OVAL INSTRUCTIONS

Ins. No. E-023-2-E

SMART COMMUNICATION UNIT
MODEL EL 2310-08E □□□

Applicable flowmeter : OVAL Coriolis Flowmeters

ALTI*mass* Type U, Type S, Type 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

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.

⚠ **CAUTION**

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

⚠ **WARNING**

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.

CD-ROM(one)
(LinkTop and driver)

Interface Adapter

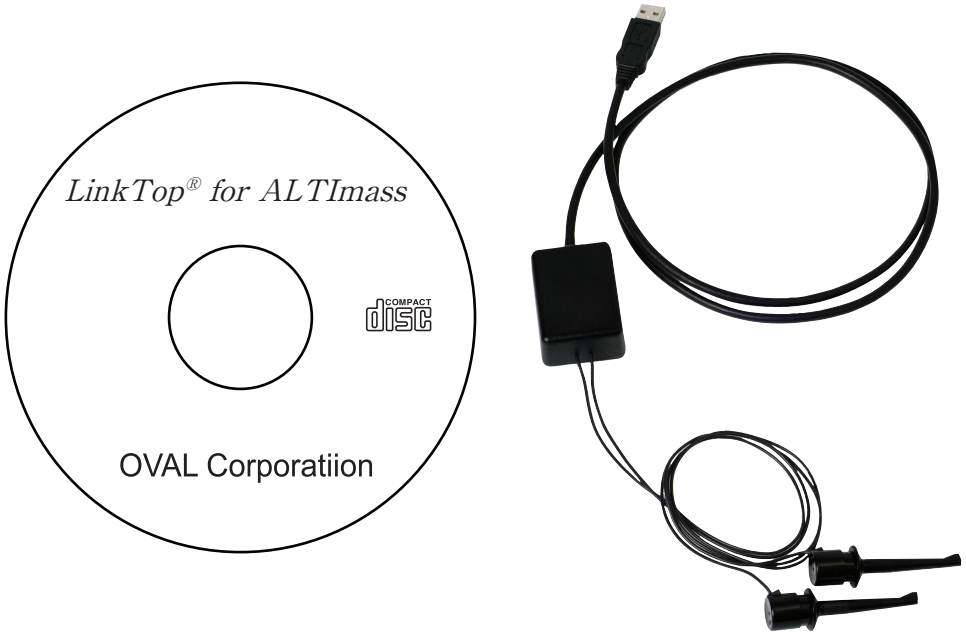


Fig.1

➡ 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.

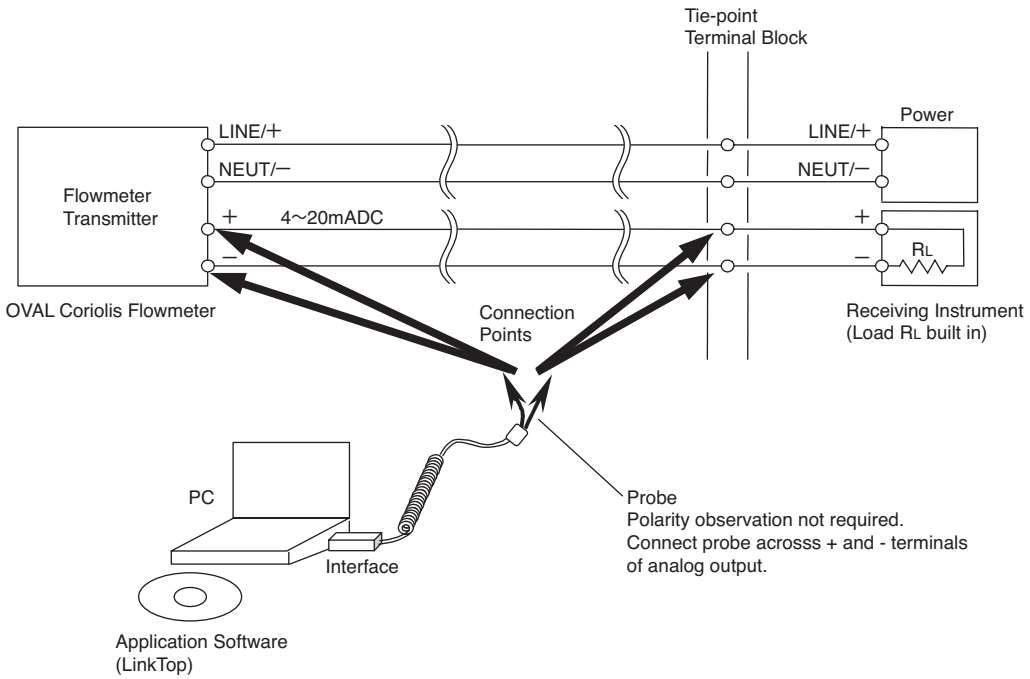


Fig.2

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

◇PC/AT compatible (DOS/V machine)
◇Operating system is the Windows 2000, Windows XP
◇RAM: 1GB or larger.
◇Hard disk: 10MB or larger
◇Provision of USB port

The receiving instrument in the figure above requires a load resistance 250Ω min. Its upper limit depends on the specification of transmitter used.
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.

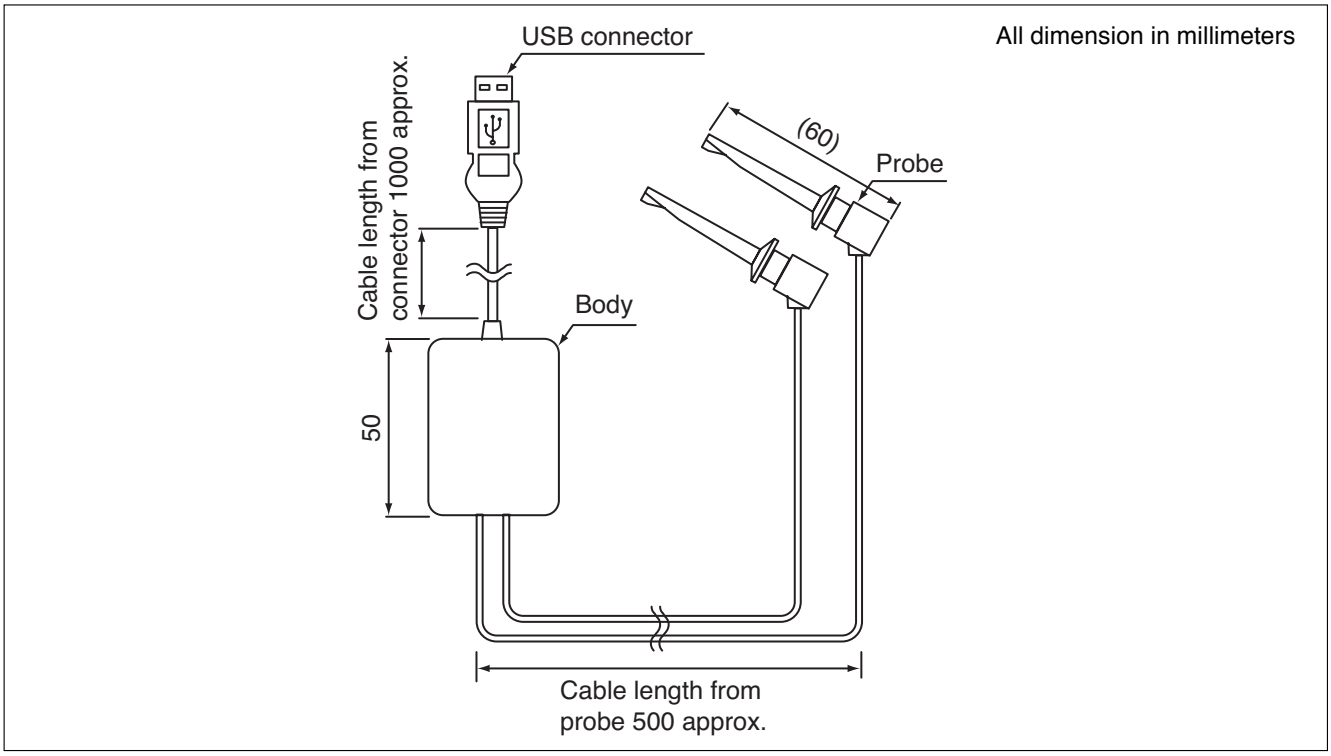


Fig.3

3.EL2310 OPERATION

3.1 About LinkTop Screen

Fig. 4 shows how the LinkTop window looks like.

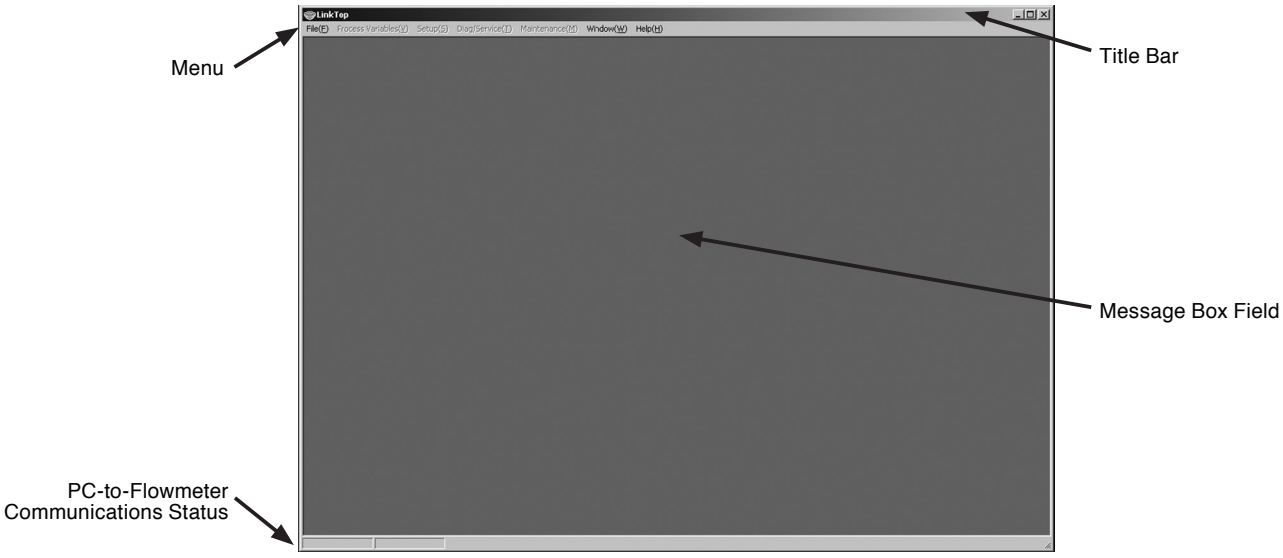


Fig.4

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

◇ During communications : RX WAIT

◇ Communications interrupted : IDLE

3.2 Starting the LinkTop and Connections

① Hook up the flowmeter transmitter, PC interface adapter, and "LinkTop" preinstalled PC as shown in Fig. 2.

② To get the LinkTop up and running, click from "Start" at lower left of the PC screen and click "LinkTop for Coriolis 3 (J)" from "Program".

③ Click "Port setting (I) Ctrl + I" in "File (F)" at the top-level menu of screen.

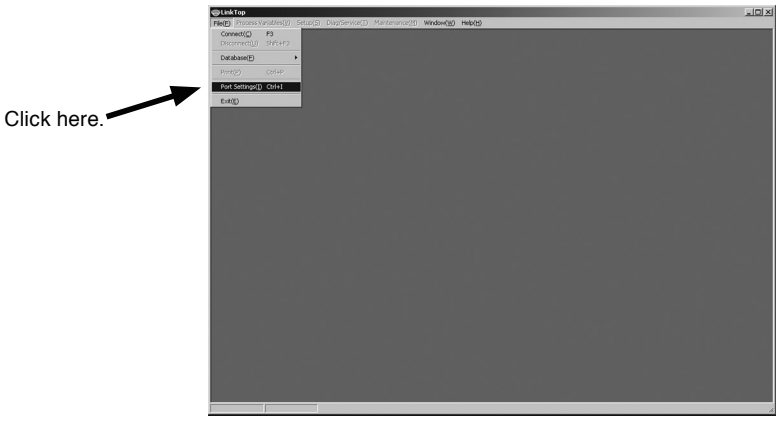


Fig.5

④ Set up the port.
Select the option labeled COM □ (USB) and click "OK" (□ is the port number connected to the interface).

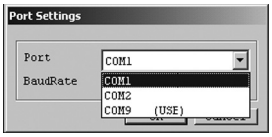


Fig.6

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

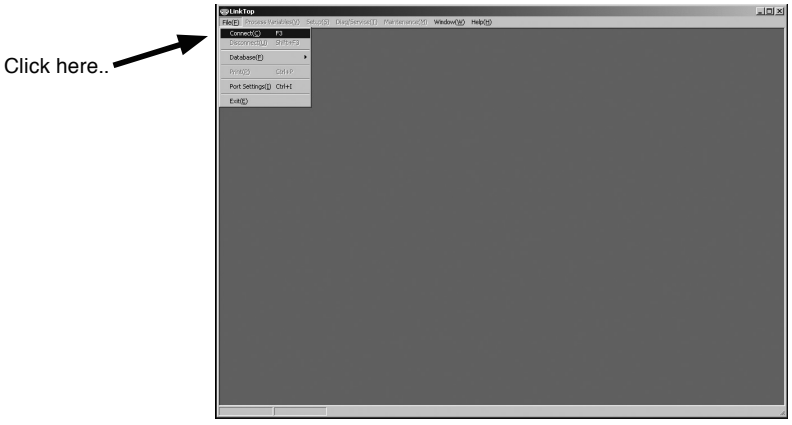


Fig.7

⑥ At the message box as like the one in Fig. 8, click "OK" button and the connection process begins.

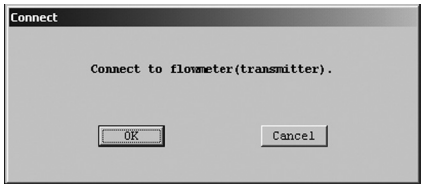


Fig.8

⑦ As you click "OK" and start the connection process, a message box like the one in Fig. 9 appears. A bar graph in the middle of message box indicates progress of connection process.

Fig.9

When the connection process begins, the transmitter connected is automatically identified and the transmitter name appears in the title bar. A message indicating "ongoing communication" appears at lower left of the screen with "IDLE" ⇔ "RX WAIT" shown alternately.

⑧ Upon completion of connections, a message box like the one in Fig. 10 appears. Click "OK" button.

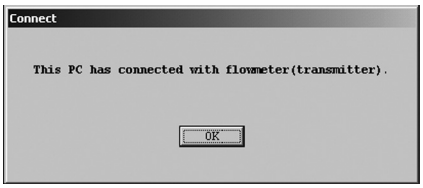


Fig.10

⑨ When connection is complete, of the menus at the top-level menu of screen, certain items that had been dimmed and couldn't be chosen are usable now (menu characters turned black).

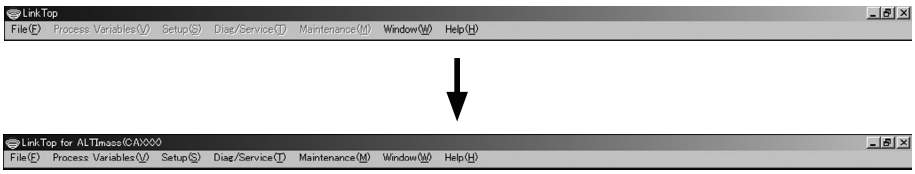


Fig.11

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. 12, select "Disconnect (U) Shift + F3" and click on again.

