverse	0
Counter 1	0
Totalizer 1	0.0000 g
Start	Stop Reset Cancel

Fig.152

(5) To close the cumulative total 1 display and control window, click "Cancel".

3.7.5.2 Cumulative total 2 display and control (Counter/Totalizer control 2)

Use this for functions such as displaying, starting the count, stopping the count, and resetting the count of cumulative total 2. Use the same method as described in section 3.7.5.1 "Counter/Totalizer 1", steps (1) to (5).

% Some models do not have the function of Totalizer 2.

3.8 Menu: Maintenance

The "Maintenance (M)" menu can be used to display the current value and a log of the transmitter's internal temperature, as well as a log of errors that occur during operation.

It is also possible to display the length of time the transmitter has been running, display elapsed time, make settings, and so on.

The actual screen is as shown in Fig. 153.

Software reset of the transmitter is also possible through communication, but do not use this function other than maintenance purposes.

Maintenance	Maintenance	Error log
	transmitter	Transmitter temperature log
		Transmitter temperature
	Device reset	History

Maintenance Item Tree

🗐 LinkToj	p for Coriolis ALTImass	(PAOK CA)		
File(F)	Process Variables(V)	Setup(S)	Diagnosis/Service(T)	Maintenance(M) Window(W) Help(H)
				Maintenance transmitter
				Device reset

Fig.153

3.8.1 Log and transmitter internal temperature display (Maintenance transmitter)

3.8.1.1 Error log display (Error log)

① Click on "Maintenance (M)" > "Maintenance transmitter" > "Error log" in the menu.

② The following window will be displayed (Fig. 154). Error log will be automatically displayed in chronological order. To stop error log display, click "Cancel".

$\begin{array}{c} 00/01/01 & 00:46:47\\ 00/01/01 & 00:45:09\\ 00/01/01 & 00:45:00\\ 00/01/01 & 00:44:52\\ 00/01/01 & 00:44:52\\ 00/01/01 & 00:44:37\\ 00/01/01 & 00:43:43\\ 00/01/01 & 00:38:01\\ 00/01/01 & 00:33:51\\ 00/01/01 & 00:33:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:51\\ 00/01/01 & 00:35:25\\ 00/01/01 & 00:34:42\\ 00/01/01 & 00:33:14\\ 00/01/01 & 00:31:43\\ 00/01/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 & 00:31\\ 00.010/01 $	Density Outside Limits Density Outside Limits Slug Flow Density Outside Limits Density Outside Limits Density Outside Limits Density Outside Limits Slug Flow Pickoff Signal Error Pickoff Signal Error Pickoff Signal Error Pickoff Signal Error Pickoff Signal Error Pensity Outside Limits CPU2 Status Power Pickoff Signal Error Temperature Connect Error Pickoff Signal Error	Off Gr On Off Off Off Of Of On Off Off Off Off
$\begin{array}{c} 00/01/01 \ 00:31:43\\ 00/01/01 \ 00:31:43\\ 00/01/01 \ 00:31:43\\ 00/01/01 \ 00:23:51\\ 00/01/01 \ 00:23:25\\ 00/01/01 \ 00:23:25\\ 00/01/01 \ 00:23:22\\ 00/01/01 \ 00:23:22\\ 00/01/01 \ 00:23:22\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:23:20\\ 00/01/01 \ 00:20:00\\ 00/01/01 \ 00:00:00\\ 00$	CPU2 Status Power Pickoff Signal Error Temperature Connect Error CPU2 Status CPU2 Status Power Pickoff Signal Error Temperature Connect Error Pickoff Connect Error CPU2 Status Power	1 On On 1 40 On On 0n 0n 0n 0n



③ Click "OK" to reload the most recent log. Then a message box (Fig. 155) will be displaed.



④ It is also possible to save a log to a file here. Click the "Save" button to display Fig. 156, specify the save location and file name, and then click "OK" to create a CSV file, completing the save process.



Fig.156

(5) Click "Cancel" to close the "Error log" window.

3.8.1.2 Transmitter internal temperature log display (Transmitter temperature log)

① Click on "Maintenance (M)" > "Maintenance transmitter" > "Transmitter temperature log" in the menu.

(2) The following window will be displayed (Fig. 157).

Transmitter temperat	ure log			
$\begin{array}{c} 00/03/30 & 20:22:50\\ 00/03/30 & 20:20:47\\ 00/03/30 & 20:18:45\\ 00/03/30 & 20:18:42\\ 00/03/30 & 20:14:39\\ 00/03/30 & 20:10:33\\ 00/03/30 & 20:10:33\\ 00/03/30 & 20:08:30\\ 00/03/30 & 20:08:30\\ 00/03/30 & 20:04:24\\ 00/03/30 & 20:04:24\\ 00/03/30 & 20:02:21\\ 00/03/30 & 19:58:14\\ 00/03/30 & 19:58:14\\ 00/03/30 & 19:56:11\\ 00/03/30 & 19:56:12\\ 00/03/30 & 19:56:12\\ 00/03/30 & 19:56:12\\ 00/03/30 & 19:56:12\\ 00/03/30 & 19:56:12\\ 00/03/30 & 19:55:12\\ 00/03/30 & 19:55:12\\ 00/03/30 & 19:55:12\\ 00/03/30 & 19:55:12\\ 00/03/30 & 19:55:12\\ 00/03/30 & 19:55:12\\ 00/03/30 & 19:47:59\\ 00/03/30 & 19:43:53\\ 00/03/30 & 19:43:53\\ 00/03/30 & 21:45:16\\ 00/03/30 & 21:44:57\\ 00/03/30 & 21:44:54\\ \end{array}$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$			
	Save	Reset	OK	Cancel

Fig.157

③ The converter's internal temperature is saved to the log approximately once every 2 minutes, and log entries begin to be repeatedly overwritten after 64 entries are saved. If the transmitter's internal temperature exceeds 90°C, then an "Transmitter temperature alarm" will occur, and after 32 log entries are saved from that point, the saving of logs will halt.