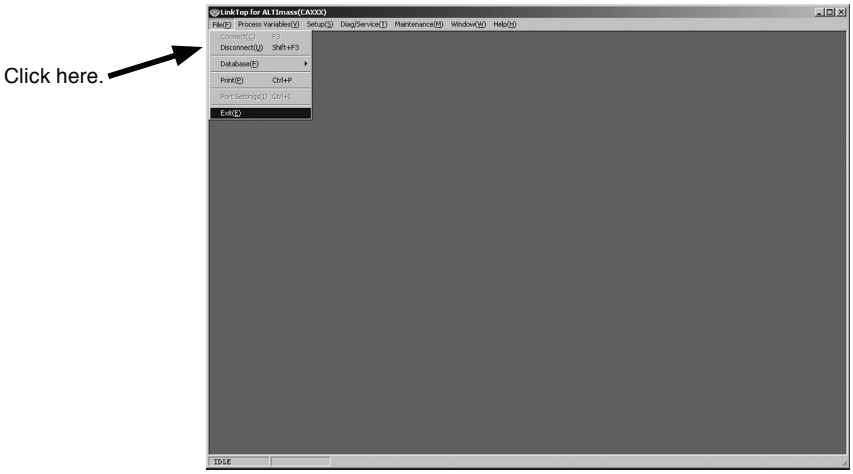


Fig.12

② At the message box as shown in Fig. 13, 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.

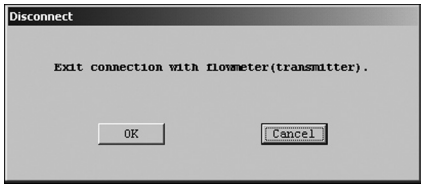


Fig.13

④ When connection is terminated, part of the menu turns to be inactive (characters turn to white in color) as shown in Fig. 14.

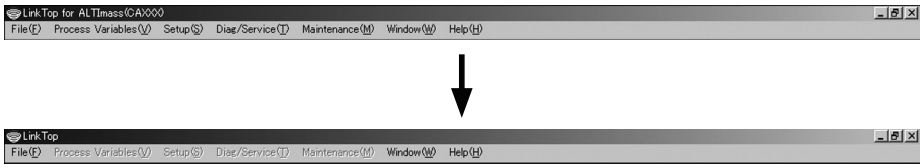


Fig.14

3.4 Terminating the LinkTop

To exit the LinkTop, click on "File (F)" at top-level menu of the screen, select "Exit (E)," and click on again. A message box as shown in Fig. 15 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."

Fig.15

3.5 Menu: Process Variables (Processing Values Display)

The "Process Variables" menu can be used to confirm the flowmeter's process values (instantaneous flow value, fluid density, fluid temperature, cumulative total flow value, and analog output), as well as the Write Protect state.
For the actual screen, refer to Fig. 16.

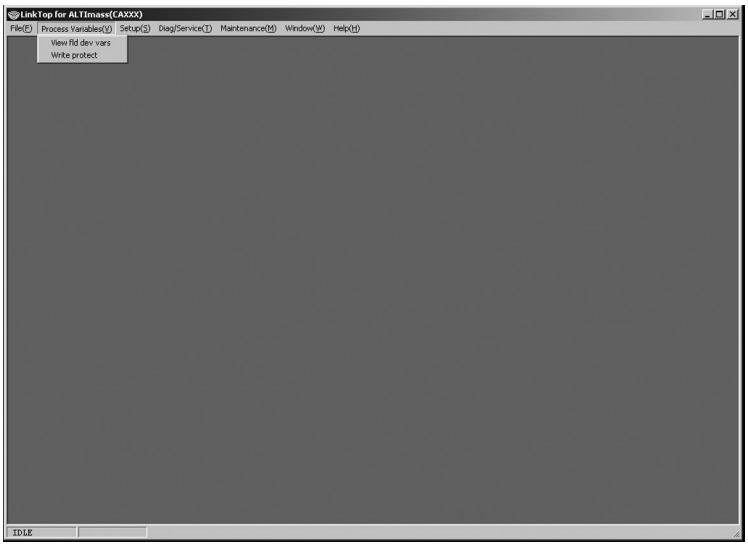


Fig.16

3.5.1 Processing value measurements (View fld dev vars)

① Click "Process Variables (V)" in the menu at the top of the screen, and then select and click "View fld dev vars".

② The following window will be displayed (Fig. 17).

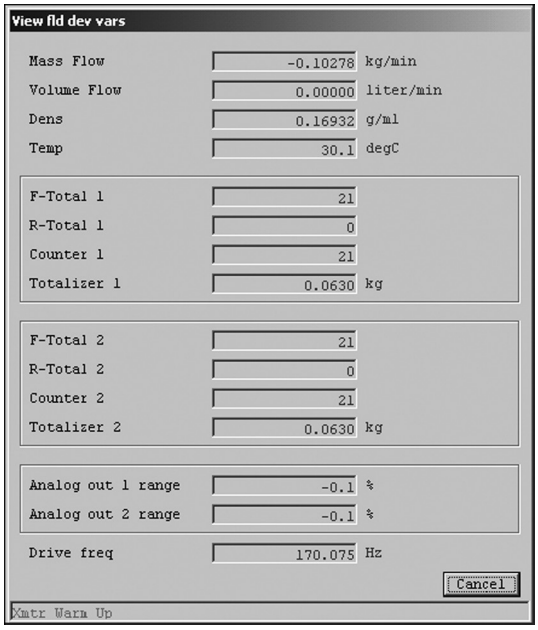


Fig.17

If the "Sensor type" is CB or CS, then "Temp (Outer)" will be added, and "Volume flow" will not be shown.

③ If there is some kind of problem with the flowmeter converter, then an error message will be displayed in the window under the process value measurement window. For details, refer to section 3.11.4, "Error and status display list".

④ To close the process value measurement window, click "Cancel".

3.5.2 Display of the converter 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. 18).

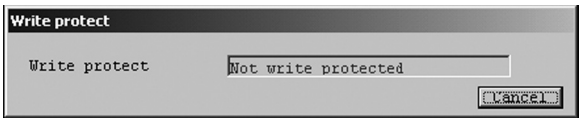


Fig.18

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

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

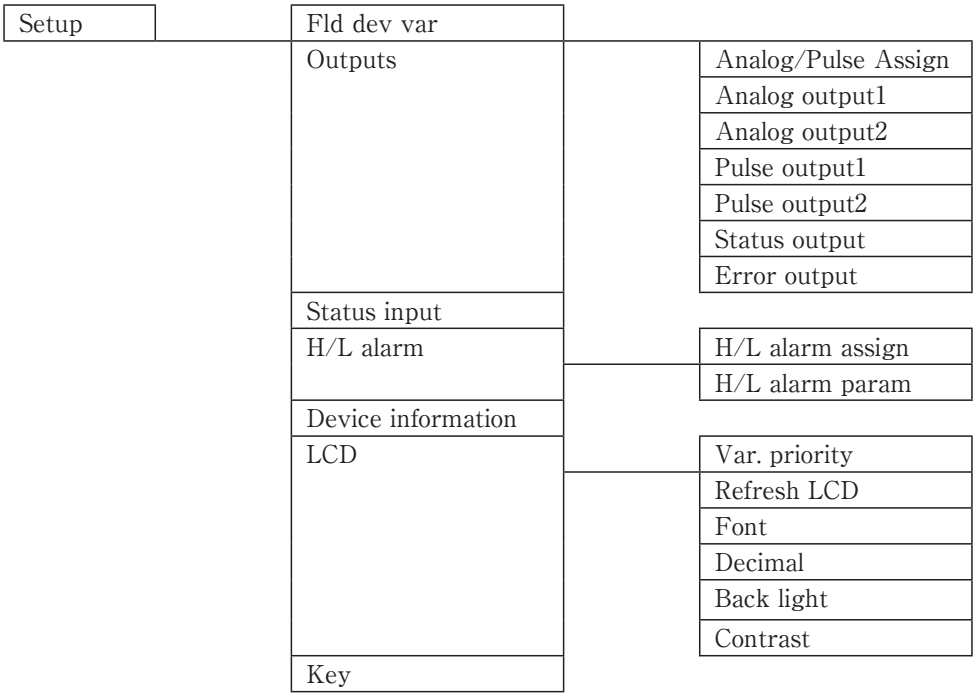
② To close the converter write protection state display window, click "Cancel".

3.6 Menu: Setup (Settings)

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

If a "Diag/Service" window is displayed on the screen, then it will not be possible to set the various parameters, converter information, and so on. Close these window before making settings.

For the actual screen, refer to Fig. 19.



Setup Item Tree

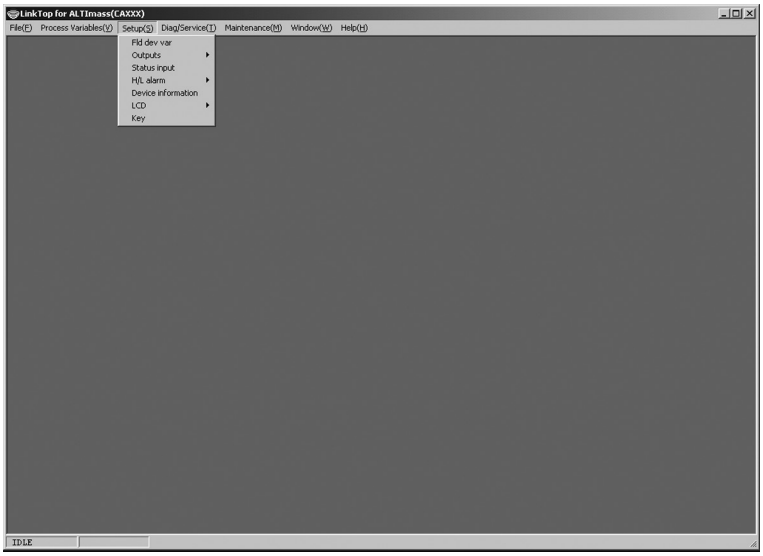


Fig. 19

3.6.1 Converter variables (Fld dev var)

① Click "Setup (S)" in the menu, and then select and click "Fld dev var".

② The following window will be displayed (Fig. 20).

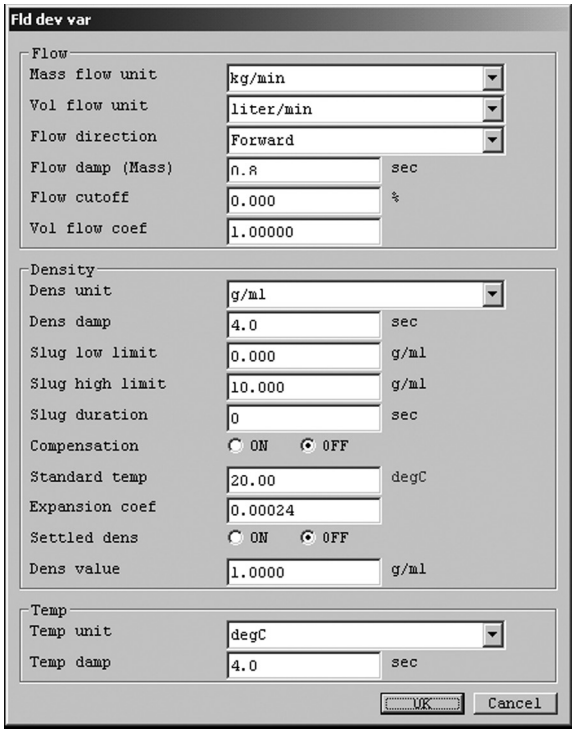


Fig.20

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.
If the "Sensor type" is CB or CS, then the volume flow unit "Vol flow unit" and "Vol flow coef" selection items will not be displayed.
The flow direction can be set to either "Forward" or "Reverse", whereby "Forward" means the direction indicated for the flow direction on the flowmeter unit is treated as the "positive direction", and "Reverse" means the opposite direction from the arrow is treated as the "positive direction". Flow cutoff indicates a percentage of the maximum allowed flow, with the standard setting at "0.3%". This functions both in the positive and negative directions.

④ In the "Density" section, the density unit, density damping, gas multiphase flow determination, density compensation, and settled density can be set.
If the gas multiphase flow determination exceeds the setting value of the measurement density's "Slug low limit" or "Slug high limit", then this is seen as a gas multiphase flow, and the flowmeter side's result and output are forcibly set to "0". When "Slug low limit" is set to "0" and "Slug high limit" is set to "10", the gas multiphase flow determination 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 become values that are converted based on the base temperature (calculated with "Standard temp" and "Expansion coef").
When settled density "Settled dens" is set to "ON", then the value set with "Dens value" is reflected in the volume flow.

⑤ In the temperature "Temp" section, the temperature unit and temperature damping can be set.

⑥ 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. For the other items, directly input a numerical value.

⑦ After all settings are complete, click the "OK" button to display a message box (Fig. 21).
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.

Fig.21

⑧ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 22) to complete the setting process.

Fig.22

⑨ 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 .

⚠ CAUTION

If the unit is changed, then it will be necessary to update the units included in other windows.
If a window including units is opened, then close that window and reopen it to update the units.

3.6.2 Output settings (Outputs)

3.6.2.1 Analog and pulse assignment (Analog/Pulse Assign)

① Click the "Setup (S)" menu, and then select and click "Analog/Pulse Assign" from the "Outputs" drop-down list.

② The following window will be displayed (Fig. 23). Assign analog output 1 and 2 here, as well as pulse output 1 and 2.

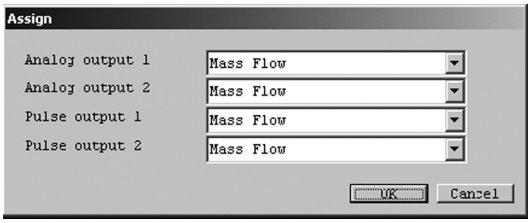


Fig.23

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. 24, Fig. 25, and Fig. 26.

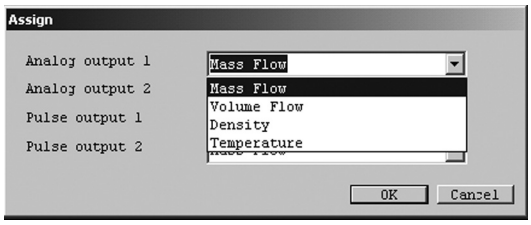


Fig.24

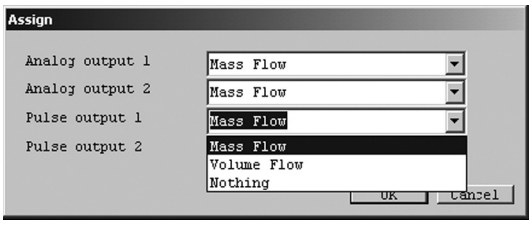


Fig.25

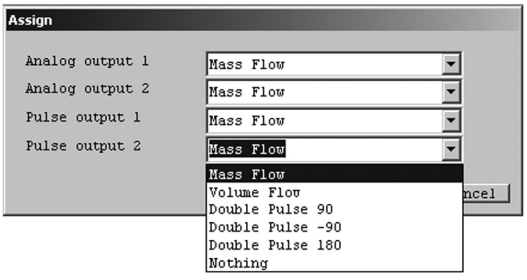


Fig.26

If the "Sensor type" is CB or CS, then the "Pulse output 1" and "Pulse output 2" selection items will be fixed at "Mass flow", and therefore will not be displayed.
Also, when the "Pulse output 2" selection items "Double Pulse 90", "Double Pulse -90", and "Double Pulse 180" are selected, the setting becomes the phase difference with "Pulse 1".

④ Click the "OK" button after all settings are completed to display the message box (Fig. 27).
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.
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. 28. 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.

Fig.27

Fig.28

⑤ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 29) 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. 30 will be displayed.

Fig.29

Fig.30

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 .

3.6.2.2 Analog output 1 setting (Analog output 1)

① Click the "Setup (S)" menu, and then select and click "Analog output 1" from the "Outputs" drop-down list.

② The following window will be displayed (Fig. 31). Set analog output 1 here.

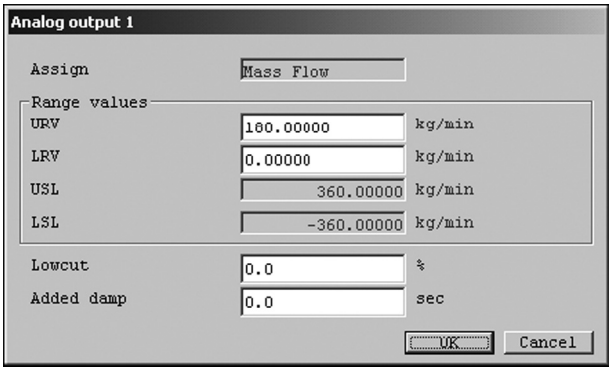


Fig.31

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.

④ Click the "OK" button after all settings are completed to display the message box (Fig. 32).
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.

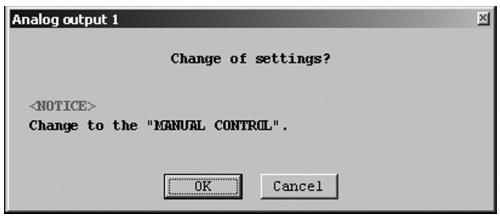


Fig.32

⑤ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 33) to complete the setting process.

Fig.33

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 2 setting (Analog output 2)

① Click the "Setup (S)" menu, and then select and click "Analog output 2" from the "Outputs" drop-down list.

② "Analog output 2" can be set by following the same procedures as described in 3.6.2.2 "Analog output 1", steps ② to ⑤ .

3.6.2.4 Pulse output 1 setting (Pulse output 1)

① Click the "Setup (S)" menu, and then select and click "Pulse output 1" from the "Outputs" drop-down list.

② The following window will be displayed (Fig. 34). Set pulse output 1 here.

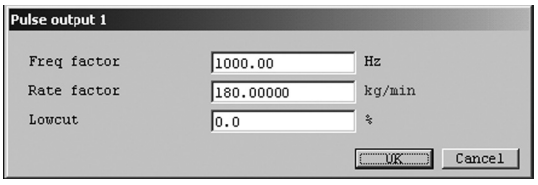


Fig.34

③ Set each item.
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. 35).
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. When "OK" is clicked in Fig. 35, the cumulative total will be reset, and a confirmation message box will be displayed as shown in Fig. 36. 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.

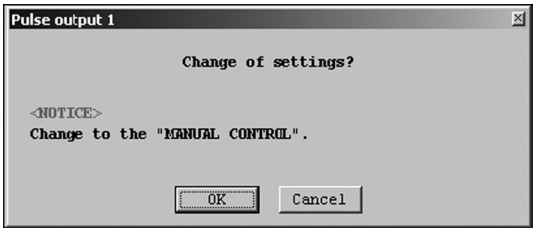


Fig.35

Fig.36

⑤ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 37) to complete the setting process.

Fig.37

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 .

3.6.2.5 Pulse output 2 setting (Pulse output 2)

① Click the "Setup (S)" menu, and then select and click "Pulse output 2" from the "Outputs" drop-down list.

② "Pulse output 2" can be set by following the same procedures as described in 3.6.2.4 "Pulse output 1", steps ② to ⑤ .

3.6.2.6 Status output setting (Status output)

① Click the "Setup (S)" menu, and then select and click "Status output" from the "Outputs" drop-down list.

② The following window will be displayed (Fig. 38). Set the status output function here.

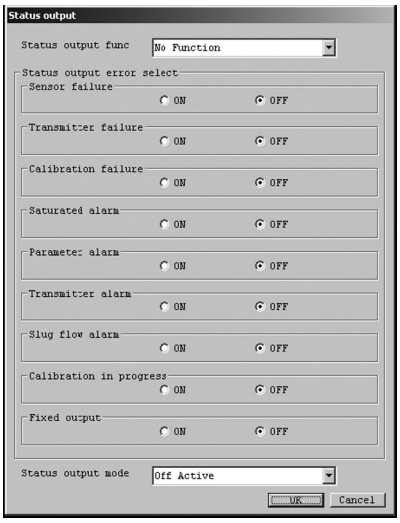


Fig.38

③ Click the triangle on the right side of "Status output func" as shown in Fig. 39, and select the function to set for status output from the drop-down list.

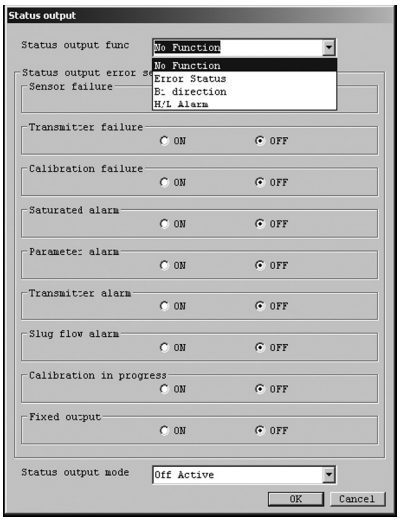


Fig.39

④ The status output is open collector output, and it is possible to select from the three functions "Error Status", "Bi direction", and "H/L Alarm".

- "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".

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

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

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	Converter error	Occurs when there is an error in the converter's 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	Converter alarm	Occurs when an error occurs in the converter's 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 (standard setting: 0.3 to 2g/mL)
Calibration in progress	Calibration execution in progress	Occurs when calibration is being executed
Fixed output		Occurs when analog output, pulse output, status output, and so on are in a fixed state

➡ Notes: 1. Click "ON" for the items to set to error output.
2. Error output is only valid if "Status output func" 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 Click the "OK" button after all settings are completed to display the message box (Fig. 40).
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.

Fig.40

⑧ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 41) to complete the setting process.

Fig.41

⑨ 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 .

3.6.2.7 Error output level settings (Error output)

① Click the "Setup (S)" menu, and then select and click "Error output" from the "Outputs" drop-down list.

② The following window will be displayed (Fig. 42). Set the analog and pulse output level for when errors occur here.

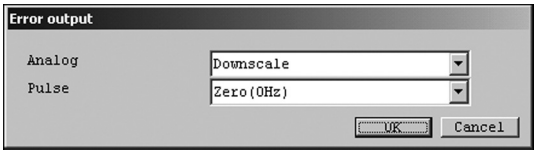


Fig.42

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. 43 and Fig. 44.

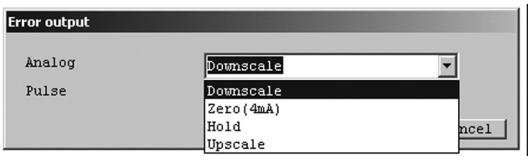


Fig.43

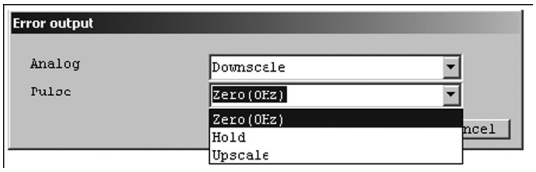


Fig.44

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 value	Maintains the final measurement 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 3.11.4 "Error and status display list".

⑤ Once all the settings are complete, click the "OK" button 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 in a state whereby it is not influenced by the flowmeter's output.

Fig.45

⑥ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 46) to complete the setting process.

Fig.46

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 the "Setup (S)" menu, and then select and click "Status input".

② The following window will be displayed (Fig. 47). Set the status input function here.

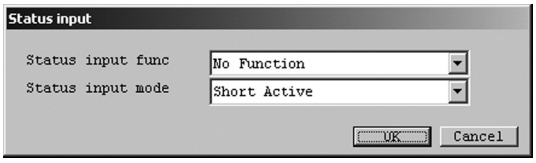


Fig.47

③ Click the triangle on the right side of "Status input func" as shown in Fig. 48, and select the output level from the drop-down list.

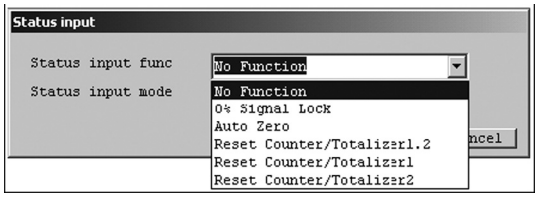


Fig.48

④ It is possible to select from the five functions "0% Signal Lock", "Auto Zero", "Reset Counter/Totalizer 1, 2", "Reset Counter/Totalizer 1", and "Reset Counter/Totalizer 2" for status input.
・"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".

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": A contact point input
・"Open Active": B contact point input
The standard selection is "Short Active".

⑥ After all settings are complete, click the "OK" button to display a message box (Fig. 49).
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

Fig.49

⑦ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 50) to complete the setting process.

Fig.50

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 ② to ⑥ .

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

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

① Click the "Setup (S)" menu, and then select and click "H/L alarm assign" from the "H/L alarm" drop-down list.

② The following window will be displayed (Fig. 51). Set the H/L alarm assignment here.

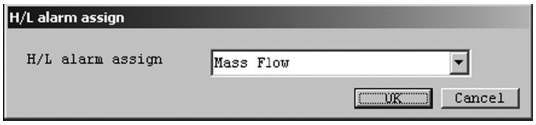


Fig.51

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. 52.

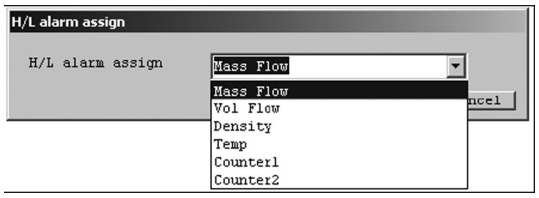


Fig.52

④ After all settings are complete, click the "OK" button to display a message box (Fig. 53).
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.

Fig.53

⑤ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 54) 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. 55 will be displayed after the change.

Fig.54

Fig.55

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 param)

① Click the "Setup (S)" menu, and then select and click "H/L alarm param" from the "H/L alarm" drop-down list.

② The following window will be displayed (Fig. 56). Set the H/L alarm parameters here.

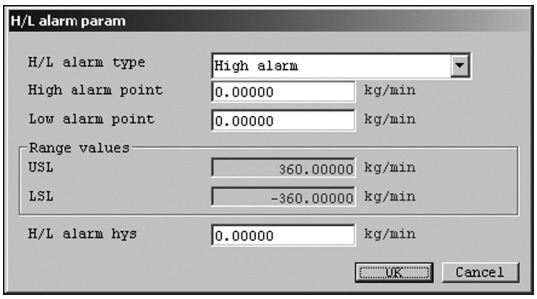


Fig.56

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 func" is "H/L Alarm"). "H/L alarm" includes the three types "High alarm", "Low alarm", and "H/L alarm". Select the alarm type that matches your usage purpose.

- "High alarm": Switches the status output when "High alarm point" is reached.
- "Low alarm": Switches the status output when "Low alarm point" is reached.
- "H/L alarm": Switches the status output when either "High alarm point" or "Low alarm point" is reached.

(Supplementary Information)
If "H/L alarm hys" 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 hys". "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 hys" 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. 57. For the other items, directly input a numerical value.

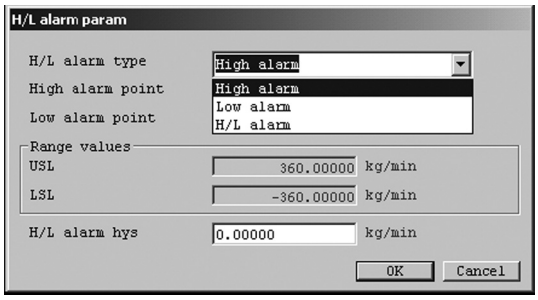


Fig.57

⑤ After all settings are complete, click the "OK" button to display a message box (Fig. 58).
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.

Fig.58

⑥ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 59) to complete the setting process.

Fig.59

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 Converter 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. 60). Set the converter information here.

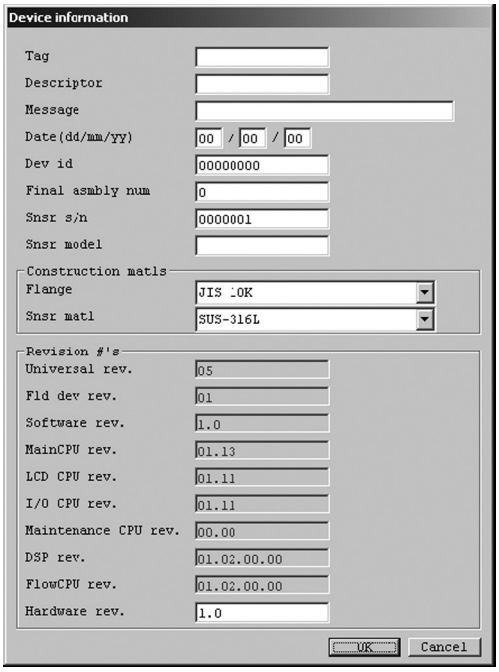


Fig.60

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. 61 and Fig. 62. For the other items, directly input a numerical value.

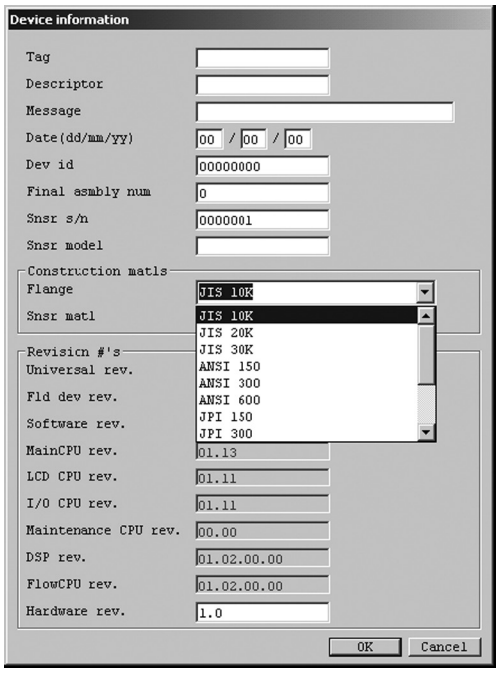


Fig.61

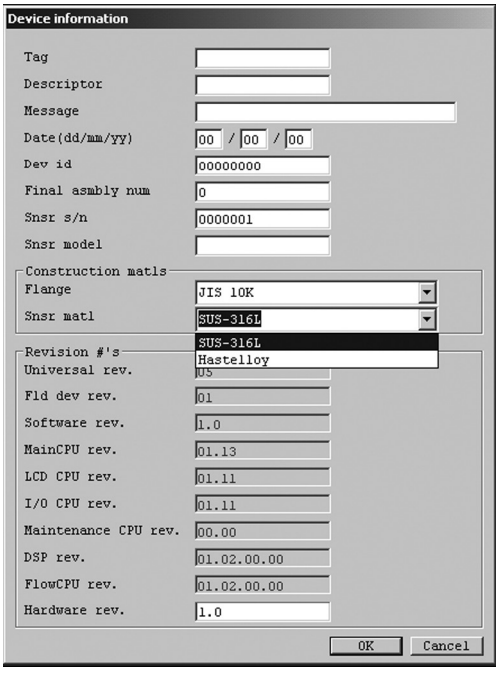


Fig.62

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. 63. Use this as a guide while making your setting.

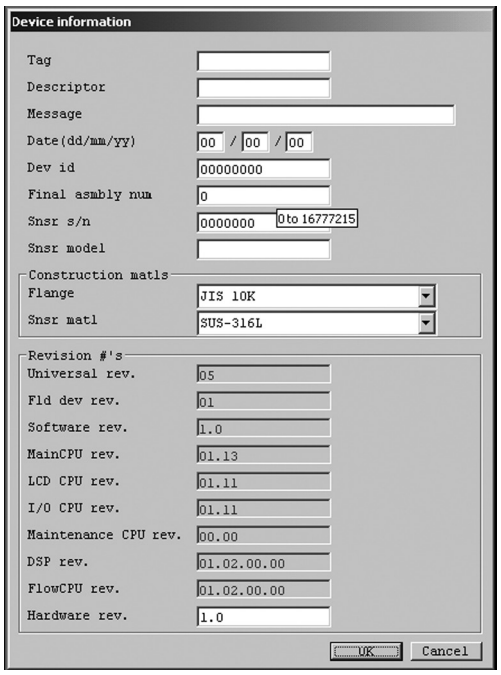


Fig.63

⑤ After all settings are complete, click the "OK" button to display a message box (Fig. 64).