To restore the system from this state, click the "Reset" button to display a message box (Fig. 158).

Transmitter temperature log				
Restart of logging xmtr temperature?				
OK Cancel				

Fig.158

entries.

Transmitter temperature log × Setup was completed.

④ Click the "OK" button here to display a message box (Fig. 159) and resume the function for saving log



(5) Also, to display the most recent log entry, click the "OK" button in the screen shown in Fig. 157 to display a message box (Fig. 160).

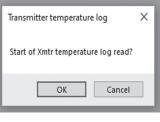


Fig.160

- 6 Click the "OK" button again to display the most recent log entry.
- (7) It is also possible to save a log to a file here. Click the "Save" button to display Fig. 161, specify the save location and file name, and then click "OK" to create a CSV file, completing the save process.

Save File	in much the	given Beteral Basels		x
G . Temp	log	✓ 4 Search Temp lo	g	ρ
Organize 🔻 New fo	older		8⊞ ▼	0
Favorites E Desktop Downloads	Name	 Date modified No items match your search. 	Туре	
 ➢ Libraries ➢ Documents ๗ Music ➢ Pictures ₩ Videos 				•
File <u>n</u> ame: Te Save as <u>t</u> ype: Lo	mpLog.csv g File (*.csv)			•
Hide Folders		Save	Cancel	

Fig.161

(8) Click "Cancel" to close the "Transmitter temperature log" window.

3.8.1.3 Ttransmitter internal temperature display (Transmitter temperature)

O Click on "Maintenance (M)" > "Maintenance transmitter" > "Transmitter temperature" in the menu.

② A window such as the one shown in Fig. 162 will appear, displaying the transmitter's current internal temperature. After verifying the temperature, click the "Cancel" button to exit "Transmitter temperature".

ransmitter temperature			
Temperature	40.3	°C	
			Cancel

3.8.1.4 Transmitter elapsed time display (History)

① Click on "Maintenance (M)" > "Maintenance transmitter" > "History" in the menu.

(2) The following window will be displayed (Fig. 163).

Operating time	10 h
History	
DD/MM/YY	01 / 01 / 00
Time	10 : 15 : 36



- ③ It is possible to display the total running time of the transmitter "Operating Time", as well as set the "History" setting, including second, minute, hour, day, month, and year. Also note that the changed date and other values are reflected in the log data. Note, however, that time stops while the power is off, so a discrepancy will arise.
- ④ After the setting is complete, click the "OK" button to display a message box (Fig. 164).

History	×
Chang	e of settings?
	OK Cancel
	Fig.164

(5) Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 165) to complete the setting process.

History	×
Setup was	completed.
	ОК
F	ig.165

⑥ Click the "OK" button to return to the item input window, then click the "Cancel" button to exit "History".

To cancel the settings, click the "Cancel" button in any step from 2 to 4 .

3.8.2 Device Reset

When "Device reset" is executed, the transmitter can be restarted.

This function may be used to eliminate abnormal conditions.

- ① Click "Maintenance (M)" > "Device reset" in the menu.
- 2 A window (Fig. 166) will appear.

Device reset	
Perform Device reset.	
	OK Cancel

Fig.166

- ③ A message box (Fig. 167) will appear as you click "OK". To exit "Device reset", click "Cancel".
- (4) To start device reset, click "OK". To complete device reset, click "OK" on a message box (Fig. 168). To abort device reset process, click "Cancel".

Device reset	Device reset X
Start of Device reset?	Device reset was completed.
OK Cancel	ОК
Fig.167	Fig.168

(5) Clicking "OK" on a window (Fig. 168) brings back the display to (2) . To exit device reset, click "Cancel".

3.9 Menu: Window

The "Window" menu can be used to arrange the currently displayed windows.

The options for arranging windows are "Cascade", "Tile Horizontal", and "Tile Vertical".

For instance, assume that multiple windows are being displayed on top of each other, as shown in Fig. 169.

① Select "Cascade" to display these windows stacked, as shown in Fig. 170.

(@ Linito for Gross All mean (GAND)	(R) LINKTing for Constru AUTimess (CA000)
Field Process Verballes(V) Setue(3) Dag Service(1) Haintanance(M) Wildow(3) Holp(3)	File[] Process WestEre() Sets() DispService[] Rentemence() Wincov() Bel()
Transfer Transmer and a second a second	Pume output 1
	(xa)
lona lise outpunt 1 Buge Filer - lona lise outpunt 2 Buges Filer -	Restrictives accept
Not an operation 1 News Table	A final og sad sod 1 Baser Flore a
Pulse ordent 2 Bass Film -	A deal out and 2 (Ress. Filter
José pulse ande (01	Polar adult internet inte
	Pulas adred 1 Been Fire
0 farmi	Doble suite sole gr
	2 Dent
	104
IOLE	
F : 400	F ! 170



② Select "Tile Horizontal" to display these windows lined up vertically, as shown in Fig. 171.

E LinkTop for Coriolis Ab	Timesa (CAROR)	
File(E) Process Veria	Nex() Setup(S) Diag/Service(D) Maintenance(M) Window(M) Help(H)	
waleg/Pulso accign		
Analog output 1	Non Fire	
Arelac astest 2	tion Flor	
Pulse output 1	theo Flas	
Pulse subst ?	theo Flav	
Doublie pulize sode		
	04 Gencel	
Key		
Left, key volume	1 0	
Right, key volume-		
Nate logy protect	0 M 8 W	
Microparation present	Le 0 M 8 97	
	DR Cancel	
Pulse output 1		
Freq factor	100.00 Nr.	
Rate Factor	100.000 kg/ain	
Lorout.	8.0 E	
	Dencal	
DLE		
244	_	



③ Select "Tile Vertical" to display these windows lined up horizontally, as shown in Fig. 172.

LinkTop for Coriolis ALT			_	_	_			
	es(Y) Setup(S)	Diag/Service(I) M	sintenance(<u>H</u>) Window(<u>H</u>)	Halp(H)				
nalog, Puise assign						pe ovtput 1		
fration output 1	Name & low	-	eft key volume	16	101	rea factor	100.00	H2
fratos outras z	Name Filme	-	laht key volue	18	10	ate factor	10.000	karfaith
Pulse output. I	Nuce E los	-	ate key protect	0.00	@ 0FF	owout.	1.1	x
Fulse output, 2	Nuco Filor	-	te-operation prevent i	on () 04	8.07			OK Den
Doublin pulse ands	011				a	General		
		06 Care		_				
e								



3.10 Menu: File

The "File" menu can be used to connect communications (refer to section 3.2 "Starting and Connecting LinkTop), to disconnect (refer to section 3.3 "Ending the Connection", and 3.4 "Exiting LinkTop), as well as to set ports (refer to section 2.3 "Installing the Driver"), to create a flowmeter transmitter parameter database, and print parameters. This section describes the database and printing features.

3.10.1 Database

The various parameters, transmitter information, and so on inputted through the "Setup" menu (described in section 3.6) are stored in a database. This can be saved on a hard disk, USB memory, or other type of storage medium.

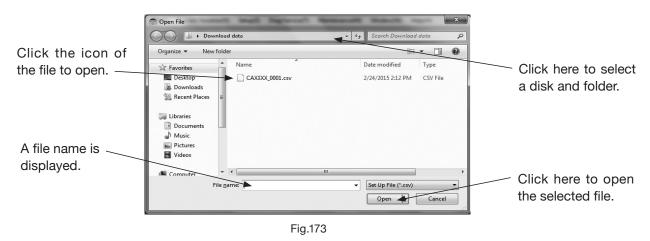
Setting values can also be downloaded to the flowmeter transmitter.

3.10.1.1 Opening files

It is possible to load data from a saved file.

(1) Click "File (F)" > "Database (F)"> "Open File (O)" in the menu.

② The common dialog box (Fig. 173) appears. Select the disk and folder which have the file to be opened from the drop-down list. ③ Select the file to open from the displayed files. Verify the "File Name (N)" and then click the "Open (O)" button. Click the "Cancel" button to exit without opening a file.

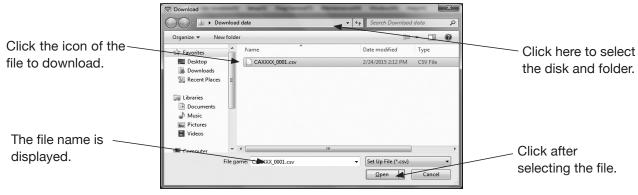


- ④ Select the file to open from the displayed files. Verify the "File Name (N)" and then click the "Open (O)" button. Click the "Cancel" button to exit without opening a file.
- (5) The selected file can be printed. For more information on printing, refer to section 3.10.2 "Printing".

3.10.1.2 Downloading

This function is used to send all the parameters from a selected file to the flowmeter transmitter. This makes it possible to use the same parameters to set up another flowmeter transmitter (to copy settings).

- ① To download, verify the parameters in the current flowmeter to ensure that it is the right flowmeter. To save parameters, follow the instructions in section 3.10.2 "Print and save file".
- 2 After verifying the flowmeter, load the data to be downloaded.
- (3) Click "File (F)" > "Database (F)" > "Download (D)" in the menu.
- ④ The standard dialog will be displayed (Fig. 174). Select the disk and folder where the file to be downloaded is stored from the drop-down list.
- (5) Select the file to download by clicking it. Verify the "File Name (N)" and click the "Open (O)" button. To exit without downloading the file, click the "Cancel" button.





(6) A message box (Fig. 175) will be displayed. Click the "OK" button to download the data to the transmitter.

To not download the data, click the "Cancel" button.





- ⑦ Once the data is downloaded, the various setting values will be modified, and this will change the output values from the flowmeter as well. If the flowmeter's output is used to control valves or other such parts, then for the sake of safety, change the control loop to manual control so that the control loop is not influenced by the flowmeter's output.
- ⑧ After the "OK" button is clicked and the download starts, a message box (Fig. 176) will be displayed. It is possible to verify the state of download progress by watching the progress bar in the middle of the window.

Download			-	
		Downloading		
	OK		Cancel	

Fig.176

(9) Once the download is complete, a message box (Fig. 177) will be displayed. Click the "OK" button.



Fig.177

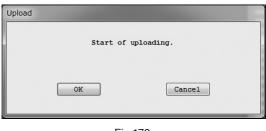
10 Confirm the downloaded contents.

Confirm that the settings have been changed to the downloaded contents according to "3.6 Menu: Setup (Settings)."

3.10.2 Print and save file

The setting parameter sheet for the transmitter can be printed and the parameters can be saved as a CSV file.

- (1) Click on "File (F)" > "Print and save file (P)" in the menu.
- ② A message box (Fig. 178) appears. Click "OK" to continue, or click "Cancel" to stop.





③ By clicking "OK" on the message box (Fig. 178), uploading of every parameter will begin (Fig. 179). Click "Cancel" to stop uploading.

σ	ploading .		
OK		Cancel	

Fig.179

④ The following window will be displayed (Fig. 180). Verify the various parameter values here, and either click the "Print" button to print, or the "Save" button to save.