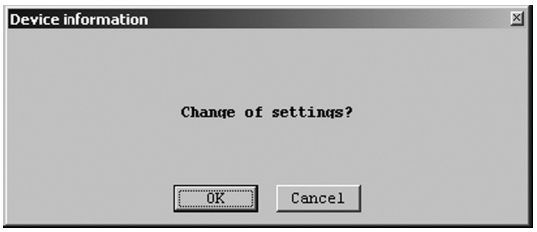


Fig.64

⑥ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 65) to complete the setting process.

Fig.65

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 .

3.6.6 Converter display settings (LCD)

3.6.6.1 Display order settings (Var. priority)

① Click the "Setup (S)" menu, and then select and click "Var. priority" from the "LCD" drop-down list.

② The following window will be displayed (Fig. 66). Set the order to be used for displaying measurement values on the LCD here.

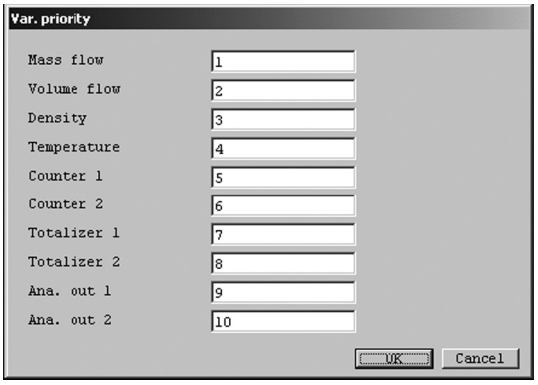


Fig.66

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. 67).

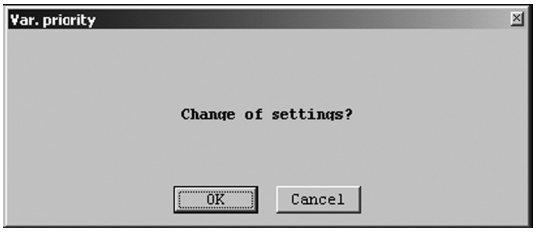


Fig.67

⑤ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 68) to complete the setting process.

Fig.68

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 .

3.6.6.2 Display update frequency setting (Refresh LCD)

① Click the "Setup (S)" menu, and then select and click "Refresh LCD" from the "LCD" drop-down list.

② The following window will be displayed (Fig. 69). Set the display update frequency for displaying measurement values on the LCD here.

Fig.69

③ Click the triangle on the right side of "Refresh LCD" as shown in Fig. 70, and select the frequency to set from the drop-down list.

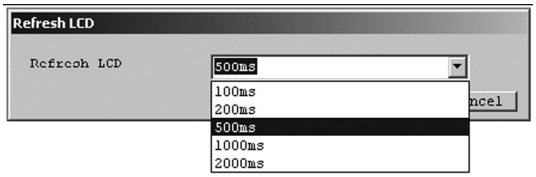


Fig.70

④ After the setting is complete, click the "OK" button to display a message box (Fig. 71).

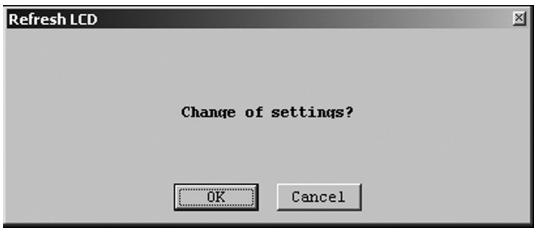


Fig.71

⑤ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 72) to complete the setting process.

Fig.72

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 .

3.6.6.3 Display character size setting (Font)

① Click the "Setup (S)" menu, and then select and click "Font" from the "LCD" drop-down list.

② The following window will be displayed (Fig. 73). Set the size of characters to be used for measurement values displayed on the LCD here.

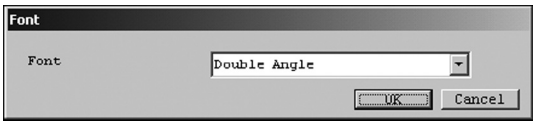


Fig.73

③ Click the triangle on the right side of "Font" as shown in Fig. 74, and select the font to set from the drop-down list.

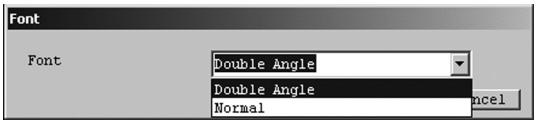


Fig.74

④ After the setting is complete, click the "OK" button to display a message box (Fig. 75).

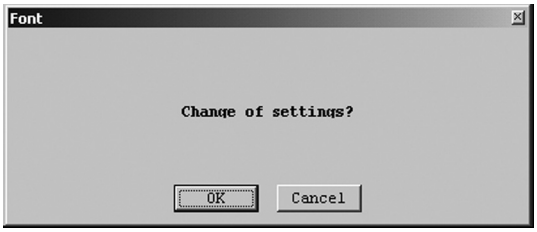


Fig.75

⑤ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 76) to complete the setting process.

Fig.76

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 .

3.6.6.4 Measurement value decimal point position settings (Decimal)

① Click the "Setup (S)" menu, and then select and click "Decimal" from the "LCD" drop-down list.

② The following window will be displayed (Fig. 77). Set the decimal point position to be used for measurement values displayed on the LCD here.

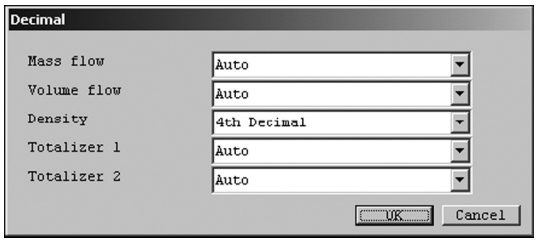


Fig.77

③ Click the triangle on the right side of each item as shown in Fig. 78, and select the decimal points to set from the drop-down lists.

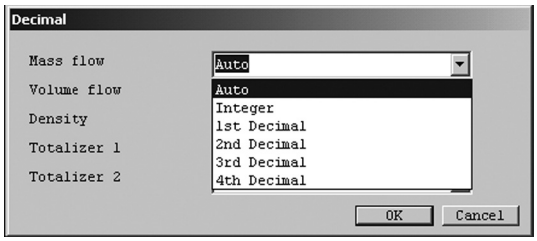


Fig.78

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 "4th Decimal" for just "Density", and "Auto" for everything else.

⑤ After all settings are complete, click the "OK" button to display a message box (Fig. 79).

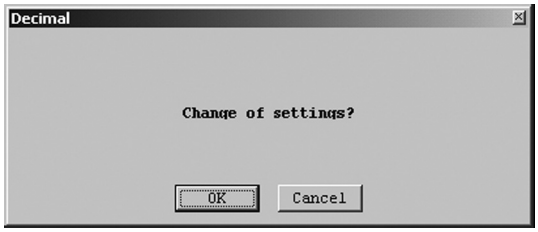


Fig.79

⑥ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 80) to complete the setting process.

Fig.80

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 .

3.6.6.5 Display backlight time setting (Back light)

① Click the "Setup (S)" menu, and then select and click "Back light" from the "LCD" drop-down list.

② The following window will be displayed (Fig. 81). Turn the back light on or off here, and set the length of time on.

Fig.81

③ Click the triangle on the right side of "Back light" as shown in Fig. 82, and select the time to set from the drop-down list.

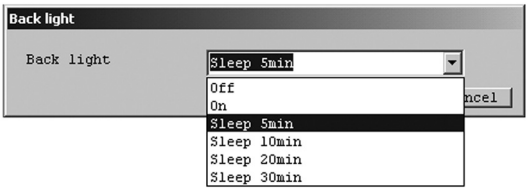


Fig.82

④ Set the amount of time to keep the display screen's back light on here.
- "Off": Back light remains in the off state.
- "On": Back light remains in the on 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" or "On" is selected.

⑤ After the setting is complete, click the "OK" button to display a message box (Fig. 83).

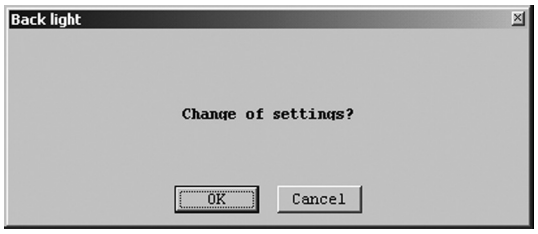


Fig.83

⑥ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 84) to complete the setting process.

Fig.84

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 .

3.6.6.6 Display contrast setting (Contrast)

① Click the "Setup (S)" menu, and then select and click "Contrast" from the "LCD" drop-down list.

② The following window will be displayed (Fig. 85). Set the contrast of displayed dots here.

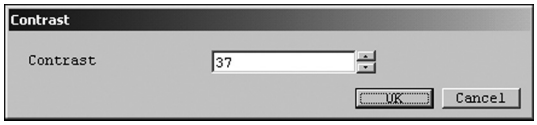


Fig.85

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. 86).

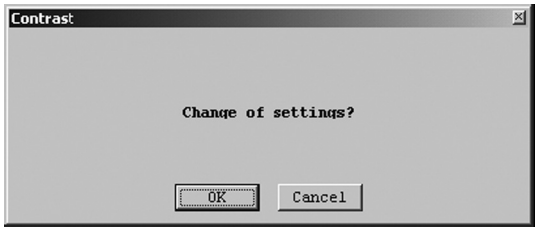


Fig.86

⑤ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 87) to complete the setting process.

Fig.87

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 Converter key settings (Key)

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

② The following window will be displayed (Fig. 88). Set the sensitivity of converter keys and other items here.

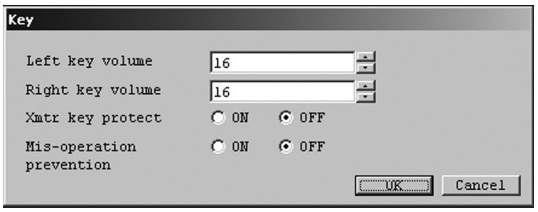


Fig.88

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 converter's left-side keys.
- "Right key volume": Sensitivity setting for the converter's right-side keys.
- "Xmtr key protect": Function for restricting the modification of parameters from the converter side.
- "Mis-operation prevention": Function for preventing erroneous converter key operations.

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

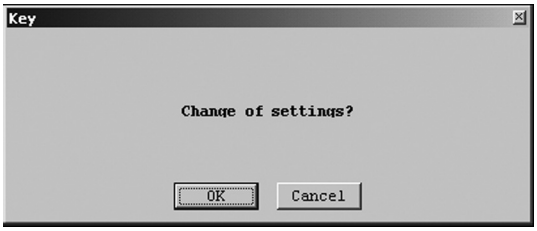


Fig.89

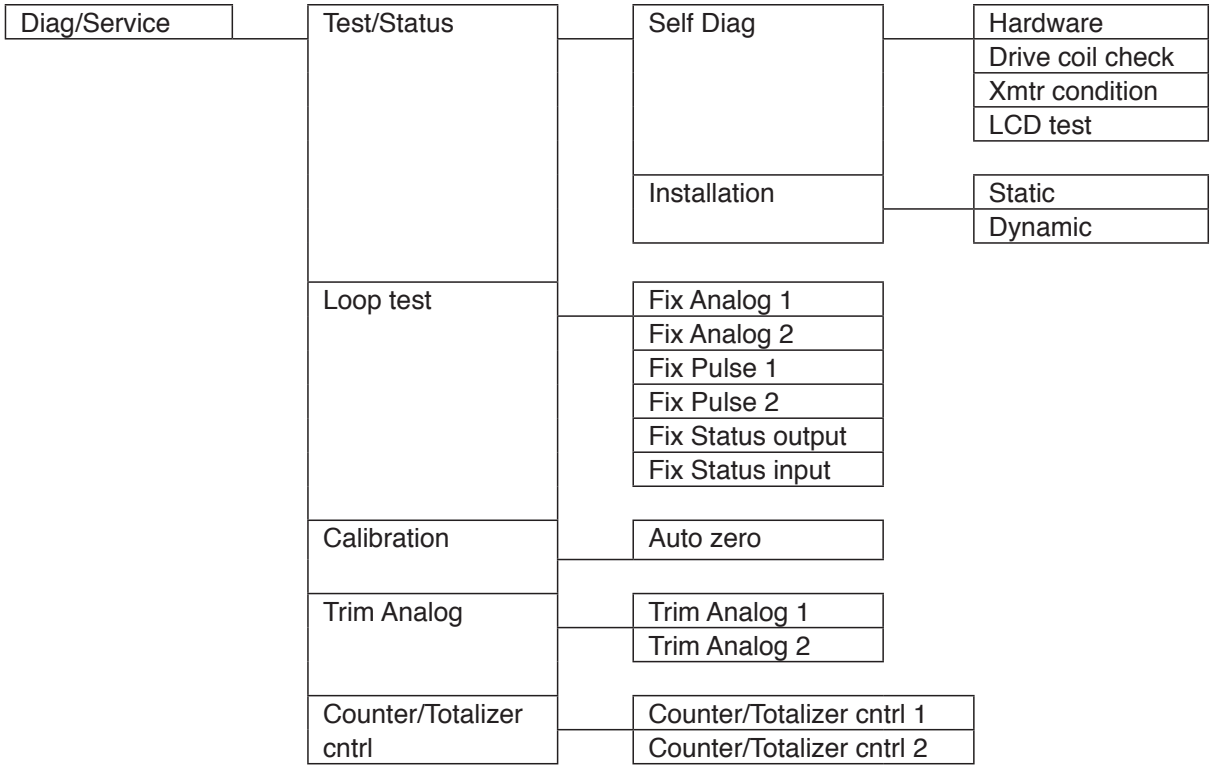
④ Click "OK" to change the settings to the inputted values, and then click the "OK" button in the displayed message box (Fig. 90) to complete the setting process.

Fig.90

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 .

3.7 Menu：Diag/Service (Checking and Adjustment)

"Diag/Service" can be used to diagnose the flowmeter converter, 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 "Diag/Service (T)" window cannot be displayed simultaneously with multiple windows (other than "Counter/Totalizer cntrl").
The actual screen is as shown in Fig. 91.



Diag/Service Item Tree

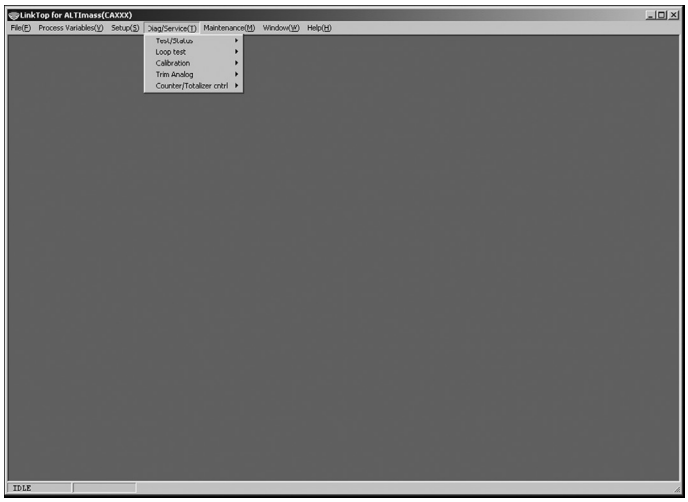


Fig.91

3.7.1 Converter self-diagnosis functions (Test/Status)

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

3.7.1.1 Self-diagnosis function 1 (Self Diag)

3.7.1.1.1 Hardware check (Hardware)

① Click the "Diag/Service (T)" menu, select "Self Diag" from the "Test/Status" drop-down list, and then click "Hardware" under that.

② The following window will be displayed (Fig. 92). This will check the hardware. Click "OK" after completely stopping the fluid.