Coriolis Flowne	ter Parameter Sheet		2019/06/25 9:25
Device information		Pulse output 1 (HART-TV)	
Tag		Assign	Nass Flow Normal
Long Tag Descriptor	3026-1234	Node Frequency factor	3000.00 Hz
Nessage	3026-1234 A042-01234	Rate factor	180,000 kg/min
Date	18/09/03	Loveut	0.0 \$
Device 1D	00000001	an invasi	0.0 μ
Final assembly number	0	Pulse output 2 (NART-GW)	
Sensor serial number	00251234	Assign	Volume Flow
Sensor model	GS026W11	Bouble pulse mode	Off
Flange	JIS 10K	Frequency factor	3000.00 Hz
Sensor material Hardware rev	SUS-316L	Rate factor Lowout	180.000 liter/ain 0.0 \$
Hardware rev	8	Lowout	0.0 %
Polling Address		Status input/output	
Polling Address	0	Input function	No Function
Loop Gurrent Node	Enabled	Input mode	Short Active
		Output function	Error Status
Characterize sensor -		Drive out point	100 \$
Sensor type	64	Output mode	On Active
Nass flow USL	180.000 kg/min		
Nass flow LSL	-180.000 kg/min 130.000 °C	H/L alarm	1.0. 5
Temperature USL Temperature LSL	130.000 ° G -25.0000 ° G	H/L alarm assign H/L alarm type	Ness Flow H/L alarm
Volume flow USL	-25.0000 C \$00,000 liter/ain	High alarm point	150,000 kg/win
Volume flow LSL	-600,000 liter/aim	Low alara point	0.00000 kg/min
Density USL	5.00000 g/ml	H/L alarm hysteresis	0.00000 kg/min
Density LSL	0.00000 g/ml		
		Error select	
Characterize sensor -		Sensor failure	00
Sensor zero value	2.2330 kg/min	Transmitter failure	OFF
Floor.		Galibration failure	OFF
Flow Nass flow unit	kg/ain	Saturated alarm Parameter alarm	OFF
Ness flow unit	liter/sin	Transmitter alarm	OFF
Flow direction	Forward	Siug flow alarm	OFF
Flow damping	4.0 sec	Galibration in progress	OFF
Flow outoff	0.000 \$	Fixed output	OFF
Volume flow coefficien	t 1.00000		
		Error output	
Density		Analog	Downscale
Unit	2/ml	Pulse	Zero (OHz)
Damping	4.0 pec	Pulse upscale frequency Slug flow output	11000.0 Hz Lower scale
Slug low limit	0.000 g/ml		Lower scale
		m	

Fig.180

(5) When the "Save" button is clicked, a common dialog as shown in Figure 181 appears. Specify the place to save the file and the file name to save the file.

🛞 Save File					×
\leftarrow \rightarrow \checkmark \uparrow \square \Rightarrow This PC \Rightarrow	Downloads > Data	~	Ō	,으 Search Data	1
Organize 👻 New folder					III • 🔞
This PC D D Objects D Decktop D Documents D Document	e ^	Date mod		Type	Size
File name: _20210611_08	3844.csv				~
Save as type: Set Up File (*.e	:sv)				~
∧ Hide Folders				Save	Cancel

Fig.181

When the "Print" button is clicked, a print setting screen opens. After completing the setting, click
 "OK" to print the parameter sheet as shown in Figure 182.