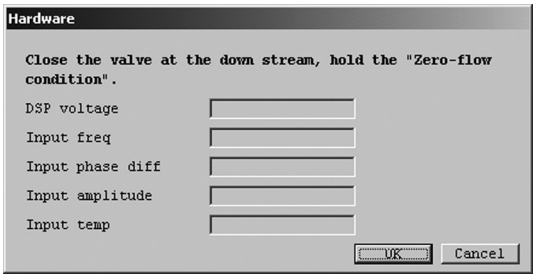


Fig.92

・"DSP voltage": Conducts a check of the internal DSP voltage for approximately 1 second.
・"Input freq": Conducts a check of the input frequency range for approximately 5 seconds.
・"Input phase diff": Conducts a check of the input phase difference range for approximately 1 second.
・"Input amplitude": Conducts a check of the input amplitude range for approximately 1 second.
・"Input temp": Conducts a check of the input temperature range for approximately 1 second.
These checks are performed in sequence, starting from the top. If there are no problems, then "OK" will be displayed. If there are problems, "NG" will be displayed.

③ Click the "OK" button to display a message box (Fig. 93).
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.

Fig.93

④ Click "OK" to execute the checks. Once they are finished, a message box (Fig. 94) will be displayed. Click the "OK" button to complete the hardware check.
The results are displayed as shown in Fig. 95.

Fig.94

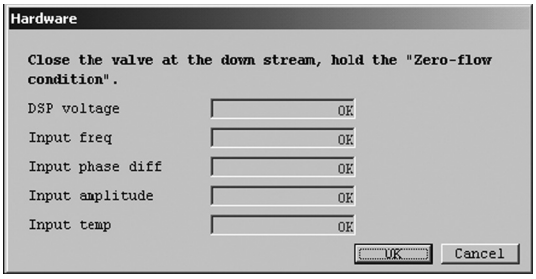


Fig.95

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 hardware check over again.

3.7.1.1.2 Drive resistance check (Drive coil check)

① Click the "Diag/Service (T)" menu, select "Self Diag" from the "Test/Status" drop-down list, and then click "Drive coil check" under that.

② The following window will be displayed (Fig. 96). This will check the drive resistance. Click "OK" after completely stopping the fluid.

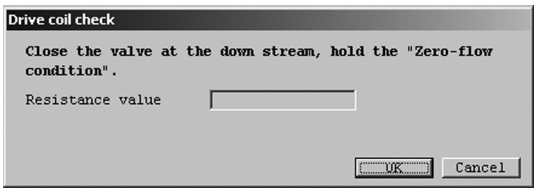


Fig.96

・"Resistance value": Checks the drive resistance for approximately 30 seconds.

③ Click the "OK" button to display a message box (Fig. 97).
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.

Fig.97

④ During the check, a progress bar will appear as shown in Fig. 98, allowing for the confirmation of the state of the check.

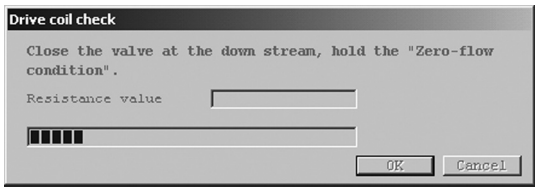


Fig.98

⑤ Click "OK" to execute the checks. Once they are finished, a message box (Fig. 99) will be displayed. Click the "OK" button to complete the hardware check.
The results are displayed as shown in Fig. 100.

Fig.99

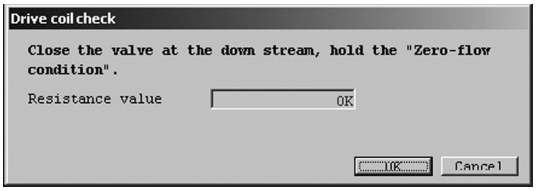


Fig.100

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 drive resistance check over again.

3.7.1.1.3 Converter internal state checks (Xmtr condition)

① Click the "Diag/Service (T)" menu, select "Self Diag" from the "Test/Status" drop-down list, and then click "Xmtr condition" under that.

② The following window will be displayed (Fig. 101). This will check the converter internal state.

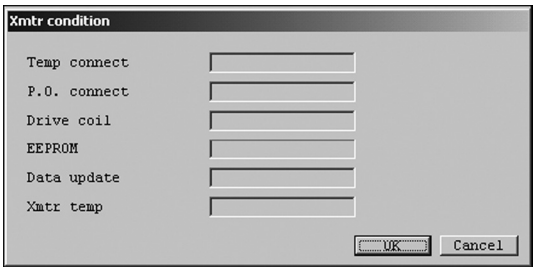


Fig.101

- "Temp connect": Conducts a check of temperature sensor connection for approximately 1 second.
- "P.O. connect": Conducts a check of the pick-off sensor connection for approximately 1 second.
- "Drive coil": Conducts a check of the drive resistance for approximately 5 seconds.
- "EEPROM": Conducts a check of the EEPROM for approximately 1 second.
- "Data update": Conducts a check of communication between CPUs to ensure that it is happening correctly for approximately 1 second.
- "Xmtr temp": Conducts a check of the converter internal temperature for approximately 1 second.

These checks are performed in sequence, starting from the top. If there are no problems, then "OK" will be displayed. If there are problems, "NG" will be displayed.

③ Click the "OK" button to display a message box (Fig. 102).
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.

Fig.102

④ Click "OK" to execute the checks. Once they are finished, a message box (Fig. 103) will be displayed. Click the "OK" button to complete the converter internal state check.
The results are displayed as shown in Fig. 104.

Fig.103

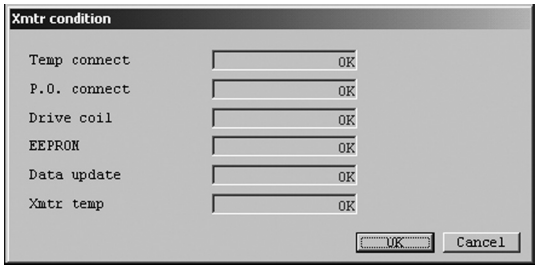


Fig.104

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 converter internal state check over again.

3.7.1.1.4 LCD test (LCD test)

① Click the "Diag/Service (T)" menu, select "Self Diag" from the "Test/Status" drop-down list, and then click "LCD test" under that.

② The following window will be displayed (Fig. 105). This will test the LCD.

Fig.105

・" Back light": Tests the back light. Shines white for 3 seconds, shines orange for 3 seconds, turns off for 3 seconds, and then repeats the process one more time.
・" LED": Tests the LED. Turns red and green on 1.5 seconds each, then turns them off for 1.5 seconds, and repeats the process five more times. Red and green are not turned on simultaneously.
・" LCD": Tests the LCD. Turns all dots on for 3 seconds, then off for 3 seconds, and then repeats the process one more time.

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

Fig.106

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 the "Diag/Service (T)" menu, select "Installation" from the "Test/Status" drop-down list, and then click "Static" under that.

② The following window will be displayed (Fig. 107). This will check the static device installation state. Click "OK" after completely stopping the fluid.

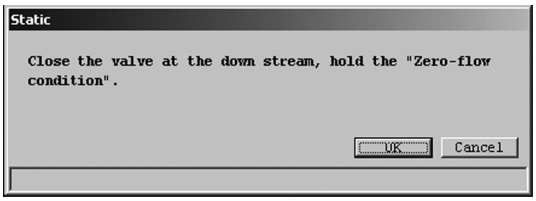


Fig.107

③ Click the "OK" button to display a message box (Fig. 108).

Fig.108

④ During the check, a progress bar will appear as shown in Fig. 109, allowing for the confirmation of the state of the check.

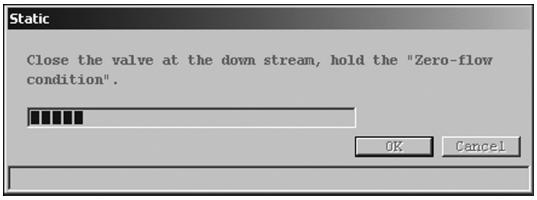


Fig.109

⑤ Click "OK" to execute the checks. Once they are finished, a message box (Fig. 110) will be displayed. Click the "OK" button to complete the static device installation state check.
The results are displayed as shown in Fig. 111.

Fig.110

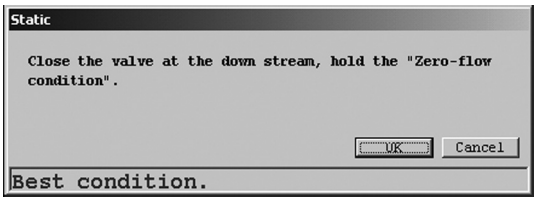


Fig.111

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": 25 or less
- "Good condition": More than 25 and equal to or less than 75.
- "Not so good condition": More than 75 and equal to or less than 150.
- "Bad condition": More than 150, or "P.O. Signal Alarm, 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 the "Diag/Service (T)" menu, select "Installation" from the "Test/Status" drop-down list, and then click "Dynamic" under that.

② The following window will be displayed (Fig. 112). This will check the dynamic device installation state. Click "OK" after completely stopping the fluid.

Fig.112

③ Click the "OK" button to display a message box (Fig. 113).

Fig.113

④ During the check, a progress bar will appear as shown in Fig. 114, allowing for the confirmation of the state of the check.

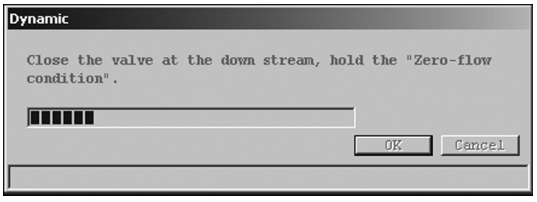


Fig.114

⑤ Click "OK" to execute the checks. Once they are finished, a message box (Fig. 115) will be displayed. Click the "OK" button to complete the dynamic device installation state check.
The results are displayed as shown in Fig. 116.

Fig.115

Fig.116

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):

- "Stable flow": 1000 or less.
- "Not so stable flow": More than 1000 and equal to or less than 2000.
- "Unstable flow": More than 2000, or "P.O. Signal Alarm, 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 in a state whereby it is not influenced by the flowmeter's output.

① Click the "Diag/Service (T)" menu, and then select and click "Fix Analog 1" from the "Loop Test" drop-down list.

② The following window will be displayed (Fig. 117). 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".

Click here and input a value to set any analog simulated output.

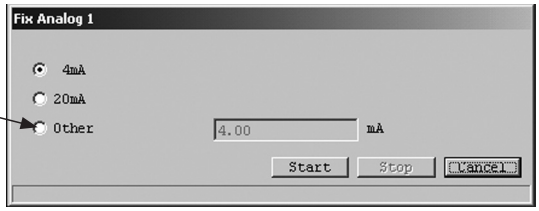


Fig.117

③ Click the "Start" button to display a message box (Fig. 118). Click the "OK" button to start "Fix Analog". Click the "Cancel" button to return to the window shown in Fig. 117.

Fig.118

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. 119.
Click the "Stop" button to halt the simulated output.

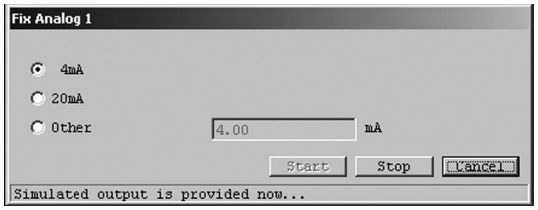


Fig.119

⑤ After the "Stop" button is clicked, a message box (Fig. 120) will be displayed. Click the "OK" button.

Fig.120

⑥ Clicking the "OK" button would return the interface to the window shown in Fig. 117, 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 in a state whereby it is not influenced by the flowmeter's output.

① Click the "Diag/Service (T)" menu, and then select and click "Fix Pulse" from the "Loop Test" drop-down list.

② The following window will be displayed (Fig. 121). 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 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.

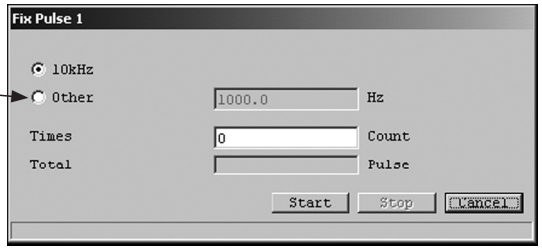


Fig.121

③ "Times" in Fig. 121 can be used to set any output time, and the system will output until the set time (the output time "Times" is equivalent to "Count" times 10.24 ms). "Total" is used to display the number of output pulses when a fixed number of output executions is reached.
This will not operate without input.

④ Click the "Start" button to display a message box (Fig. 122). Click the "OK" button to start "Fix Pulse".
Click the "Cancel" button to return to the window shown in Fig. 121.

Fig.122

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. 123.
Click the "Stop" button to halt the simulated output.

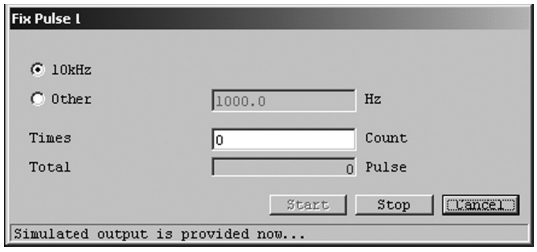


Fig.123

⑥ After the "Stop" button is clicked, a message box (Fig. 124) will be displayed. Click the "OK" button.

Fig.124

⑦ Clicking the "OK" button would return the interface to the window shown in Fig. 121, 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 in a state whereby it is not influenced by the flowmeter's output.

① Click the "Diag/Service (T)" menu, and then select and click "Fix Status output" from the "Loop Test" drop-down list.

② The following window will be displayed (Fig. 125). Select either "ON" or "OFF" for the simulated output state, and then click the "Start" button.

Fig.125

③ Click the "Start" button to display a message box (Fig. 126). Click the "OK" button to start "Fix Status output".
Click the "Cancel" button to return to the window shown in Fig. 125.

Fig.126

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. 127.
Click the "Stop" button to halt the simulated output.

Fig.127

⑤ After the "Stop" button is clicked, a message box (Fig. 128) will be displayed. Click the "OK" button.

Fig.128

⑥ Clicking the "OK" button would return the interface to the window shown in Fig. 125, so click the "Cancel" button to exit "Fix Status output".

3.7.2.6 Status input loop test (Fix Status input)

This displays the state of status input.

① Click the "Diag/Service (T)" menu, and then select and click "Fix Status input" from the "Loop Test" drop-down list.

② A window will appear as shown in Fig. 129, displaying the current state of status input, either "Short" or "Open". After verifying the state, click the "Cancel" button and exit "Fix Status input".

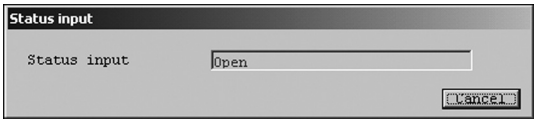


Fig.129

3.7.3 Converter adjustment function (Calibration)

This is an flowmeter converter adjustment function.

3.7.3.1 Automatic zero point adjustment (Auto zero)

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

① Click the "Diag/Service (T)" menu, and then select and click "Auto zero" from the "Calibration" drop-down list.

② The following window will be displayed (Fig. 130). Click the "OK" button after completely stopping the fluid.

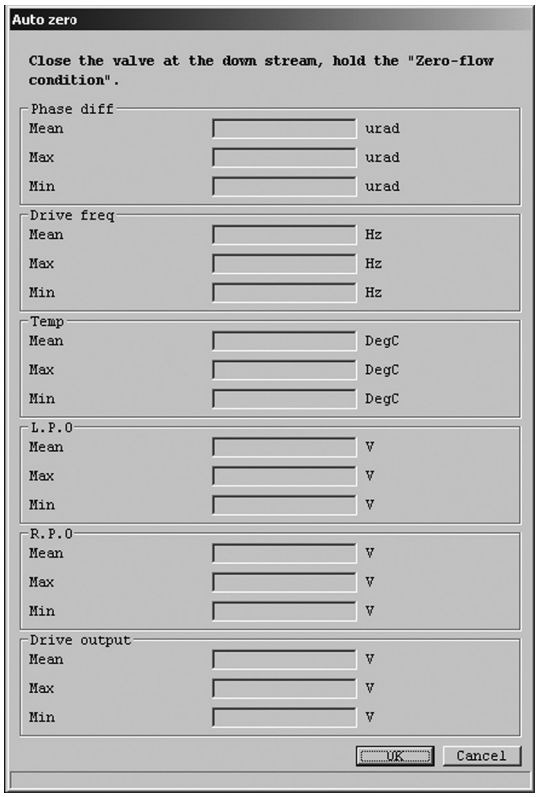


Fig.130

③ Click the "OK" button to display a message box (Fig. 131).

Fig.131

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. 132.

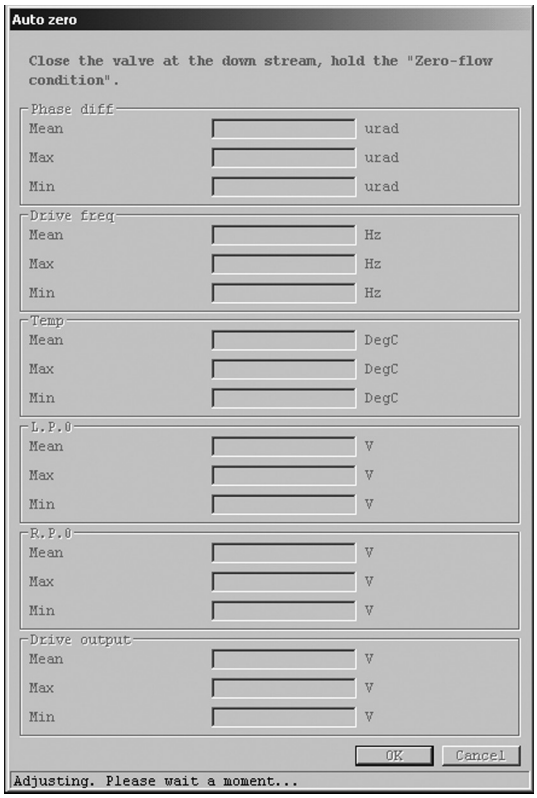


Fig.132

⑤ Click "OK" to execute the zero point adjustment, then click "OK" again in the message box (Fig. 133) displayed when adjustment is complete to exit automatic zero point adjustment.
The results are displayed as shown in Fig. 134.

Fig.133

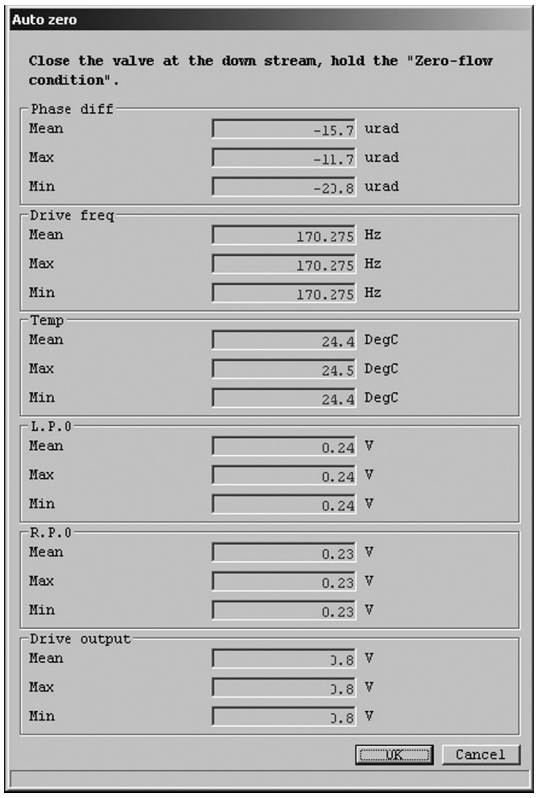


Fig.134

⑥ Click the "OK" button to return to the window shown in Fig. 132, then click the "Cancel" button to exit "Autozero".

> **⚠ CAUTION**
> **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.**

3.7.4 Analog output adjustment (Trim Analog)

This adjusts the output value of the flowmeter converter's analog output.
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 in a state whereby it 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 converter's analog output 1.

① Click the "Diag/Service (T)" menu, and then select and click "Trim Analog 1" from the "Trim Analog" drop-down list.

② A message box (Fig. 135) will be displayed. Click the "OK" button to adjust analog output 1.

Fig.135

③ The following window will be displayed after the "OK" button is clicked (Fig. 136). Select the scale from 4 to 20mA for adjusting analog 1, or select another scale (Other scale), then click the "OK" button.

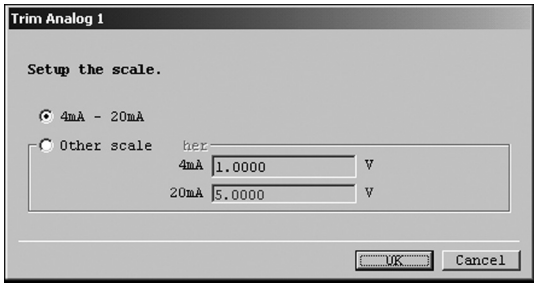


Fig.136

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 ⑦ .
When another scale is used, load resistance is inserted into the analog output 1 output loop, and adjustment follows the method described in steps ⑧ to ⑫ (this description covers the situation where R_L=250 ohms will be inserted, with adjustment to both ends of the voltage value scale of 1 to 5V).

④ Select "4mA to 20mA" from the window shown in Fig. 137 and click the "OK" button to display the window shown in Fig. 161. 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.

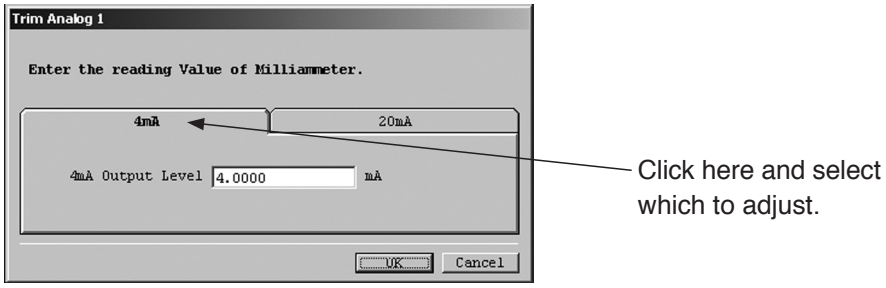


Fig.137

Once the value reading is sent, the converter 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. 137, 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. 138.

Fig.138

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. 136, another scale can be inputted as shown in Fig. 139. 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 a value into the second field. Inputting into the first field causes a value to be inputted into the second field as well.

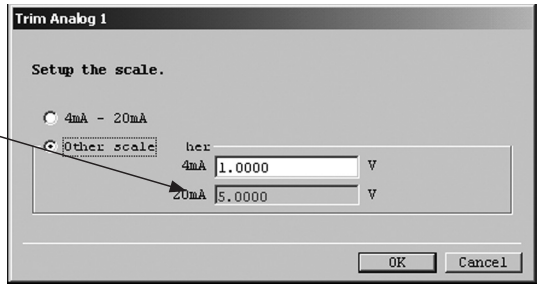


Fig.139

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. 140. 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.

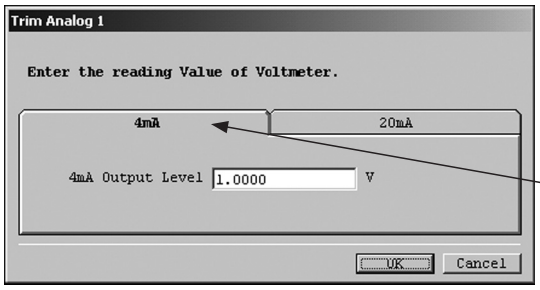


Fig.140

When a value reading is sent, the converter 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.

⑩ 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.

⑪ 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.

⑫ 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 converter'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 ⑫ .

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

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 cntrl 1)

① Click the "Diag/Service (T)" menu, and then select and click "Counter/Totalizer cntrl 1" from the "Counter/Totalizer cntrl" drop-down list.

② The following window will be displayed (Fig. 141).

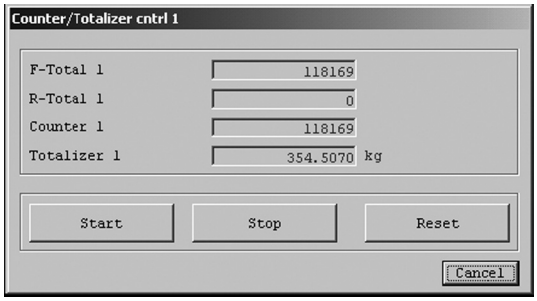


Fig.141

③ Cumulative totals include "F-Total", "R-Total", "Counter", and "Totalizer".

- "F-Total": This count is incremented whenever the flow goes in the direction set with "Flow direction" (the positive direction).
- "R-Total": This count is incremented whenever the flow goes in the reverse direction, if "Bi direction" is selected for "Status output func".
- "Counter": "Counter=F-Total − R-Total".
- "Totalizer": "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 "Reset" will cause the window to appear as shown in Fig. 142.

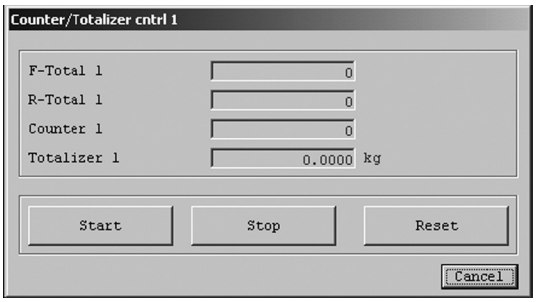


Fig.142

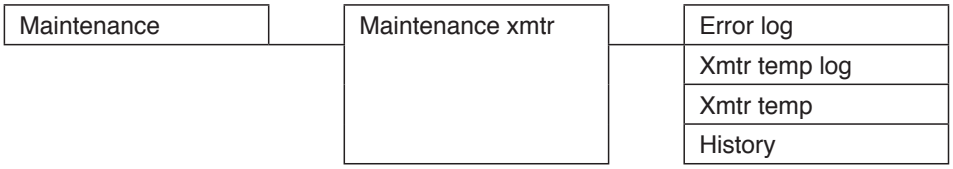
⑤ To close the cumulative total 1 display and control window, click "Cancel".

3.7.5.2 Cumulative total 2 display and control (Counter/Totalizer cntrl 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 ④ .

3.8 Menu: Maintenance

The "Maintenance (M)" menu can be used to display the current value and a log of the converter'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 converter has been running, display elapsed time, make settings, and so on.
The actual screen is as shown in Fig. 143.



Maintenance Item Tree

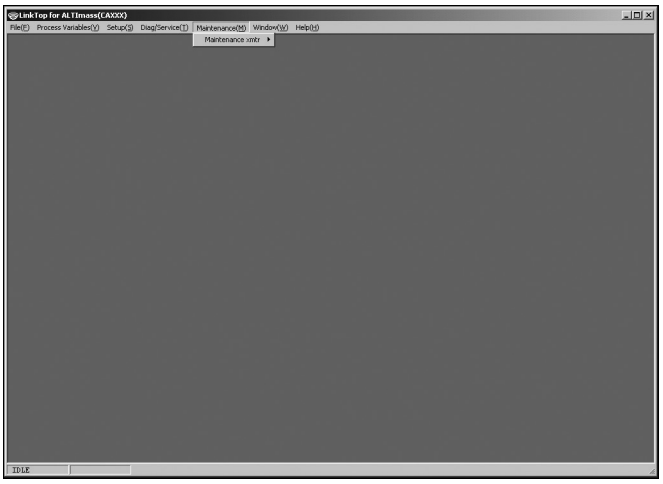


Fig.143

3.8.1 Log and converter internal temperature display (Maintenance xmtr)

3.8.1.1 Error log display (Error log)

① Click the "Maintenance (M)" menu, and then select and click "Error log" from the "Maintenance xmtr" drop-down list.

② The following window will be displayed (Fig. 144).

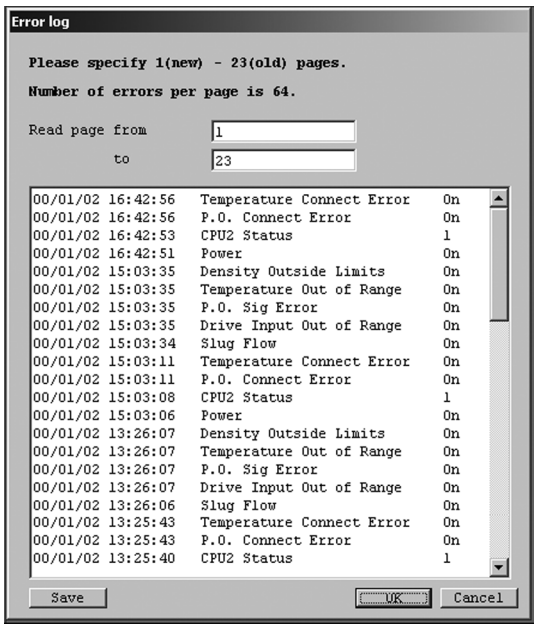


Fig.144

③ When the window is displayed, the 64 latest log entries will be shown. Input a value into "Input address" and click the "OK" button to display a message box (Fig. 145).

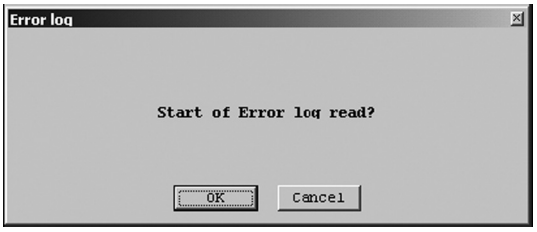


Fig.145

④ Click the "OK" button again to display the last 64 entries in the log corresponding to the "Input address".

⑤ "Current address" shows the address of the most recent log entry. To display the most recent log entry, input the "Current address" value into "Input address", or input "3000H".
To display past log entries, input values by subtracting "200H" at a time from "Current address".

⑥ It is also possible to save a log to a file here. Click the "Save" button to display Fig. 146, specify the save location and file name, and then click "OK" to create a CSV file, completing the save process.

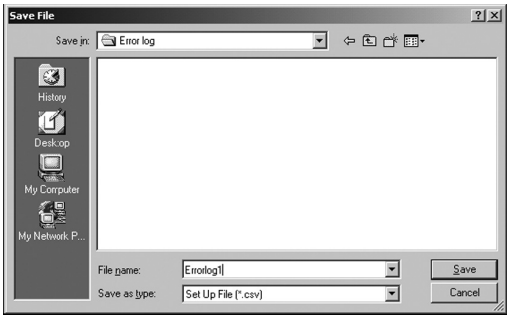


Fig.146

⑦ Click "Cancel" to close the "Error log" window.

3.8.1.2 Converter internal temperature log display (Xmtr temp log)

① Click the "Maintenance (M)" menu, and then select and click "Xmtr temp log" from the "Maintenance xmtr" drop-down list.

② The following window will be displayed (Fig. 147).

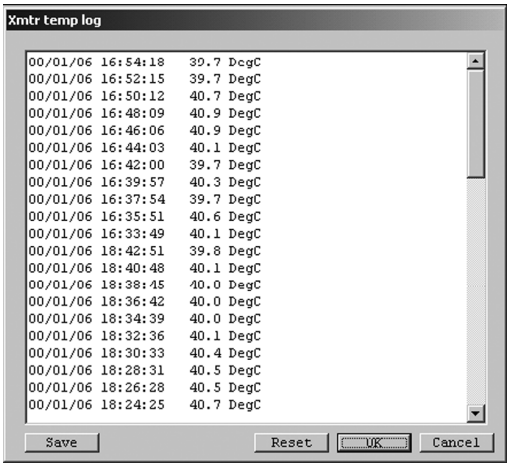


Fig.147

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 converter's internal temperature exceeds 90℃, then an "Xmtr 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. 148).

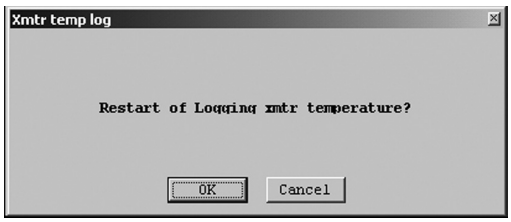


Fig.148

④ Click the "OK" button here to display a message box (Fig. 149) and resume the function for saving log entries.