Coriolis Flowmeter Parameter Sheet

			Pulse output 1 (HART-TV)	
Device information Tag	1		Assign	Mass Flow
Long Tag			Mode	Normal
Descriptor			Frequency factor	1000.00 Hz
Message			Rate factor	180.000 kg/min
Date	00/00/00		Lowcut	0.0 %
Device ID	00000001		Lonout	0.0 /
Final assembly number	0		Pulse output 2 (HART-QV)	
Sensor serial number	00000000		Assign	Mass Flow
Sensor model	00000000		Double pulse mode	Off
Flange	JIS 10K		Frequency factor	1000, 00 Hz
Sensor material	SUS-316L		Rate factor	180.000 kg/min
	0			
Device type code			Lowcut	0.0 %
Hardware rev	8			
			Status input/output	
Polling Address			Input function	No Function
Polling Address		0	Input mode Output function	Short Active
Loop Current Mode		Enabled	Output function	No Function
			Drive out point	100 %
Characterize sensor -	Sensor type		Output mode	100 % Off Active
Sensor type		CA		
Mass flow USL		360.000 kg/min	_H/L alarm	
Mass flow LSL		-360.000 kg/min	H/L alarm assign	Mass Flow
Temperature USL		200.000 °C	H/L alarm type	High alarm
Temperature LSL		-200, 000 ° C	High alarm point	0.00000 kg/min
Volume flow USL		1200.000 liter/min	Low alarm point	0.00000 kg/min
Volume flow LSL		-1200.00 liter/min	H/L alarm hysteresis	0.00000 kg/min
Density USL		5. 00000 g/ml		1 0.00000 Ng/11111
Density LSL		0.00000 g/ml	Error select	
Densily LoL		0.00000 g/III1		OFF
a	7 6 1		Sensor failure	
Characterize sensor -	Zero Tactor	0 0000 1 / 1	Transmitter failure	OFF
Sensor zero value		0.0000 kg/min	Calibration failure	OFF
			Saturated alarm	OFF
Flow			Parameter alarm	OFF
Mass flow unit		kg/min	Transmitter alarm	OFF
Volume flow unit		liter/min	Slug flow alarm	OFF
Flow direction		Forward	Calibration in progress	OFF
Flow damping		0.8 sec	Fixed output	OFF
Flow cutoff		0.000 %		
Volume flow coefficien	nt	1.00000	Error output	
			Analog	Downscale
Density			Pulse	Zero(OHz)
Unit		g/ml	Pulse upscale frequency	
Damping		4.0 sec	Slug flow output	
Slug low limit		0.000 g/ml	orag from output	
Slug high limit		10.000 g/ml	Characterize sensor - Flow parame	tors
Slug duration		0 sec	SK20	56. 05967 Hz*kg/h/urad
Compensation		OFF	SKM	1. 00000E+000
Compensation		20.00 °C	JKM OK+	4. 44000E-004
Standard temperature			SKt	
Expansion coefficient				4. 44000E=004
A		0. 00024	Calibration temperature	20.00 °C
Settled density		OFF	Calibration temperature (Outer)	20.00 °C 20.00 °C
Settled density Density value		0.00024 OFF 1.00000 g/ml	Calibration temperature (Outer) Calibration frequency	20.00 °C 20.00 °C 150.000 Hz
Density value		OFF	Calibration temperature (Outer) Calibration frequency SKdt	20.00 °C 20.00 °C 150.000 Hz 0.00000E+000
Density value Temperature		OFF 1.00000 g/ml	Calibration temperature (Outer) Calibration frequency SKdt SKfa	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000
Density value Temperature Unit		OFF 1.00000 g/ml	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 0.00000E+000
Density value Temperature		OFF 1.00000 g/ml	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt	20.00 ° C 20.00 ° C 150.000 Hz 0.0000E+000 0.0000E+000 0.0000E+000 4.2200E-004
Density value Temperature Unit Damping		OFF 1.00000 g/ml	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 0.00000E+000
Density value Temperature Unit Damping Analog output 1 (HART-	-PV)	0FF 1.00000 g/ml C 4.0 sec	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt FKt	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000
Density value Temperature Unit Damping	-PV)	OFF 1.00000 g/ml	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Characterize sensor - Density par	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters
Density value Temperature Unit Damping Analog output 1 (HART-	-PV)	0FF 1.00000 g/m1 * C 4.0 sec Mass Flow Normal	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt FKt Characterize sensor - Density par Density (Water)	20.00 °C 20.00 °C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E+000 4.22000E+000 ameters 0.99740 g/ml
Density value Temperature Unit Damping Analog output 1 (HART- Assign	-PV)	OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Characterize sensor - Density par Density (Water) Calibration temperature	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode	-PV)	OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Characterize sensor - Density par Density (Water) Calibration temperature	20.00 °C 20.00 °C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E+000 4.22000E+000 ameters 0.99740 g/ml
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV	-PV)	OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Characterize sensor - Density par Density (Water) Calibration temperature Calibration temperature (Outer)	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV Lowcut	-PV)	0FF 1.00000 g/ml * C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 %	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Characterize sensor - Density par Density (Water) Calibration temperature Calibration temperature Calibration frequency	20.00 °C 20.00 °C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 °C 20.01 °C 150.001 Hz
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV LOWOUT Added damping	-PV)	OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 % 0.0 sec	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKdt Characterize sensor - Density par Density (Water) Calibration temperature Calibration temperature (Outer) Calibration frequency Frequency coefficient β	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C 20.01 ° C 150.001 Hz 0.00000E+000
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV Lowout Added damping Upper rate limit	-PV)	0FF 1.00000 g/ml *C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 % 0.0 sec 110.0 %	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Calibration temperature Calibration temperature Calibration frequency Calibration frequency Frequency coefficient β	20.00 °C 20.00 °C 150.000 Hz 0.00000E+000 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 °C 20.01 °C 150.001 Hz 0.0000E+000 26.25069
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV LOWOUT Added damping	-PV)	OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 % 0.0 sec	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKdt Calibration temperature Calibration temperature Calibration temperature (Outer) Calibration temperature Calibration temperature Salibration frequency Frequency coefficient β A	20.00°C 20.00°C 150.000 Hz 0.00000E+000 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/m1 20.01°C 150.001 Hz 0.00000E+000 26.25069 47.62119
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV LRV Lowcut Added damping Upper rate limit Lower rate limit		0FF 1.00000 g/ml *C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 % 0.0 sec 110.0 %	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKdt Calibration temperature Calibration temperature Calibration temperature (Outer) Calibration temperature (Outer) Calibration temperature Calibration frequency Frequency coefficient β A B C	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C 20.01 ° C 150.001 Hz 0.0000E+000 26.25069 47.62119 22.37050
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV Low LRV Low Low Low Low Low Low Low Low		OFF 1.00000 g/ml *C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0000 kg/min 0.0 % -10.0 %	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKdt Calibration temperature Calibration temperature Calibration temperature Calibration temperature Calibration temperature Calibration frequency Frequency coefficient B A B C K	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C 20.01 ° C 20.01 ° C 150.001 Hz 0.00000E+000 26.25069 47.62119 22.37050 1.00000
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV Lowcut Added damping Upper rate limit Lower rate limit Analog output 2 (HART- Assign		OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 % 0.0 sec 110.0 % -10.0 % Mass Flow	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Calibration temperature Calibration temperature Calibration temperature (Outer) Calibration temperature (Outer) Calibration temperature Frequency coefficient β A B C K fw20kd	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C 20.01 ° C 150.001 Hz 0.00000E+000 26.25069 47.62119 22.37050 1.00000 147.953
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV Lowcut Added damping Upper rate limit Lower rate limit Analog output 2 (HART- Assign Mode		OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 % 0.0 sec 110.0 % -10.0 % Mass Flow Normal	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKdt Calibration temperature Calibration temperature Calibration temperature Calibration temperature Calibration temperature Calibration frequency Frequency coefficient B A B C K	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C 20.01 ° C 20.01 ° C 150.001 Hz 0.00000E+000 26.25069 47.62119 22.37050 1.00000
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV Lowcut Added damping Upper rate limit Lower rate limit Lower rate limit Analog output 2 (HART- Assign Mode URV URV URV URV URV UNT Mode URV URV URV URV UNT Mode URV URV URV URV URV URV URV URV		0FF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0000 kg/min 0.0 sec 110.0 % -10.0 % Mass Flow Normal 180.000 kg/min	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Characterize sensor - Density par Calibration temperature Calibration temperature (Outer) Calibration temperature (Outer) Calibration frequency Frequency coefficient B A B C K fw20kd fa20kd	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C 20.01 ° C 150.001 Hz 0.00000E+000 26.25069 47.62119 22.37050 1.00000 147.953
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV Lowcut Added damping Upper rate limit Lower rate limit Analog output 2 (HART- Assign Mode URV LRV LRV LRV LART- Assign Mode URV LART- Assign Mode URV LRV LRV LRV LRV LRV LRV LRV L		OFF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 % 0.0 % 110.0 % -10.0 % Mass Flow Normal 180.000 kg/min 0.00000 kg/min	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Density (Water) Calibration temperature Calibration temperature Calibration temperature (Outer) Calibration temperature Calibration frequency Frequency coefficient β A C K Galibration temperature Valibration frequency Frequency coefficient β A B C K fw2Okd fa2Okd write protect	20.00 ° C 20.00 ° C 150.000 Hz 0.0000E+000 0.0000E+000 0.0000E+000 4.2200E-004 0.0000E+000 ameters 0.93740 g/ml 20.01 ° C 20.01 ° C 0.0000E+000 20.01 ° C 20.01 ° C 20.01 ° C 150.001 Hz 0.0000E+000 26.25069 47.62119 22.37050 1.00000 147.953 175.684
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV Lowcut Added damping Upper rate limit Lower rate limit Analog output 2 (HART- Assign Mode URV LART- Lower tal Limit Analog output 2 (HART- Assign Mode URV LRV Lowcut		OFF 1.00000 g/ml *C 4.0 sec Mass Flow Normal 180.000 kg/min 0.0000 kg/min 0.0 % -10.0 % Mass Flow Normal 180.000 kg/min 0.0000 kg/min 0.0000 kg/min 0.00%	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Characterize sensor - Density par Calibration temperature Calibration temperature (Outer) Calibration temperature (Outer) Calibration frequency Frequency coefficient B A B C K fw20kd fa20kd	20.00 ° C 20.00 ° C 150.000 Hz 0.00000E+000 0.00000E+000 4.22000E-004 0.00000E+000 ameters 0.99740 g/ml 20.01 ° C 20.01 ° C 150.001 Hz 0.00000E+000 26.25069 47.62119 22.37050 1.00000 147.953
Density value Temperature Unit Damping Analog output 1 (HARI- Assign Mode URV LRV Lowout Added damping Upper rate limit Lower rate limit Analog output 2 (HARI- Assign Mode URV LRV Lowut Added damping Mode URV LRV Lowut Added damping		0FF 1.00000 g/ml C 4.0 sec Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.0 sec 110.0 % -10.0 % Mass Flow Normal 180.000 kg/min 0.00000 kg/min 0.00000 kg/min 0.0000 kg/min 0.0000 kg/min	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Density (Water) Calibration temperature Calibration temperature Calibration temperature (Outer) Calibration temperature Calibration frequency Frequency coefficient β A C K Galibration temperature Valibration frequency Frequency coefficient β A B C K fw2Okd fa2Okd write protect	20.00 ° C 20.00 ° C 150.000 Hz 0.0000E+000 0.0000E+000 0.0000E+000 4.2200E-004 0.0000E+000 ameters 0.93740 g/ml 20.01 ° C 20.01 ° C 0.0000E+000 20.01 ° C 20.01 ° C 20.01 ° C 150.001 Hz 0.0000E+000 26.25069 47.62119 22.37050 1.00000 147.953 175.684
Density value Temperature Unit Damping Analog output 1 (HART- Assign Mode URV LRV Lowcut Added damping Upper rate limit Lower rate limit Analog output 2 (HART- Assign Mode URV LART- Lower tal Limit Analog output 2 (HART- Assign Mode URV LRV Lowcut		OFF 1.00000 g/ml *C 4.0 sec Mass Flow Normal 180.000 kg/min 0.0000 kg/min 0.0 % -10.0 % Mass Flow Normal 180.000 kg/min 0.0000 kg/min 0.0000 kg/min 0.00%	Calibration temperature (Outer) Calibration frequency SKdt SKfa SKfb FKt FKt Density (Water) Calibration temperature Calibration temperature Calibration temperature (Outer) Calibration temperature Calibration frequency Frequency coefficient β A C K Galibration temperature Valibration frequency Frequency coefficient β A B C K fw2Okd fa2Okd write protect	20.00 ° C 20.00 ° C 150.000 Hz 0.0000E+000 0.0000E+000 0.0000E+000 4.2200E-004 0.0000E+000 ameters 0.93740 g/ml 20.01 ° C 20.01 ° C 0.0000E+000 20.01 ° C 20.01 ° C 20.01 ° C 150.001 Hz 0.0000E+000 26.25069 47.62119 22.37050 1.00000 147.953 175.684

2020/08/03 15:26

Fig.182

3.11 Menu: Help

In the "Help" menu, you can open the version confirmation window and the operation manual window. When "Manual" is clicked, the operation manual window as shown in Figure 183 appears and detailed explanations of each window can be confirmed.

0.00000	kg/min	It displays the sensor process values.
0.00000	liter/min	Mass Flow : Mass flowrate Volume Flow : Volume flowrate
0.00000	g/ml	Density : Density
0.0	degC	Temperature : Tube temperature (Process temperature) Totalizer 1 Forward : Pulse output 1 Totalized forward flow value (Number
270643		Totalizer 1 Reverse : Pulse output 1 Totalized reverse flow value (Number Counter 1 : Pulse output 1 Totalized difference value
0		(Totalized forward flow value ? Totalized reverse fl Totalizer 1 : Pulse output 1 Totalized flowrate value (Actual uni
270643		Totalizer 2 Forward : Pulse output 2 Totalized forward flow value (Number
811.9290	ka	Totalizer 2 Reverse : Pulse output 2 Totalized reverse flow value (Number
		Counter 2 : Pulse output 2 Totalized difference value (Totalized forward flow value ? Totalized reverse fl
270643		Totalizer 2 : Pulse output 2 Totalized flowrate value (Actual uni
0		Analog out 1 range : Analog output 1 Output percentage value / Current v
270643		Analog out 2 range : Analog output 2 Output percentage value / Current v
811.9290	kg	Status input level : Status input level Close/Open Status output level : Status output level Close/Open
		Status output level : Status output level Close/Upen
0.0	%	Tenperature(Outer) : Outer casing tenperature
4.00	mA	Drive frequency : Tube vibration frequency *Displayed items may differ according to the model.
0.0	%	*Jisplayed items may differ according to the model.
4.00	mA	
-	degC	[Process Variables > View sensor values] Displays sensor process values. (Internal measurement data)
50.000	Hz	Left pickoff : Left pickoff signal amplitude value (Outlet-side out
		cel <
	0 0 270643 0 270643 811,9290 270643 811,9290 270643 811,9290 0 270643 811,9290 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 degC 270643 0 0 0 270643 0 0119200 kg 270643 0 0119200 kg 000 % 0.0 % 0.0 % 0.0 % 0.0 % 0.0 % 0.0 % 0.00 %

Fig.183

3.12 Troubleshooting

3.12.1 If there is no response

If there is a problem preventing communication between the PC and flowmeter when the flowmeter is connected as described in section 3.2 "Starting and Connecting LinkTop", or while this application is being used, then a message box will appear as shown in Fig. 184. Click the "OK" button if this happens, then verify the following and try reconnecting from the beginning as described in section 3.2 "Starting and Connecting LinkTop":

- · Is the smart communication unit's probe or unit disconnected?
- · Is the flowmeter transmitter receiving power?