Fig.149

⑤ Also, to display the most recent log entry, click the "OK" button in the screen shown in Fig. 147 to display a message box (Fig. 150).

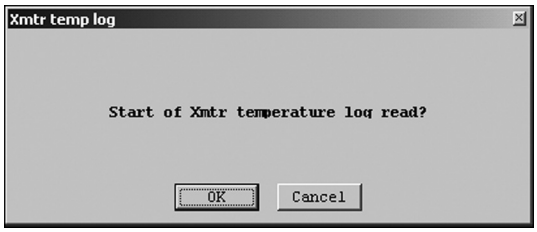


Fig.150

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. 151, specify the save location and file name, and then click "OK" to create a CSV file, completing the save process.

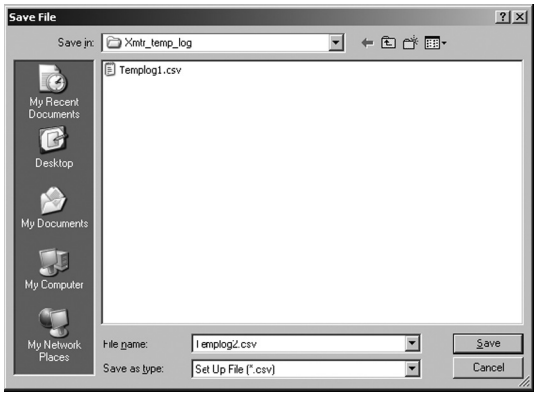


Fig.151

⑧ Click "Cancel" to close the "Xmtr temp log" window.

3.8.1.3 Converter internal temperature display (Xmtr temp)

① Click the "Maintenance (M)" menu, and then select and click "Xmtr temp" from the "Maintenance xmtr" drop-down list.

② A window such as the one shown in Fig. 152 will appear, displaying the converter's current internal temperature. After verifying the temperature, click the "Cancel" button to exit "Xmtr temp".

Fig.152

3.8.1.4 Converter elapsed time display (History)

① Click the "Maintenance (M)" menu, and then select and click "History" from the "Maintenance xmtr" drop-down list.

② The following window will be displayed (Fig. 153).

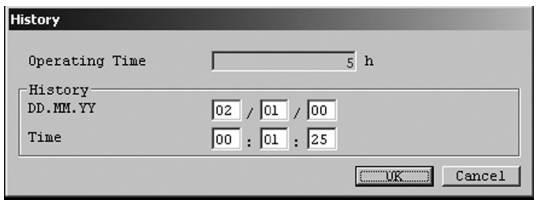


Fig.153

③ It is possible to display the total running time of the converter "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. 154).

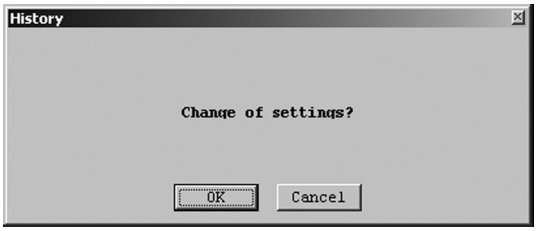


Fig.154

⑤ Click "OK" to change the settings to the selected values, and then click the "OK" button in the displayed message box (Fig. 155) to complete the setting process.

Fig.155

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 .

3.9 Menu: Window (Window)

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

The options for arranging windows are "Cascade", "TileHorizontal", and "TileVertical".

For instance, assume that multiple windows are being displayed on top of each other, as shown in Fig. 156.

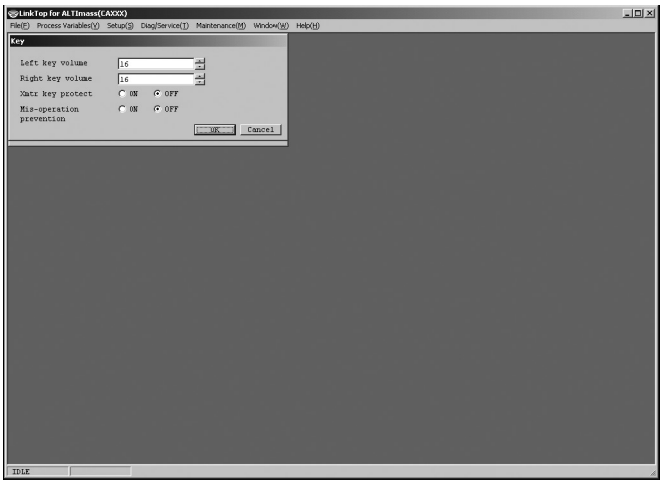


Fig.156

① Select "Cascade" to display these windows stacked, as shown in Fig. 157.

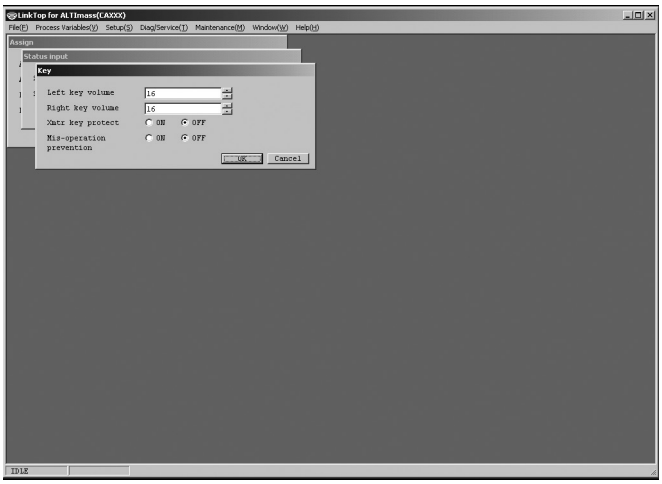


Fig.157

② Select "TileHorizontal" to display these windows lined up vertically, as shown in Fig. 158.

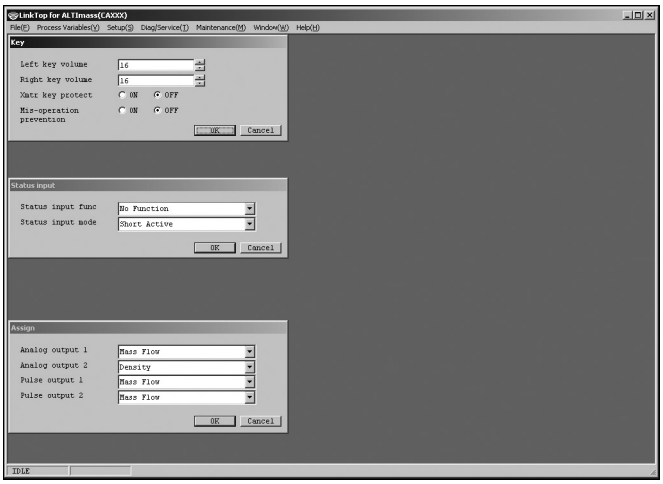


Fig.158

③ Select "TileVertical" to display these windows lined up horizontally, as shown in Fig. 159.

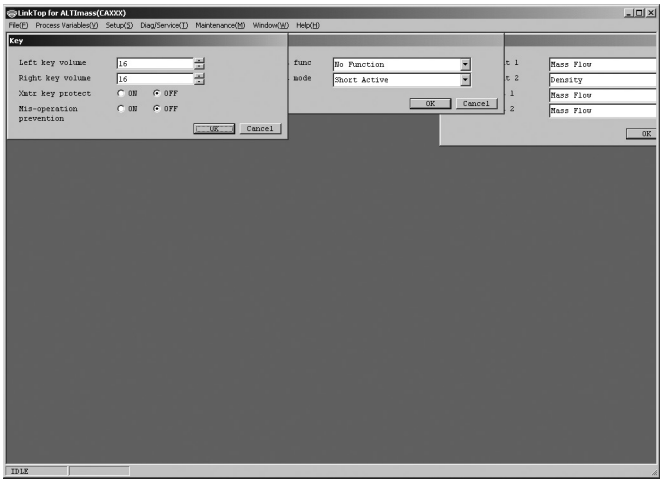


Fig.159

3.10 Menu: File (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 converter parameter database, and print parameters. This section describes the database and printing features.

3.10.1 Database

The various parameters, converter 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, floppy disk, or other type of storage medium.
Setting values can also be downloaded to the flowmeter converter.

3.10.1.1 Opening files

It is possible to load data from a saved file.

① Click the "File (F)" menu, and then select and click "Open File (O)" from the "Database (F)" drop-down list.

② The common dialog box (Fig. 160) 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.

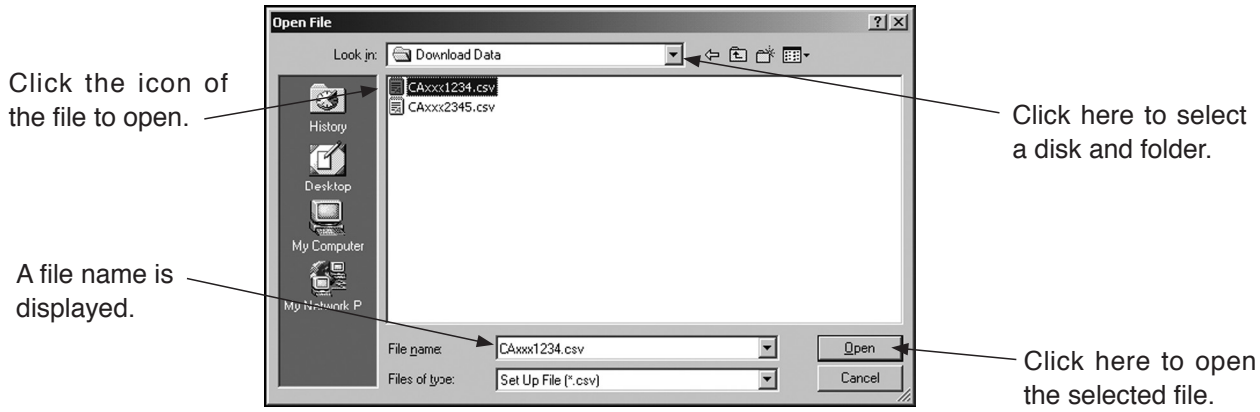


Fig.160

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 Saving files.

It is possible to save the data set in the flowmeter converter to a file.

① Click the "File (F)" menu, and then select and click "Save File (S)" from the "Database (F)" drop-down list.

② The common dialog box (Fig. 161) will be displayed. Select the disk and folder in which the data is to be stored from the drop-down list.

③ Input the name of the file to be saved and click the "Save (S)" button.
This completes the file saving process.
If you select the wrong location for storing the file, click the "Cancel" button and start over.

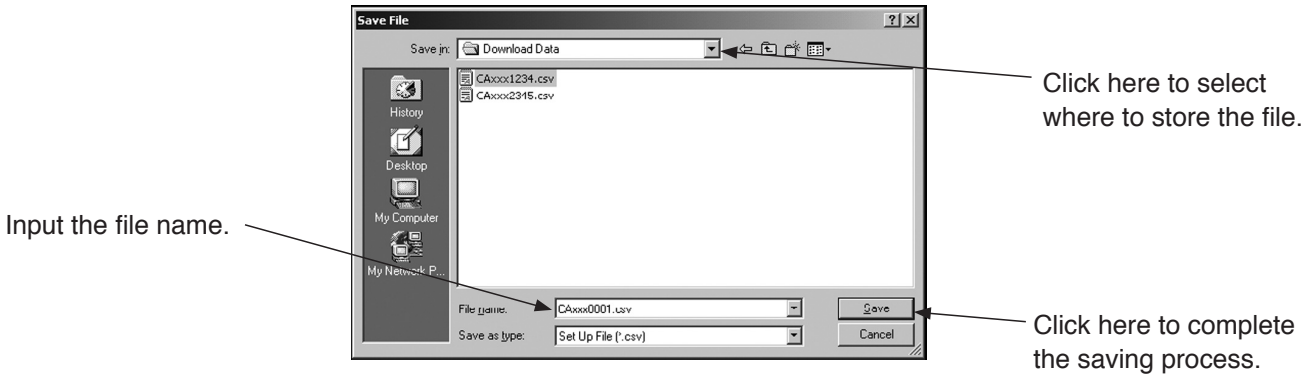


Fig.161

3.10.1.3 Deleting files

It is possible to delete data files that are no longer necessary.

① Click the "File (F)" menu, and then select and click "Delete File (X)" from the "Database (F)" drop-down list.

② The common dialog box (Fig. 162) will be displayed. Select the disk and folder in which the file to be deleted is stored from the drop-down list.

③ Select the file to delete by clicking it. Verify the "File Name (N)" and click the "Open (O)" button. To exit without deleting the file, click the "Cancel" button.

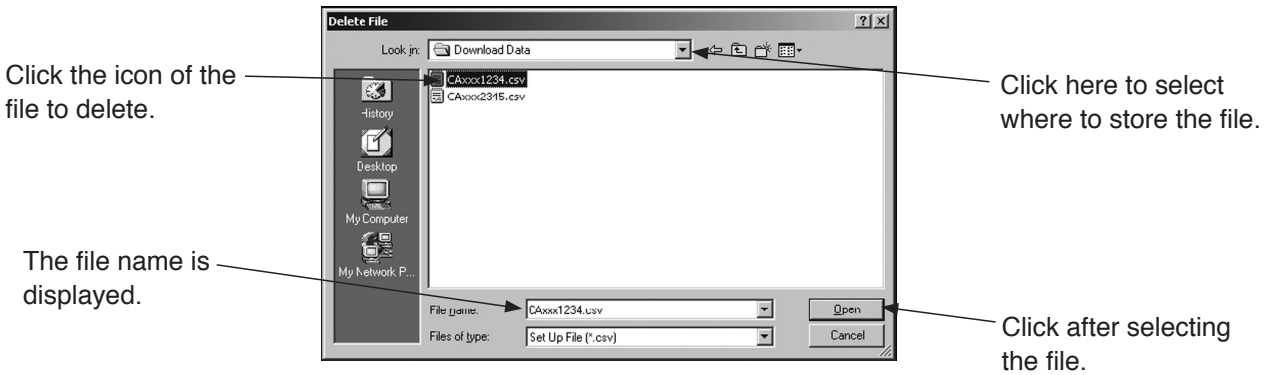


Fig.162

④ After the click, the selected file will open, and a message box (Fig. 163) will be displayed. To delete, click the "Yes (Y)" button. To not delete, click the "No (N)" button. After the "Yes (Y)" button is clicked, the file will be deleted.

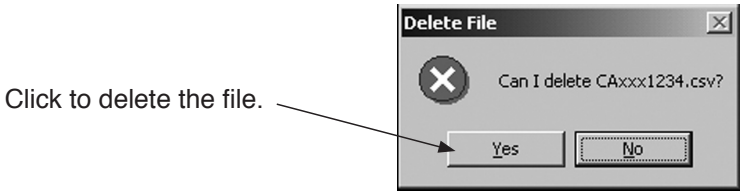


Fig.163

3.10.1.4 Downloading

This function is used to send all the parameters from a selected file to the flowmeter converter. This makes it possible to use the same parameters to set up another flowmeter converter (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 3.10.1.2 "Saving files".

② After verifying the flowmeter, load the data to be downloaded.

③ Click the "File (F)" menu and select "Download (D)" from the "Database (F)" drop-down list.

④ The standard dialog will be displayed (Fig. 164). 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.