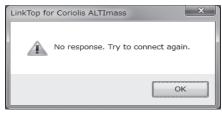


Fig.184

3.12.2 If it is not possible to connect to the flowmeter

If, when the flowmeter is connected as described in section 3.2 "Starting and Connecting LinkTop", a transmitter not supported by this application software is connected, then the message box shown in Fig. 188 will appear. Click the "OK" button, then verify the following and try reconnecting from the beginning as described in section 3.2 "Starting and Connecting LinkTop":

Does the connected transmitter match the type of transmitter supported by the application software that is running?

nnect	
F	ailed to connect with flowmeter(transmitter).
	Polling address:0
	OK

Fig.185

3.12.3 Input errors

If incorrect data is inputted into the "Menu: Setup (Settings) or the "Menu: Diagnosis/Service (Checking and Adjustment)", and an attempt is made to communicate with the flowmeter transmitter, then an error box will appear on the desktop indicating an "input error ". Also note that there are two types of input errors; one where it is determined that there is an error in the setting in LinkTop, and one where the data is sent to the flowmeter transmitter, and the error is in the setting on the transmitter side.

① If a mistake is discovered in LinkTop settings after the setting items are inputted and the "OK" button is clicked, then the error box shown in Fig. 186 will be displayed. Click the "OK" button and correct the mistaken input.

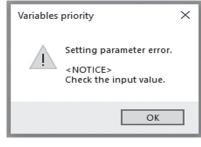


Fig.186

② If a mistake is discovered in settings on the transmitter side after the setting items are inputted and the "OK" button is clicked, then the error box shown in Fig. 187 will be displayed. Click the "OK" button and correct the mistaken input. Also note that if an input error is discovered on the transmitter's side, then a message will be displayed with error details, so use this as a guide when correcting the input.



Fig.187

3.12.4 Error and status display list

Error List

Error Type	Name	Details	Resolution Conditions	
	Analog Output 1 Saturated	Value of analog output 1 has exceeded possible output range (-10% to 110%) and unable to output properly	Measurement is out of range. Control selected measurement so that the measurement falls within the range between lower limit and upper limit for analog output or modify the range	
Saturated	Analog Output 2 Saturated	Value of analog output 2 has exceeded possible output range (-10% to 110%) and unable to output properly	setting. (Refer to section "Analog Output Function" on the instruction manual of the flowmeter.)	
Alarm	Pulse Output 1 Saturated	Value of pulse output 1 is over 11KHz and unable to output properly	Selected instantaneous flow rate is exceeding full-scale flow rate of pulse output. Lower the instantaneous flow rate or increase full-scale flow rate	
	Pulse Output 2 Saturated	Value of pulse output 2 is over 11KHz and unable to output properly	setting. (Refer to section "Pulse Output Function" on the instruction manual of the flowmeter.)	
	Drive Input Out of Range	Drive frequency is out of normal range and unable to measure properly	There may be an error in drive coil connection. Check the connection status of drive coil by self-diagnostic function. (Refer to section "Drive coil check" on the instruction manual of the flowmeter.)	
	Scale Over	Mass flow or volumetric flow is over 110% of the maximum allowable range and possibly unable to measure properly	Mass flow or volumetric flow rate is bigger than the specified range. Make sure to operate within the maximum allowable range.	
	Temperature Out of Range	Measured temperature is out of normal range and unable to measure properly	There may be an error with temperature sensor. Check the connection status of temperature sensor by self-diagnostic function. (Refer to section "Transmitter check" on the instruction manual of the flowmeter.)	
Sensor	Density Outside Limit	Measured density is out of normal range (0 to 5[g/mL]), and unable to measure properly	Measured fluid may contain air bubbles. Check if air bubbles are entrapped in the fluid.	
Sensor Failure	Pickoff Signal Error	Pick-off signal voltage is out of normal range and unable to measure properly	There may be an error with pick-off sensor. Check the connection statu of pick-off coil by self-diagnostic function. (Refer to section "Transmitter check on the instruction manual of the flowmeter.)	
	Temperature Connect Error	Unable to verify normal connection of the temperature sensor	There is an error with temperature sensor connection. Check the connection status of temperature sensor.	
	Pickoff Connect Error	Unable to verify normal connection of the pick-off sensor	There is an error with pick-off coil connection. Check the connection status of pick-off coil.	
	Drive Coil Error	Unable to verify normal connection of drive coil	There is an error in drive coil connection. Check the connection status of drive coil. (This error does not appear during measurement. To make sure the erro is cleared, perform drive coil check by self-diagnostics.)	

Error Type	Name	Details	Resolution Conditions		
Transmitter	EEPROM Error	Unable to operate due to parameter error	Malfunction of EEPROM is suspected. Please contact OVAL.		
Failure	Data Update Error	Error existent in internal data	Malfunction of transmitter is suspected. Please contact OVAL.		
	Analog 1 Set Alarm	Parameter settings of analog output 1 or analog output 2 are under any of following conditions: • Upper limit < Lower limit	Verify parameters and make necessary changes to set proper values.		
Parameter	Analog 2 Set Alarm	 Upper or lower limit>max. acceptable setting Upper or lower limit<-max. acceptable setting 	(Refer to section "Analog Output Function" on the instruction manual of the flowmeter.)		
Alarm	H/L Alarm Point Set Alarm	 H/L Alarm Point Set Alarm H/L Alarm Point Set Alarm High alarm point or Low Alarm Point) are under any of following conditions: High alarm point <low alarm="" li="" point<=""> High alarm point or Low alarm point >max. acceptable setting High alarm point or Low alarm point <- max. acceptable setting </low>			
Calibration Failure	Auto Zero Failed	Auto Zero adjusted value is out of normal range	Stabilize the flow condition and perform Zero adjustment again.		
Slug Flow Alarm	Slug Flow Alarm	Certain period of time has passed since air bubbles are detected by slug flow detection	Air may be entrapped in measured fluid. Inspect fluid and process line for improper conditions.		
Transmitter Alarm	Transmitter Temperature Alarm	Internal temperature of transmitter is abnormal (80°C)	Increasing temperature inside transmitter may shorten parts life. Take necessary measures to lower the ambient temperature.		

Status List

Status Type	Name	Details	Resolution Conditions	
	Analog Output 1 Fixed	Analog output 1 fixed output is in progress (%1)	Analog output 1 fixed output is complete	
	Analog Output 2 Fixed	Analog output 2 fixed output is in progress (%1)	Analog output 2 fixed output is complete	
Fixed Output	Pulse Output 1 Fixed	Pulse output 1 fixed output is in progress (%1)	Pulse output 1 fixed output is complete	
	Pulse Output 2 Fixed	Pulse output 2 fixed output is in progress (%1)	Pulse output 2 fixed output is complete	
	Status Output Fixed	Status output fixed output is in progress (%1)	0% Signal Lock from status input is complete	
	0% Sig Lock	0% Signal Lock from status input is in progress (※1) (No pulse output with analog output clamped at 4mA)	0% Signal Lock from status input is complete	
Calibration in Progress	Calibration in Progress	Auto Zero in progress	Auto Zero is complete	
H/L Alarm	H/L Alarm Triggered	H/L Alarm triggered (See section "High/Low Alarm Function" on instruction manual for details.)	 When following conditions are met: Something other than H/L Alarm is set for Status Output func High Alarm or H/L Alarm is set for H/L Alarm type, and measurement value set for H/L Alarm Assign is High Alarm point—H/L Alarm hys or below Low Alarm or H/L Alarm is set for H/L Alarm type, and measurement value set for H/L Alarm Assign is High Alarm type, and measurement value set for H/L Alarm hys or below Low Alarm or H/L Alarm Assign is High Alarm point—H/L Alarm hys or above 	
Drive Out Alarm	Drive Out Alarm	Drive output is over the threshold	Drive output is under the threshold	
Maintenna	Self Diagnosis	Self-diagnosis in progress	When following processes are complete: Self Diag—Transmitter condition Self Diag—LCD test	
Maintenance	Installation	Pipeline vibration check in progress	When following processes are complete: Installation – Static Installation – Dynamic	
	Transmitter Operating-Time Over	Total run time has exceeded 100,000 hours. Malfunction and degradation of components are concerned. Transmitter replacement is recommended.	At master reset	
Transmitter Operation	Transmitter Warm Up	Warmup in progress (at power-on)	20 minutes after power-on	
oporation	Power OK?	Poor power supply condition is suspected. (Short-duration power cycling has occurred several times.) While operation should not be affected by this status, verification of power supply is recommended.	20 minutes after the last power-on	

Note % 1. Simulated output is available regardless of alarm state. (Certain types of errors disable the output, however.)

4. PRODUCT CODE EXPLANATION

					Ρ	rod	u	ct	Cc	bde	•				Description
Item	1	2	3) (4	1) (5	5)6)	-	7	8	9	10	(1)	(12)	Description
Mode	Node E L 2 3 1 0 -							Smart Communication Unit							
Power	' so	our	ce						0						Always "0"
Applic (applic										8					OVAL Coriolis Flowmeter ALTImass (PA0K Transmitter), (PA5K Transmitter) ALTImass II (PA2K Transmitter), CoriMate II Separate-type Model MT9411, MT9431, MT9630 (% 1)
	0							Less application software ("0" in the 8th digit)							
Langu	Language							Japanese (Japanese version OS)							
	E						English (English version OS)								
Interfa												0			Less interface (application software only)
пцепа	ice											1			Interface provided
													0		Less application software ("0" in the 8th digit)
Media (applic		on	50	ofty	wai	re)							1		CD-ROM
	Jan		50		, a	,							9		Other than the above
Reserv	ve	co	de											0	

► Note : %1 You need different software for transmitters depending on their production periods. Please check the product code of the transmitter to choose the corresponding EL2310 in the table below.

	Product code	Corresponding EL2310
MT9603	MT9603-	EL2310-0 <u>5</u>
10119003	MT9603-	EL2310-0 <u>8</u>
MT9411	MT9411-	EL2310-0 <u>5</u>
MT9431	MT9411-	EL2310-0 <u>8</u>

5. GENERAL SPECIFICATIONS

	Item	Description		
	Connector	USB (type A)		
	Input/output signal	Bell 202 ⇔ USB		
Interface	Operating temp.	–5 to 60°C		
(※1)	Outline dims.	Basic unit: 50W×20H×35D (in mm) Probe: 1500mm approx. (fixed to the interface itself)		
	Housing	Plastic (black)		
Communication	protocol	HART™ protocol		
Communicatior	terminal resistance	Load resistance 250Ω min. (Upper limit depends on flowmeters transmitter specifications.)		
Functions		 Monitors flowmeter transmitter output. Reads, sets up, and saves parameters. Trims analog outputs. Checks analog output loop. Confirms diagnostic messages. 		

Notes * 1. Installation of dedicated driver software is required. (Stored in the driver software LinkTop CD-ROM.)
*: PC requirements (Movement environment)

- OS : Windows 7 to 11 (32bit/64bit) Japanese/English
- \cdot Memory (RAM) $\,:\, 1GB$ or more recommended
- Free disk space : 10MB min.
- $\boldsymbol{\cdot}$ Ensure that a USB interface port is installed.

All specifications are subject to change without notice for improvement.

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