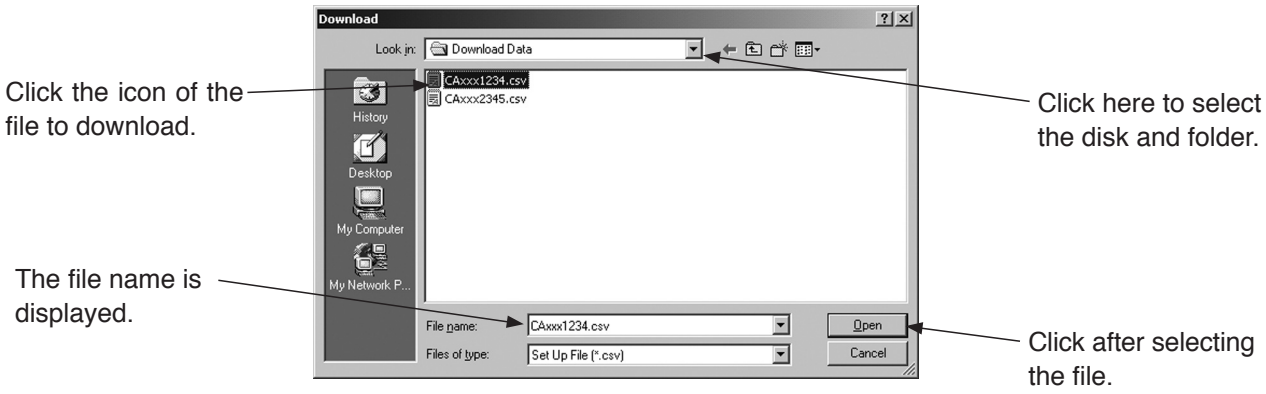


Fig.164

⑥ A message box (Fig. 165) will be displayed. Click the "OK" button to download the data to the converter.
To not download the data, click the "Cancel" button.

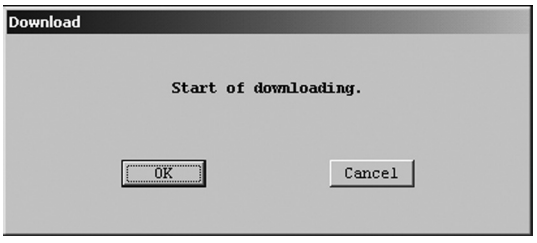


Fig.165

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 in a state whereby it is not influenced by the flowmeter's output.

⑧ After the "OK" button is clicked and the download starts, a message box (Fig. 166) will be displayed. It is possible to verify the state of download progress by watching the progress bar in the middle of the window.

Fig.166

⑨ Once the download is complete, a message box (Fig. 167) will be displayed. Click the "OK" button.

Fig.167

⑩ Verify the downloaded settings. Disconnect communications as described in section 3.3 "Ending the Connection".
Next, reconnect communications by following the instructions in section 3.2 "Starting and Connecting LinkTop". Verify that the settings have been changed to the downloaded settings by following the instructions in section 3.6 "Setup Menu (Settings)".

3.10.2 Printing

It is possible to print a table of the converter's setting parameters.

① Click the "File (F)" menu, and then select and click "Print Ctrl+P".

② The following window will be displayed (Fig. 168). Verify the various parameter values here, and either click the "Print" button to print, or the "Close" button to not print.
To set the margins, input the value for the left margin and click the "Apply" button.

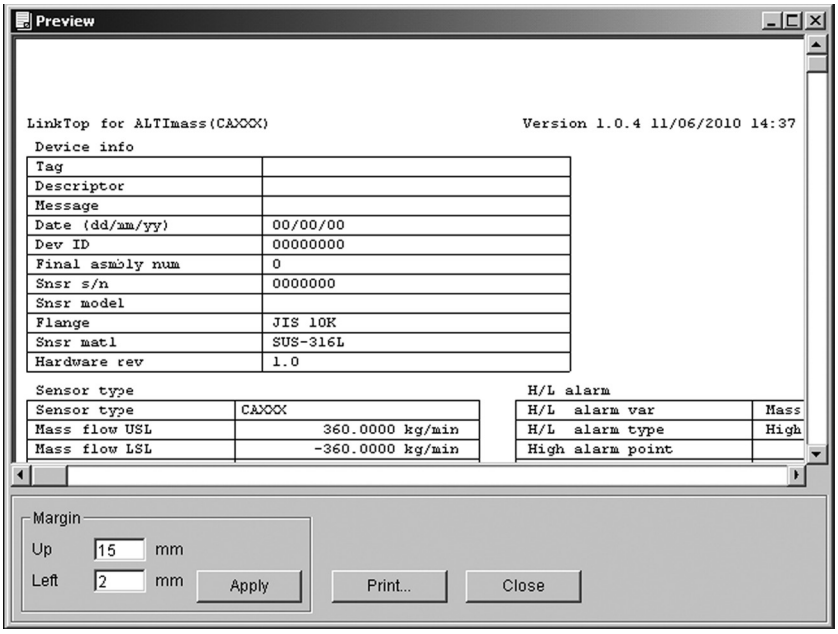


Fig.168

③ Once the "Print" button is clicked, a table will be printed as shown in Fig. 169.

④ The printer to use for printing can be set the items from the PC's "Start menu" → "Settings" → "Control Panel" → "Printers".

LinkTop for ALTImass(CAXXX)

Version 1.0.0 2010/01/14 11:34

Device info

Tag	
Descriptor	
Message	
Date	00年00月00日
Dev ID	00000000
Finale asmbly num	0
Snsr s/n	0000000
Snsr model	
Flange	JIS 10K
Snsr matl	SUS-316L
Hardware rev	1.0

Sensor type

Sensor type	CAXXX
Mass flow USL	360.0000 kg/min
Mass flow LSL	−360.0000 kg/min
Temperature USL	200.0 ℃
Temperature LSL	−200.0 ℃

Flow

Mass flow unit	kg/min
Vol flow unit	liter/min
Flow direction	Forward
Damp(Mass)	0.8 sec
Flow cutoff	0.000 %
Vol flow coef	1.00000

Density

Unit	g/ml
Damp	4.0 sec
Slug low limit	0.000 g/ml
Slug high limit	10.000 g/ml
Slug durattion	0 sec
Density compensation	OFF
Standard temp	20.00 ℃
Expansion coef	0.00024
Settled density	OFF
Density value	1.0000 g/ml

Temperature

Unit	℃
Damp	4.0 sec

Analog output 1

Assign	Mass Flow
URV	180.0000 kg/min
LRV	0.0000 kg/min
Lowcut	0.0 %
Added damp	0.0 sec

Analog output 2

Assign	Mass Flow
URV	180.0000 kg/min
LRV	0.0000 kg/min
Lowcut	0.0 %
Added damp	0.0 sec

Pulse output 1

Assign	Mass Flow
Freq factor	1000.00 Hz
Rate factor	180.0000 kg/min
Lowcut	0.0 %

Pulse output 2

Assign	Mass Flow
Freq factor	1000.00 Hz
Rate factor	180.0000 kg/min
Lowcut	0.0 %

Status input/output

Input function	No Function
Input mode	Short Active
Output function	No Function
Output mode	Off Active

H/L alarm

H/L alarm var	Mass Flow
H/L alarm type	High alarm
High alarm point	0.0000 kg/min
Low alarm point	0.0000 kg/min
H/L alarm hys	0.0000 kg/min

Error select

Sensor failure	OFF
Transmitter failure	OFF
Calibration failure	OFF
Saturated alarm	OFF
Parameter failure	OFF
Transmitter alarm	OFF
Slug flow alarm	OFF
Calibration in progress	OFF
Fixed output	OFF

Error output

Analog	Downscale
Pulse	Zero(0Hz)

Flow Cal

SK20	56.05967 MHz*kg/h
SKM	+1.000000E+0
SKt	+4.440000E−4
Cal temp	20.00 ℃
Cal freq	150.000 Hz
SKfa	+0.000000E+0
SKfb	+0.000000E+0
FKt	+4.220000E−4

Density parameters 1

Dens(Water)	0.99730 g/ml
Cal temp	20.00 ℃
Cal Freq	150.000 Hz

Density parameters 2

Freq coeff β	+0.000000E+4

Fig.169

3.11 Troubleshooting

3.11.1 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. 170. 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 converter receiving power?

Fig.170

3.11.2 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 converter not supported by this application software is connected, then the message box shown in Fig. 171 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 converter match the type of converter supported by the application software that is running?

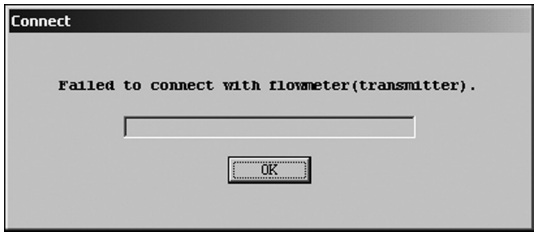


Fig.171

3.11.3 Input errors

If incorrect data is inputted into the "Menu: Setup (Settings) or the "Menu: Diag/Service (Checking and Adjustment)", and an attempt is made to communicate with the flowmeter converter, 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 converter, and the error is in the setting on the converter 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. 172 will be displayed. Click the "OK" button and correct the mistaken input.

Fig.172

② If a mistake is discovered in settings on the converter side after the setting items are inputted and the "OK" button is clicked, then the error box shown in Fig. 173 will be displayed. Click the "OK" button and correct the mistaken input. Also note that if an input error is discovered on the converter's side, then a message will be displayed with error details, so use this as a guide when correcting the input.

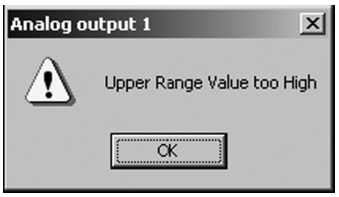


Fig.173

3.11.4 Error and status display list

Error List

Error Type	Name	Details	Resolution Conditions
Saturated Alarm	Analog Output 1 Saturated	The value of analog output 1 has exceeded the range that can be outputted, and cannot be outputted normally	Bring the value of analog output 1 within the range of -10 to 110%
	Analog Output 2 Saturated	The value of analog output 2 has exceeded the range that can be outputted, and cannot be outputted normally	Bring the value of analog output 2 within the range of -10 to 110%
	Pulse Output 1 Saturated	The value of pulse output 1 has exceeded 11kHz, and cannot be outputted normally	Bring the value of pulse output 1 under 11kHz
	Pulse Output 2 Saturated	The value of pulse output 2 has exceeded 11kHz, and cannot be outputted normally	Bring the value of pulse output 2 under 11kHz
Sensor Failure	Drive Input Out of Range	Drive frequency is outside the normal range and measurements cannot be taken normally	Bring the drive frequency within the lower and upper range limits
	Scale Over	The mass flow has exceeded 110% of the maximum allowed flow, and is in a state where it might not be possible to take measurements normally	Bring the mass flow under 110% of the maximum allowed flow
		The volume flow has exceeded 110% of the maximum allowed flow, and is in a state where it might not be possible to take measurements normally	Bring the volume flow under 110% of the maximum allowed flow
	Temperature Out of Range	Temperature has gone out of range 110% (-110%) of the maximum/ minimum temperature range, and is in a state where it might not be possible to take measurements normally	Bring the temperature (inner/outer) under the maximum allowed temperature +10%, and above the minimum allowed temperature -10%
	Density Outside Limit	Density is outside the normal range and measurements cannot be taken normally	Bring the density within the lower and upper range limits
	P.O. Sig Error (*1)	Pick-off signal voltage is outside the normal range and measurements cannot be taken normally	Bring the LPO and RPO voltage values within the range of 0 to the pick-off upper limit
	Temperature Connect Error (*1)	Cannot verify a normal connection with the temperature sensor	Bring the temperature resistance 1 to 3 measurements under the upper limit
	P.O. Connect Error (*1)	Cannot verify a normal connection with the pick-off sensor	Bring the LPO and RPO measurement resistance values under the upper limit
Xmtr Failure	EEPROM Error (*1)	An error occurred in writing to the EEPROM	Perform a master reset operation
	Data Update Error (*1)	An error occurred in internal data	Match the parameters between the main CPU and the DSP
Parameter Alarm	Analog 1 Set Alarm	An error occurred in the analog output 1 parameter setting values	Correct the analog output 1 parameter setting values
	Analog 2 Set Alarm	An error occurred in the analog output 2 parameter setting values	Correct the analog output 2 parameter setting values
	H/L Alarm Point Set Alarm	An error occurred in the H/L Alarm parameter setting values	Bring the High Alarm Point and Low Alarm Point settings within the range of the upper and lower limits
Calibration Failure	Auto Zero Failed	Auto Zero could not exit normally	Run Auto Zero again so that it exits normally, or turn the power off and back on again
Slug Flow	Slug Flow Alarm	A measurement value error is suspected to be due to the interfusion of air bubbles	Change the Slug duration time or the upper and lower limits of the value, or bring the density within the range of the Slug upper and lower limits
Xmtr Alarm	Xmtr Temperature Alarm	An error occurred due to an abnormal temperature of the converter internal	Bring the converter's internal temperature within the range

(*1) If this error occurs, contact our sales office or the distributor.

Status List

Status Type	Name	Details	Resolution Conditions
Fixed Output	Analog Output 1 Fixed	Executing analog output 1 fixed output	When analog output 1 fixed output ends
	Analog Output 2 Fixed	Executing analog output 2 fixed output	When analog output 2 fixed output ends
	Pulse Output 1 Fixed	Executing pulse output 1 fixed output	When pulse output 1 fixed output ends
	Pulse Output 2 Fixed	Executing pulse output 2 fixed output	When pulse output 2 fixed output ends
	Status Output Fixed	Executing status output fixed output	When status output fixed output ends
	0% Signal Lock	Executing 0% Signal Lock from status input	When 0% Signal Lock from status input ends
Calibration in Progress	Calibration in Progress	Executing Auto Zero	When Auto Zero ends
H/L Alarm	H/L Alarm Triggered	・H/L Alarm set for Status Output func ・High Alarm or H/L Alarm set for H/L Alarm type, and the measurement value set for H/L Alarm Assign is High Alarm point or higher ・Low Alarm or H/L Alarm set for H/L Alarm type, and the measurement value set for H/L Alarm Assign is Low Alarm point or lower H/L Alarm occurs when any of the conditions described above are met	・When something other than H/L Alarm is set for Status Output func ・If High Alarm or H/L Alarm is set for H/L Alarm type, and the measurement value set for H/L Alarm Assign is High Alarm point - H/L Alarm hys or lower ・If Low Alarm or H/L Alarm is set for H/L Alarm type, and the measurement value set for H/L Alarm Assign is Low Alarm point + H/L Alarm hys or higher The alarm is cleared when the above conditions are met
Maintenance	Self Diagnosis	Conducting self-diagnosis	Self Diag - Hardware Self Diag - Drive coil check Self Diag - Xmtr condition Self Diag - LCD test When the diagnosis type in the above list ends
	Installation	Executing installation	Installation - Static Installation - Dynamic When the installation type in the above list ends
Xmtr Operation	Xmtr Operating－Time Over	Maximum operating time exceeded (operating time is in excess of 100,000 hours)	When the master reset is executed
	Xmtr Warm Up	Converter warming up (when power is turned on)	When 20 minutes passes after power is turned on
	Power OK?	(When the previous time between power on and off is under three seconds, ten times in a row)	When 20 minutes passes after the last time power is turned on

4. PRODUCT CODE EXPLANATION

Item	Product Code												Description
	①	②	③	④	⑤	⑥	–	⑦	⑧	⑨	⑩	⑪	⑫	
Mode	E	L	2	3	1	0	—							Smart Communication Unit
Power source								0						Always "0"
Applicable flowmeter (application software)									8					OVAL Coriolis Flowmeter ALTImass (PA0K Transmitter)
Language										0				Less application software ("0" in the 8th digit)
										J				Japanese (Japanese version OS)
										E				English (English version OS)
Interface											0			Less interface (application software only)
											1			Interface provided
Media (application software)												0		Less application software ("0" in the 8th digit)
												1		CD — ROM
												9		Other than the above
Reserve code													0	

5. GENERAL SPECIFICATIONS

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

➡ Notes : ※ 1 Requires installation of a dedicated software. (Driver software is contained in the supplied LinkTop CD-ROM.)

※ Required PC specifications (operating environment)

- PC/AT compatible (DOS/V machine)
- OS: Windows 2000, Windows XP (compatible with Japanese or English version)
  Application software (LinkTop) is available in Japanese OS or English OS version.
- RAM: 1GB or larger.
- Hard disk: 10MB or larger
- Provision of USB port

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2011.12 Revised △
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OVAL Corporation

Head Office: 10-8, Kamiochiai 3-chome, Shinjuku-ku, Tokyo, Japan
Phone. 81-3-3360-5121 Fax. 81-3-3365-8605